

The Impact of
Wider Integration
of Data Analytics
and Automation on
Manpower in the
Singapore Financial
Services Sector



EY

Building a better
working world

Contents

03		
1. Preface		
04		
2. Executive Summary		
10		
3. Methodology		
	4. Findings	18
	4.1 Banking	18
	4.2 Asset Management	80
	4.3 Insurance	101
	4.4 Enterprise	124
	4.5 New and Emerging Roles in Financial Services	158
	5. Potential Interventions	162
	6. References	170
	7. Appendix	174
	7.1 Job Dashboards	175
	7.2 Industry Participants	289
	7.3 Skills Taxonomy	290
	8. Contacts	293



1. Preface

EY Singapore was commissioned by the Institute of Banking and Finance (IBF) and the Monetary Authority of Singapore (MAS) to conduct a study on “The Impact of Wider Integration of Data Analytics and Automation on Manpower in the Singapore Financial Services Sector”.

While there are many factors impacting the landscape of the financial services sector in Singapore, this study focused on what the impact will be on future workforce – in the next three to five years – due to data analytics and automation. By looking at job roles and job tasks across financial services, the study sought to gain a better understanding of the extent to which job roles will be impacted and how job tasks will look like in the future. A skills analysis was also conducted to understand the additional skills that will be necessary to meet the demands of jobs in the future.

2. Executive Summary

Key findings from the impact study

Billions of dollars are being invested in data analytics and automation capabilities in financial services globally. These investments promise to enhance competitive positioning, generate cost savings, enhance operating efficiencies, and streamline compliance procedures. While organisations and individuals recognise that change is coming, it is not clear when it will happen or what the changes will entail. Consequently, organisations are looking at roles (and more specifically, tasks within roles) to proactively prepare for changes as a result of data analytics and automation.

The rise of data analytics and automation may not necessarily equate to a smaller aggregate workforce. As an example, when the sales and trading of stocks were disrupted by computerised trading almost two decades ago, the reduction in the number of traditional traders in investment banks in New York was offset by computer engineers to support the automated trading programmes. We have hypothesised that few job roles (if any) within financial services would be entirely displaced by automation, without the need for human oversight or intervention. At the same time, the converse is true, that few job roles would remain unchanged as a result of data analytics and automation. Job holders who have in-depth business knowledge about products, services and processes will add value to their organisations if they are able to focus on clients' needs as well as drive process improvements within the organisation.

Consequently, the composition and make-up of job tasks may evolve to reflect the transformation of roles as institutions start to use data analytics and automation more pervasively.

While this hypothesis follows history, the narrative across the industry has been divided. All questions pointed to the absence of clarity on how today's increase in data analytics and rise of automation will affect the financial services workforce in Singapore. To seek answers to this question, we worked with the industry over six months to examine the impact of three technology trends: Robotic Process Automation (RPA), Advanced Analytics, and Artificial Intelligence (AI) – on the job tasks performed by 121¹ job roles identified across front office, mid-office, back office, and enterprise functions in the financial services industry in Singapore. The job roles are level agnostic and the job role title is not linked to role hierarchy.

Of the 121 job roles, 40 job roles have been identified as being highly impacted – with the potential for convergence or displacement – as the range of job tasks performed by these roles are prone to automation (Exhibit 1).

Exhibit 1: High Impact Job Roles Across Subsectors

*Exists in Investment Banking and Private Banking

Retail and Corporate Banking		Asset Management	
<ul style="list-style-type: none"> ▶ Bancassurance Officer ▶ Branch Operations ▶ Branch Teller ▶ Business Assurance ▶ Credit and Loan Officer ▶ Credit Operations ▶ Customer Service/Call Centre Representative ▶ Fund Administrator 	<ul style="list-style-type: none"> ▶ Mortgage Specialist ▶ Product Sales – SME ▶ Relationship Manager – SME ▶ Transaction Banking Operations ▶ Transaction Processing Officer 	<ul style="list-style-type: none"> ▶ Client Service Office ▶ Fund Accountant ▶ Investment Performance Analyst ▶ Portfolio Assistant/Front Office Support ▶ Product Manager 	<ul style="list-style-type: none"> ▶ Post Trade Specialist ▶ Trade Support Specialist ▶ Trader (Buy-side) ▶ Transaction Processing Officer ▶ Transfer Agent/Registrar
Investment and Private Banking	Insurance	Enterprise	
<ul style="list-style-type: none"> ▶ Post Trade Specialist* ▶ Trade Support Specialist* ▶ Product Controller ▶ Remisier ▶ Trader ▶ Transaction Processing Officer* 	<ul style="list-style-type: none"> ▶ Claims Examiner (Retail) ▶ Contact Centre Representative ▶ New Business Operations Officer ▶ Policy Servicing Officer ▶ Underwriter (Retail) 	<ul style="list-style-type: none"> ▶ AML/CFT Transaction Surveillance ▶ Compliance Monitoring and Testing ▶ Trade Surveillance 	



Financial institutions (FIs) have to manage complex regulatory requirements in a variety of ways, including understanding how new and emerging technologies will be regulated when the impact is currently unknown.

Throughout the study, we found that the impact of data analytics and automation was often articulated alongside three common narratives:

Moving away from silo functions...

The need to be increasingly agile is facilitating a shift toward more cross-functional teams and organisations. For example, some of the cross-disciplinary collaborations cited were:

- ▶ The development of trading algorithms in investment banking requires a close working relationship between the Quant Analysts, Traders as well as Technology Specialists.
- ▶ Increasing collaboration between Data Scientists and compliance professionals to detect complex behavioural patterns, anticipate future crime schemes and predict emerging criminal behaviours.
- ▶ A retail Underwriter working with Data Analysts to leverage new data streams (i.e. wearable technology and sensors) and playing a more active role in product design, such as defining the core elements (e.g. rules and pricing frameworks) that are crucial for the development of standardised product architectures.

Role convergence, rather than elimination...

As automation technologies take over repetitive administrative tasks, some traditional jobs will be affected and the work performed by humans is likely to converge and evolve. For example,

- ▶ Surveillance jobs in compliance are expected to converge as a result of automation, and will be carried out by job holders who are capable of handling both trade and transaction monitoring. They will need to be reskilled in advanced digital acumen/literacy to understand how to operate new AI-enabled machines and in order to analyse and provide predictive insights.
- ▶ Similarly, as RPA is increasingly adopted to generate investment performance reports. The job role of an Investment Performance Analyst in Asset Management firms is likely to expand to include aspects of product development given their understanding of investment products.

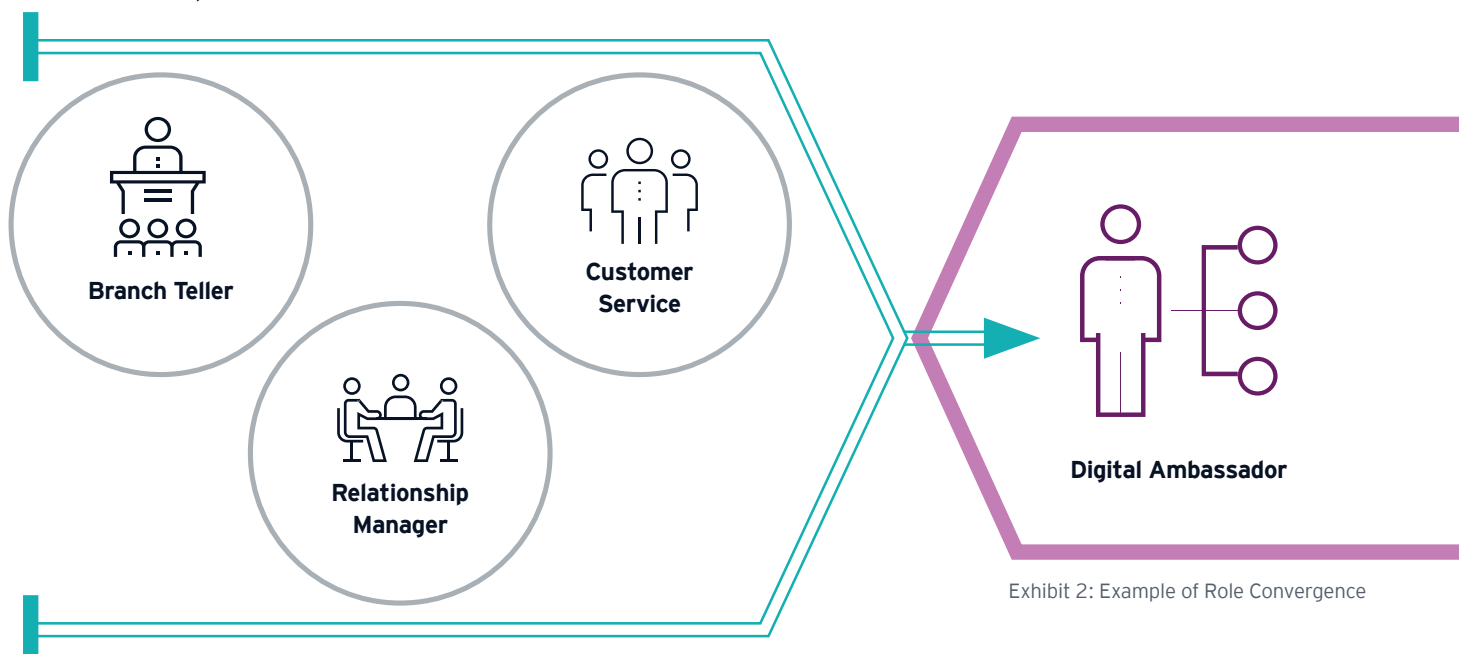


Exhibit 2: Example of Role Convergence

2. Executive Summary

- ▶ In retail banking, Unit Trust-Fund Administrators will likely see a convergence with other product sales roles as Advanced Analytics and AI provide greater and faster insights into the customer needs and purchase appetite. This will require job holders to reskill in data interpretation and analysis to be able to best draw insights from the data at hand and convert to actionable plans that can result in improved selling capabilities.

There will always be a role for human expertise, but the nature of roles is changing...

While AI-powered machines can outperform humans in many tasks, human expertise will remain critical. The ability to deliver creative and innovative solutions, for example, is beyond the reach of machines. Despite automation, there will be a need for oversight, results interpretation, and exception management/processing, which still require human intervention. For example,

- ▶ As AI and RPA are gradually adopted to streamline the claims management process, a Claims Examiner as a specialist, will shift focus towards performing ex-post checks to ensure the continued robustness of the process, complex claims assessment, fraudulent investigation, and liaise with forensics and claimants.
- ▶ The same applies to a Remisier. With the rise of online trading, the role will move from carrying out manual trade execution for clients to being a trusted advisor.

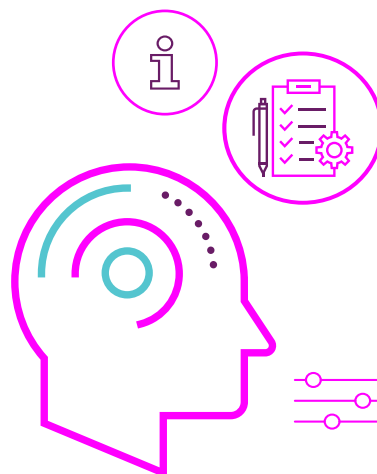
In the coming 3 to 5 years, it will remain critical for organisations to keep these factors in mind as they could potentially slow down or accelerate the degree of impact. As certain industry norms and/or regulations are formalised or changed, that will influence how job roles are impacted by data analytics and automation. It is important to note that data analytics and automation are not the only factors that could have an effect on future impact. Other factors were considered, however, given the focus and scope of the study around data analytics and automation, other factors were not explored in depth.

Through the discussions, industry also identified three key factors that could affect the pace and extent of the anticipated impact of data analytics and automation on job roles in the industry, namely, regulatory requirements on new and emerging technologies, legacy infrastructure, and ever-changing customer preferences/customer trust.

Fls have to manage complex regulatory requirements in a variety of ways, including understanding how new and emerging technologies will be regulated when the impact is currently unknown. This is proving to be a balancing act for Fls, as well as an example of encouraging innovation while maintaining organisational and personal security of data. Complexities exist in regulating the various parties involved in many of these processes.

Many Fls are still using core banking systems that were developed a few decades ago. As the business and the Fls grew, so did the number of systems required. The lack of synchronisation between these siloed systems has become a bottleneck for digital business transformation in some instances. Fls face an added complexity of having access to increasing amounts of data which theoretically should benefit the business, however, managing unstructured and unclear data is challenging. Fls therefore can only substantially benefit if they are able to harmonise and rely on the data quality to draw actionable insights.

Last but not least, **customers' preferences and trust play a big part in the implementation and adoption of data analytics and automation.** A study² conducted by EY reported that while customers agreed that having a digital presence is highly important for Fls, 60% thought that physical presence is absolutely vital as physical locations are perceived as a proxy for trustworthiness. For this reason, even though the impact of automation on job roles such as a traditional Branch Teller is high (mainly with the use of AI and digital applications) **the job role will remain relevant in the future in an evolved state** (Exhibit 2).



In an effort to proactively prepare the workforce for upcoming changes, we examined the skills and training investments that organisations will need to make concurrently with technology investments to ensure that they are able to fully benefit from the latter.

Key skills findings

Given the range of impact that will be seen across financial services due to data analytics and automation, **one of the best ways to prepare the prospective workforce will be to look at the future skill requirements** that will help job holders gain new capabilities or identify ways to enhance existing skill sets. The wide range of job roles within financial services means that for some, additional skills training will come as natural progressions in their roles, while for others, it may require a substantial shift in skills to be able to work alongside tasks that have been automated or to contribute in meaningful ways when data analytics provides more information than was previously available.

A key finding that emerged in the skills analysis is **as roles evolve, job holders will need to acquire new skills and be adaptable to changes** as the sector undergoes transformation. This means that to perform these future roles, job holders will need to be more fluid and agile to adjust to what is required in the industry. This, in part, is due to the increased collaboration that will be seen in the future amongst job roles, business units and ultimately across the organisation.

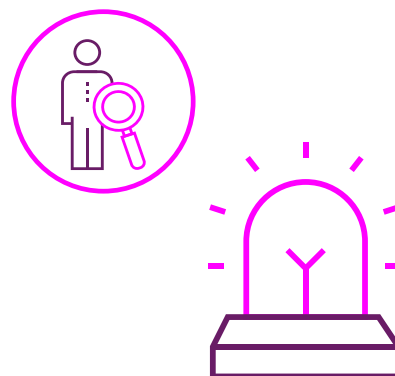
Job holders need to be adaptable to learn and re-learn skills

In the future, the ability to learn and re-learn skills will be vital. This adaptability will give job holders more opportunities across their organisation to develop and value add. As data analytics and automation is the main focus of the study, it is understandable that many of the future and emerging skills found here will be related to data, digital and technology. However, it is important to note that the rise of soft and business-related skills will be equally, if not more, important. While job role tasks can and will be affected, there is a human-centric element that will be necessary to realise the full potential of data analytics and automation.

Increasing product, service and solution complexity impacts skills required

A common finding across all of the subsectors is that as product, processes, services and client complexity increases, the nature of the skills required will look much more tailored to the given role and there will be a need to rely more heavily on human judgment for deep, bespoke insights. An example is in Private Banking, where portfolio and product development roles need to display the ability to connect the dots using all information available while applying personal judgment to deliver customised solutions or services to their stakeholders. While data analytics and automation is expected to augment certain job roles in this subsectors, ultimately the core of these will remain reliant on human interactions and the critical personalised touch with clients. Across financial services, as Advanced Analytics is more fully embedded in the organisation, FIs will move to more customer-centric views. This will result in products and services that will be customised at all levels of the wealth stream requiring a shift or rethinking by FIs on how to manage consumers of the future.

Another point to note is that roles that require deep domain and industry expertise will continue to need those specific skills even with the adoption of data analytics and automation. As an example, while research related roles and tasks can become more efficient when using RPA and AI to collect information, the actual task of insight generation and deriving meaning behind the data will continue to require human judgment and decision making.



2. Executive Summary

Risk awareness skills across multiple functions in the organisation

As FIs incorporate data analytics and automation within their organisations, new risks will emerge. Given that such initiatives are often undertaken in a decentralised manner, job roles that span the whole organisation will start to see the inclusion of risk management and risk awareness skills. This level of awareness will be necessary to conduct tasks with new software and tools that were previously unavailable. As FIs begin to explore and partner more frequently with Fintech, Insurtech and Regtech providers that can offer potential solutions, they will also require new methods of managing risks and the potential challenges that may arise. Therefore, it is important for job holders to understand the underlying risks and how to address or escalate these. This will require a general shift in the baseline to take a more proactive approach rather than a reactive stance toward risk.

Leveraging technology to its full potential

To achieve successful technology adoption, humans and technology must join forces to elevate each other's strengths rather than compete with each other. As an example, while technology focuses on processing mundane administrative tasks, humans are needed to perform three key responsibilities: 1) define rules and train technology to perform selected tasks, 2) validate the outcomes of performed tasks, and 3) oversee the operations of automation systems to ensure smooth operations. In order to do this, the future workforce needs to understand how different technologies can be applied in their respective areas of work. This will result in the ability to bring together business knowledge and insights to be able to evaluate the validity of technology generated results and identify potential errors and omissions.

Elevating Data and Digital Skills

While “buying” and “co-creating” may offer short term solutions, there is a great need to focus on the elevation of data and digital skill sets across the broader workforce to ensure that the existing population is able to meet the needs of the industry. Individuals will need to adopt a growth mindset and be willing to learn new skills. This will create opportunities for individuals to increase the portability of their skill sets, identify new areas of interest and stay up to date with industry needs to remain employable. On the other hand, FIs can help to support individuals by providing opportunity for development, such as contributing to the design and implementation of fluid and future-focused learning roadmaps. FIs can also encourage their workforce to embrace newer and more complex skills - regardless of which position or area these job holders are in. Training providers, government and education institutions need to ensure they are providing the right materials to enable data and digital reskilling. Incorporating agile methodologies and flexible learning methods will make it easier for individuals to access learning at their convenience and mitigate possible challenges.

Build, buy, co-create

Given the future potential skills gaps, there is a range of recommendations put forth from the short to longer term future. In relation to skills development, organisations have shared that in the short term there is a need to ‘buy’ skills in order to accelerate capability development for growth in the organisation, as well as to ‘co-create’ and partner with third parties, in order to not lag behind in the digital journey or business opportunities. While Singapore is out to plug its skills shortages through development, this takes time, and roles such as Data Scientists are currently lacking in supply today. Hence, in the short term, partnerships and ‘buying’ of talent will enable business growth and also facilitates building internal capabilities, allowing for knowledge transfer and learning on the job.

In the medium term, it is important to build skills and be ready for the future in the workplace. As FIs digitalise and automate, having a workforce with the right blend of technical skills and 'human' skills is more important than ever before. Many FIs in Singapore recognise that there is a need to take steps and collaborate with education and learning institutions. This would allow FIs to ideate and plan for learning and development programmes that are tailored to their future needs.

Many FIs are also changing the way in which they are organised structurally, in order to allow for greater cross collaboration and cross learning to bridge or complement different skills in the organisation.

Moving forward

What will this new world of work look like? In a word – it will become more human. As featured in the quote below, this new world of work promises to “... unleash the power of human ingenuity.”

Such promise emerging from the industry's investments in data analytics and automation is nothing short of inspiring, but we cannot assume that such outcomes are predetermined. Challenges do exist, and proactive steps will be required to deliver this new world of work and ensure that the workforce is equipped for organisations to realise the full benefit of these investments.

“

As more and more work is done by machines, people can spend more time on other activities. Not just leisure and amusements, but also on the deeper satisfactions that come from invention and exploration, from creativity and building, and from love, friendship, and community... If the first machine age helped unlock the forces of energy trapped in chemical bonds to reshape the physical world, the real promise of the second machine age is to help unleash the power of human ingenuity.³

3. Methodology

Which technologies are driving change in financial services?

The advances in RPA, Advanced Analytics, and AI are making inroads in the workplace, shifting the nature of job roles in the financial services industry.⁴

The benefits in the near term will be derived from innovation based on RPA and Advanced Analytics. AI, on the other hand, could present game-changing opportunities

in the medium term (3-5 year mark). This section will dive deeper into these three key technology trends and look into the benefits of each and where this has already been adopted in Singapore.

Spotlight on the three technologies and its successful adoption in Singapore

Robotic Process Automation (RPA)



Advanced Analytics



Artificial Intelligence (AI)



Robotic Process Automation (RPA)

In recent years, RPA has evolved significantly to become an enterprise-grade technology that can lighten, if not eliminate manual processes with little subjective judgment. Today, FIs are taking advantage of RPA to generate many benefits, including:

Cost savings –

According to a study conducted by EY, with automated solutions that work 24/7, costs can easily be reduced by 50% for high-frequency tasks.⁶ With RPA supporting manual and high-frequency tasks, job holders can shift to focus on cognitive tasks.

Accuracy, quality, and consistency –

Manual processes are prone to human errors. With RPA in place, the damage to operations due to human errors can be avoided entirely. In addition, RPA provides consistency in performing tasks and is able to generate a full audit of process flows, actions and exceptions.

“

RPA involves using software robots to undertake operational tasks.⁵

Flexibility and scalability –

RPA is typically technology agnostic. They are compatible with in-house or third-party applications and can be deployed without expensive upgrades to legacy systems or risks around integration dependencies.

The wide adoption of RPA technology over the past few years in specific areas such as operations and back office functions where value can be gained through automating repetitive tasks, had allowed it to successfully progress from being proof of concept to being part of 'business as usual' activities.

The uptake will continue in the coming years to generate quick cost savings. However, organisations are aware that RPA serves as an interim solution, it is not capable of addressing root causes of process inefficiency. As process changes and other game-changing technologies, such as AI, start to pick-up and replace existing operations or systems, the industry believes that the value of RPA will diminish in the longer term.

Robotic Process Automation (RPA)

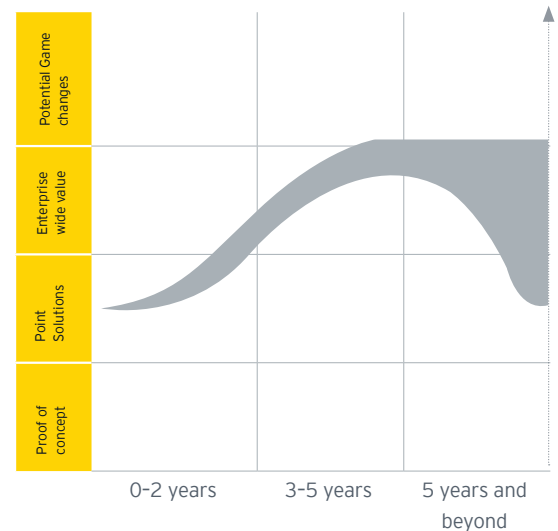


Exhibit 3: Benefit Trajectory for RPA

3. Methodology

Advanced Analytics

The term encompasses a series of techniques, for instance:

Behavioural analytics –

Examines how and why humans make decisions.

Sentiment analysis –

Discerns sentiment (i.e. positive, negative or neutral) from structured and unstructured data.

Data visualisation –

Encodes data and information as visual objects to ease the communication and presentation of insights, allowing audiences to grasp difficult concepts or identify new patterns effortlessly.

Text mining –

Analyses unstructured texts, and transforms them into useful insights.

Network and cluster analysis –

Applies statistical classification to cluster objects or points into group based on their characteristics.

Predictive analytics –

Develops understanding of the underlying relationship between input and outputs, analysing why something occurs, prior to determining future outcomes with greater confidence.

“

Advanced Analytics helps organisations gain more precise insights and make better decisions through the use of sophisticated tools and extensive data sets.⁷ Access to enriched information allows better predictions, and understanding of relationships between data to drive faster and more robust decision making.

In the era of increasing data availability and complexity, organisations are actively seeking to lift their analytics capabilities to create competitive advantage. Advanced Analytics is being used to solve specific problems in many FIs today. However, what remain as key challenges are sourcing, accessing and understanding enormous volumes of structured and unstructured data.

An EY study indicated that “the cost and complexity associated with sourcing and organising the data greatly exceeds the cost of the analytics engines themselves”⁸. Therefore, it is fair to assume that Advanced Analytics will start to deliver to its full potential value in the medium and long term – depending on the maturity and adoption of other data enablers, such as Application Programming Interfaces (API) and Cloud Computing.

Advanced Analytics

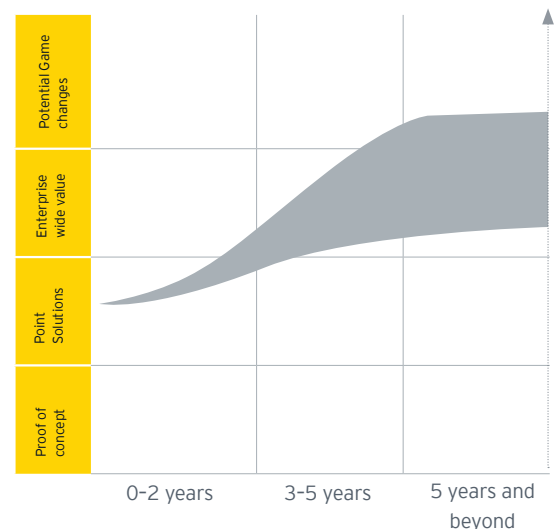


Exhibit 4: Benefit Trajectory for Advanced Analytics

Artificial Intelligence (AI)

The journey to build machines with human-level intelligences has been around for many decades. The recent growth in computing power with lower costs – combined with the availability and ability to analyse Big Data – has opened new opportunities for organisations.

There are many methods that can be applied, for instance:

Natural learning processing (NLP) –

Gives machines the ability to read and understand the language that humans write or speak.

Machine learning –

The development of computer algorithms that improve automatically through experience.

Deep learning –

A sub-field of Machine Learning, creates an “artificial neural network” and trains the machine to learn on its own to perform human-like tasks, such as recognising speech, making predictions, identifying images¹⁰ – simply through recognising patterns using layers of processing.

“

AI is a broad concept covering the theory and development of computer systems that is able to perform tasks that normally require human intelligence and capabilities, such as decision making, speech recognition and visual perception⁹.

As a further advancement to RPA to achieve greater efficiency, the use of AI and machine learning can be adopted to deduce business processes from transaction history and customer service logs. AI can aid in identification of the time taken for various steps of the process to be fulfilled, and track exceptions and compliance, thereby enabling greater efficiency with minimal or no human intervention.

Many leading FIs are aggressively seeking opportunities, either developing in-house capabilities (such as setting up innovation labs) or partnering with FinTechs to tackle specific challenges in areas including fraud detection, client engagement, investment research, and trading support.

With AI having such a broad range of applications, and being further enabled by increased computing power and improved data technologies, the use of AI in financial services will experience a steep hike in the near future.

Artificial Intelligence (AI)

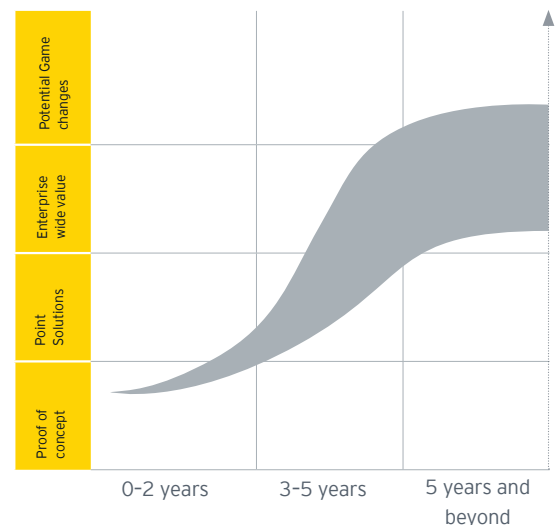


Exhibit 5: Benefit Trajectory for Artificial Intelligence

3. Methodology

How did we approach the study?

Our approach to analysing the impact of data analytics and automation utilised both quantitative and qualitative data.

What did we want to know?

The data sets paired with qualitative findings provided a robust basis for revealing the analysis for:

- 1) data analytics and automation's impact on nature of jobs,
- 2) magnitude of impact and potential timeline, and
- 3) future skills required to perform job roles as a result of data analytics and automation.

Phase 1: The impact study



>> 121

Job roles were identified to analyse the impact of data analytics and automation

How did we reliably answer the questions?

After defining the focus technologies, this study took a three-phased process to generate insights about the impact of data analytics and automation.

Phase 1, Part A: Identified relevant job roles by leveraging existing resources, including IBF standards, MAS Manpower Survey, and a financial services database of historical job postings data in Singapore, the United Kingdom (UK), United States (US), Canada and Australia. The combined data set—containing more than 7 million discrete data points—led to a preliminary set of job families and job roles within banking, capital markets, asset and wealth management, and insurance.

These job families and job roles were then validated with leading industry players across all subsectors to ensure a holistic coverage of roles, with the end result an agreed set of 121¹¹ job roles. Also included were initial recommendations for new roles emerging within financial services (e.g., Big Data Engineers).

Phase 1, Part B: With a validated set of job families and job roles in hand, a drill-down into the specific tasks was performed within each job role. These tasks were consolidated into three to five buckets in order to examine the impact of data analytics and automation on the consolidated tasks. Ultimately, the analysis outcomes supported the level of impact of each job role. The definitions of impact are as follows:

Outcome 1: High Impact

Convergence or Displacement

A. High impact: Convergence or Displacement

The Impact: The job role experiences high exposure to automation, jobs are at risk of convergence or displacement by automation. Automation and data analytics can result in multiple job roles converging into a single job role. In the case of displacement, automation and data analytics substitute a significant proportion of job tasks.

Characteristics of Job Roles: Transactional tasks that are of high volume, low decision-latitude, and with little control over organisation decisions, will be automated. In some

cases, automation coupled with data analytics could be used for problem resolution where responsive actions are required and there is little need for human judgment or advisory.

An Example: Life Insurance Claims Manager

RPA software extracts data from structured and unstructured documents such as forms and attachment files, and then correctly classifies, processes, validates, and integrates the data into core systems. AI (i.e. machine learning solutions) can then analyse all records and documents and recommend an outcome – approve, partial approve, or decline claims request. The same software can also determine a payout amount with only limited human intervention.

Outcome 2: Medium Impact

Augmentation

B. Medium impact: Augmentation

The Impact: Moderate exposure to data analytics and automation will enhance performance thus allowing individuals to deliver above and beyond what would traditionally be expected. Data analytics and automation substitute a small proportion of job tasks, and at the same time amplify human performance.

Characteristics of Job Roles: Repetitive and manual computational tasks such as data entry, form filling, and exchanging information through dynamic technological support are handled by RPA. Advanced Analytics are applied to structured and unstructured data to obtain

timely and more accurate insights to support human decision making or advisory obligations. Consequently, job holders can focus on value-adding areas and overall client experiences to enhance performance.

An Example: Portfolio Manager

Advanced Analytics and RPA can be used to perform portfolio analysis and construction, streamline the decision-making process through more efficient filtering of investment ideas, and weigh the possibilities against clients' investment parameters. Additionally, predictive analytics can help forecast upcoming events and trends that might sway their advice supporting buy or sell decisions. The technology significantly enhances the manager's ability to perform the job role.

Outcome 3: Low Impact

Complementary

C. Low impact: Auxiliary and Complementary

The Impact: Little or no exposure to automation. Analytics and other (technology) enablers can increase the efficiency of work, but current skills or modest upskilling will be typically sufficient for an employee to remain an up-to-date contributor. People retain the job role but use data analytics and other technologies to supplement the performance of job tasks.

Characteristics of Job Roles: Focused on applying Advanced Analytics to data in order to obtain timely and accurate insights that enhance decision-making and advisory capability.

An Example: Private Banker

This role is highly relationship-based, and predictive analytics are often used to assist in conducting trend analysis on financial products, analysing customer behaviours, and identifying target markets to drive more effective acquisition activities.

3. Methodology

Phase 1, Part C: Study findings were validated through more than 30 validation sessions with representative firms in Singapore. These firms represented the local and global banks, insurance companies, and asset management firms. These in-depth validation sessions ensured that this study was relevant for, and representative of, Singapore's financial services sector.

What could overstate or understate the impact assessment in this study?

Firstly, this study acknowledges that organisations in Singapore supporting the discussions have various operating models, business strategies, and extent of outsourcing/offshoring of business operations. The study however has been calibrated to provide an industry-wide view (i.e. all players from big to small, local and global were considered).

Secondly, this study acknowledges that the journey and timing to full technology adoption can be affected by a number of factors that could impact speed of realisation – such as regulatory hurdles, legacy infrastructure, and ever-changing customer preferences/customer trust. In addition, the pace of technology adoption varies across organisations. Certain organisations may be moving at or even beyond industry pace, some choosing to be fast followers, while others adopting a wait-and-see approach. These considerations while all relevant were not studied in depth given the focused scope of the study on the impact of data analytics and automation on the financial services sector in Singapore.

Phase 2: Skills analysis

At a high level, our approach for the skills analysis was in two steps. We first leveraged many established data sources, namely, O*NET, ~7 million job posting data from Burning Glass Technologies, published Singapore Skills Frameworks and EY Digital Leadership Skills repository as a baseline to understand general skills patterns and trends. These include the understanding of which skills have been in high demand as well as those that have been declining in demand in the financial services sector over the past 4 years. More importantly, we used these data sets as a basis to understand current skills that are critical to perform the in scope job roles today. Lastly we referenced job postings from the UK and US to understand their trends and to identify common or dissimilar patterns with Singapore.

The skills taxonomy, consisting of 42 skills, was created to use as standardised terminology to evaluate the future skills necessary for financial services, given the impact of data analytics and automation.

The four categories are: foundational, interpersonal, business, and data and digital. The overall composition of the skills needed to perform the job role varies depending on the nature of the job and the impact of data analytics and automation.

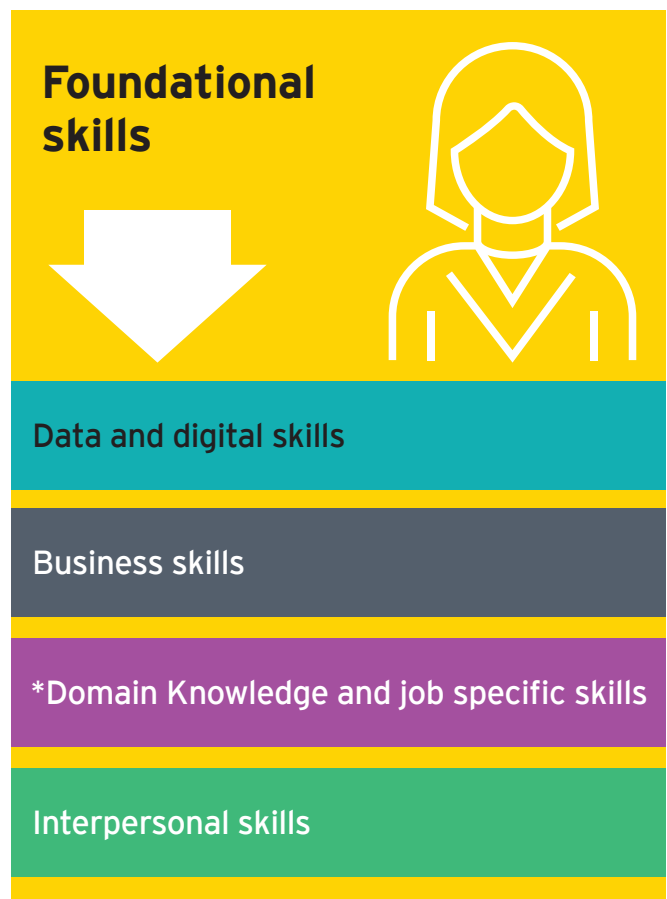


Exhibit 6: Skills Overview

**Note: Domain knowledge and job specific skills are captured within the IBF Standards*



We then performed a detailed task-to-skill analysis to inform our preliminary hypotheses before we engaged the industry to test our insights. This included conducting a network analysis of skills co-occurrence in job posting data for the past four years (2014-2017), gathering outputs from the impact analysis, and external industry research and engagement sessions with EY financial services leaders.

This culminated in key hypotheses developed at a job role level which were used for a robust second round of more than twenty validation sessions with industry leaders. This method allowed for richness in insights to be derived in a holistic and balanced manner to identify the future skills, that took into account changes to job tasks at the job role level.

4. Findings

4.1 Banking

A total of 54 job roles were examined across the banking sector, specifically retail, corporate, investment, and private banking. Based on research and industry validation, we determined that middle and back office job roles are currently experiencing the greatest impact in terms of potential job convergence or displacement. Many enterprise job roles, especially those that are required to perform tasks such as data sourcing, in-depth analysis, and investigation are being augmented as a result of investments in data analytics and automation.

Many FIs have prioritised their efforts to automate processes across their organisation. Most retail banks are already entrenched in 'wave one' of the data analytics and automation journey. RPA is being used to increase efficiency of transaction processes and relieve the heavy lifting that job holders have traditionally performed. Examples of RPA enabled processes have reduced transactional tasks including the manual transfer of loan information from the front to the back office as well as manual settlement reconciliation. Today, retail banks are gradually moving into the next wave of automation – focusing on redefining the entire customer experience leveraging AI and Advanced Analytics. Predictive analytics can be used to achieve better insights that engage customers, and AI-powered chatbots exist to provide basic support across digital platforms. Consequently, customer experience can be improved while driving real-time data processing, and greater efficiency can be achieved by reducing operational workload.

With further advancements in data analytics and automation, front-office roles across the different sub-sectors will evolve



to focus on higher-value tasks. For example, AI-powered robo-advisors could potentially help relationship and wealth managers to expand the client base, but it is unlikely to displace jobs. Similarly, while many administrative tasks of Equity Capital Market (ECM), Debt Capital Market (DCM) and Corporate Finance Bankers are automated today, the nature of these roles remain high touch, and with the rise of predictive analytics, the quality of service provided will be enhanced.

Today, FIs including the likes of Deutsche Bank, J.P. Morgan, DBS Bank, Standard Chartered, American International Group (AIG), OCBC Bank and Citibank are **using Advanced Analytics and/or AI to improve business processes and support time intensive analysis, facilitate repetitive generic enquiries as well as sales and advisory matters.**

“

Managing one's wealth is a high touch business, and will continue to be [high touch]. Robo-advisors can generate and manage a portion of the portfolio; but will never be 100%. Therefore, it is safe to say that robo-advisors will not take away any jobs in the sector¹²

Industry example:



DBS Bank in collaboration with A*Star and Cloudera, enabled the development of a ground breaking program that detects abnormal trade finance transaction activities. DBS Bank became the first Singapore bank to use data (including broad range of trade information such as shipping data) and Advanced Analytics in detecting fraud anomalies through transaction trends, red flagging odd trade flows and triggering further analysis.¹³

United Overseas Bank (UOB) employed a virtual employee, Amy, to support the Trade Finance Operations function, helping to process requests for Letters of Credit by corporate customers. Upon extracting the data, the bot will enter the information into the Finance of International Trade Automated System for approval. With the help of Amy, a task that require 240 seconds, 12 screens and multiple cross-checking for accuracy, takes Amy 40 seconds to complete.¹⁴

In short, the pace and scale of data analytics and automation have started to alter the future of work within the sector. In addition to our historical job posting analysis, the wealth of insights shared by the key players across Singapore revealed an apparent change in the mix of skills that are required in the future of banking.

Data interpretation and analysis skills were identified as one of the most critical skills across client-facing and non-client facing job roles. Take the example of client facing roles, such as SME Banking Product Sales and Private Banker. Job holders of these roles would need to discern when patterns in data are meaningful and draw actionable conclusions that facilitate lead generation. Similarly, the skill of data interpretation and analysis will also play a big part in non-client facing job roles, for instance, in the role of a Credit and Loan Officer – to improve lending decisions, or in the role of a Product Developer – to deliver more competitive pricing strategies.

Advanced digital acumen and literacy is also reported as critical across multiple job roles. From the perspective of client facing job roles, job-holders will be required to: 1) leverage innovation, 2) engage clients or customers and facilitate the sales cycle, and 3) assist clients or customers in adopting digital solutions.

Some of the banks' representatives expressed the **need for the workforce of the future to learn to "work alongside robots and machines"**. It was shared that in the next decade (if not sooner), the relationship between the human workforce and machines will **shift from providing instructions to collaboration**, and from perceiving it as a 'tool' to a 'virtual colleague'.

What does it take to foster this man-machine collaboration? **It calls for a combination of soft and technical skills: Soft skills (such as adaptability, collaboration and empathy) that bring an open mindedness of a human to establish a positive work relationship with the machine, and technical skills (such as automation management, systems thinking and technology design) that allow the human to guide the improvement of machines.** As machines are trained to become more intelligent, the pre-emptive information and insights generated will allow humans to make more informed judgment in solving new and/or more complex problems.¹⁵ The outcome of which will serve as a new criteria, or rules that feed into the machine therefore **creating a virtuous cycle.**

4. Findings

Industry example:



DBS Bank embarked on a journey to reimagine the space of retail banks, incorporating 'human centred design thinking' into its flagship branch at Marina Bay Financial Centre with the intent to "optimise customer's time and to make the branch visit simple and delightful". This concept has also been further expanded in its first 'café and branch' that features Video Teller Machines (VTM), an industry-first VR corner for retirement planning via the humanoid robot, Pepper. The new space is designed with the technology savvy generation in mind and offers customers a highly digital experience to meet their lifestyle needs.¹⁶

Key Observation for Trade Finance

As Trade Finance evolves, Blockchain technology stands out as the game changer. It allows for real time tracking of transaction statuses or title ownership transfers, and generates authentic information without a central entity who traditionally is responsible for safekeeping trading records. If Blockchain could benefit both buyer and seller, why is the uptake slow?

Digitising trade finance not only requires significant support and capacity, it requires participation from a number of parties – e.g. customs/port authorities, governments, and regulators, and simultaneous changes across different industries, within which levels of capabilities and technological sophistication may vary.

Siloed digitisation within a single organisation has limited benefits.¹⁷ Therefore, as long as adoption is not widespread, both FIs and other players within the ecosystems (e.g. transportation, logistics, insurance, etc.) are not encouraged to adopt disruptive technologies. This ultimately creates a vicious cycle.

Government and regulators could take the initial steps to overcome the adoption issue. They can work closely with FIs to harmonise processes across the end-to-end trade finance cycle – such as encouraging legal acceptance of digital trade documents/data, improving customs clearance efficiency, and standardising 'Know Your Customer' requirements – to encourage and establish higher adoption rate of disruptive technology solutions.

Industry example:




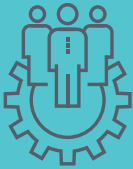

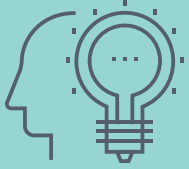
MUFG Bank introduced the first multilingual robot bank teller, 'NAO,' embedded with camera and microphone capabilities, into the retail banking workforce in 2015 to interact with customers in their branches. NAO is programmed to speak 19 languages. The robot analyses customers' emotions from their facial expressions and tone of voice, enabling him to greet customers and ask which services they need. NAO can support most banking transactions such as remittance, opening a bank account and money exchange.¹⁸



4. Findings

Below is a summary of impact levels by job roles and the associated new skills required to perform these roles in the future:

Retail Banking

Front office				
	 Customer Service	 Relationship Management	 Sales and Distribution	 Product Management
High	<ul style="list-style-type: none"> ▶ Customer Service/Call Centre Representative 		<ul style="list-style-type: none"> ▶ Bancassurance Officer ▶ Branch Operations ▶ Branch Teller ▶ Mortgage Specialist 	
Medium		<ul style="list-style-type: none"> ▶ Financial Consultant/ Personal Banker 		<ul style="list-style-type: none"> ▶ Product Analyst
Low				
New Skills Required	<ul style="list-style-type: none"> ▶ Complex Problem Solving ▶ Technology Troubleshooting ▶ Data Interpretation and Analysis ▶ Customer Mindset ▶ Product Awareness 	<ul style="list-style-type: none"> ▶ Advisory ▶ Advanced Digital Acumen/Literacy ▶ Change Management ▶ Customer Mindset ▶ Data Storytelling 	<ul style="list-style-type: none"> ▶ Advisory ▶ Customer Mindset ▶ Data Interpretation and Analysis ▶ Change Management ▶ Lateral Thinking ▶ Product Awareness 	<ul style="list-style-type: none"> ▶ Customer Mindset ▶ Data Storytelling ▶ Influencing and Negotiation ▶ Project Management ▶ Stakeholder Engagement

Middle/Back office

 Business Assurance	 Credit and Loan Operations	 Unit Trust Operations	 Transaction Operations
<ul style="list-style-type: none"> ▶ Business Assurance 	<ul style="list-style-type: none"> ▶ Credit and Loan Officer 	<ul style="list-style-type: none"> ▶ Fund Administrator 	<ul style="list-style-type: none"> ▶ Transaction Processing Officer
<ul style="list-style-type: none"> ▶ Advanced Digital Acumen/Literacy ▶ Change Management ▶ Data Interpretation and Analysis ▶ Lateral Thinking ▶ Process Excellence 	<ul style="list-style-type: none"> ▶ Advisory ▶ Automation Management ▶ Complex Problem Solving ▶ Data Interpretation and Analysis ▶ Process Excellence 	<ul style="list-style-type: none"> ▶ Advisory ▶ Data Interpretation and Analysis ▶ Lateral Thinking ▶ Product Awareness ▶ Targeted Technical Sales 	<ul style="list-style-type: none"> ▶ Automation Management ▶ Business and Financial Acumen ▶ Process Excellence ▶ Risk Awareness ▶ Technology Troubleshooting

Exhibit 7: Overview of impact level for Retail Banking by role including prevalent skills by role(s)

4. Findings

Overview of High Impact Roles

9 Job Roles

Convergence

Displacement

- ▶ Bancassurance Officer
- ▶ Branch Operations
- ▶ Branch Teller
- ▶ Business Assurance

- ▶ Credit and Loan Officer
- ▶ Customer Service/Call Centre Representative
- ▶ Fund Administrator

- ▶ Mortgage Specialist
- ▶ Transaction Processing Officer

Implications on job roles

With a significant proportion of the tasks being automated, the roles will...

Spend less time on...

- ▶ Over-the-counter transactions
- ▶ Cold calling
- ▶ Document validation
- ▶ Credit analysis



Spend more time on...

- ▶ Product advisory
- ▶ Customised sales
- ▶ Exception management
- ▶ Digital assistance

Implications on skills (Skills differentiators)

- ▶ Data Interpretation and Analysis
- ▶ Advisory
- ▶ Lateral Thinking
- ▶ Complex Problem Solving
- ▶ Process Excellence

Bancassurance Officer and Mortgage Specialist



Product Sales roles will evolve to become more proactive in addressing customer needs. This role will be able to provide more advice to customers by leveraging on connected platforms and enhanced data to be able to provide more specific customer support. In this day and age, it is common for customers to undertake research by themselves to better understand products and services that are available to them prior to making a purchase. This means that customers will explore and scrutinise the products and/or services available in various banks to find the product and/or service that best suits their needs. These changes have prompted banks to look towards digital platforms that can be easily adapted to various product offerings and cater directly to customer needs, therefore, transforming the role of Mortgage Specialists and Bancassurance Officers.

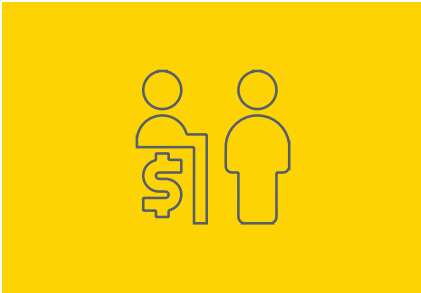
Greater access to information will change the way the customer interacts with the Product Sales team. Improved customer profiles and more connected platforms will allow job holders to act in a more advisory capacity and spend additional time to resolving more complicated cases. **As shared by many industry participants, the role will likely shift to focus on multiple products within a sales portfolio rather than just one product, helping to serve customers in a more comprehensive manner.**

Skills Implication

Moving forward, the converged role will be expected to display the ability to leverage insights (gathered from different platforms within the bank) tailored to customers' needs.

4. Findings

Branch Operations and Branch Teller



The Branch Teller and Branch Operations roles will evolve from one that is primarily transactional and focused on single tasks to one that is driven by sales and advisory. The role will focus more on supporting a better customer experience for retail clients. There are significant opportunities for the introduction of data analytics and automation due to the high volume, repetitive and rules-based nature of work by Branch Tellers, especially for tasks pertaining to over the counter transactions and enquiries, daily transaction calculations and data entry. In these instances, the use of technologies such as RPA and AI (supported by digital applications) will increase efficiency in resolving the customer's banking needs, resulting in a reduction of an employee's workload. **This role has already evolved in recent years, and will see convergence or displacement in the future due to changing branch footprints.** Take, for instance, OCBC Bank that has announced its plan to reduce half of its Branch Teller jobs by 2020¹⁹. In parallel, the local bank also assured that no tellers employed today will be made redundant, instead, investment is being made to proactively reskill and redeploy job holders to digital and advisory roles such as branch digital ambassadors and service executives.

Even today, the role of Branch Digital Ambassadors and Service Executives in Singapore has seen convergence with other roles (such as product sales, customer service officer etc.) to take on more value-adding and advisory-related tasks. **In the near future, it is envisaged that this role may evolve and become increasingly consolidated with retail banking Relationship Managers to take more digital and/or advisory roles. For example, Digital Ambassadors who will help customers take advantage of bank's Smart ATM or Video Teller Machine, internet and mobile banking services.**

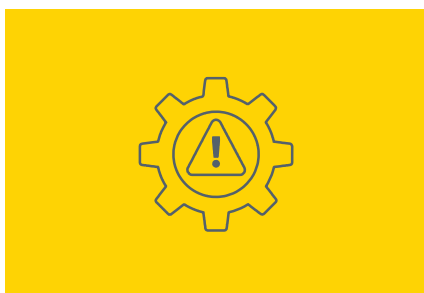
Skills Implication

The future employee in this role will be digitally savvy, possesses in-depth knowledge of new digital service machines, has a customer-oriented mindset, and more importantly has an emphasis on human attributes such as empathy and influencing. The potential convergence with sales and advisory-driven job roles will also call for the need to develop targeted technical sales, product awareness, and advisory skills.

While banks operating in Singapore today may shift away from traditional branches, there is an opportunity for kiosks or micro branches to continue servicing segments of the population who prefer banking in physical locations²⁰. With that, it is safe to say that the Branch Operations role will stay but the scope of responsibility will change to identify innovation and new product opportunities in the ATM space, and drive the delivery of enhanced ATM functionality.

As the role of Branch Tellers and Branch Operations transforms, some skills that will be critical include process excellence, customer mindset and user experience design. Data interpretation and analysis will also be an important skill in evaluating interactions between the customer and ATM. These insights will be used to put forth recommendations for improvement of the role. Lastly, a change-oriented mindset will be critical in driving the successful implementation of digital tools in the branch, ensuring that policies and processes are refined to align to the business strategy.

Business Assurance



The Business Assurance (also known as Business Compliance) role has the potential to evolve from one that involves a series of high volume and document-intensive tasks, such as client document collection and information verification, to one that leverages on data to generate greater customer insights and proactively manage case solutions. For most retail banks in Singapore, the number of job holders involved in client on-boarding is relatively high, hence this is seen as an area of considerable cost for banks. In addition to cost, manual on-boarding processes – with multiple back and forth requests for client documentation – can have a negative impact on client experience.

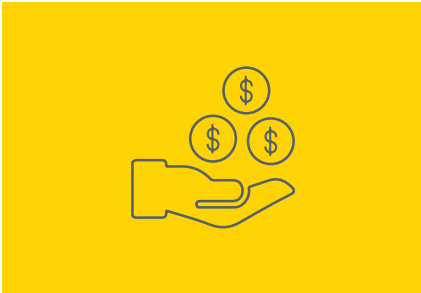
While customer information collection can be streamlined and obtained directly via APIs (internally) and potentially Blockchain (externally), there is also a significant opportunity to digitise the end-to-end on-boarding process. This includes the electronic upload of documentation and the identification of missing information, improving the overall client experience. With a greater pool of information made available to job holders, Advanced Analytics can allow for better insights into customers and a quicker analysis of potential pain points based on individual situations.

Skills Implication

Data interpretation and analysis, as well as lateral thinking skills will be important for this role, mainly to leverage data/information to find a creative but sound solution for unique cases. As the model for client on-boarding changes, this role is also expected to possess advanced digital acumen/literacy, process excellence, a customer mindset, and change management skills to contribute to the redesign of KYC processes from a customer's perspective.

4. Findings

Credit and Loan Officer



The Credit and Loan Officer role will evolve from one that performs tasks such as documentation, validation, and other administrative and rules-based aspects of credit analysis and processing, to one that will focus more on leveraging data to provide insights on a customer's creditworthiness and tailored recommendations to product sales. Leveraging web-based portals and Robotics Process Automation (RPA), customer information can be directly uploaded to the loan origination platform, pre-populating the information into required fields, and then differentiating ready-to-go applications from those that are incomplete. The use of technology in this instance has also reduced inconsistency and delay of manually collecting mandatory data from customers.

Credit analysis could also draw upon big data to reach more accurate loan decisions. In addition to evaluating individual credit scores and income, advanced machine learning has the ability to scrutinise an individual's digital footprint (also known as alternative data), including social media interactions and internet browsing history²¹. This may provide more robust insights that can help predict an individual's creditworthiness, which is especially useful for individuals without a traditional credit history. Whilst this sounds ideal, such capabilities do raise privacy concerns. In order to obtain full consent to access clients' information, banks need to set out clear parameters with full transparency on the type of information that will be collected from each individual and used. In light of these challenges, **the idea of big data being used commonly within the next 3 to 5 years seems less likely.**

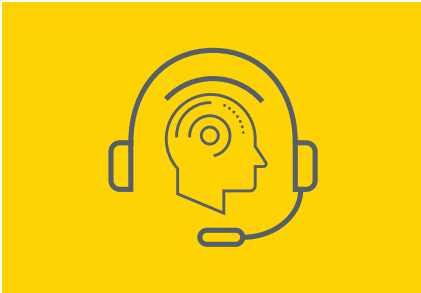
Data protection laws will act as a counter to the speed of technological advancements that can be realised.

Retail banks will continue to embrace digital and innovation-led solutions to ease the processes of loan applications, credit analysis/underwriting, and disbursements.

Skills Implication

In spite of digitalisation, personal advisory services will continue to be an important segment in the lending process. While Credit and Loan Officers may not be client-facing, advisory skills, complex problem solving, data interpretation and analysis capability will be critical as they are required to provide personalised recommendations to their stakeholders – i.e. Product Sales or Relationship Managers.

Customer Service/Call Centre Representative



The Customer Service/Call Centre Representative role will move away from handling high-volume transactional tasks to addressing more complex customer issues and queries. For example, dealing with sales, product enquiries, purchase or payment-related activities, technical issue resolution, and helping customers navigate digital platforms. **In view of the goal of keeping the team lean, the person in this role is likely to be a 'jack of all trades' who is able to resolve the different (and more complex) client queries.**

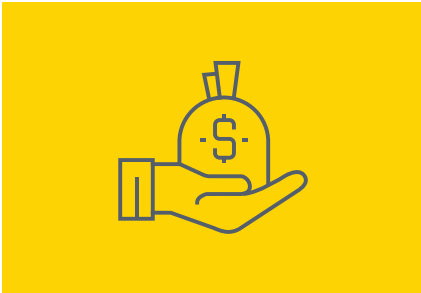
The increasing use of self-service platforms and chatbots across banks in Singapore has facilitated most general enquiries to be answered or resolved without the need for human intervention. However, as shared in multiple validation sessions, **contact centres today serve as a critical component in a bank's ability to deliver omnichannel customer experience** as more customers are expected to migrate to digital for routine transactions in the near future. Furthermore, the product mix will continue to evolve to meet the ever-changing customer expectations and together, these will contribute to the role's evolution.

Skills Implication

Some of the skills that will be critical for the future of customer service are technology troubleshooting, product awareness, data interpretation and analysis, a customer mindset, and complex problem solving. Depending on the bank's operating model, the capability to lead a virtual team could also be important.

4. Findings

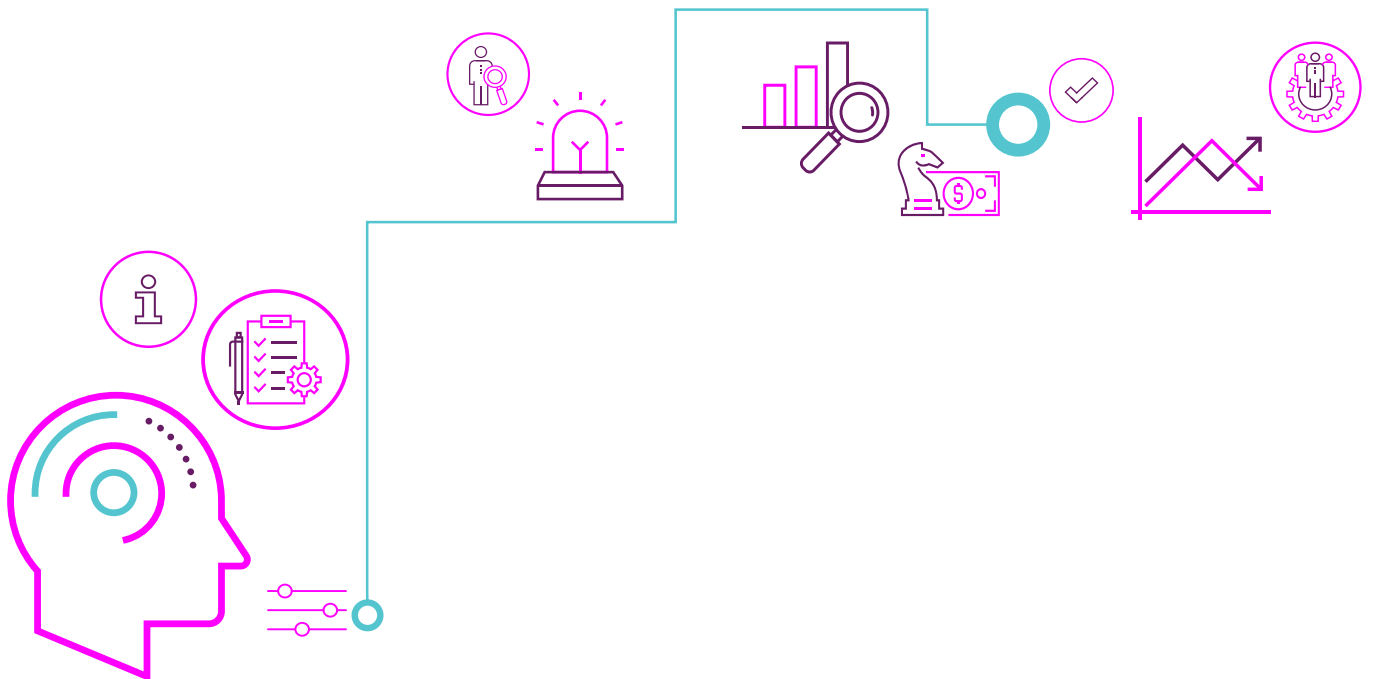
Fund Administrator



The Fund Administrator role is likely to converge with either Customer Service and/or Product Sales, focusing less on routine administrative and transactional processes and more on ad-hoc servicing or advisory activities. This is largely due to the growth of digital channels which has empowered customers to purchase investment products (such as Unit Trusts) without additional input and advice from the bank.

Skills Implication

As this role converges with other product sales roles, the in-depth understanding across product types will be necessary to ensure a balanced approach to sales and customer advisory. With the increasing use of data and analytics across organisations, skill sets such as data interpretation and analysis to lateral thinking will be important to draw insights to connect those insights to actionable plans to improve selling capabilities.



Transaction Processing Officer



Due to its rules-based, repetitive and document-intensive nature of work, namely transaction processing or operations (payments, clearing, remittances, etc.), the Transaction Processing Officer role is identified as one of the areas that will be highly impacted by data analytics and automation. However, this role is expected to evolve to focus more on operational management and exception handling.

Within Retail banking, **the increasing use of Advanced Analytics applications has also facilitated a switch from traditional cash or credit cards to mobile or digital wallets (i.e. in-app, micro payments). This will inevitably reduce dependence on traditional channels such as ATMs and point of sale (POS) terminals. Similarly, potential usage of blockchain in areas such as payments and remittances will significantly reduce processing efforts, and thus likely result in the displacement of the associated jobs.**

Following the trend of RPA and AI disrupting the back office functions, the Transaction Processing Officer will also be highly impacted. For example, RPA can be used to scan and index transaction records for filing and storage, while AI can authenticate and perform checks on different types of identity documents, including the authenticity of the client's signature. This removes many laborious and repetitious tasks, freeing up time for individuals to focus on higher valued tasks. For this reason, this job role is expected to be

less in demand within the next 3 to 5 years as banks continue to invest in data analytics and automation technologies to replace manual handling of transaction processing. **In spite of the risk of displacement, the responsibilities of this role will not be entirely removed and the industry sees potential for this role to be converged with other back-office roles.**

Skills Implication

The future of this role will provide oversight and manage exceptions, focusing on operational management, particularly review, approval, and decision making. Therefore, the key skills required will include automation management, technology troubleshooting, business and financial acumen, process excellence, and risk awareness.

4. Findings

Overview of Medium Impact Roles



Augmentation

2 Job Roles

▶ Financial Consultant/Personal Banker

▶ Product Analyst

Implications on job roles

With some of the tasks being replaced, the roles will...

Spend less time on...

- ▶ Market research
- ▶ Product monitoring and reporting
- ▶ Documentation and processing



Spend more time on...

- ▶ Customer-led new product creation
- ▶ Proactive customer advisory
- ▶ Cross-functional collaboration

Implications on skills (Skills differentiators)

- ▶ Data Storytelling
- ▶ Stakeholder Engagement
- ▶ Influencing and Negotiation
- ▶ Advanced Digital Acumen/Literacy
- ▶ Customer Mindset

Financial Consultant/Personal Banker



As the more routine tasks are being automated, the expectation is for Relationship Managers (RMs) to possess an increased depth of knowledge across the FIs product and service offerings.

Many of the specific tasks performed by RMs will be an area of focus for data analytics and automation. The application of Advanced Analytics (e.g. self-service platforms, chatbots, etc.) will increase the efficiency of RMs by enabling them to serve a larger portfolio of clients as the more routine tasks are being replaced by technology.

Skills Implication

On top of lateral thinking, advisory skills, and advanced digital acumen/literacy, skills such as data interpretation and analysis, change management, and risk awareness should also form the core skills inventory of this role.

“

[...] advisory skills should be enhanced as a result of automation. By removing the administrative components, the RM will be able to spend more time engaging with the client, and perhaps, there may be a wider range of service and offerings that will be made available [to clients]²²

4. Findings

Product Analyst



The Product Analyst role is becoming more proactive in leveraging data as an input in product design for consumer needs of the future. The product design offered by the banks today are changing to incorporate more features and benefits, adapting to the changing customer preferences.

Given that the competition is more intense than ever, moving forward, it is crucial for this role to shift towards a new methodology that will interact collaboratively with the entire banking ecosystem, and improve the speed to market. For these reasons, banks that are slow in leveraging Advanced Analytics to facilitate their product development lifecycle could fall short of their competitors.

Skills Implication

Industry participants revealed that this job holder needs to possess strong data storytelling, influencing, and stakeholder engagement skills in the near future. On top of this, it is also important to maintain or enhance the customer mindset skill set.

“


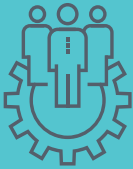

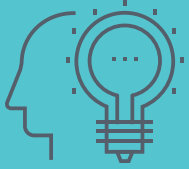
For a Product Analyst, it is the soft skills that matters. They need to be able to manage diversity and understand the various needs of customers from diverse backgrounds²³



4. Findings

Below is a summary of impact levels by job roles and the associated new skills required to perform these roles in the future:

Corporate Banking

Front/Middle office				
	 Relationship Management	 Sales	 Product Management	 Middle Office
High	<ul style="list-style-type: none"> ▶ Relationship Manager – SME 	<ul style="list-style-type: none"> ▶ Product Sales – SME 		
Medium	<ul style="list-style-type: none"> ▶ Assistant Relationship Manager/Credit Analyst ▶ Relationship Manager – Commercial/Corporate** 	<ul style="list-style-type: none"> ▶ Product Sales – Commercial/Corporate** 	<ul style="list-style-type: none"> ▶ Product Management 	<ul style="list-style-type: none"> ▶ Client Implementation Officer
Low	<ul style="list-style-type: none"> ▶ Relationship Manager – MNC/FI/NBFI** 	<ul style="list-style-type: none"> ▶ Product Sales – MNC/FI/NBFI** 	<ul style="list-style-type: none"> ▶ Product Development* 	
New Skills Required	<ul style="list-style-type: none"> ▶ Advisory ▶ Advanced Digital Acumen/Literacy ▶ Data Interpretation and Analysis ▶ Influencing and Negotiation ▶ Lateral Thinking 	<ul style="list-style-type: none"> ▶ Advisory ▶ Data Interpretation and Analysis ▶ Data Storytelling ▶ Influencing and Negotiation ▶ Stakeholder Engagement 	<ul style="list-style-type: none"> ▶ Advanced Digital Acumen/Literacy ▶ Change Management ▶ Customer Mindset ▶ Data Interpretation and Analysis ▶ Influencing and Negotiation ▶ Project Management ▶ Stakeholder Engagement 	<ul style="list-style-type: none"> ▶ Advanced Digital Acumen/Literacy ▶ Change Management ▶ Complex Problem Solving ▶ Process Excellence ▶ Project Management

*Role write-up covered under Corporate Banking – Medium Impact Roles

**Role write-up covered under Corporate Banking – High Impact Roles

			Back office
 <p>Client Servicing</p>	 <p>Business Management</p>	 <p>Credit Recovery</p>	 <p>Operations</p>
			<ul style="list-style-type: none"> ▶ Credit Operations ▶ Transaction Banking Operations
<ul style="list-style-type: none"> ▶ Client Service Officer 	<ul style="list-style-type: none"> ▶ Business Manager 		
		<ul style="list-style-type: none"> ▶ Credit Recovery Manager 	
<ul style="list-style-type: none"> ▶ Advanced Digital Acumen/Literacy ▶ Change Management ▶ Customer Mindset ▶ Data Interpretation and Analysis ▶ Process Excellence ▶ Technology Troubleshooting 	<ul style="list-style-type: none"> ▶ Change Management ▶ Lateral Thinking ▶ Project Management ▶ Risk Awareness ▶ Stakeholder Engagement 	<ul style="list-style-type: none"> ▶ Advisory ▶ Data Interpretation and Analysis ▶ Lateral Thinking ▶ Product Awareness ▶ Targeted Technical Sales 	<ul style="list-style-type: none"> ▶ Advanced Digital Acumen/Literacy ▶ Change Management ▶ Complex Problem Solving ▶ Data Interpretation and Analysis ▶ Process Excellence ▶ Systems Thinking

Exhibit 8: Overview of impact level for Corporate Banking by role including prevalent skills by role(s)

4. Findings

Overview of High Impact Roles

4 Job Roles

Convergence

Displacement

- ▶ Credit Operations
- ▶ Product Sales – SME
- ▶ Relationship Manager – SME
- ▶ Transaction Banking Operations

Implications on job roles

With a significant proportion of the tasks being automated, the roles will...

Spend less time on...

- ▶ Data mining and screening
- ▶ Documentation processing
- ▶ Account operations
- ▶ Routine sales



Spend more time on...

- ▶ Output validation
- ▶ Technology implementation and oversight
- ▶ Exception management
- ▶ Complex case investigation

Implications on skills (Skills differentiators)

- ▶ Data Interpretation and Analysis
- ▶ Project Management
- ▶ Advanced Digital Acumen/Literacy
- ▶ Stakeholder Engagement
- ▶ Process Excellence

Credit Operations



Credit Operations works very closely with Relationship Managers (RM) to handle credit requests, perform financial analysis and credit reviews for Small and Medium Enterprises (SMEs). As a result of automation this role will likely evolve to one that will need to support credit analysis for more complicated products in the future.

It is notable that the time and resources taken to process a small loan are almost identical to the time and resources taken to process a much bigger loan. With that in mind, banks are aware that a failure to leverage technology for simpler products will result in being less cost-effective as compared to competitors. This is one of the reasons why banks have been experimenting with and implementing new approaches to making lending decisions for many years, looking at different client segments and prioritising small enterprises.

The prediction of loan performance for SMEs is more challenging given the lack of standardised financial reporting and the higher variance in performance. Both RPA and AI can be leveraged to include more credit attributes in the analysis, ultimately, reducing the risks while improving the speed of analysis.

Apart from the careful prevention of data privacy breaches or unethical use of the data, one bank cited another challenge as a lack of open-source information for small-and medium enterprises. To that end, the next-generation of credit and loan processing, specifically using big data, may not see an incremental acceleration in investment and innovation.

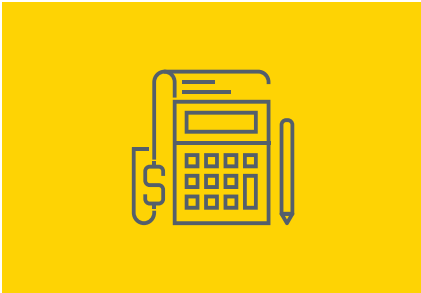
In the future, banks will be able to integrate new data sources and retrieve real-time data of borrowers from both business and directly from diverse data sources. These include the individual's bank statement and transaction history information from the financial/banking institution, tax filing/return information from the tax bureau, sales history from e-commerce sites, and more. This can be accomplished in a short timeframe that then allows machine learning to predict the probability of a borrower running into financial distress. This will increase accuracy of credit assessment models and reduce judgment-related errors.

Skills Implication:

With sufficient upskilling in domain knowledge, this role may be able to support credit analysis for complicated products or client segment/industry. Some skills that will remain significant in the future regardless of the client segments are advanced digital acumen/literacy, data interpretation and analysis, project management, stakeholder engagement, and investigation.

4. Findings

Product Sales – SME/Commercial/Corporate/MNC/FI/NBFI



Today, this role is responsible for generating new business opportunities, focusing mainly on small enterprises, however there is potential for these tasks to be displaced with the introduction of digital platforms, hence, human expertise in focusing on strategy or support in product innovation will be critical.

Today, whilst the Relationship Manager (RM) acts as a main point of contact with the client, the Product Sales role works closely with RMs to provide advice and deliver products/services that are most suitable for their clients.

According to the industry, mass acquisition for simple accounts (such as small enterprise, subsidiary MNC and FI clients) could potentially be displaced with the introduction of digital platforms and self-service tools. Human expertise will then play a different role in product sales, spending less time pushing out financing products and other more mundane tasks like documentation, they will be more strategy-focused, leveraging data of the existing customer base to support new product innovation, bundling services, and contribute to the planning/roll-out of product promotions and campaigns. In addition, Product Sales may also network and work closely with external parties to oversee the generation and follow-up of marketing leads which are passed on to RMs.

The nature of tasks performed by this role is a combination of research, advisory, and sales-driven activities. It is expected to evolve with technological advancements, with this role having a better view of the client. This translates to being able to understand the potential for relationship expansion and offer effective cross-selling strategies.

In terms of product advisory and recommendations, the large volume of client data paired with AI-powered tools can be used to carry out detailed analysis of corporates' transaction

flows, payables and receivables, assets and liabilities. That enables banks to provide more personalised advice on bill payment, discounts eligibility, hedging strategies, financial balance sheet management, and other investments to clients.

Skills Implication:

In addition to advisory and stakeholder engagement skills, which remain key for this role, other skills required include influencing and negotiation, data interpretation and analysis, and data storytelling.

The industry emphasised that a Product Sales officer who serves a different client group may face a different level of impact. For example, Product Sales for mid-corporate clients may be augmented with the application of data analytics and automation, such as anticipating client needs or infuse personalisation into conversations. On the other hand, Product Sales who serve the regional headquarters (RHQ) and non-bank financial institutions (NBFIs), will need to possess deep institutional knowledge and provide bespoke solutions/advice to their clients.²⁴

Advisory skills will continue to be important for this role to engage with their clients, and a future job holder will leverage rich insights gathered through analyses to develop proactive sales strategy and improve their quality of advice – tailoring to the unique needs of their clients. Hence, data interpretation and analysis skills will be needed to make sense of quantitative and qualitative data, and data storytelling capability to disseminate key messages in a clear and compelling manner to various audiences will be key.

Relationship Manager – SME/Commercial/Corporate/MNC/FI/NBFI



In Corporate Banking, the Relationship Managers (RMs) role will be augmented by data analytics and automation to focus on managing mid-sized corporate clients. Unlike small enterprises, subsidiaries or FIs (where information is available and accessible), the industry shared that managing medium enterprises tends to be slightly more complex. A new approach to segmentation (emphasising on behaviours and needs, rather than revenue) will allow banks to gain better understanding of the complexity of client tranches, where ultimately the RM could prioritise their efforts on the most valuable customers.

The future of this role will shift from reactive to more proactive management of client accounts by leveraging software/analytics that gather intelligence to identify cross selling opportunities (this is not limited to FX, trade or cash management). As with the role of Product Sales, digital and self-service platforms have been implemented to support the acquisition for simple accounts as well as other post-sales activities. With the right tools in place, RMs can anticipate different client needs and provide bespoke recommendations that lead to a more meaningful exchange with their clients.

Skills Implication:

Whilst lateral thinking and advisory skills are inherent for this role, future RMs will need to be proficient with different tools, and understand how to leverage them to further improve their engagement with clients. Rather than merely understanding the theories, they also need to be proficient in the application of data, specifically learning how to interpret information and translate insights into sound decisions or solutions.



Relationship Managers need to learn how to handle data [...] use data as a trigger to think differently²⁵

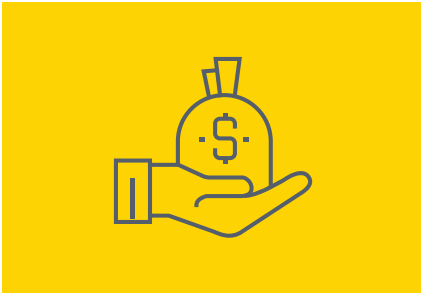
Industry example:



DBS Bank is the first bank in Singapore to have launched a new service that allows SMEs to apply for a LC online which takes five minutes and is issued within two business days, as opposed to the traditional application where clients without an existing credit line for trade finance had to visit a bank branch to submit their application and would take up to a week to obtain.²⁶

4. Findings

Transaction Banking Operations



Today, this role typically oversees the processing for trade finance and cash management whereby they are required to handle, screen, and process a high number of documents and this is expected to evolve as this role in the future would see a reduction in administrative tasks and would instead focus on leveraging data to inform strategies for early and late payments, and balance sheet advisory, etc.

Take trade finance as an example, the job holder dedicates significant time evidencing the documents, and this requires human intervention. Traditionally, tasks included manual screening, through to reducing risk and providing assurance to sellers, buyers, and the banks. In recent years, the industry is seeing documentary trade, which was traditionally facilitated by letters of credit (LC), slowly being replaced by open-account trade. Due to security issues and settlement risk, LC is still the preferred payment mode in Singapore.

The industry highlighted that whilst the workforce in this area may be displaced, the timeline for this to take effect is highly dependent on the industry adoption rate, which will be affected by many factors.

Skills Implication:

Skill sets that will be required by this role as the transformation takes place are advanced digital acumen/literacy, systems thinking to understand how various software and solutions operate within the context of larger systems, and process excellence to highlight the root causes of process inefficiencies as well as to identify the right processes that require automation.

Similarly cash management operations is traditionally heavily transaction-oriented, ranging from basic corporate account management to payment. We see various developing technologies that will impact cash management. For example, Blockchain is able to transform the payment infrastructure allowing for greater convenience. In recent years, banks have begun to offer clients a wide range of digital self-service tools for cash management and payments.

Moving forward, the job holder will leverage Advanced Analytics and will need to possess data interpretation and analysis skills to inform strategies for early and late payments, and balance sheet advisory, etc. Other skills that are reportedly important, are systems thinking and advanced digital acumen/literacy.



4. Findings

Overview of Medium Impact Roles



Augmentation

7 Job Roles

- ▶ Assistant Relationship Manager/
Credit Analyst
- ▶ Business Manager
- ▶ Client Implementation Officer
- ▶ Client Service Officer
- ▶ Product Management
- ▶ Product Sales – Commercial/
Corporate**
- ▶ Relationship Manager –
Commercial/Corporate**

Implications on job roles

With some of the tasks being replaced, the roles will...

**Spend less
time on...**



**Spend more
time on...**

- ▶ Market research
- ▶ Documentation and processing
- ▶ Tracking and monitoring
- ▶ Product development and improvement
- ▶ Data-driven insight generation
- ▶ Managing complex cases
- ▶ Oversight
- ▶ Customer servicing

Implications on skills (Skills differentiators)

- ▶ Data Interpretation and Analysis
- ▶ Advisory
- ▶ Data Storytelling
- ▶ Complex problem solving
- ▶ Stakeholder Engagement

**Role write-up covered under Corporate Banking – High Impact Roles

Assistant Relationship Manager/Credit Analyst



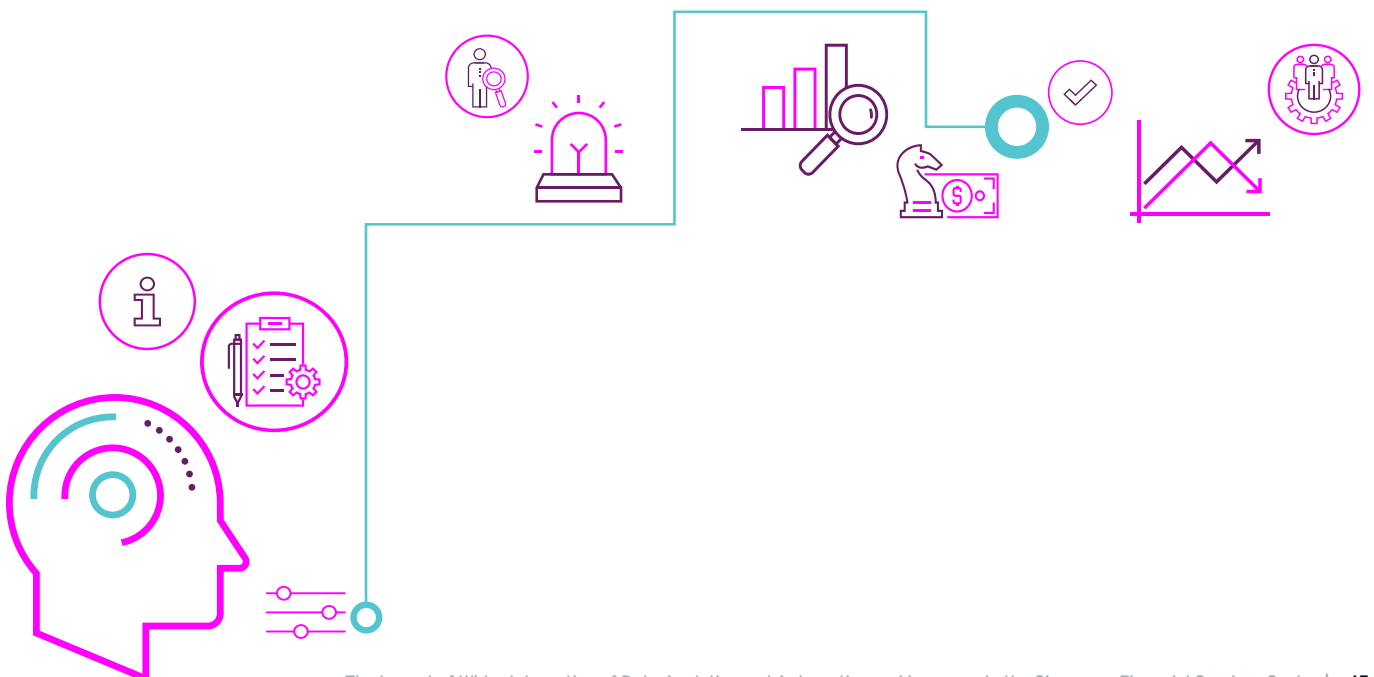
Assistant Relationship Managers (ARMs) are required to support Relationship Managers and/or Private Bankers (roles in Private Banking), a task that would require them to possess stakeholder management skills. However, a majority of their tasks are fairly repetitive, document intensive and ad-hoc. With the help of RPA and Advanced Analytics, it will be able to streamline and automate a significant portion of the client on-boarding process that tends to fall under the purview of the ARMs. Credit analysis tasks carried out will also be increasingly automated, or job holders will focus on managing exceptions and complex cases.

With the idea of self-service being widely accepted as an industry norm from the perspective of high-net-worth clients, two scenarios may take place – 1) the job scope of an

ARM will take on a larger advisory role possibly converging with Relationship Managers and/or Private Bankers (roles in Private Banking), where they will be tasked to handle private clients in lower tiers, or 2) the role of ARMs become gradually displaced.

Skills Implication:

In order to transition into a Relationship Manager and/or Private Banker (roles in Private Banking), the job holder needs to possess a global mindset, robust understanding of financial and investment products of different asset classes, and be upskilled in sales, advisory as well as customer mindset.



4. Findings

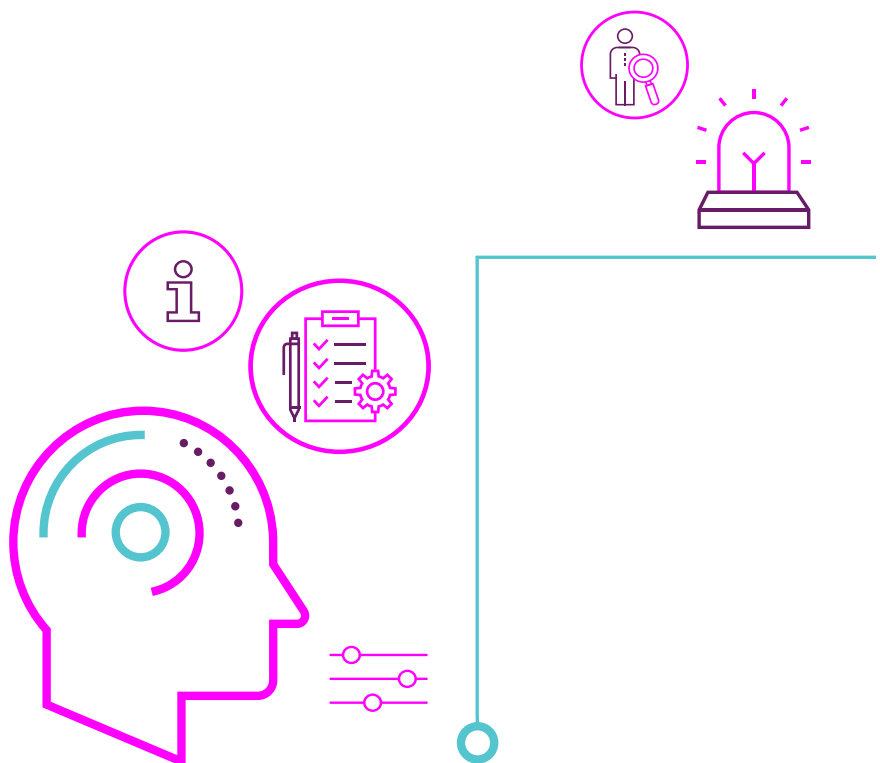
Business Manager



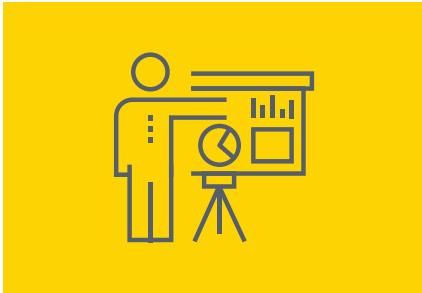
A Business Manager typically provides business and strategy support to business units across corporate and private banking, with the objective to manage a portfolio of projects and change initiatives that drive the business forward. While Advanced Analytics could facilitate the tracking of business metrics, human judgment will remain critical in applying the insights to improve the decision-making processes, and to better manage operational risk.

Skills Implication:

Some critical skills required for this role are project management, stakeholder management, change management, and lateral thinking. In addition, data storytelling capability will be increasingly important as this role dedicates more time to extract business-relevant insights from data. Hence, they will need to be able to disseminate key messages and findings from research and analysis - in a compelling, impactful, and easy-to-understand manner to audiences with varying levels of interest.



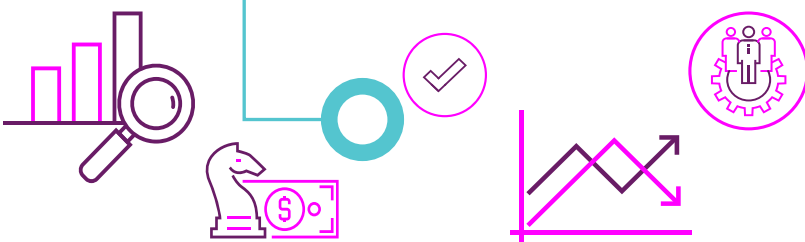
Client Implementation Officer



This role is responsible for on-boarding new corporate clients, ensuring that they are well-equipped to use the products and services. While the actual implementation (set-up and/or installation) of a solution is not prone to automation, banks have begun to develop digital or self-service platforms that offer online training to end users, though it is hypothesised that clients with a larger portfolio may continue to demand for bespoke services despite the availability of digital platforms. On top of training delivery, job holders will act as a single, consultative point of contact throughout the implementation cycle, provide oversight, manage complicated cases, coordinate acceptance testing, and address issues that are hindering client on-boarding.

Skills Implication:

Apart from having a strong customer mindset, the skills that will remain critical moving forward include project management skills to ensure products are implemented in a timely manner, stakeholder engagement, process excellence, and complex problem solving. With the rise of digital and self-service platforms, a future job holder must also acquire advanced digital acumen and change management capability to drive effective change as well as to ensure the client can successfully adopt digital solutions to support their day-to-day operations.



4. Findings

Client Service Officer

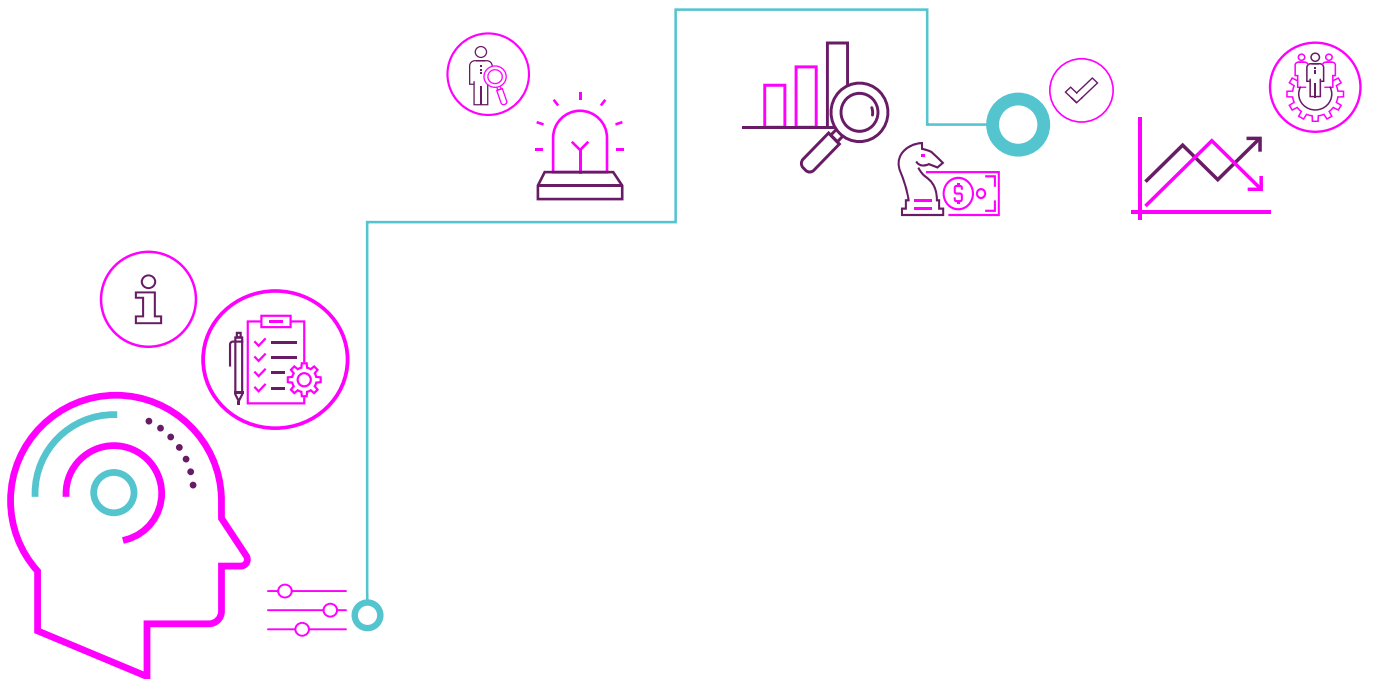


The day-to-day of a client servicing role in Corporate Banking focuses on responding to enquiries on account or operational matters, and moving forward, this role will likely require more focused attention in managing escalated cases and proactively managing the client experience.

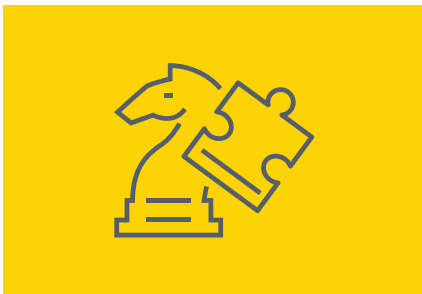
Similar to customer service in retail banking, self-service platforms are deployed across banks which have facilitated general enquiries to be answered or resolved without the need for human intervention.

Skills Implication:

Client Service Officers will focus on providing oversight, managing escalated cases, and proactively managing the client experience through the analysis of data collected. Therefore, the incumbent in this role will need to possess skill sets such as advanced digital acumen/literacy, to be able to adapt to using new technology and software tools as part of their role. Other skills such as technology troubleshooting, and complex problem solving, process excellence and data interpretation and analysis will be important for the future.



Product Management and Development



With the objective to offer a series of solutions for a variety of corporate clients, this role is responsible for the overall product development and management – not limited to researching for market trends, conducting competitor analysis, determining a product's positioning, identifying target markets, defining pricing strategy, planning for product launch, and tracking profitability. It is envisaged that this role will evolve to use data in a more predictive or proactive way that enables banks to improve their pricing strategies.

Banks are gradually using analytics to achieve product optimisation. For example, using real-time monitoring or reporting to pro-actively identify products that are under-performing, or incorporate the large volume of data – customer behaviour dynamics, customer value, transaction activities, price sensitivity, risk and many other metrics – into analysis to enable banks to improve their pricing strategies.

Skills Implication:

From a skills perspective, while the role needs to think innovatively, they are also expected to possess strong data interpretation and analysis skills and to effectively convey findings to different audiences. Advanced digital acumen/literacy skills will need to increase in conjunction with the organisation's adoption of data and digital tools. To this end, stakeholder engagement skills will be increasing important to liaise with internal and external stakeholders, and effectively elicit stakeholders' views. As collaboration across the business increases, project management and change management skill sets will also become important.

4. Findings

Overview of Low Impact Roles

4 Job Roles

Complementary

- ▶ Credit Recovery Manager
- ▶ Product Development*
- ▶ Product Sales – MNC/FI/NBFI**
- ▶ Relationship Manager – MNC/FI/NBFI**

Implications on job roles

With technology supplementing the day-to-day, the roles will...

Be better able to...

- ▶ Develop and refine products
- ▶ Establish effective pricing
- ▶ Understand client segments
- ▶ Provide product advisory
- ▶ Manage stakeholders

Implications on skills (Skills differentiators)

- ▶ Data Interpretation and Analysis
- ▶ Risk Awareness
- ▶ Stakeholder Engagement
- ▶ Influencing and Negotiation
- ▶ Advisory

* Role write-up covered under Corporate Banking – Medium Impact Roles

** Role write-up covered under Corporate Banking – High Impact Roles

Credit Recovery Manager



Credit Recovery Managers are required to have in depth business knowledge to negotiate repayment arrangements with clients. Enhanced data analytics could be a valuable input for this role to allow the job holder to evaluate a broader range of scenarios and make more robust and informed decisions. Predictive analytics could aid this role in providing early warning signs to the job holder and suggest enhanced restructuring offers. This role will continue to require human judgment to determine which options are most favourable and weigh the necessary risk criteria in the decision process. Understanding the intricacies associated with restructuring deals will remain critical for the success of this role, though this will be complemented by data analytics.




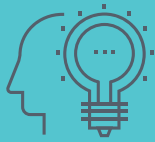

Skills Implication:

The job holder will need to be able to extract insights from data and use it to support discussions and restructuring decisions. The use of data analytics will facilitate more robust negotiations and the job holder must be able to present convincing arguments backed by qualitative and quantitative information. In addition, risk awareness and stakeholder management will continue to be important to this role. By understanding potential risks associated with decisions, the job holder can also help to mitigate issues before they become part of the negotiations. The ability to incorporate digital tools will help the job holder provide enhanced services to clients while minimising losses for the firm.

4. Findings

Below is a summary of impact levels by job roles and the associated new skills required to perform these roles in the future:

Investment Banking

Front Office					
	 Relationship Management	 Research	 Sales and Trading	 Product Origination	 Equity Capital Market (ECM)/ Debt Capital Market (DCM)
High			▶ Trader (Liquid Assets)		
Medium		▶ Economist ▶ Research Analyst	▶ Trader (Illiquid Assets)*		▶ ECM Banker ▶ DCM Banker
Low	▶ Senior Banker/ Coverage Officer		▶ Institutional Sales Officer	▶ Structurer	
New Skills Required	<ul style="list-style-type: none"> ▶ Customer Mindset ▶ Data Storytelling ▶ Global Perspective ▶ Influencing and Negotiation ▶ Lateral Thinking 	<ul style="list-style-type: none"> ▶ Advanced Digital Acumen/Literacy ▶ Advisory ▶ Analytics and Computational Modelling ▶ Data Storytelling ▶ Lateral Thinking ▶ Programming and Coding 	<ul style="list-style-type: none"> ▶ Advanced Digital Acumen/Literacy ▶ Analytics and Computational Modelling ▶ Customer Mindset ▶ Data Storytelling ▶ Influencing and Negotiation ▶ Lateral Thinking 	<ul style="list-style-type: none"> ▶ Advanced Digital Acumen/Literacy ▶ Advisory ▶ Data Interpretation and Analysis ▶ Programming and Coding ▶ Influencing and Negotiation 	<ul style="list-style-type: none"> ▶ Advanced Digital Acumen/Literacy ▶ Data Interpretation and Analysis ▶ Influencing and Negotiation ▶ Project Management ▶ Stakeholder Engagement

*Role write-up covered under Investment Banking – High Impact Roles






Middle/Back Office				
 Corporate Finance	 Distribution	 Trade Management	 Operations	 Quants
	<ul style="list-style-type: none"> ▶ Remisier 	<ul style="list-style-type: none"> ▶ Post Trade Specialist ▶ Trade Support Specialist 	<ul style="list-style-type: none"> ▶ Product Controller 	
<ul style="list-style-type: none"> ▶ Corporate Finance Banker 			<ul style="list-style-type: none"> ▶ Treasury Operations Officer 	<ul style="list-style-type: none"> ▶ Quantitative Analyst
<ul style="list-style-type: none"> ▶ Analytics and Computational Modelling ▶ Data Interpretation and Analysis ▶ Lateral Thinking ▶ Global Perspectives ▶ Influencing and Negotiation 	<ul style="list-style-type: none"> ▶ Advisory ▶ Data Interpretation and Analysis ▶ Influencing and Negotiation ▶ Research ▶ Risk Awareness 	<ul style="list-style-type: none"> ▶ Automation Management ▶ Advanced Digital Acumen/Literacy ▶ Process Excellence ▶ Complex Problem Solving ▶ Risk Awareness ▶ Data Interpretation and Analysis 	<ul style="list-style-type: none"> ▶ Data Interpretation and Analysis ▶ Data Storytelling ▶ Process Excellence ▶ Risk Awareness ▶ Strategy Planning ▶ Stakeholder Engagement 	<ul style="list-style-type: none"> ▶ Advanced Digital Acumen/Literacy ▶ Analytics and Computational Modelling ▶ Programming and Coding ▶ Risk Awareness ▶ Technology Design

Exhibit 9: Overview of impact level for Investment Banking by role including prevalent skills by role(s)

4. Findings

Overview of High Impact Roles



Convergence

Displacement

5 Job Roles

- ▶ Post Trade Specialist
- ▶ Product Controller

- ▶ Remisier
- ▶ Trade Support Specialist

- ▶ Trader (Liquid assets)

Implications on jobs roles

With a significant proportion of the tasks being automated, the roles will...

Spend less time on...

- ▶ Balance Sheet Control
- ▶ Trade Booking
- ▶ Reconciliation
- ▶ Clearing and Settlement
- ▶ Margin Management



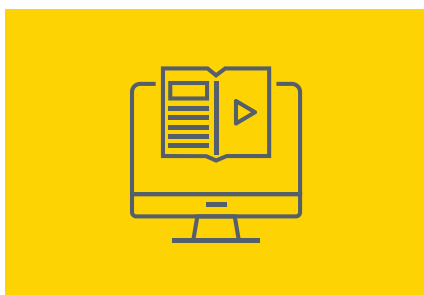
Spend more time on...

- ▶ Product advisory
- ▶ Exception management
- ▶ Structuring complex trades
- ▶ Troubleshooting
- ▶ Process improvement

Implications on skills (Skills differentiators)

- ▶ Data Interpretation and Analysis
- ▶ Risk Awareness
- ▶ Process Excellence
- ▶ Automation Management
- ▶ Advanced Digital Acumen/Literacy

Post Trade Specialist and Trade Support Specialist



Over the years, these two roles have converged with the Trade Support team in many banks, supporting both trade booking and confirmation, as well as post-trade settlements.

Today, many of the tasks (such as such as reconciliation, data extractions etc.) performed by this role are rules-based and subject to Straight-through Processing (STP) and RPA, which is already actively being used today in the trading of certain asset classes. It is expected that this role will evolve to focus on exception management and driving automation initiatives for trade support.

Furthermore, industry expects that the implementation of Blockchain could engineer away the need for many of the reconciliations that are being performed today, as they provide a single source of truth that is independently validated and available to all parties.

While some have argued that this role is on the verge of being diminished, the majority have indicated that this role will only be entirely displaced when most, if not all, financial assets are traded on electronic venues and exchanges. This would be when trades are passed straight through to back offices by linking trade execution, confirmation, clearing and settlement with risk management procedures.

Skills Implication:

Despite facing the risk of displacement, there will always be a place for human expertise. Job holders will switch from delivering routine tasks to exception management, facilitating decisions in reducing counterparty credit risk, and driving initiatives that focus on automating trade support (where human judgment and creative solutions are required). Therefore, skill sets such as automation management, advanced digital acumen/literacy, process excellence, and complex problem solving will become critical skill sets moving forward.

4. Findings

Product Controller



This role today acts as a “guardian of data and information in an investment bank”²⁷, overseeing the completeness and accuracy of daily profit and loss (P&L) for trading books as well as ensuring the alignment with regulatory requirements. It is expected that with the rise of cloud-based solutions to provide a more integrated view, this role will move away from manual consolidation to focus more on analysis and generate more intelligent decisions.

In order to address the increased regulatory scrutiny, new regulations, data and risk complexities, many investment banks have started to rethink their product control function. They recognise the key to success of a product control setup is transparency, thus, having a platform that provides real-time information and a ‘single source of truth’ to stakeholders is crucial. Therefore, cloud-based solutions provided by external service providers – that offer transparency and aggregated reporting across different business units – are preferred. Moving away from disparate platforms will also reduce the manual consolidation and analysis, ultimately leading to a more cost-effective option for trading P&L positions. Some banks have also offshored this function to India or Philippines.

Skills Implication:

Moving forward, the job holder in this role is required to be proficient in leading virtual teams – especially when key tasks of this role are outsourced. A deep understanding of risk and control remains critical as job holder needs to implement new regulatory requirements, address any trade/P&L discrepancies and ensure that effective process controls and process re-engineering are in place to improve inefficiencies.

With the use of sophisticated analytics tools, the tracking of P&L and balance sheets of trading desks can also be improved. Job holders with strong business and financial acumen and data interpretation and analysis skills will be able to uncover hidden insights and help to generate more intelligent decisions.

The industry also shared that, with their strong risk controls and reporting expertise, incumbents of this function could potentially be reskilled to take on risk management (credit or market) roles in the future.

Remisier



Traditionally, a Remisier is a stockbroking and share trading agent who carries out trade execution for clients. Moving forward, this role is expected to conduct greater research to provide more personalised services to clients.

Whilst technology has created ways to reach out to more investors, it has also provided a platform for clients or investors to switch to online trading. Additional challenges faced by Remisiers include the rise of robo-advisers, and automated online advisory platforms that can customise investment plans for an investor at a lower cost.

For years, this role has been changing to fit into the current digital landscape and to better serve their sophisticated and tech-savvy clients. In spite of the convenience of technology, investors in general, appreciate an intellectual exchange with an expert prior to reaching an investment decision. Compared to an impersonal machine, this is where a Remisier can continue to make a difference. For this reason, the industry has strongly expressed the need for this job role to conduct more in-depth research and provide more personalised services, in terms of finding unconventional ways to better present information, exchanging market views, and using data to tailor advice to their clients.²⁸

Skills Implication:

With more available information and clients becoming more demanding, Remisiers need to stay well-informed about the market landscape, as well as possess strong data interpretation and analysis skills and the ability to incorporate data insights into their recommendations and/or advice. Gaining better knowledge of product and service options will help the Remisier stay relevant, meaning they will need to reskill and pick up research and advisory capabilities. Maintaining strong stakeholder management skills will remain important as the Remisiers will need to be more proactive in making connections with and influencing potential customers.

“

[...] if Remisiers do not transform [to become more advisory], their job will diminish in the next 3 to 5 years²⁹

4. Findings

Trader (Liquid and Illiquid Assets)



The extent to which traders may be impacted would depend on the asset class that they cover. The use of technologies, ranging from IM/chat messages to electronic, computer-to-computer FIX³⁰ communication, and a switch to virtual turrets have significantly enhanced how trades are conducted today. Liquid Asset Traders may be more susceptible to the impact of automation due to the ease of trade, availability of data and standardisation, while Illiquid Asset Traders would still be required to rely more on high-touch and human judgment in managing trades and interacting with clients. The complexity in the calibration of factors associated with illiquid assets, such as underlying contracts, make it difficult to automate the analysis of such trades or create standardisation and transparency. Traders in liquid assets would need to be equipped to trade a broader range of assets, or acquire additional skills to support the implementation of electronic trading platforms.

Similarly, integration of new data sources and enhancements to algorithmic trading via AI technologies have fundamentally reshaped the trading floors of certain asset classes and the expectation is for this trend to extend to more asset classes as informational opacity reduces over time. The use of analytics and algorithms are likely to supplement a Trader's execution capabilities, while offering the flexibility to 'model' and predict scenarios based on different investment styles and market conditions.

Skills Implication:

With upskilling in domain knowledge, job holders can be equipped to trade more complex financial assets and/or diversify across asset classes. As the role transforms, the ability to utilise advanced analytics and automation tools, as well as quantitative techniques, will become increasingly important to enhance decision making.

Other skills that will be critical include influencing and negotiation capability – the ability to convince clients with new ideas, and align them to the same way of thinking, and developing a customer mindset. The ability to engage with diverse clients and communicate their advice/idea in a clear and concise manner will also be important as this role is expected to become more advisory in nature.



4. Findings

Overview of Medium Impact Roles



Augmentation

8

Job Roles

- ▶ Corporate Finance Banker
- ▶ Debt Capital Markets (DCM) Banker
- ▶ Economist
- ▶ Equity Capital Markets (ECM) Banker
- ▶ Quantitative Analyst
- ▶ Research Analyst
- ▶ Trader (Illiquid assets)*
- ▶ Treasury Operations Officer

Implications on job roles

With some of the tasks being replaced, the roles will...

Spend less time on...



Spend more time on...

- ▶ Data mining
- ▶ Market research
- ▶ Trading model validation
- ▶ Organisational book compilation
- ▶ Data-driven advice
- ▶ Trading algorithms development
- ▶ Prioritized client outreach
- ▶ Governance

Implications on skills (Skills differentiators)

- ▶ Advanced Digital Acumen/Literacy
- ▶ Data Interpretation and Analysis
- ▶ Data Storytelling
- ▶ Stakeholder Engagement
- ▶ Influencing and Negotiation

*Role write-up covered under Investment Banking – High Impact Roles

Corporate Finance Banker, DCM Banker and ECM Banker



These roles will see a transition in moving away from some of its administrative tasks, freeing up time to engage with clients and perform tailored analysis with the support of data.

Global banks today have started to automate some administrative tasks, such as contacting the legal department to assign lawyers, compiling organisational books for meetings and other similar tasks.³¹ However, the nature of these tasks also requires job holders to spend time engaging with clients, negotiating with relevant stakeholders, and closing deals. In the future, predictive analytics such as sentiment analysis and IPO price prediction can enhance the quality of service provided by these roles. While data analytics and automation will be able to augment these roles, it will not take over most of the tasks performed by the bankers.

Moreover, the needs and characteristics of clients are distinctive. The analyses performed are typically tailored to a particular organisation and the unique structure of a transaction. The efforts to automate the more human-dependent processes would therefore be cost inefficient (even if possible).

Skills Implication:

As a result, most of the current skill sets used by Corporate Finance, ECM and DCM Bankers will remain relevant and incumbents will likely need to reskill and learn the fundamentals of the new analytics tools at their disposal.

4. Findings

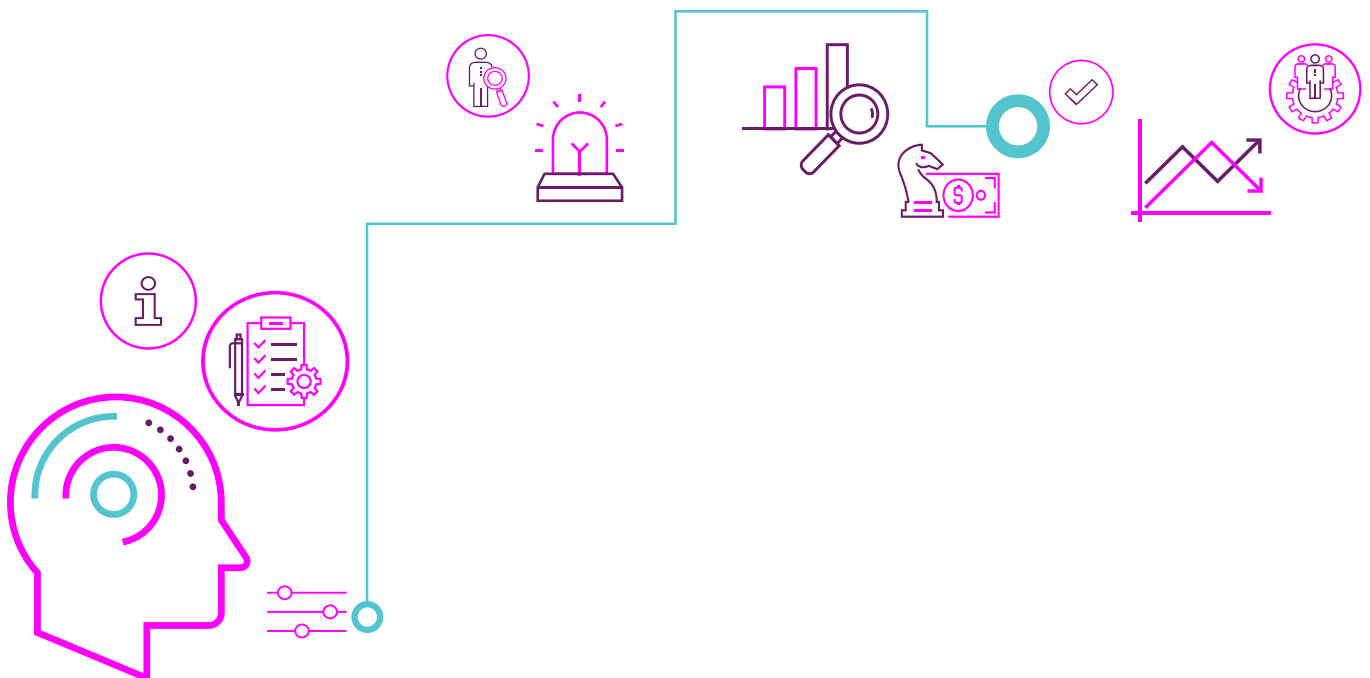
Economist



The ability to provide high-quality research to inform decisions is one of the services that helps support and reinforce relationships with clients. By combining natural language inputs with Advanced Analytics and unstructured data engineering across economic reports, monetary policy changes and political events, banks are already gaining the ability to automate human-intensive knowledge work. The real competitive edge in investment banking will come from the ability to service the market with powerful insights as an Economist would, rather than just being good at providing commoditised services. In agreement with observations gathered from the industry, data analytics and automation is perceived as an instrument to augment one's job, particularly in gathering information, disseminating research, and sharing insights with clients, and is not seen as a threat to the job of an Economist.

Skills Implication:

Strong programming, coding, analytics and computational modelling skills will continue to be required to run or evaluate complex mathematical models and simulations. In addition, a future job holder will need to utilise advanced digital and/or analytics technologies to improve the research and data collation process. They would also need to possess better advisory skills as well as display the ability to clearly articulate their data-driven points of view to different stakeholder groups.



Quantitative Analyst



The role of a Quantitative Analyst (Quant) is one in which data analytics and automation can augment numerous tasks performed. Moving forward, the role is expected to evolve to lead the development of trading algorithms.

This role is placed within different functions within each bank, but for the purpose of this study, we examined the role from the perspective of Quants related to trading.

Conventionally, Quants sit in model validation teams that verify the adherence of derivative pricing and risk management models to regulatory requirements. Today however, these validation tasks are likely to be offshored. As trading desks are increasingly being automated, Quants are now expected to support and possibly lead the development of trading algorithms and work closely with technology specialists in areas such as AI or machine learning. They are also expected to work closely with Traders and technology specialists to develop trading tools.

Skills Implication:

Moving forward, Quants will continue to be required to be exceptionally proficient in mathematics and quantitative analysis.

While a good understanding of C++, Python or other equivalent programming languages will remain critical, Quants will also need to be proficient in data mining, various automated trading systems, and other tools such as MATLAB. In addition, close collaboration with the technology team to design appropriate systems to run the developed models requires the employee to have a solid understanding in technology design to facilitate an effective partnership.

Apart from the technical skills, the traits of flexibility and adaptability to adapt and react to the fast pace of data and technology the advancement, as well as the evolution of risk and regulations, will become key differentiators.

4. Findings

Research Analyst



Today, the Research Analyst role involves a fair number of repetitive tasks but is also advisory-centric in nature. Moving forward, this role will continue to be highly valued should analysts be able to provide differentiated and value-added ideas.

Financial search engines, using linguistic search algorithms tailored for investment research, are proving to significantly reduce research time. This is accomplished by supporting the gathering of relevant data across regulatory filings, customer presentations, earnings call transcripts, and other available data parameters.

The industry also believes that report and recommendation generation will be prime for automation via AI and natural language generation. A report by Gartner suggests that machines will author 20 per cent of business content by the end of 2018.³² The potential here to augment Research Analyst's performance is promising allowing for a shift in effort to more value-adding tasks.

With regulations (MiFID II) demanding transparency about research costs, FIs are likely to scrutinise costs and leverage data analytics and automation. This regulation may have a negative impact by reducing demand for Research Analyst roles within investment banking. Research providers,

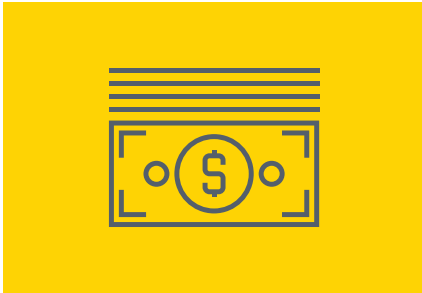
including some investment banks and smaller brokerages have started to make substantial cuts, and whilst the demand for Research Analysts has not slowed down today, there is an expectation that there will be less demand within the sector in approximately five years³³.

Top performing analysts who can provide differentiated and value added ideas will be at an advantage. From a sell-side perspective, they can become consultants or advisors who possess an expert view of different industries. Alternatively, if they were to focus on a niche and specialised area, their research materials will continue to be valued by buy-side firms.

Skills Implication:

In addition to research skills, this role is required to possess strong advisory and data storytelling skills to deliver impactful (and data-driven) advice to the business. The ability to customise research content dependent on the intended audience will lead to more relevant information being shared. In addition, moving away from excel-based tools, job holders will need to be proficient in Advanced Analytics software/platforms to process large volumes of data quickly and efficiently.

Treasury Operations Officer



Today, banks are deploying RPA to reduce the manual processing efforts of this role, therefore it is expected that this role will evolve to focus more on translation of complex data to sound strategy or insights for various client groups.

“Capital requirements have increased significantly for most banks, and liquidity remains scarce. Efficient treasury operations are critical for meeting regulatory obligations to maintain liquidity and profitability.”³⁴

Banks are deploying RPA in areas where manual processing is required in an effort to increase efficiency. Job holders in the future will gain access to near real-time views of cash balances with the application of Advanced Analytics solutions. Another augmentation to the role will be the ability for RPA to help comb through data across repositories, therefore allowing job holders to obtain true insights to support decision-making.

Skills Implication:

In the future, this role will leverage sophisticated analytics solutions with the incorporation of larger data sets to better manage the bank's capital and liquidity, ensuring that the bank can better withstand any future market stresses. Therefore, data interpretation and analysis and strategy planning skills will be essential to translate complex data into sound strategy, decisions or actions, and data storytelling capability will be needed to disseminate insights in a clear and compelling manner to audiences with varying levels of interests and appetite. In addition, in-depth risk knowledge to oversee hedging, credit, and financial risks and strong stakeholder management skills to liaise with internal and external stakeholders will continue to be critical.

4. Findings

Overview of Low Impact Roles

3 Job Roles

Complementary

- ▶ Institutional Sales Officer
- ▶ Senior Banker/Coverage Officer
- ▶ Structurer

Implications on job roles

With technology supplementing the day-to-day, the roles will...

Be better able to...

- ▶ Contribute to strategy
- ▶ Develop bespoke and complex products and services
- ▶ Build networks
- ▶ Maintain relationships
- ▶ Develop trade ideas

Implications on skills (Skills differentiators)

- ▶ Lateral Thinking
- ▶ Influencing and Negotiation
- ▶ Data Interpretation and Analysis
- ▶ Advanced Digital Acumen/Literacy
- ▶ Advisory

Institutional Sales Officer



Shifting away from execution-focused tasks, Institutional Sales roles in investment banks will move up the value curve. They are increasingly helping clients to decide when to execute a trade most effectively, and they will play the advisor-role to their clients.

Sales can typically be categorised into low and high touch. Low touch sales officers will work with large groups of clients while supporting or encouraging them to use a bank's electronic trading systems. As for a high touch sales officer, they traditionally rely heavily on the deep sector and personal knowledge of their client base to establish and maintain effective relationships, decide the trade actions in response to their clients' needs, and more importantly, ensure that clients' trades are executed accordingly.

This process can be significantly enhanced by systematically improving the quality, richness, relevance and insightfulness of the available data. For example, AI-powered tools leverage the rich data to support the job holder in client interactions by anticipating their requests and helping them decide on the next best action. The implementation of such advanced technologies presents an opportunity to approach clients with data-driven trade recommendations and enables the role to have targeted conversations. Despite the technological intervention, what is most important for this role is the ability to develop strong and trusting relationships with their clients.

Skills Implication:

To that end, this role will need to be proficient in new electronic platforms to strengthen client engagement, possess strong lateral thinking skills to connect the diverse information into delivering creative solutions, and use data to generate trading ideas with the ability to communicate in a clear and concise manner. Lastly, an Institutional Sales Officer must be able to become their client's trusted advisor.

4. Findings

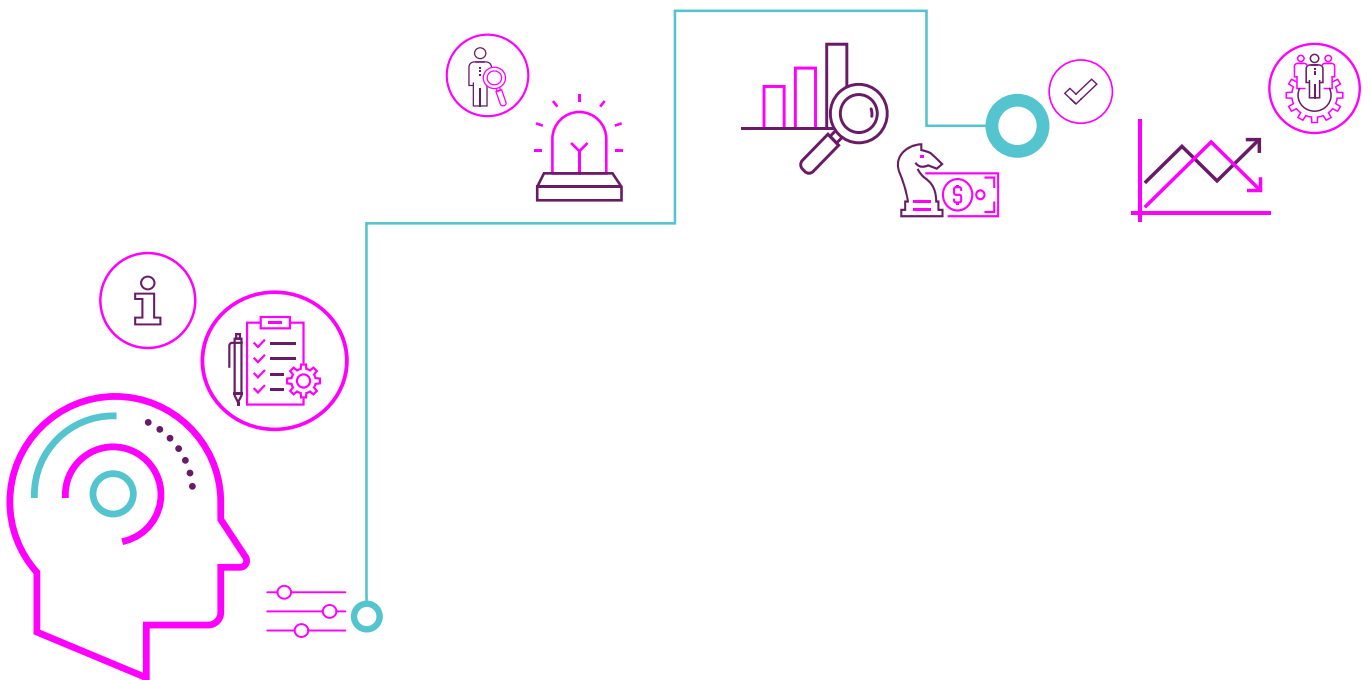
Senior Banker/Coverage Officer



Senior Bankers (or Coverage Officers) in Investment Banks rely heavily on their personal network and knowledge of their client base to source for new clients and establish effective relationships. While most of the non-core routine tasks have already been automated today, the use of predictive and behavioural analytics can complement this role. For example, it can help job holders understand the highest performing client relationships, prioritise client engagements and strengthen client outreach with data-backed proposals and solutions.

Skills Implication:

Apart from practical domain knowledge, this role must continue to possess a global and customer mindset, and continue to reskill on strategic planning, influencing and negotiation, lateral thinking, and data storytelling capabilities.



Structurer



Given the highly bespoke nature of the services provided by the role, it is expected that there will be minimal replacement of tasks by technology. However, with efficiency gains there may be a need for the role to possess multi-asset expertise as a cross-asset structure instead of focusing on a single asset class.

Advances to data collection approaches and access to new sources of data can certainly assist in the day-to-day tasks of the role. For instance, AI-powered solutions, such as linguistic search algorithms, can significantly reduce time spent on research. However, the difficulty in replacing tasks within the role is mainly due to the ambiguity of client demands – at times, the role needs to determine the objectives of the client before proceeding to the structuring phase.






Skills Implication:

Moving forward, quantitative skills – such as data interpretation and analysis and programming and coding – will continue to be critical. In addition, deep knowledge of the instruments, market, and customer coupled with advisory and influencing skills will be needed to provide pricing recommendations, as well as to gain buy-in from stakeholders.

4. Findings

Below is a summary of impact levels by job roles and the associated new skills required to perform these roles in the future:

Private Banking

Front Office					
	 Relationship Management	 Client Servicing and Reporting	 Sales and Trading	 Research	 Product Management
High			▶ Trader*		
Medium		▶ Assistant Relationship Manager****		▶ Economist*** ▶ Research Analyst***	▶ Credit Structuring Officer
Low	▶ Private Banker/ Wealth Manager				
New Skills Required	<ul style="list-style-type: none"> ▶ Advanced Digital Acumen/Literacy ▶ Advisory ▶ Customer Mindset ▶ Influencing and Negotiating ▶ Product Awareness 	<ul style="list-style-type: none"> ▶ Advanced Digital Acumen/Literacy ▶ Advisory ▶ Analytics and Computational Modelling ▶ Customer Mindset ▶ Product Awareness 	<ul style="list-style-type: none"> ▶ Analytics and Computational Modelling ▶ Advanced Digital Acumen/Literacy ▶ Customer Mindset ▶ Data Storytelling ▶ Lateral Thinking 	<ul style="list-style-type: none"> ▶ Advanced Digital Acumen/Literacy ▶ Advisory ▶ Analytics and Computational Modelling ▶ Data Storytelling ▶ Lateral Thinking ▶ Programming and Coding 	<ul style="list-style-type: none"> ▶ Advanced Digital Acumen/Literacy ▶ Data Interpretation and Analysis ▶ Lateral Thinking ▶ Risk Awareness ▶ Stakeholder Engagement

*Role write-up covered under Investment Banking – High Impact Roles

**Role write-up under Retail Banking – High Impact Roles

***Role write-up under Investment Banking – Medium Impact Roles

****Role write-up under Corporate Banking – Medium Impact Roles






Middle/back office				
 Wealth and Estate Planning	 Market Management	 Trade Management	 Transaction Operations	 Portfolio Management
		<ul style="list-style-type: none"> ▶ Post Trade Specialist* ▶ Trade Support Specialist* 	<ul style="list-style-type: none"> ▶ Transaction Processing Officer** 	
<ul style="list-style-type: none"> ▶ Wealth Planner/Advisor 	<ul style="list-style-type: none"> ▶ Business Manager**** 			<ul style="list-style-type: none"> ▶ Portfolio Manager/Portfolio Advisor
<ul style="list-style-type: none"> ▶ Advanced Digital Acumen/Literacy ▶ Automation Management ▶ Customer Mindset ▶ Data Interpretation and Analysis ▶ Influencing and Negotiation 	<ul style="list-style-type: none"> ▶ Change Management ▶ Lateral Thinking ▶ Risk Awareness ▶ Project Management ▶ Stakeholder Engagement 	<ul style="list-style-type: none"> ▶ Automation Management ▶ Advanced Digital Acumen/Literacy ▶ Process Excellence ▶ Complex Problem Solving ▶ Risk Awareness ▶ Data Interpretation and Analysis 	<ul style="list-style-type: none"> ▶ Automation Management ▶ Business and Financial Acumen ▶ Process Excellence ▶ Risk Awareness ▶ Technology Troubleshooting 	<ul style="list-style-type: none"> ▶ Advanced Digital Acumen/Literacy ▶ Customer Mindset ▶ Data Interpretation and Analysis ▶ Lateral Thinking ▶ Stakeholder Engagement

Exhibit 10: Overview of impact level for Private Banking by role including prevalent skills by role(s)

4. Findings

Overview of High Impact Roles

4 Job Roles

Convergence

Displacement

- ▶ Post Trade Specialist*
- ▶ Trade Support Specialist*
- ▶ Trader*
- ▶ Transaction Processing Officer**

Implications on jobs roles

With a significant proportion of the tasks being automated, the roles will...

Spend less time on...

- ▶ Trade execution
- ▶ Trade booking
- ▶ Reconciliation
- ▶ Clearing and settlement
- ▶ Margin management



Spend more time on...

- ▶ Exception management
- ▶ Structure complex trades
- ▶ Troubleshoot
- ▶ Process improvement

Implications on skills (Skills differentiators)

- ▶ Data Interpretation and Analysis
- ▶ Risk Awareness
- ▶ Process Excellence
- ▶ Automation Management
- ▶ Advanced Digital Acumen/Literacy

* Role write-up covered under Investment Banking – High Impact Roles

** Role write-up covered under Retail Banking – High Impact Roles



4. Findings

Overview of Medium Impact Roles

7 Job Roles

Augmentation

- ▶ Assistant Relationship Manager**
- ▶ Business Manager**
- ▶ Credit Structuring Officer
- ▶ Economist*
- ▶ Portfolio Manager/Portfolio Advisor
- ▶ Research Analyst*
- ▶ Wealth Planner/Advisor

Implications on job roles

With some of the tasks being replaced, the roles will...

Spend less time on...



Spend more time on...

- ▶ Market research
- ▶ Account management
- ▶ Portfolio construction
- ▶ Management reporting
- ▶ Personalised credit solutions
- ▶ Financial advice
- ▶ Client management/networking

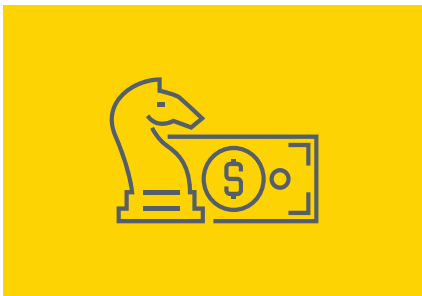
Implications on skills (Skills differentiators)

- ▶ Advanced Digital Acumen/Literacy
- ▶ Data Interpretation and Analysis
- ▶ Data Storytelling
- ▶ Stakeholder Engagement
- ▶ Influencing and Negotiation

*Role write-up covered under Investment Banking – Medium Impact Roles

**Role write-up under Corporate Banking – Medium Impact Roles

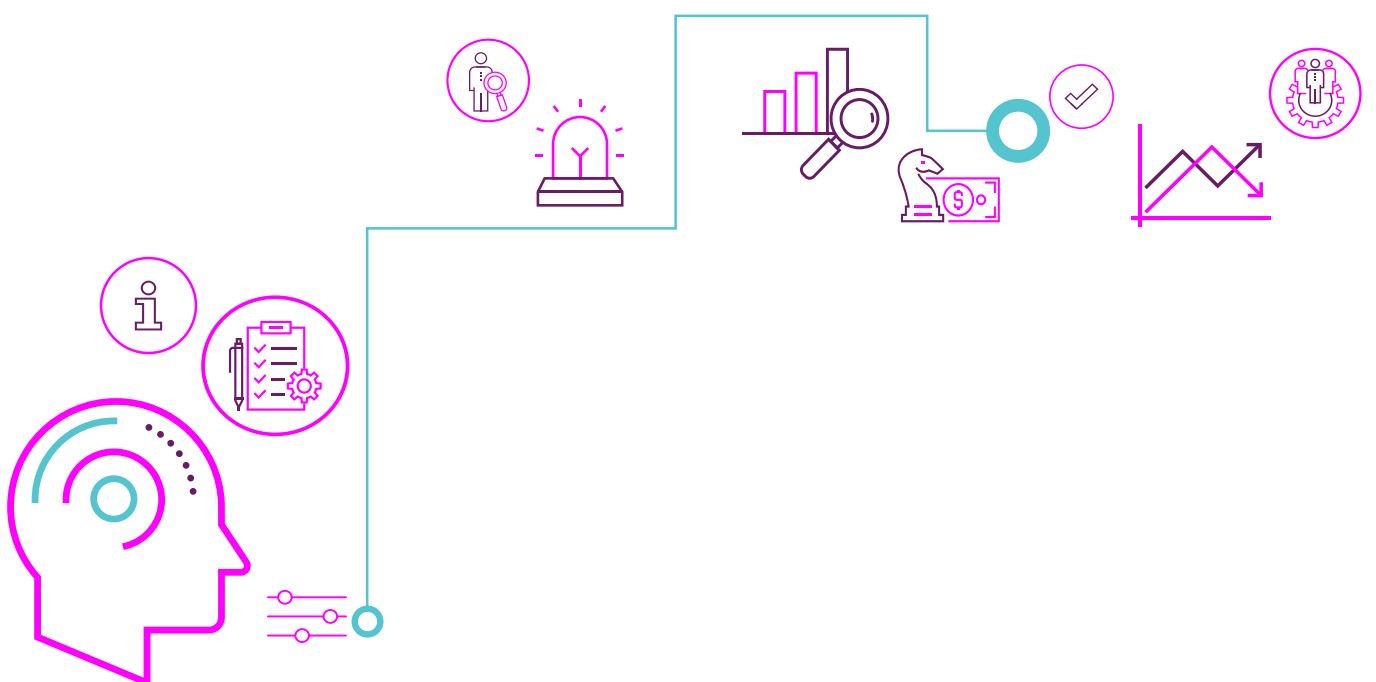
Credit Structuring Officer



With the responsibility to structure complex financing, this role is required to work closely with multiple stakeholders including Private Bankers, the credit risk management and legal functions – to ensure credit related issues are tailored to the needs of clients in Private Banking.

Skills Implication:

With data being more accessible today, AI tools and Advanced Analytics can be leveraged to pro-actively identify new opportunities to increase the sales of the bank's lending proposition. On top of having a global mindset, a job holder will continue to be skilled at interpreting information, keeping abreast of the changing legal, risk, and regulatory environment, translating insights into actionable recommendations, and subsequently presenting lending cases to internal stakeholders to gain buy-in.



4. Findings

Portfolio Manager/Portfolio Advisor



The tasks performed by a Portfolio Manager in Private Banking will be augmented, as deep technical knowledge and client interactions are still fundamental and critical for this role. They will be responsible for providing high net worth clients with market updates and tailored portfolio advisory services according to clients' investment appetite.

However, as the adoption of robo-advisors advances, clients will gain access to automated investment strategies, and portfolio creation recommendations that are specific to their needs³⁵. Therefore, the frequency of engagement with Portfolio Manager/Advisor may be reduced. Ultimately, the level of engagement between clients and Portfolio Manager/Advisor will depend on the types of investment decisions that clients are trying to make – with the more complex investments requiring them to rely more on human advice and services, such as those rendered by Portfolio Manager/Advisor. To that end, Portfolio Manager/Advisor need to constantly reskill to provide different forms of value adding services to their clients.

Skills Implication:

Algorithmic automation could potentially be used to streamline the decision-making process through “filtering” the universe of investment ideas against investment parameters, and RPA can be used to enable the communication process to traders. However, this role is required to collaborate with other stakeholders (i.e. research and investment team) to generate ideas and make informed investment decisions. As such, stakeholder management and relationship building skills will still be necessary.

In the next 3 to 5 years, this role will leverage sophisticated software/programmes and analysis outcomes to facilitate the decision on investments.

“

Robo-advisors can help to expand the client base and potentially simplify the investing process. But they are not equipped to handle complex conditions that may not be related to the mechanics of investing — like market trends or logic

Wealth Planner/Advisor

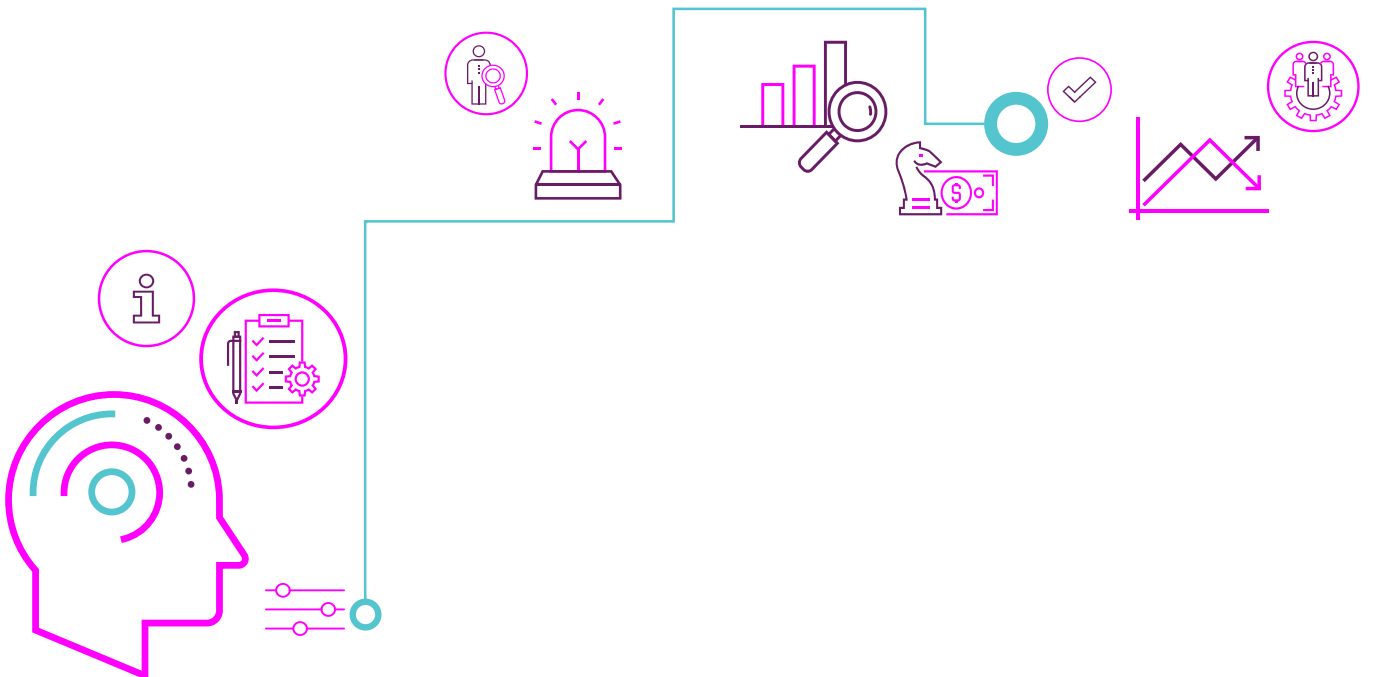


Today, Wealth Planners/Advisors play a significant role in providing specialised and targeted advice to private clients.

With a new generation of clients in Private Banking increasingly opting for a digital experience as compared to previous generations, the analysis of a client's financial status could be improved with the application of AI (or machine learning), and RPA can relieve the preparation and submission of documents. It is also vital to emphasise that as convenient as it can be, robo-advisors will not make human financial planners obsolete. Investors may engage a robo-advisor in the initial stage, but since the machine cannot (at current) account for the influence of emotion and sentiment on wealth and estate planning, human judgment, expertise and insights will remain key.

Skills Implication:

Key skill sets that are critical for the Wealth Planner/ Advisor in 3 to 5 years include possessing a customer mindset to understand clients' needs and objectives, automation management capability, data interpretation and analysis skills to interpret quantitative and qualitative data (and subsequently translating insights into recommendation), and influencing and negotiation skills to effectively communicate information to clients.



4. Findings

Overview of Low Impact Roles

1 Job Role

Complementary

- ▶ Private Banker/Wealth Manager

Implications on job role

With technology supplementing the day-to-day, the role will...

Be better able to...

- ▶ Generate targeted product recommendations
- ▶ Develop advice and solutions for client's needs
- ▶ Manage relationships effectively

Implications on skills (Skills differentiators)

- ▶ Advanced Digital Acumen/Literacy
- ▶ Advisory
- ▶ Customer Mindset
- ▶ Influencing and Negotiating
- ▶ Product Awareness

Private Banker/Wealth Manager



Notably, there are both push and pull factors at play for Private Bankers. Banks are actively encouraging clients within the lower brackets of Private Banking to move towards digital channels. At the same time, the industry shared that there is a stronger demand for digital (self-service) options from Private Banking clients themselves. This is attributed to Singapore's client demography being comparatively younger relative to their global counterparts. As inter-generational wealth shifts take place the needs of Private Banking clients will shift to have different appetites for digital tools and technology. As such, Private Bankers need to ensure they can co-exist with this change in customer needs while offering the right advisory and guidance that enables them to continue providing value-add to customers. Private Banks broadly acknowledge the increasing need to futureproof through adopting a 'digital mindset' and defining a "high touch, high-tech"³⁶ operating model.

Skills Implication:

Advanced digital acumen/literacy skills will be needed to operate new digital tools being introduced to the day-to-day of a Private Banker/Wealth Manager. In-depth financial product knowledge and robust advisory and influencing skills will be essential to align the client's way of thinking to the job holder's objectives.

4. Findings

4.2 Asset Management

Across the Asset Management subsector, a total of 16 roles were examined. Relative to Banks and Insurers, Asset Management firms tend to have a leaner set up in Singapore. Even for full-service Asset Management firms, they are largely focused on wholesale relationships and do not directly offer services to retail customers. Products are typically managed as large segregated accounts or pooled investment vehicles that do not require support from a large salesforce or branch networks on the front-end, or individual account management on the back-end. There is also a greater prevalence amongst Asset Managers to outsource operations that involve repetitive tasks to service providers.

Therefore, the implication on Asset Management firms is that the scope and need for technology adoption is lesser compared to bank. This does not necessarily translate into Asset Managers falling behind the technology adoption curve. Instead, this merely translates into a greater challenge for Asset Managers to identify areas for technology adoption. Even so, firms have found pockets within the value chain whereby technology can add value.

Despite the lean structure, Asset Management firms continuously seek ways to further streamline processes, and RPA is an area that is promising to many firms in Singapore. It has the capability to automate tasks that are repetitive and rules-based in nature – many of the tasks performed by non-client facing roles. Examples of these tasks are investment performance reporting, fund fact sheet production and trade processing reconciliation. Generally, RPA adoption amongst firms in Singapore is on the rise and the benefits of implementation will continue to be realised.

Advanced Analytics and AI have the potential to augment tasks requiring research and analysis by reducing the time spent on data entry as well as sanitisation and collation of data from various sources. With Advanced Analytics and Artificial Intelligence capabilities, technology is able to assist with the mundane and time consuming aspects of the job, freeing up time for the job holder to focus on higher value-adding cognitive tasks. There are a number of global Asset Management firms beginning to build and grow data and analytics teams in Singapore. This trend is likely to continue as more firms adopt these tools to remain competitive and lower costs in the long run.

Generally, there is a divide between the types of job families and the types of technologies that can be theoretically adopted (practical application depends on several factors – company maturity, organisation structure and talent capability).

Non-client facing job roles or supporting functions, such as Performance Reporting, Post Trade Management and Processing and Transaction Operations perform many tasks that are repetitive and rules-based which are ideal opportunities for adoption of RPA. With automation, activities will evolve (e.g. exceptions management, operational efficiencies improvement) and different skill sets may be required to target the configuration of operational processes for automation and to validate bot outputs. The new skills, such as automation management, process excellence, and complex problem solving skills will be the focus and priority for automation initiatives.

On the contrary, for client facing job roles such as Distribution Manager, Product Management, Portfolio Management and Research Analyst there can be value in adopting Advanced Analytics and AI. These technologies augment tasks by reducing time spent on mundane albeit necessary activities, such as data entry and collation and sanitisation of data. Additional data sets will help to deliver insights that support teams in making more informed investment decisions. While technology can support and improve productivity, the research direction and methodology, efficacy of research findings, integrity and quality of data sets will still require the input of expert investors with deep technical knowledge and industry experience. Instead, job holders will be able to focus on higher value added work, such as long-term client relationship building, enhanced investment idea generation and formulating differentiated research methodologies. Job holders will also be able to focus on engaging with clients and intermediaries to customise investment products and portfolio solutions to better meet client needs.

Key Observation for Asset Management






The industry also sees Blockchain (or distributed ledger technology) as a potential game changer for this role – particularly removing the manual processing of fund subscriptions and redemption. Blockchain could be able to record transactions while reducing risk by streamlining processes, ensuring the accuracy of transactions and eliminating fraudulent modifications. As ledgers on Blockchain are tamper-proof, the need for reconciliations and validation will no longer be required which optimises efficiency. However, legacy systems (in both the transfer agencies and Asset Management firms) are one of the obstructions impeding this implementation.



4. Findings

Below is a summary of impact levels by job roles and the associated new skills required to perform these roles in the future:

Asset Management

Front office					
	 Client Servicing	 Relationship Management	 Sales and Trading	 Research	 Portfolio Management
High	<ul style="list-style-type: none"> ▶ Client Service Officer 		<ul style="list-style-type: none"> ▶ Trader (Buy-side) 		<ul style="list-style-type: none"> ▶ Portfolio Assistant/ Front Office Support
Medium				<ul style="list-style-type: none"> ▶ Economist** ▶ Research Analyst** 	<ul style="list-style-type: none"> ▶ Portfolio Manager/Advisor
Low		<ul style="list-style-type: none"> ▶ Distribution Manager 			<ul style="list-style-type: none"> ▶ Alternatives Investment Partner
New Skills Required	<ul style="list-style-type: none"> ▶ Advanced Digital Acumen/Literacy ▶ Customer Mindset ▶ Risk Awareness ▶ Stakeholder Engagement ▶ Technology Troubleshooting 	<ul style="list-style-type: none"> ▶ Advisory ▶ Data Interpretation and Analysis ▶ Data Storytelling ▶ Influencing and Negotiation ▶ Stakeholder Engagement 	<ul style="list-style-type: none"> ▶ Advisory ▶ Advanced Digital Acumen/Literacy ▶ Data Storytelling ▶ Lateral Thinking ▶ Risk Awareness 	<ul style="list-style-type: none"> ▶ Advanced Digital Acumen/Literacy ▶ Advisory ▶ Analytics and Computational Modelling ▶ Data Interpretation and Analysis ▶ Data Storytelling ▶ Lateral Thinking ▶ Programming and Coding 	<ul style="list-style-type: none"> ▶ Advanced Digital Acumen/Literacy ▶ Customer Mindset ▶ Data Interpretation and Analysis ▶ Data Storytelling ▶ Global Perspective ▶ Influencing and Negotiation ▶ Lateral Thinking ▶ Risk Awareness

*Role write-up covered under Retail Banking – High Impact Roles

**Role write-up covered under Investment Banking – Medium Impact Roles

Middle/Back office				
 Transaction Operations	 Product Management	 Trade and Post Trade Management	 Performance Reporting	 Asset Servicing
<ul style="list-style-type: none"> ▶ Transaction Processing Officer* 	<ul style="list-style-type: none"> ▶ <i>Product Manager^a</i> 	<ul style="list-style-type: none"> ▶ Post Trade Specialist ▶ Trade Support Specialist 	<ul style="list-style-type: none"> ▶ <i>Fund Accountant^a</i> ▶ <i>Investment Performance Analyst^a</i> 	<ul style="list-style-type: none"> ▶ <i>Transfer Agent/Registrar^a</i>
	<ul style="list-style-type: none"> ▶ Product Developer 			
<ul style="list-style-type: none"> ▶ Advanced Digital Acumen/Literacy ▶ Automation Management ▶ Complex Problem Solving ▶ Process Excellence ▶ Technology Troubleshooting 	<ul style="list-style-type: none"> ▶ Business and Financial Acumen ▶ Change Management ▶ Customer Mindset ▶ Data Storytelling ▶ Influencing and Negotiation ▶ Project Management ▶ Stakeholder Engagement 	<ul style="list-style-type: none"> ▶ Advanced Digital Acumen/Literacy ▶ Automation Management ▶ Complex Problem Solving ▶ Data Interpretation and Analysis ▶ Process Excellence ▶ Risk Awareness 	<ul style="list-style-type: none"> ▶ Automation Management ▶ Complex Problem Solving ▶ Data Storytelling ▶ Process Excellence ▶ Project Management ▶ Influencing and Negotiation ▶ Outsourced/asset servicing 	<ul style="list-style-type: none"> ▶ Advanced Digital Acumen/Literacy ▶ Data Storytelling ▶ Process Excellence ▶ Project Management ▶ Systems Thinking

Exhibit 11: Overview of impact level for Asset Management by role including prevalent skills by roles(s)

^aoutsourced/asset servicing

4. Findings

Overview of High Impact Roles

10 Job Roles

Convergence

Displacement

- ▶ Client Service Officer
- ▶ Fund Accountant**
- ▶ Investment Performance Analyst**
- ▶ Portfolio Assistant/Front Office Support
- ▶ Post Trade Specialist
- ▶ Product Manager**
- ▶ Trade Support Specialist
- ▶ Trader (Buy-Side)
- ▶ Transaction Processing Officer*
- ▶ Transfer Agent/Registrar**

Implications on jobs roles

With a significant proportion of the tasks being automated, the roles will...

Spend less time on...

- ▶ Inquiry response
- ▶ Clearing and settlement
- ▶ Documentation
- ▶ Dividend disbursement



Spend more time on...

- ▶ Oversight and exception management
- ▶ Vendor management
- ▶ Troubleshooting and process improvement
- ▶ Complex transactions

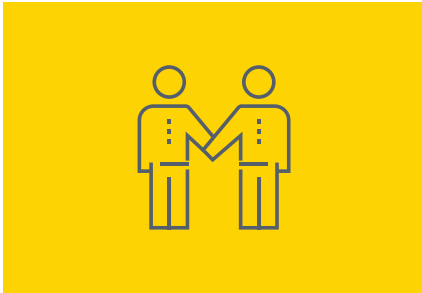
Implications on skills (Skills differentiators)

- ▶ Automation Management
- ▶ Systems Thinking
- ▶ Advanced Digital Acumen/Literacy
- ▶ Lead Virtual Teams
- ▶ Data Interpretation and Analysis

*Role write-up covered under Retail Banking – High Impact Roles

**Outsourced/Asset Servicing

Client Service Officer



The majority of tasks delivered by a Client Service Officer involve reporting, documentation and resolving first level client queries, all of which have the potential for automation leveraging RPA and AI (particularly NLP). However, a key task is transition management and this is not as easily automated. This task involves mitigating risk by devising a trading strategy that minimises the impact of differing portfolio characteristics on overall portfolio performance due to the restructuring of assets. To perform this task, human judgment coupled with risk management capabilities, stakeholder engagement, and influencing and negotiation skills will be important.

Due to the highly bespoke nature of Asset Management clients, the use of chatbots have not been widely tested in comparison to other sectors. As such, while many tasks within this role can be automated in theory, firms have been slow to leverage technology.

Skills Implication:

This role will require skills such as data interpretation and analysis, and advanced digital acumen/literacy in order to leverage data for greater insights in managing communications related matters (e.g. customer service). The job holder will also need to continually enhance their customer mindset skills.

4. Findings

Industry example:



Since the implementation of RPA, BNY Mellon Investment Management has realised increased accuracy in account closures across five enterprise systems with an 88% reduction in processing time.³⁷ One example of how RPA has impacted Fund Accountants is in the data reconciliation process. Where people previously needed to access a client's website to pull records to compare against the bank's own records to ensure a match, the bots now do the basic

work leaving humans to handle exceptions. As the bots are able to work continuously, BNY Mellon Investment Management no longer has to pay for overtime. In fact, since the bots are able to handle an overflow when a stream of work outpaces the available staffing, the firm is able to maintain a leaner team. This implies that the demand for Fund Accountants and Administrators could decrease as more firms begin to implement RPA.³⁸

Fund Accountant



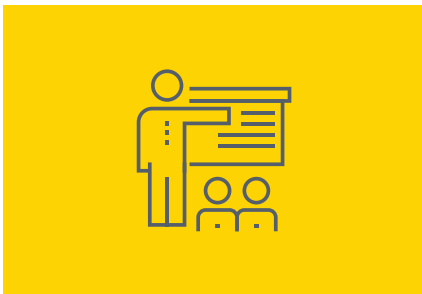
Today, this role involves repetitive, rule-based, monitoring and document preparation tasks which are optimal for RPA implementation. With the assistance and availability of RPA and fund accounting software, providers of fund accounting and administration services can increasingly adopt automation. While Asset Managers are ultimately responsible for the fund products, jobs are evolving to take on vendor management and exception management roles.

In addition, RPA extracts financial data from multiple sources and enterprise systems, conducts pre-checks and validation of fund performance and portfolio data, and then prepares data for Net Asset Value (NAV) calculation based on a set of pre-determined rules. Similarly, RPA is able to assemble standardised reports or financial statements, on the condition that report templates are available.

Skills Implication:

Amongst Asset Management firms, technology in this area continues to be leveraged. There has been an evolution of the Fund Accountant job role to focus on providing oversight, handling exceptions, reconciling differences as well as coordinating with third-party service providers (in the case of this area being outsourced and/or offshored). With these new tasks in place, some of the key skills required for this role include leading virtual teams (specific to counterparty management) and advanced digital acumen/literacy to understand how solutions can be further enhanced to support business needs. In addition to better manage the more sophisticated cases, business and financial acumen along with complex problem solving will continue to be important.

Investment Performance Analyst



The role of the Investment Performance Analyst can be significantly impacted by technology as a large part of this role involves reporting, which is rule based, repetitive and error prone. Hence, many Asset Management firms are leveraging RPA to enable the extraction of data from multiple sources or databases, validate fund performance/portfolio data and automate report generation.

However, some of the tasks performed by this role, such as attribution analysis, requires human judgment. Experience and technical knowledge is needed to steer and identify causes of excess returns, leading such tasks to unlikely to be automated. Such tasks will be augmented by Advanced Analytics.

Skills Implication:

Two sets of skills may be required for different segments of this role. In order to manage the automated tasks, the employee will be expected to possess complex problem solving, automation management, and process excellence skills to oversee the performance of the machine and put forth strategies for continuous improvement.

This role is also expected to provide technical support and guidance for new products and initiatives. Therefore, influencing and negotiation and data storytelling skills will become more important in guiding the decisions related to the product improvement or prospective product development.

4. Findings

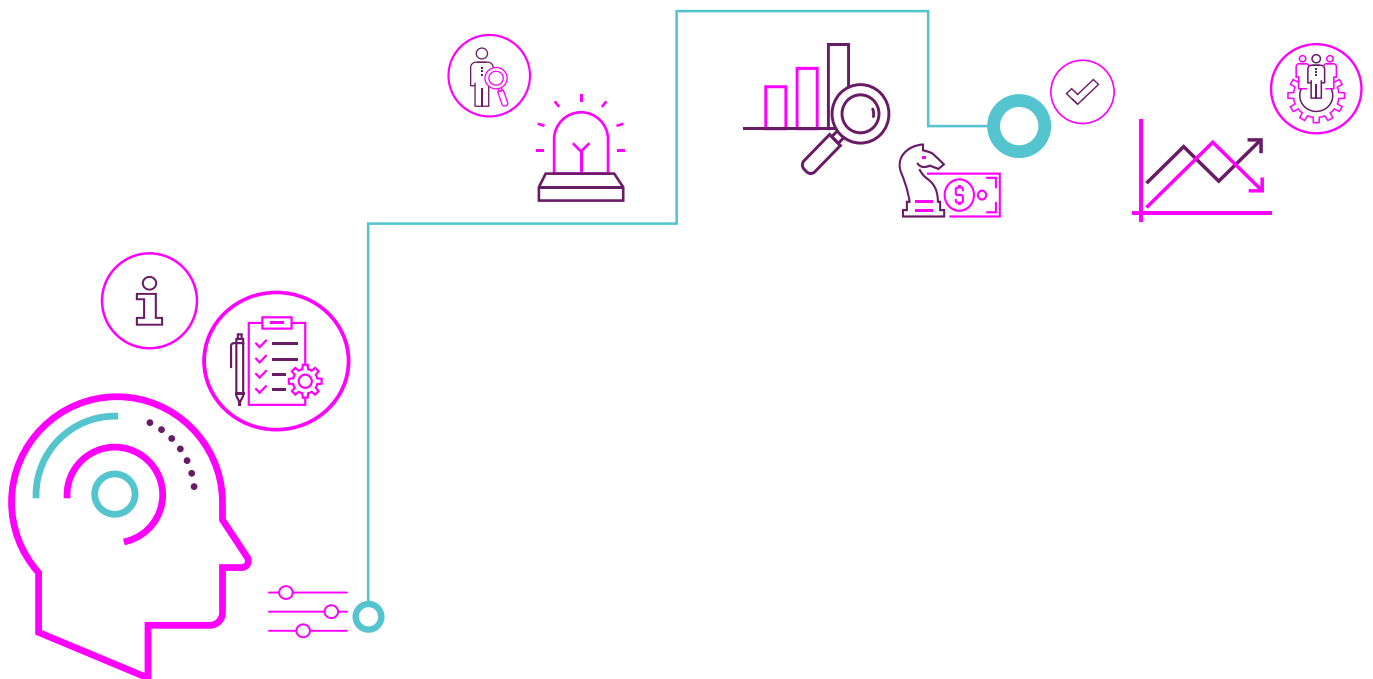
Portfolio Assistant/Front Office Support



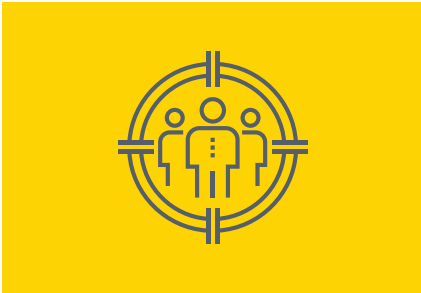
Traditionally, this role provides support to the Fund Managers (also known as Portfolio Managers) in executing and monitoring the performance of their investment strategy. As a result, the majority of their tasks are rule based, repetitive and involve active monitoring. While individuals in this role can provide their point of view, investment decisions are ultimately made by Fund Managers. Unsurprisingly, this role is often viewed as a “training ground” to become Fund Managers.

Skills Implication:

As technology is increasingly adopted to replace trade order monitoring or cash management tasks, the job scope of this role is expected to shift. Apart from deep technical expertise, advisory capability, lateral thinking, and influencing and negotiation skills will be important for this role as it evolves to become a Junior Fund Manager, who will play a bigger part in constructing investment decisions.



Product Manager



The role of the Product Manager is susceptible to automation as the majority of tasks are document intensive, repetitive and rule-based. RPA coupled with AI, are the key technologies that will impact the tasks performed by the Product Manager. It is expected that this role will evolve to be more data-driven to inform structuring of investment products.

AI technology is increasingly adopted by Asset Management firms, and for this reason, the role is likely to evolve and the incumbent will be required to manage exceptions and provide oversight. Firms may also consider outsourcing or offshoring the bulk of tasks performed by this role – such as product due diligence, registration, and product performance tracking/reporting, and if so, the added responsibility of coordination with third-party service providers will be embedded.

Skills Implication:

As the role evolves (likely to converge with Product Developer), the underlying skill sets may change. In the next 3 to 5 years, Product Managers will leverage Advanced Analytics to gain better understanding of the market or economic environment, portfolio positioning, customer behaviours, and possess in-depth knowledge of related regulations – to structure investment products with clear differentiators. Other skills required to manage offshored activities include leading virtual teams and complex problem solving.

4. Findings

Trade and Post Trade Specialist



Similar to Investment Banking, these roles perform tasks such as clearing, settling and collateral and margin management. Capturing and processing corporate actions could be automated in the near future as a result of electronic trading. The expectation is for this role to focus on exception management and driving trade automation initiatives.

Historically, collateral management has been an area of underinvestment and, as a result, many firms experienced a proliferation of systems, processes, and data across regions and asset classes. Thus, RPA is able to address cost and quality issues in processes such as documentation, margin calculation, margin calls and valuation. Notably, there are already more holistic solutions in other markets such as Serisys (Hong Kong) that are based on a multitude of technologies such as Blockchain and Cloud Services, automating almost the entire value chain (trade and post trade management).

Skills Implication:

Despite facing the risk of displacement, there remains a need for human expertise. Job holders will shift away from routine tasks and focus on exception management, complex case resolution, and driving initiatives for trade support automation – where human judgment and creative solutions are required.

Hence, skill sets such as automation management, advanced digital acumen/literacy, technology troubleshooting, process excellence, and complex problem solving will be critical moving forward.

Trader (Buy-Side)



In brief, buy-side Traders in the future will no longer solely be responsible for execution, they will be expected to be proficient in multi-asset trading, make key decisions and generate trading ideas using sophisticated trading tools and technology.

The continuous development of capital markets and regulatory requirements for transparency, extending to other asset classes beyond equities, has caused increasing convergence towards electronic trading and the advent of algorithmic trading tools and applications across asset classes. This has already resulted in the emergence of cross-asset dealing desks and it is highly likely that all Traders will eventually need to have cross-asset expertise to remain relevant.

Nevertheless, the trading role will remain relevant within the buy-side as the human element is key for the sourcing of liquidity for lightly traded, illiquid or non-exchange traded securities, more so in Asia. As liquidity may be scarce in certain markets, the ability to leverage on relationships with banks/brokers will be key to sourcing trades quickly and potentially, generating additional returns.

Skills Implication:

Programming and coding skills will be increasingly important for buy-side Traders to 1) evaluate the efficacy of manual or algo-trading and 2) comb through the data available to develop prototype quant strategies.

Principalium Capital AG is a Switzerland-based family office managing a fund-of-funds and other alternative investments, and they are a client of AlgoTrade³⁹. AlgoTrade is a Java-based, algorithmic trading platform that enables trading firms to rapidly develop, simulate, deploy and automate quantitative trading strategies for any instrument type across markets. Designed by industry experts, it provides users with maximum control of high-speed, fact-based trading for consistent and superior results. These platforms help automate the execution of quantitative strategies developed by users. This suggests that algorithms are not embedded in the platform, but input by the users themselves. Hence, Traders of the future would be expected to build

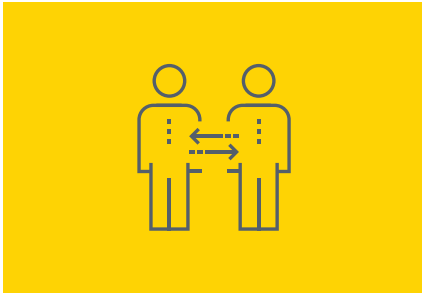


Industry example:

algorithms and quantitative trading strategies which serve as input into the trading platforms. Secondly, from a headcount perspective, firms would require fewer headcount to execute trades as Algo-Traders are able to manage orders with a wide range of order types and execution algorithms⁴⁰.

4. Findings

Transfer Agent/Registrar



The role of Transfer Agent/Registrar falls under asset servicing, rather than Asset Management. The tasks performed by these roles are typically rule based, document-intensive, and repetitive – for instance, shareholder record keeping, dividend processing, subscriptions/redemptions processing, and so forth.

The industry also sees Blockchain (or distributed ledger technology) as a potential game changer for this role – particularly removing the manual processing of fund subscriptions and redemption. Blockchain could be able to record transactions while reducing risk by streamlining processes, ensuring the accuracy of transactions and eliminating fraudulent modifications. As ledgers on Blockchain are tamper-proof, the need for reconciliations and validation will no longer be required which optimises efficiency. However, legacy systems (in both the transfer agencies and Asset Management firms) are one of the obstructions impeding this implementation.

Skills Implication:

STP is already being leveraged today, with Transfer Agents increasingly exploring, testing and implementing advanced technologies such as RPA. Such initiatives offer job holders an opportunity to develop skills around technology implementation and reshaping the role's tasks. For example, risk awareness and process excellence skills will be required for Transfer Agents to design or amend processes for operational improvements with new resources continually becoming available to the role. Transfer Agents will have to implement these changes while simultaneously ensuring alignment with risk and regulatory requirements.



4. Findings

Overview of Medium Impact Roles

4 Job Roles

Augmentation

- ▶ Economist*
- ▶ Portfolio Manager/Advisor
- ▶ Product Developer
- ▶ Research Analyst*

Implications on jobs roles

With some of the tasks being replaced, the roles will...

Spend less time on...

- ▶ Data mining and aggregation
- ▶ Market research
- ▶ Trend analysis
- ▶ Performance tracking



Spend more time on...

- ▶ Data-driven decision making
- ▶ Customer-driven solution development
- ▶ Innovative design
- ▶ Stakeholder engagement

Implications on skills (Skills differentiators)

- ▶ Advanced Digital Acumen/Literacy
- ▶ Data Storytelling
- ▶ Lateral Thinking
- ▶ Stakeholder Engagement
- ▶ Risk Management

*Role write-up covered under Investment Banking – Medium Impact Roles

Portfolio Manager/Advisor



The Portfolio Manager/Advisor role will be moderately impacted by automation and data analytics. As this role requires deep technical knowledge and client interactions, the tasks will be augmented by technology. Digital platforms and visualisation tools will be able to support the role to create investment reports and proposals that are tailored to the client's goals, as well as enabling the creation of interactive presentations during face-to-face discussions.

Skills Implication:

There are aspirations from the industry to adopt technology to support the data gathering and sanitisation components, as well as strengthening analysis work with the availability of new and more exhaustive data sources. To that end, the focus and key differentiator of the role moving forward is technical expertise and human judgment to steer the basis and direction of analysis, which ultimately translates into the quality of investment decisions. The underlying skill set is likely to remain unchanged, but become increasingly valuable. For example, displaying the ability to apply advanced modelling techniques and interpret and derive insights from data, as well as demonstrating lateral thinking will help to strengthen investment strategies. Portfolio Managers should also possess strong communication skills (such as influencing, data storytelling) to communicate the recommendations to various stakeholders in a way that makes sense to them.

4. Findings

Product Developer



This role can be divided into two broad categories: 1) consumer and competitive market research for new product development, and 2) internal stakeholders and external client engagement, where internal stakeholders comprise fund distribution, institutional sales, portfolio and investment management and product structuring teams while external clients comprise intermediaries and institutional investors. Depending on the category supported by this role, Product Developers are expected to see an augmentation in their role due to data analytics.

In the first category predictive analytics and machine learning can augment performance by delivering “what-if” analysis and scenario testing that supports product design and enhancements. The rise of new alternative sources of data collected directly from consumers and intermediaries through mobile applications and digital platforms adds an additional layer an additional layer of insights to deliver more robust analysis and accurate outcomes to predict how a hypothetical product may fare upon launch. Similarly, technology such as Natural Language Processing (NLP) increases efficiency by mining unstructured data to provide added data points to sharpen analyses. Because Product Developers continue to exercise human judgment and apply technical knowledge and experience, data analytics and automation therefore plays an augmenting role.

For the second category, human interaction and building rapport with clients is still key as Product Developers are required to work collaboratively with other business units to be up-to-date with consumer preferences. Where technology plays a role in internal and external client engagement is in the digital platforms and communication methods designed to enhance client conversations. The role, however, still centres on building long-term sustainable relationships with clients and thus technology plays an augmenting role.

Skills Implication:

A number of skills that will remain important in the next 3 to 5 years are data interpretation and analysis – leveraging insights from existing data and competitive market research to steer the directions for development, lateral thinking – focusing on the ability to think creatively (or out-of-the-box) when linking product development with clients’ needs, strategic planning – focusing on how to realise the desired results, and influencing and negotiation – displaying the ability to influence various individuals/groups and making sure that the key stakeholders are onboard to drive implementation.



4. Findings

Overview of Low Impact Roles

2 Job Roles

Complementary

- ▶ Alternatives Investment Partner
- ▶ Distribution Manager

Implications on jobs roles

With technology supplementing the day-to-day, the roles will...

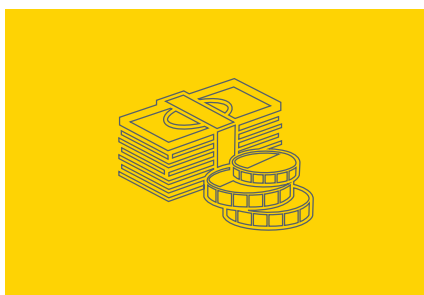
Be better able to...

- ▶ Contribute to strategy
- ▶ Specialize and provide product and market advice
- ▶ Manage relationships
- ▶ Foster collaboration and partnerships

Implications on skills (Skills differentiators)

- ▶ Influencing and Negotiation
- ▶ Data Interpretation and Analysis
- ▶ Stakeholder Engagement
- ▶ Data Storytelling
- ▶ Project Management

Alternatives Investment Partner



Alternatives Investment Partners will continue to be heavily reliant on human judgment moving forward, despite investment in AI and Advanced Analytics.

Alternative Investment teams which involve Private Equity, Hedge Funds, Real Estate, and Infrastructure investments will not be significantly augmented or impacted by technology. These roles require strategic decision making and judgment involving experience and deep industry knowledge. Investment opportunities and data on private companies are not as readily available compared to publicly traded companies, making it challenging for the application of AI techniques, or Advanced Analytics.

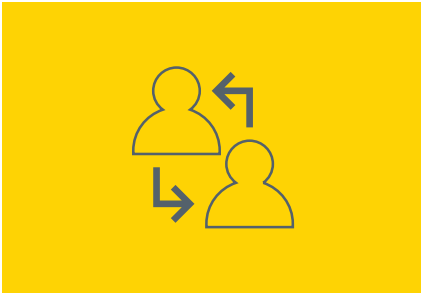
An element of negotiation is also required—particularly for Private Equity, Infrastructure, and Real Estate investments (Hedge Fund investments are more transactional in nature)—whereby deals are made with private entities and corporates. An understanding of negotiation styles and body language is a key focus and requires human judgment. Differing from traditional investments, alternative investments involve post-deal intervention (with the exception of Hedge Funds). The job role also requires professionals who can provide advice to senior stakeholders and management, and to make decisions about when to exit the deal at a higher valuation. These tasks are, and will continue to be, heavily reliant on human judgment.

Skills Implication:

However, technology does play a role in the screening process to identify target investments based on predetermined criteria (e.g. risk appetite, time horizon, industry volatility and industry diversity) against the overall portfolio. Predictive analytics and alternative sources of data may potentially enhance the decision-making process as well, however the value add and differentiating factor for Alternative Investment roles are in the post-deal engagements to “turnaround” the operations of the business. Hence, there is limited to no opportunities for automation for this role. Nevertheless, while technology is not applicable directly to the role in itself, there is value for the incumbent to be knowledgeable about the potential of data analytics and automation and their applications to improve the operations of investee companies.

4. Findings

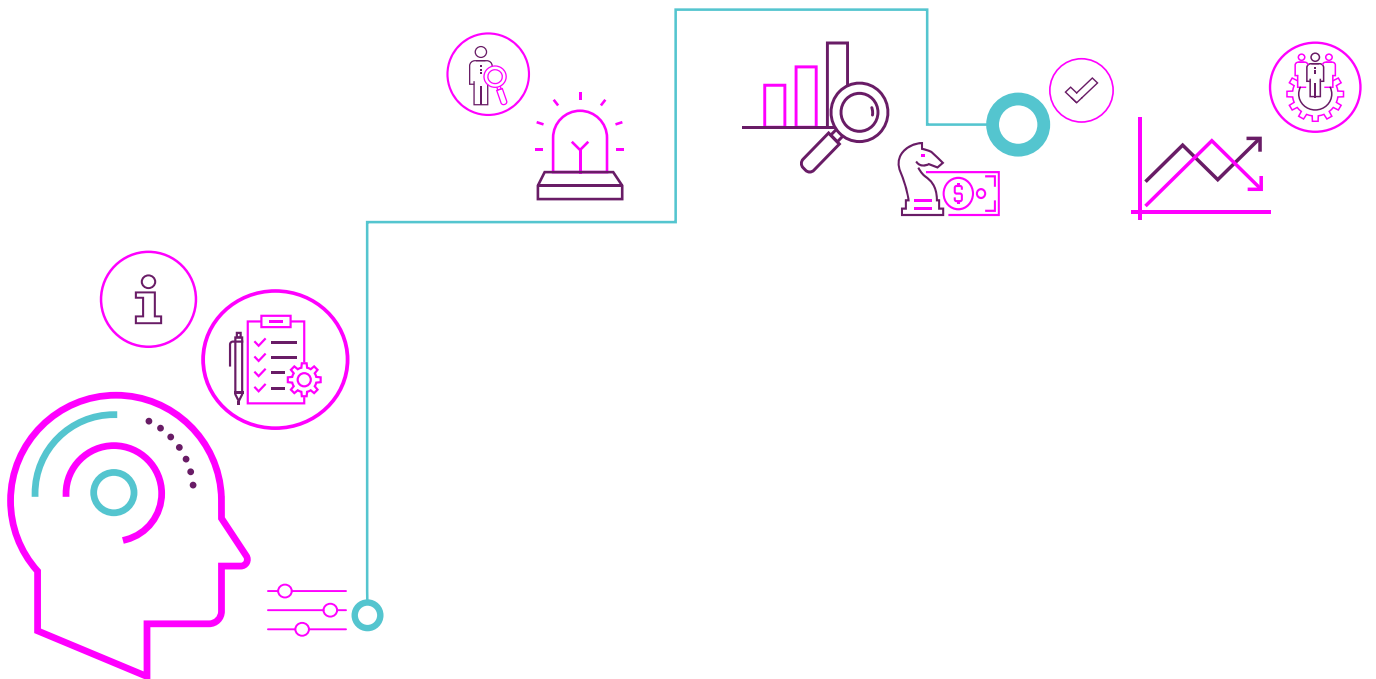
Distribution Manager



Limited opportunities for automation can be seen for this role. While new platforms and digital technology may complement the performance of day-to-day work, the core of this role is building long-term client relationships by understanding the investment needs of clients and working with product and portfolio management teams to customise or create specific investment solutions.

Skills Implication:

Apart from possessing in-depth product knowledge, incumbents will need to display strong stakeholder engagement, influencing and negotiation, and advisory skills to work effectively with portfolio managers, product teams and other stakeholders. These skills will allow the job-holder to more effectively service client's needs as well as secure new client accounts.



4.3 Insurance

Across the Insurance sector a total of 17 job roles were examined. The insurance sector has been experiencing slower adoption of data analytics and automation than the banking sector. There are two waves of automation impact – 1) Stopgap measures involving piecemeal improvement processes, and 2) far-reaching measures that are contributing to disintermediation within the value chain. Many insurers remain within wave one today. Not constrained by the preceding innovation or implementation, insurers are placed in a good position to leapfrog traditional operational models and adopt new technologies in the business functions. Gone are the days of silo operations. Today, insurers are reshaping their business model and organisation culture to encourage and foster agile ways of working, such as the introduction of cross-collaboration or multi-disciplinary teams, combining distribution, product, business, software, marketing, and other functions – with the ultimate goal of continuous improvement in business processes and increased speed to market. In the next 3 to 5 years, the pace of adoption and implementation will increase rapidly, however, commercial lines of insurance will face bigger challenges due to the complexity of the business.

Insurers have seen the value of investing in digital and mobile platforms, increasing customer engagement and improving the customer experience. Customers have become more accustomed to self-service and on-demand services and the Insurance sector is no exception.

Access to Advanced Analytics will change many of the job roles in insurance due to the improved information provided about customers' preferences and habits. Insurers will be able to better cater to customer needs due to this enhanced information, leading to additional product customisation. In addition to helping meet customer needs, insurers will be able to help take more proactive measures to improve claims outcomes and price products as competitively as possible. Pertaining to claims, with the increasing availability of big data, this changes the process from relying on the experience of an adjuster to drawing on claims history at the company level or even industry level. Thereby allowing for adjusters to be highly data-driven in triaging claim assignment.

American insurer, Lemonade, and Singapore Life are good examples in demonstrating a revolutionary approach to thinking within retail insurance. Both companies have built an innovative value proposition and offer modern approaches to purchasing insurance policies as well as filing claims, ultimately delivering an astonishing experience to their customers.

After gathering perspectives from the key insurers across Singapore, it became evident that the nature of roles is changing within the industry, however, there will always be a critical role for human expertise. Their role will focus on delivering user-centric designs to address the underlying needs and desires of their customers.






Take the example of a Retail Underwriter. Technological advancements and stronger analytical capabilities have changed the role, and it has gradually shifted away from internal processes and specific transactions – where Underwriters have historically invested their time and energy – to have a larger involvement in customer-facing processes such as solution development, risk assessment and decision making. This evolution calls for the need to identify the future skills necessary to harness the digital potential and develop the next-generation workforce to realise the value of the technology investments within the subsector. The industry agreed that to harness the value of disruptive thinking, stakeholder engagement is essential for various job roles, to name a few – Agency Management, Actuary, Claims Examiner, Partnership/Affinity Management. In the next 3 to 5 years, stronger roles and predictive modelling will become more prevalent. Data-related skills will be needed across the insurance value chain to improve analysis and storytelling capabilities.

Lastly, while historical job posting data revealed that programming and coding has been a highly in demand skill over the past four years, industry participants agreed that it is a “good to have”, rather than “need to have” skill for the users of data analytics and automation. For example, Pricing Actuaries who possess programming and coding skills could potentially accelerate their work delivery, but it is not a pre-requisite. However, some participants believed that in the next decade, programming and coding skills (such as R and Python) will become more common in the actuarial space. Every part of the insurance sector is changing due to automation and stronger analytical capabilities. This is evident through the number of job roles that fall under the high impact category. To that end, the skills required for most jobs are evolving. Across roles, insurers have started to place stronger emphasis on adaptability, agility, and flexibility. In an environment where changes are rapid and innovation often happens quickly, being the first to act on an opportunity is a competitive advantage. The ability to strive, thrive, and handle change when one's job description changes as a result of digital disruption, has become increasingly important.

4. Findings

Below is a summary of impact levels by job roles and the associated new skills required to perform these roles in the future:

Insurance

Front office					
	 Customer Service	 Underwriting	 Sales and Distribution	 Actuarial and Pricing	 Policy Management
High	<ul style="list-style-type: none"> ▶ Contact Centre Representative 	<ul style="list-style-type: none"> ▶ Underwriter (Retail) 			<ul style="list-style-type: none"> ▶ Policy Servicing Officer
Medium			<ul style="list-style-type: none"> ▶ Agency Management Officer ▶ Broker ▶ Financial Planner/ Insurance Agent 	<ul style="list-style-type: none"> ▶ Pricing Actuary ▶ Valuation Actuary 	
Low		<ul style="list-style-type: none"> ▶ Underwriter (Non-retail) 	<ul style="list-style-type: none"> ▶ Partnership and Affinity Management 		
New Skills Required	<ul style="list-style-type: none"> ▶ Automation Management ▶ Data Interpretation and Analysis ▶ Targeted Technical Sales ▶ Technology Troubleshooting ▶ User Experience Design 	<ul style="list-style-type: none"> ▶ Advanced Digital Acumen/Literacy ▶ Analytics and Computational Modelling ▶ Data Interpretation and Analysis ▶ Lateral Thinking ▶ Stakeholder Engagement 	<ul style="list-style-type: none"> ▶ Advanced Digital Acumen/Literacy ▶ Advisory ▶ Change Management ▶ Data Interpretation and Analysis ▶ Global Perspective ▶ Leading Virtual Teams ▶ Stakeholder Engagement 	<ul style="list-style-type: none"> ▶ Analytics and Computational Modelling ▶ Business and Financial Acumen ▶ Data Storytelling ▶ Lateral Thinking ▶ Programming and Coding ▶ Stakeholder Engagement 	<ul style="list-style-type: none"> ▶ Automation Management ▶ Complex Problem Solving ▶ Data Interpretation and Analysis ▶ Data Storytelling ▶ Process Excellence

Middle/Back office






 Operations	 Claims Management	 Reinsurance Management	 Product Management	 Investment Management
<ul style="list-style-type: none"> ▶ New Business Operations Officer 	<ul style="list-style-type: none"> ▶ Claims Examiner (retail) 			
	<ul style="list-style-type: none"> ▶ Claims Examiner (Non-retail) ▶ Loss Prevention 	<ul style="list-style-type: none"> ▶ Reinsurance Management Officer 	<ul style="list-style-type: none"> ▶ Product Development 	<ul style="list-style-type: none"> ▶ Investment Management Officer
<ul style="list-style-type: none"> ▶ Advanced Digital Acumen/Literacy ▶ Automation Management ▶ Complex Problem Solving ▶ Lead Virtual Teams ▶ Process Excellence 	<ul style="list-style-type: none"> ▶ Advanced Digital Acumen/Literacy ▶ Advisory ▶ Complex Problem Solving ▶ Data Interpretation and Analysis ▶ Investigation ▶ Research ▶ Stakeholder Engagement 	<ul style="list-style-type: none"> ▶ Advisory ▶ Complex Problem Solving ▶ Data Interpretation and Analysis ▶ Lateral Thinking ▶ Process Excellence 	<ul style="list-style-type: none"> ▶ Customer Mindset ▶ Data Interpretation and Analysis ▶ Global Perspective ▶ Lead Virtual Teams ▶ Project Management 	<ul style="list-style-type: none"> ▶ Advanced Digital Acumen/Literacy ▶ Complex Problem Solving ▶ Influencing and Negotiation ▶ Lateral Thinking ▶ Risk Awareness

Exhibit number 12: Overview of impact level for Insurance by role including prevalent skills by role(s)

4. Findings

Overview of High Impact Roles

5 Job Roles

Convergence

Displacement

- ▶ Claims Examiner (Retail)
- ▶ Contact Centre Representative
- ▶ New Business Operations Officer
- ▶ Policy Servicing Officer
- ▶ Underwriter (Retail)

Implications on job roles

With a significant proportion of the tasks being automated, the roles will...

Spend less time on...

- ▶ Enquiries resolution
- ▶ Policy issuance
- ▶ Claims filing
- ▶ Payment calculation
- ▶ Application review



Spend more time on...

- ▶ Targeted cross-selling and up-selling
- ▶ Complex case investigation
- ▶ Data interpretation for solutions
- ▶ Customer experience improvements

Implications on skills (Skills differentiators)

- ▶ Data Interpretation and Analysis
- ▶ Risk Awareness
- ▶ Process Excellence
- ▶ Automation Management
- ▶ Advanced Digital Acumen/Literacy

Claims Examiner (Retail)



With a large component of the Claims Examiner's role involving transaction-related tasks such as document collection and processing to settlement, existing systems are able to assess a large percentage of standard claims that allow for Straight Through Processing (STP), enabling incumbents to focus on the remaining 20% of claims that are complex and require critical evaluation and expertise.

While acknowledging AI will likely result in lower headcount in claims, AI will also enhance the ability to perform job roles better – by handling massive amounts of requests and data in a short amount of time – rather than the displacement of the job roles entirely.

The General Insurance Association of Singapore estimates that one in five claims the industry receives are either false or inflated, which works out to approximately S\$140 million (US\$101 million) each year.⁴¹ The introduction of AI will eventually help to improve the claim process and lead to a reduction in losses. Additionally, future claims examiners are required to be familiar with advanced technology such as self-driving cars and sensor technology products, to better understand product liability issues.

Skills Implication:

In the next three years, the Insurance industry will see fewer lower-skilled claims handlers, with a greater focus on more complex adjusting skills. Some of the critical skills reported by industry participants are data interpretation and analysis, investigation, and complex problem solving.



Industry example:

Allianz is moving towards the digital agency model in APAC where the focus is to empower their sales force with the right skills and tools to advise and engage customers. Part of this proposition includes raising the bar on an agent's professionalism and competencies through a regional training academy. This initiative was first launched in Shanghai in May 2016 and will be rolled out in other markets within Asia Pacific. While there is general industry consensus that a large proportion of this role today is spent on routine administration which will decline with increased automation, this role will still involve the investigation of fraudulent activities and communicating with lawyers, forensics and loss adjusters.⁴²

4. Findings

Contact Centre Representative



Many of the tasks performed by a Contact Centre Representative (such as the resolution of inquiries, data entry and issue log tracking) are repetitive and high in volume and can be automated by systems that already exist today. This role will see a decline in the next 3 to 5 years with many insurers in Singapore already outsourcing this part of their operations.

Skills Implication:

Those who remain in the Singapore insurance workforce must continue to evolve to be able to support customers on more technical service related issues as customers increasingly adopt the usage of digital and mobile applications. In the future, this role must possess data interpretation and analysis skills to be able to analyse information gathered from chatbots and other AI-enabled solutions which will be useful to continue to train the systems to be even more robust in their capabilities. Other critical skills for this group of people would be technology troubleshooting and leading virtual teams.

Depending on the direction of the business, this role may become more involved in the sales process and providing insights on customers' interests, browsing patterns, and user experience. Under such circumstances, different skill sets, such as targeted technical sales, user experience design, and advanced digital acumen/literacy skills will be relevant.

“

This role will focus on maintaining the logic of chatbots and technology and providing advice to the business on how to further enhance the operational aspects of day-to-day activities⁴³

New Business Operations Officer

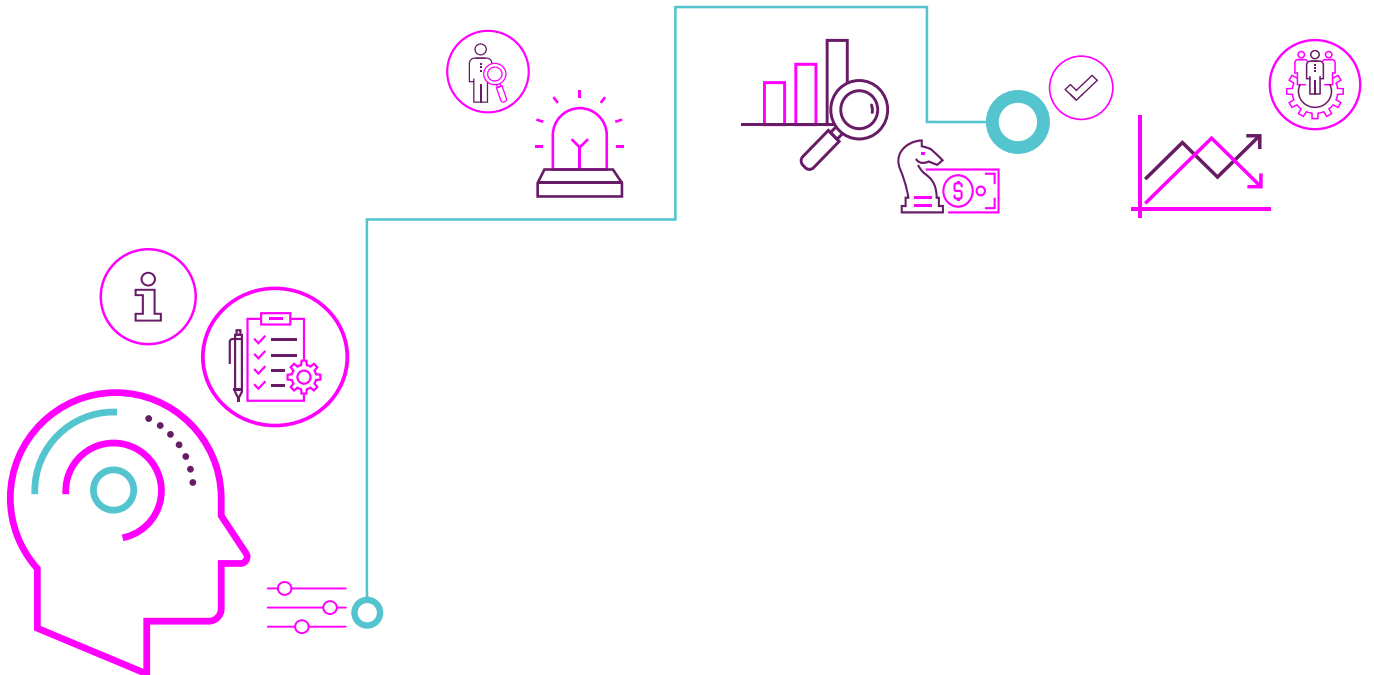


Similar to Policy Servicing Officers, this role will see a decline in the next 3 to 5 years with many insurers in Singapore already outsourcing this part of their operations to other countries (e.g. China, Malaysia). New Business Operations Officers are tasked with handling a large volume of cases that are highly manual, paper-based and low in complexity. To that end, the skill set to lead a virtual team will become important in ensuring that the operations maintain efficiency.

In addition, many insurers are currently leveraging RPA or workflow management systems to support the elimination of manual tasks such as document review and data collection. Further to improving cycle time and efficiency, insurers also recognise that RPA solutions greatly reduce error rates.

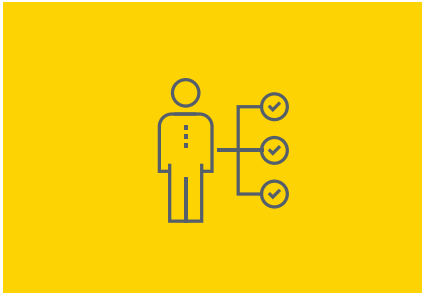
Skills Implication:

Industry participants shared that for those who will remain in this role, they must possess strong digital acumen/literacy – including the in-depth knowledge in RPA and AI Blockchain technology to support the process and system integration.



4. Findings

Policy Servicing Officer



The industry participants shared that 80% to 90% of the work for this role is administrative and can be automated. While this role is at risk of being replaced, a dedicated team will be responsible for exceptions handling, and this will continue to be a core part of insurance servicing that will not be sidelined.

In Singapore, insurers recognise that maximising performance in policy management can drive value for the company, and often, policy management and servicing has been a primary focus to reduce operating costs for insurers. To this end, we have seen transformation to reduce routine policy servicing, and these efforts will continue to be refined with the rise of Advanced Analytics and AI. Advancement of analytical capabilities have simplified collection and analysis of data, allowing job holders to make informed decisions in shorter timeframes. With the utility of telematics and increase in adoption of biometric sensors in Singapore, there will be more real-time data accessible on individuals, which will positively impact the insurer-policy holder relationship.

Skills Implication:

Predictive analytics will become more important for this role to determine and predict attrition rate. However, participants shared that instead of hands-on analytics or computational modelling, the ability to interpret analysis outcomes and use a combination of visualisation and narratives to inform business stakeholders on action plans will be more important in the next 3 to 5 years.

The industry also shared that automation management skills may be important in the future as policy servicing officers will need to reconfigure the entire process and ensure that the system works effectively.



Industry example:

AIA Hong Kong has also launched a revolutionary digital initiative, "AIA iCare Self Help Service Kiosk" in 2016, which focuses on providing customers with comprehensive repository of information for frequent enquiries, claim guidelines and claim submission procedures. In addition to the wealth of information available to users, the kiosk promises to help expedite long claim processes and provide a user-friendly and prompt alternative to the Traditional Policy Servicing Officers. The kiosk contains the function of interactive, live-chats with AIA agents and with that, it combines the best of efficient automation and the "human touch". This will help expedite the work that Policy Servicing Officers have to cope with, and provide alternative venues for users to connect with AIA's agents.⁴⁴

AXA has launched its end-to-end insurance transactional API to deliver customised insurance products in a simplified way and as a start for Home, Travel, and Car insurance.⁴⁵ This will be available for partners to integrate with their customers' journey, supporting all steps of insurance purchase from prospecting, quotation to policy issuance. This year the service includes policy servicing capabilities that seek to increase efficiency in policy issuance and enrich the customer experience. AXA has also announced that they will be pushing out additional APIs for AXA's other service lines such as prospecting and quotation by the first quarter of 2018, and will also include customer and policy servicing related functionality to support customer's queries, claims and policy management.⁴⁶

Underwriter (Retail)



While it is estimated that 40% of tasks an Underwriter performs involve activities around data gathering and processing, it is evident that automation of processing tasks would be less complex in retail lines of insurance as opposed to non-retail lines of insurance. This role is expected to evolve to take on more complex assessment of risks across different sectors and use data to analyse and identify trends.

Underwriters in the direct-to-market retail area (across motor, travel insurance etc.) will continue to face a decline in demand as direct-to-consumer platforms have automated most of the underwriting process (or pre-underwritten services are already in place). The tasks involved for life and consumer Underwriters typically involve documentation and information collection which today is already managed through STP. In addition, Underwriters processing these products that are less complex typically do not require negotiation or complicated premium settings which are more challenging to automate as they require judgment and advisory capabilities.

Life insurance Underwriters require information to be gathered from multiple sources and then risks to be assessed for any given policy. Over the past few years, life insurers had been aggressively moving from paper-based processes to electronic processes that will help to ensure consistency in decision making and improved accuracy. Life insurers are seeing an increase in policy purchases, potentially due to longer life expectancy, or increased uptake in savings-oriented plans and retirement plans. Given the increased volume of business, insurers are compelled to accelerate automation in order to manage an increased sales volume.

Having said that, despite the digital wave in Asia, most life insurers are still relying on paper applications completed by agents or Bancassurance Officers. This is expected to change in the near future with potential e-submissions at the point of sale, which would have a positive impact on Underwriters with the reduction of paper handling.

Skills Implication:

The case for Underwriters of tomorrow is one that spends less time on data entry and is able to support more complex assessment of risk across different sectors. Reskilling in areas such as research, and data interpretation and analysis skills will allow future Underwriters to be able to use data from new sources, help to identify important trends, predict new areas for analysis (e.g. new risks that are emerging like medical conditions/procedures), and stay well-informed on emerging threats.

Moreover, raising digital acumen/literacy, and gaining a strong understanding of advanced technology (such as self-driving cars and sensor technology products) will be a key for Retail Underwriters, as the risk criteria will for instance shift from driver-focus to car-model specific.

Depending on the level of automation and an organisation's direction, insurers may place top performing Retail Underwriters to play considerably different, and higher value roles as the traditional day-to-day tasks are replaced by technology. For instance, instance, converging this role with sales or the product development team. To undertake different roles in the future, Retail Underwriters will need to develop different skill sets, such as stakeholder engagement, targeted technical skills, and lateral thinking to leverage the power of automation in a manner that enables timely insights.

4. Findings

Overview of Medium Impact Roles



Augmentation

10 Job Roles

- ▶ Agency Management Officer
- ▶ Broker
- ▶ Claims Examiner (Non-Retail)
- ▶ Financial Planner/Insurance Agent
- ▶ Investment Management Officer
- ▶ Loss Prevention
- ▶ Pricing Actuary
- ▶ Product Development
- ▶ Reinsurance Management Officer
- ▶ Valuation Actuary

Implications on job roles

With some of the tasks being replaced, the roles will...

Spend less time on...

- ▶ Market research
- ▶ Management reporting
- ▶ Contract administration
- ▶ Agent onboarding



Spend more time on...

- ▶ Data-driven decision making
- ▶ Product innovation and customisation
- ▶ Communicating insights
- ▶ Proactive risk management

Implications on skills (Skills differentiators)

- ▶ Advanced Digital Acumen/Literacy
- ▶ Data Interpretation and Analysis
- ▶ Data Storytelling
- ▶ Stakeholder Engagement
- ▶ Influencing and Negotiation

Agency Management Officer



For Agency Management Officers, the relationship management aspect on the role is not expected to change as it will continue to require significant personalised service, with technology supporting some of its more administrative tasks such as commission calculation.

With a tied agency channel remaining a core channel of distribution in Singapore for insurers, this role will remain relevant in the next 3 to 5 years. Having said that, the channel is seeing changes due to self-service platforms and AI being implemented to assist with tasks such as commission calculation, payment cycle information, and deduction of training fees. Insurers are taking steps to augment this role to better serve agents. Many of the inquiries that agents have can be addressed in the future by the creation of self-service channels as well as digital applications. In addition, there's a greater focus on the role to equip agents with the knowledge to use digital tools in order to keep them abreast of consumer demands and digitalisation trends.

Skills Implication:

In addition to adopting advanced digital acumen/literacy skills, industry participants shared that conflict management to manage agents is key to this role as the competition for talent is intense within the sector, as well as organisation. Other skills that were reported to be critical in the future include leading virtual teams, stakeholder engagement, and data interpretation and analysis.

4. Findings

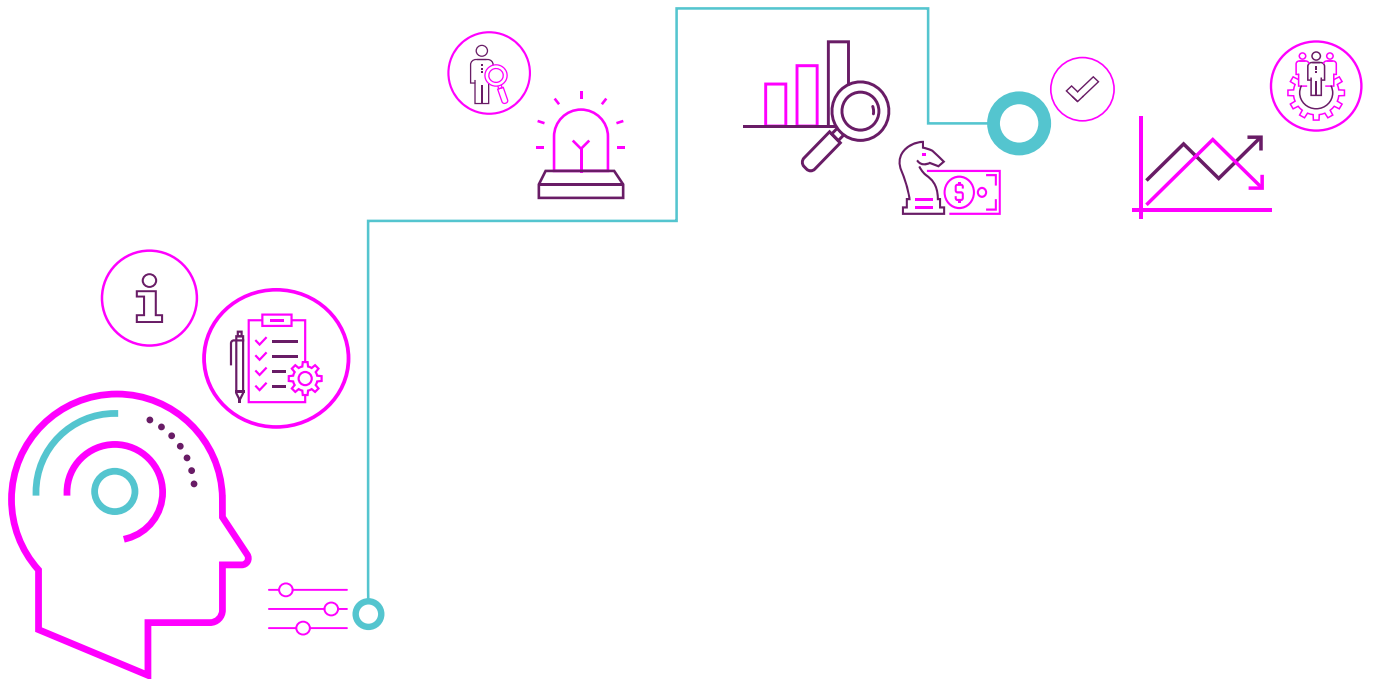
Broker



This role will be augmented by data analytics, which will allow Brokers to make more targeted and specific recommendations to meet customers' needs. Data analytics can also be used to improve definition of prospective leads. This will allow Brokers to spend less time on tasks such as customer identification and more time on sustaining customer relationships and providing tailored advice to customers.

Skills Implication:

Job holders will need to be familiar with new technologies and digital tools that can help them manage data and increase their effectiveness. Data interpretation and analysis skills will be critical to drive negotiations with customers and insurers, improve advisory capabilities and deliver more targeted recommendations.



Claims Examiner (Non-retail)



Unlike Claims Examiners for retail, those who look after commercial lines of insurance are less able to rely on solutions that use STP. Non-retail lines of insurance are often much more complex, requiring additional human evaluation and judgment. This can especially be seen in claims cases that have a high risk of fraud or are above certain financial thresholds, and these cases will require escalation for additional review and potential reliance on external inspectors and specialists to make final decisions.

Influencing and negotiation are, therefore, important skills for this role, as non-retail claims are a series of negotiations between the insured and the carrier starting from day one of the loss. Depending on the size of the loss and the complexity of the business, settlements or claims processes can take months, or years.

Due to the variability of the claims processing timeframe, stakeholder engagement skills are critical to effectively communicate the outcomes to senior stakeholders.

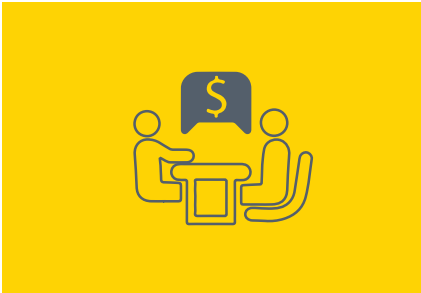
Specialists are typically hired, trained or engaged to deal with emerging risks, especially cyber crime, data breaches and fraud. The industry agreed that commercial specialty insurers will see smaller reductions in workforce.

Skills Implication:

In the next 3 to 5 years, the industry expects to see closer collaboration between claims examiners and data analytics teams to be more proactive in managing claims. This role will therefore require strong data storytelling skills to effectively communicate findings via a combination of data visualisation and narratives. Also, they are required to excel in data interpretation and analysis, not only to incorporate analytics in decision-making processes, but also improve claims-handling processes to create business value through the intelligent use of claims data.

4. Findings

Financial Planner/Insurance Agent



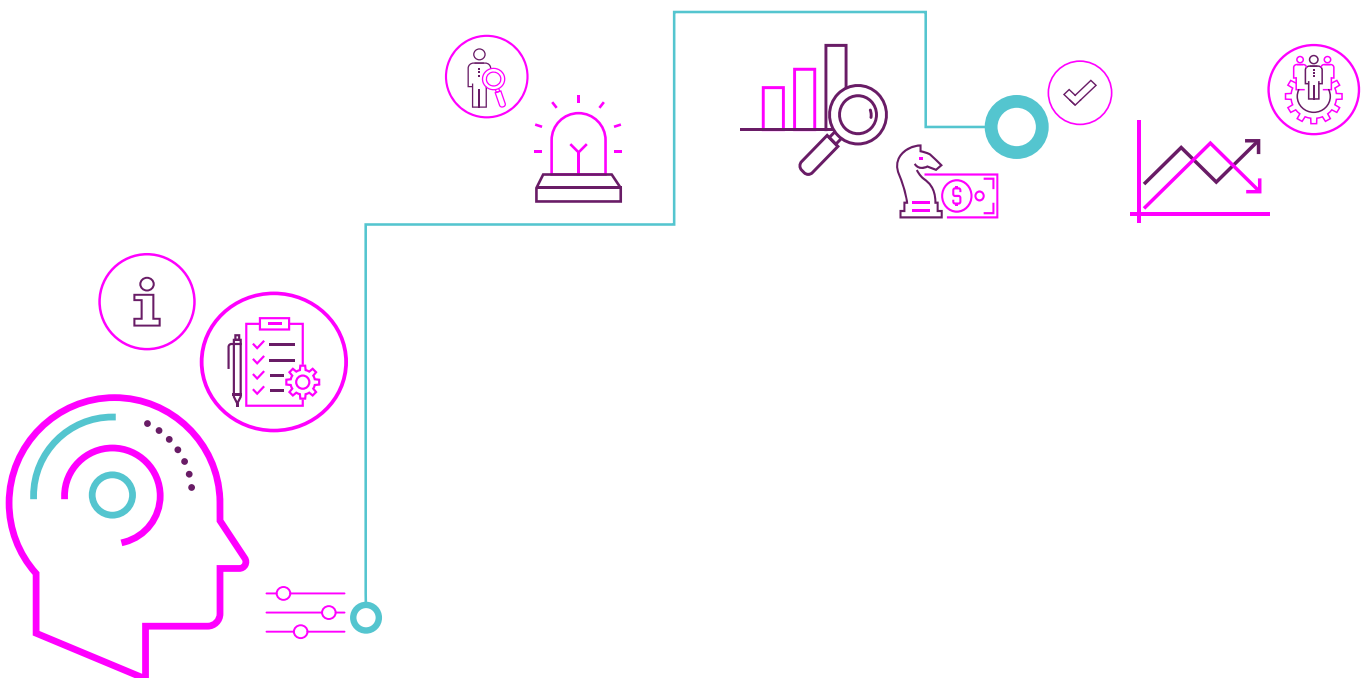
Customers' insurance purchasing habits are changing, due to the emergence of aggregators as well as customers being more informed about policies available to them.

Today, leading insurance companies are already leveraging analytical engines to generate a single view of the customers' profile, aiding insurance agents' conversations with the customers. The virtual (AI-driven) assistant, for example, could provide insurance agents with insights about the customer's recent real estate purchase, or upcoming flight booking, thereby enabling agents to engage in potentially cross-selling Insurance products that would benefit their customers.

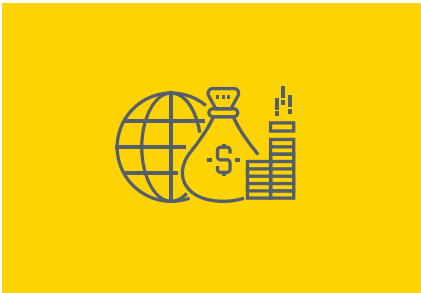
While Advanced Analytics allow insurance agents to have a better understanding of customer preferences, the industry believes that human expertise will remain critical to provide advice and insights to customers in the near future – especially on complex commercial cases and life insurance.

Skills Implication:

Moving forward, it is likely that agents will shift to focus on advisory and education activities including providing additional financial planning services to cater to customer needs in a more holistic way. Therefore, advisory skills, coupled with advanced digital acumen/literacy skills will be necessary to facilitate interactions with customers, improve service effectiveness, and data interpretation and analysis skills will be relevant to better inform customers' servicing needs. Some participants also reported the need to further enhance the product awareness skills set and overall knowledge of regulatory changes.



Investment Management Officer



The increased use of Advanced Analytics will help Investment Management Officers make better and more informed decisions in the future.

There is potential for automation of portfolio performance monitoring and structuring, as well as advanced scenario modelling to evaluate more scenarios than previously possible.

The job holder will need to have enhanced risk awareness skills to be able to evaluate risk and return decisions given new types of investment opportunities that are available. As investment strategies become more and more complex, the job holder will need to have complex problem solving skills. As the job holder is able to connect the dots between business objectives and investment strategies, the role will be able to achieve enhanced outcomes.

Skills Implication:

Ultimately this role will be augmented. For this role to be optimised they will need to work collaboratively with various business units to understand their objectives and then determine how best to leverage technological resources to achieve those results.

4. Findings

Loss Prevention



Technological advancements have allowed Loss Prevention job holders to conduct more swift and comprehensive identification of risks and hazards by analysing large amounts of data collected from on-site investigations. In the future, the use of Advanced Analytics and AI will help to formulate the best strategies for clients to mitigate these risks, therefore, the role will be augmented.

Skills Implication:

In the future this role will need to possess advanced digital acumen/literacy skills to obtain deep understanding of how sensors can create a network of vehicles, home appliances and other devices. Software connectivity will enable these devices to connect and exchange data seamlessly reducing the manual processes that were once a part of a Loss Prevention Officer's role. Such knowledge/expertise coupled with strong advisory and data storytelling skills will enable them to provide clients with valuable risk insights as well as actionable recommendations.

Additionally, the ability to leverage big data, interpret data, exploit information for unprecedented risks identification, and facilitate proactive loss prevention/management will be critical, as this will provide insurers with competitive advantages over their peers.

Pricing Actuary and Valuation Actuary



Pricing Actuaries require in-depth product knowledge and are increasing their focus on ways to improve current offerings, which will be assisted by increased access to Advanced Analytics. With the increased adoption of RPA, the role can also improve efficiency and focus more on assumptions review, analysis and interpreting financial impacts, ultimately, improving pricing strategies which will help insurers to drive profitability and remain competitive in the market.

The same can be said about Valuation Actuaries, with expectations to look over enterprise risk management frameworks and to stress-test and run scenarios to more proactively 'predict' potential risks. The role of actuaries will evolve over the next 3-5 years as regulatory and solvency frameworks become more complex.

“

Stakeholder engagement and effective communications skills to present machine learning findings to stakeholders will be important to obtain buy-in⁴⁷

Skills Implication:

The Pricing Actuaries' role will be augmented by technology and allow more time to focus on product innovation in addition to current responsibilities. Hence, lateral thinking skills (which encompass collaboration and out-of-the-box thinking) will be needed. The Pricing Actuaries role will evolve to focus more on assumptions review, analysis and interpreting their financial impact based on Advanced Analytics to uncover deeper insights. Some tasks in pricing may be automated, however Actuaries will need to spend more time on more complex model creation and analysis as the size of data sets increases across insurers. By strengthening their business acumen and data storytelling skills, they will be able to communicate complex topics and analysis outcomes more effectively to stakeholders (or key decision makers).

In Singapore, while there is a general talent shortage in this role, the nature of this role is also evolving. Traditionally Actuaries have been tasked to perform pricing activities and conduct valuation exercises. However insurers today are driven strongly by regulatory requirements and while a small portion of the role can be supported by automation, a large part will still continue to grow and expand as regulatory and solvency frameworks become more complex. Expectations are also shifting as this role will need to be involved in stress testing, enterprise risk management, and capital requirement allocation. The overall shortage of actuarial talent had previously been highlighted as a major challenge faced by several member countries of the ASEAN Insurance Council, with neighbouring countries such as Indonesia and Thailand also facing severe talent shortages for this role.

Like Pricing Actuaries – in addition to having the technical capabilities, Valuation Actuaries will need to increase their ability to communicate their business insights to the broader organisation. This will lead to a more collaborative environment where actuaries will work more closely with other colleagues such as those in the finance and risk departments to achieve desired results.

4. Findings

Product Development

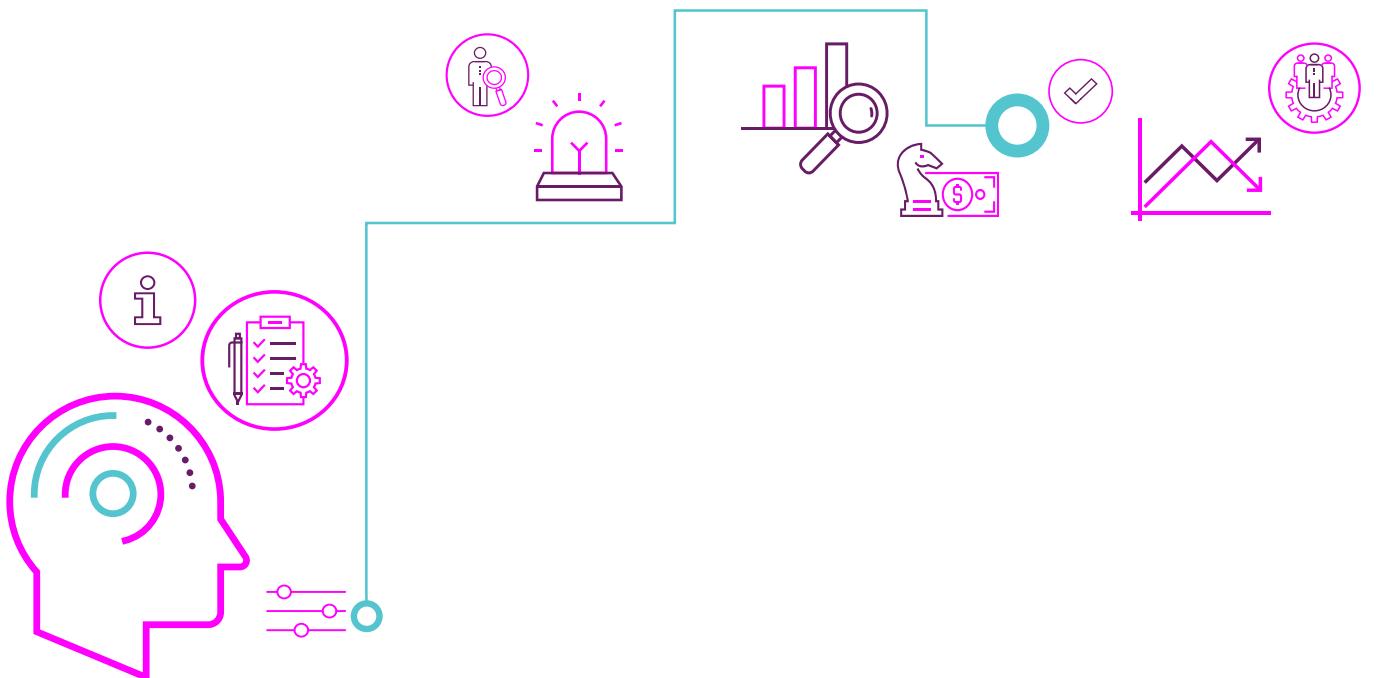


Traditionally, this role took a 'client-led' or 'competitor-led' approach in developing new products. The expectation for product creation did not require a deep data driven approach. However, that is changing now with an increased need to gather information to create products that are based on customer expectations and preferences.

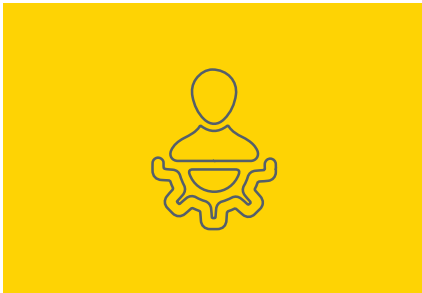
Advanced Analytics will allow Product Developers to have access to information that will allow them to be more precise in targeting customers for future products. In addition, insurers are also applying machine learning capabilities to help run scenario and stress testing before launching new products, which will improve product performance in the long run and minimise risks for the insurer.

Skills Implication:

Moving forward, Product Developers will need to continue to work with other business units to ensure that products are viable as well as priced appropriately for profitability. With the support of real time data, possessing data interpretation and analysis skills will allow this role to evaluate various metrics and further understand how products are performing and opportunities for up-selling or cross-selling.



Reinsurance Management Officer



Reinsurance Management Officers look after many aspects of the relationship between an insurer and a reinsurer, with many of these tasks being paperwork-based and including processing documentation and the maintenance of accurate calculation records between the two parties. It is important that transactions between insurers and reinsurers are captured in an accurate and timely fashion as it affects the business operations of both parties.

Due to the nature of the tasks of this role, RPA will be able to assist with the consolidation of information for quicker review. This will decrease manual data and documentation processes and allow additional capacity for complete more complex analysis. Advanced Analytics will help provide more granular information for premium reviews and calculations helping to ensure that the insurer and re-insurer are decreasing potential losses.

In the future, there is potential for Blockchain to be a further enabler for this role and currently proof of concepts (POC) are being explored where it would be possible for all transactions between an insurer and a reinsurer to be recorded. Given the immutable nature of Blockchain, this would help in the verification process between parties to remove potential omission or errors.

Skills Implication:

Moving forward, Reinsurance Management Officers will benefit from skill sets such as data interpretation and analysis to evaluate findings to ensure accuracy as this impacts business operations of both insurer and reinsurer. In addition, process excellence skills would benefit this job holder with more technology being introduced to streamline processes, which would allow for more efficiency in reinsurance management.

4. Findings

Overview of Low Impact Roles

2 Job Roles

Complementary

- ▶ Partnership and Affinity Management
- ▶ Underwriter (Non-Retail)

Implications on job roles

With technology supplementing the day-to-day, the roles will...

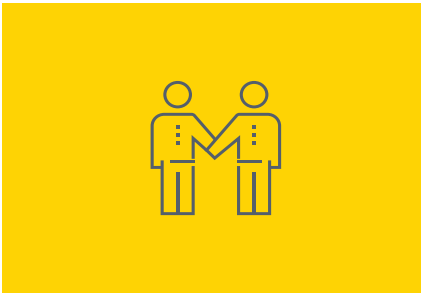
Be better able to...

- ▶ Manage and develop relationships
- ▶ Build networks and partnerships
- ▶ Identify insights to guide decisions

Implications on skills (Skills differentiators)

- ▶ Influencing and Negotiation
- ▶ Product Awareness
- ▶ Customer Mindset
- ▶ Advanced Digital Acumen/Literacy
- ▶ Advisory

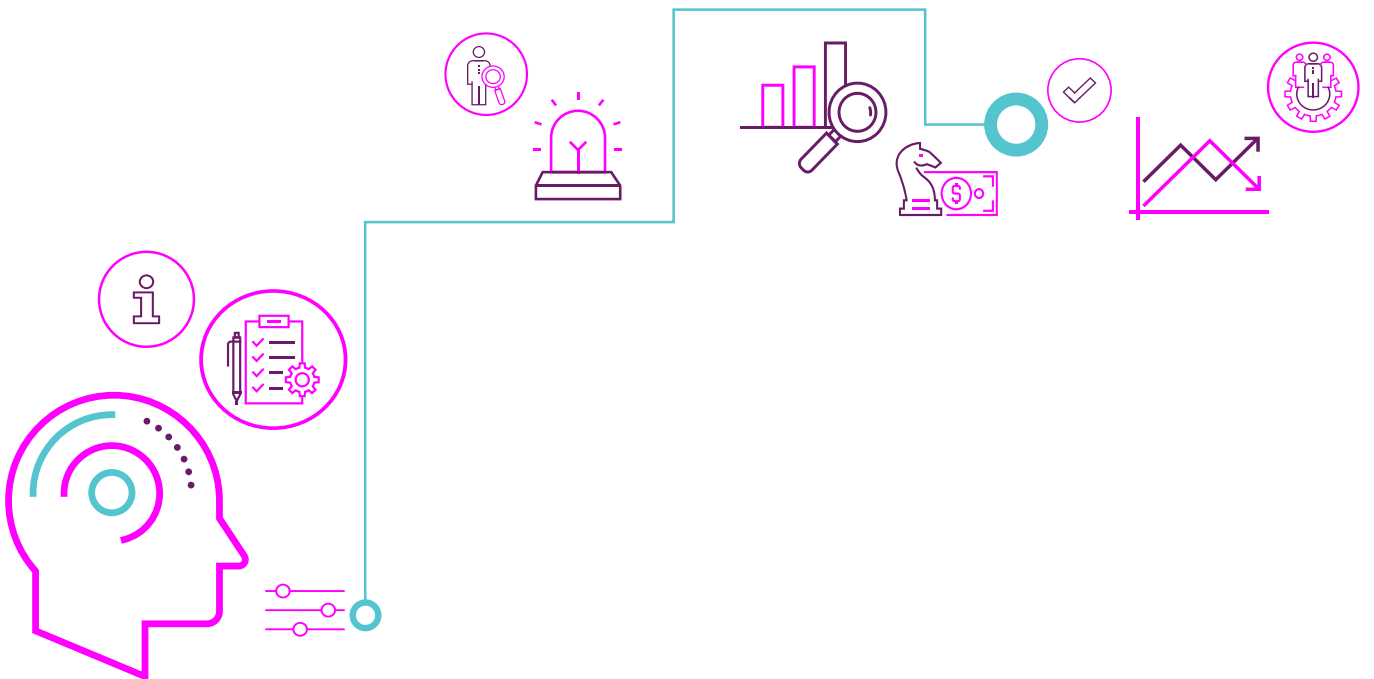
Partnership and Affinity Management



Similar to Agency Management roles, there will be a need to reskill job holders as insurers are transforming. Partnership and Affinity Management job holders will inevitably need to embrace 'digital' solutions. While it is not envisaged that this role will change dramatically – with relationship building and networking being a core component of the role – reskilling to use digital technology and having the ability to engage in data-driven conversations will become increasingly necessary.

Skills Implication:

It is also important that this role understands the different levels of technology adoption amongst existing and potential partners to be able to customise solutions that will meet their needs. In addition to advanced digital acumen/literacy, other skills that are reported to be important in the next 3 to 5 years include change management and process excellence. Insurers will need to be flexible and ready to change in order to cater for different levels of customisation that may be required.



4. Findings

Underwriter (Non-Retail)

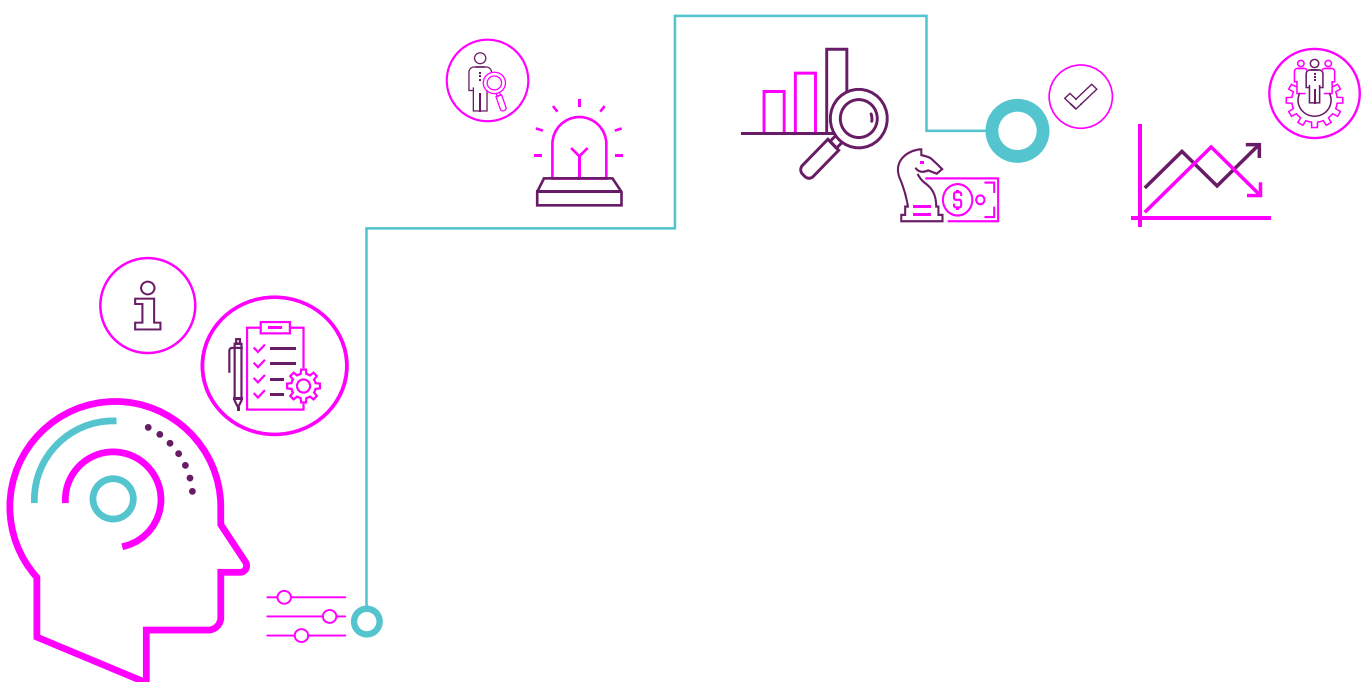


In the non-retail line, automation of paper based tasks will allow Underwriters to perform less manual tasks (e.g. collecting, combining and reviewing documentation for submission), providing more capacity to use data to review historical performance, perform risk assessments and identify cross-selling opportunities. However, given the complexity and deep industry knowledge required, tasks performed in this role will not be easily automated as compared to retail lines.

Skills Implication:

Similar to a retail Underwriter, data interpretation and analysis skills are critical for this role, mainly to leverage data insights in contributing to new product/service development, strengthening risk selection, and modifying underwriting rules.

Lateral thinking and risk awareness skills will also be critical as the digital age will require Underwriters to understand and create solutions for new forms of risk, while also enabling Underwriters to work more effectively in their jobs.










4. Findings

4.4 Enterprise

Across the financial services subsectors that were evaluated, an additional 34 job roles were identified at the enterprise level. These roles share similarities across subsectors, and most roles, especially those that perform tasks such as data sourcing, in-depth analysis, and investigation, are being augmented as a result of investments in data analytics and automation. The majority of the roles within the compliance (advisory/policy development) and IT job families fall under the low or medium impact, due to a number of key factors such as the lack of trusted RegTech solutions, and the high advisory nature of the roles as the technical and domain expertise is not easily automatable. Enterprise roles cut across the organisation. These job roles are responsible for supporting the business. While they are not unique to financial services, the impact of data analytics and automation will still affect these roles.

Front Office					
	 Legal	 Digital and Innovation	 Data Analytics	 HR, Finance, Tax and Audit	 Marketing
High					
Medium	<ul style="list-style-type: none"> ▶ Paralegal 		<ul style="list-style-type: none"> ▶ Data Analyst ▶ Data Scientist 	<ul style="list-style-type: none"> ▶ Finance Operations and Tax ▶ Human Resource Operations ▶ Internal Audit 	<ul style="list-style-type: none"> ▶ Marketing and Communications Officer
Low	<ul style="list-style-type: none"> ▶ Legal Counsel 	<ul style="list-style-type: none"> ▶ Customer Experience Designer ▶ Digital Transformation 			<ul style="list-style-type: none"> ▶ Digital Marketing Officer
New Skills Required	<ul style="list-style-type: none"> ▶ Advanced Digital Acumen/Literacy ▶ Change Management ▶ Cybersecurity ▶ Lateral Thinking ▶ Risk Awareness 	<ul style="list-style-type: none"> ▶ Advanced Digital Acumen/Literacy ▶ Advisory ▶ Change Management ▶ Complex Problem Solving ▶ Customer Mindset ▶ Data Storytelling ▶ Influencing and Negotiation ▶ Lateral Thinking ▶ Stakeholder Engagement 	<ul style="list-style-type: none"> ▶ Advisory ▶ Business and Financial Acumen ▶ Data Storytelling ▶ Data Engineering ▶ Investigation ▶ Lateral Thinking ▶ Process Excellence ▶ Stakeholder Engagement 	<ul style="list-style-type: none"> ▶ Advanced Digital Acumen/Literacy ▶ Advisory ▶ Business and Finance Acumen ▶ Change Management ▶ Complex Problem Solving ▶ Data Interpretation and Analysis ▶ Lateral Thinking ▶ Process Excellence 	<ul style="list-style-type: none"> ▶ Data Interpretation and Analysis ▶ Targeted Technical Sales ▶ Product Awareness ▶ Customer Mindset ▶ Advanced Digital Acumen/Literacy ▶ Technology Troubleshooting

The underlying skills across Enterprise roles vary due to the diverse nature of the roles, but one common theme is that these functions are becoming increasingly involved with other parts of the organisation ranging from the front to back office

Below is a summary of impact levels by job roles and the associated new skills required to perform these roles in the future:





Middle/Back office			
 Operational Excellence	 Information Technology	 Risk	 Compliance
			<ul style="list-style-type: none"> ▶ AML/CFT Transaction Surveillance ▶ Compliance Monitoring and Testing ▶ Trade Surveillance
<ul style="list-style-type: none"> ▶ Operational Excellence Officer 	<ul style="list-style-type: none"> ▶ IT Applications and Software ▶ IT Security ▶ IT Operations Management ▶ IT Project Delivery ▶ IT Testing/Audit and Quality Assurance ▶ IT Service Support ▶ IT Strategy and Architecture 	<ul style="list-style-type: none"> ▶ Credit Risk Officer 	<ul style="list-style-type: none"> ▶ Compliance Regulatory Reporting Officer ▶ Financial Crime Compliance Investigation and Intelligence ▶ Financial Crime Data Analytics ▶ Regulatory Change Management Officer
		<ul style="list-style-type: none"> ▶ Enterprise Risk Management ▶ Liquidity Risk Officer ▶ Market Risk Officer ▶ Operational Risk Management 	<ul style="list-style-type: none"> ▶ AML/CFT Policy Advisory ▶ Anti-Fraud, Bribery and Corruption Advisory ▶ Compliance Advisory
<ul style="list-style-type: none"> ▶ Business and Financial Acumen ▶ Project Management ▶ Risk Awareness ▶ Change Management ▶ Global Perspectives ▶ Process Excellence ▶ Systems Thinking ▶ Cybersecurity 	<ul style="list-style-type: none"> ▶ Business and Financial Acumen ▶ Project Management ▶ Risk Awareness ▶ Change Management ▶ Global Perspectives ▶ Process Excellence ▶ Systems Thinking ▶ Cybersecurity 	<ul style="list-style-type: none"> ▶ Data Engineering ▶ Data Storytelling ▶ Programming and Coding ▶ Stakeholder Engagement ▶ Analytics and Computational Modelling ▶ Data Interpretation and Analysis ▶ Systems Thinking ▶ Automation Management 	<ul style="list-style-type: none"> ▶ Data Interpretation and Analysis ▶ Advanced Digital Acumen/Literacy ▶ Data Storytelling ▶ Complex Problem Solving ▶ Product Awareness ▶ Lateral Thinking ▶ Analytics and Computational Modelling

Exhibit 13: Overview of impact level for Enterprise roles including prevalent skills by role(s)

4. Findings

Overview of High Impact Roles



Convergence

Displacement

3 Job Roles

▶ AML/CFT Transaction Surveillance

▶ Compliance Monitoring and Testing

▶ Trade Surveillance

Implications on job roles

With a significant proportion of the tasks being automated, the roles will...

Spend less time on...



Spend more time on...

- ▶ Manual monitoring and reporting
- ▶ Administrative processing
- ▶ Data mining and extraction
- ▶ Manual calculations

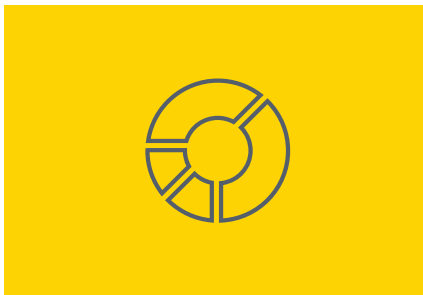
- ▶ Data analysis and insights generation
- ▶ Exception management
- ▶ Complex case resolution
- ▶ Process excellence
- ▶ Oversight

Implications on skills* (Skills differentiators)

- ▶ Data Interpretation and Analysis
- ▶ Advanced Digital Acumen/Literacy
- ▶ Investigation
- ▶ Risk Awareness
- ▶ Complex Problem Solving

*These are based on general trends observed and do not represent the nature of all roles due to the diverse nature of roles across Enterprise. For specifics, consult each specific Job Dashboard to understand implication on the roles.

Compliance (AML/CFT Transaction Surveillance, Compliance Monitoring and Testing, and Trade Surveillance)



As organisations become more collaborative, the expectation is that enterprise wide roles such as IT, marketing, data and digital will need to have business and financial acumen skills to be able to understand pain points, resolve issues, and provide more customised products and services to clients. In contrast, roles such as HR, Legal, Compliance and Risk will need to learn more technical skills to be able to enhance delivery of their tasks to achieve desired outcomes. Compliance functions as a second line of defence (2LOD), playing a vital role in FIs. Over the last few years, majority of FIs have equipped themselves with transaction-monitoring systems that flag suspicious transactions based on pre-defined rules, thresholds, and scenarios.

By some industry estimates, as much as 90% of the flags/alerts generated by the traditional parameter-driven transaction monitoring systems are false positives. Such a high rate of false positives requires extensive human effort to review. FIs therefore tend to increase this function's headcount when volumes surge. However, the sustainability of this intervention is questionable. To quote Mr. Chua Kim Leng, former MAS Special Advisor of Financial Supervision Group, "throwing more warm bodies at the problem is not a sustainable solution"⁴⁸.

FIs today are exploring the next generation of transaction surveillance systems that are powered by Advanced Analytics and AI such as machine learning. They can identify unusual transaction patterns in real time and across network entities. Should the industry see success in implementing these technologies, the workforce is expected to reskill to handle exception or complicated cases.

During our discussion with a global bank in Singapore, it was shared that the next generation of transaction surveillance systems is being developed. FIs would still take a cautious approach in fully relying on such systems, for two key reasons: 1) the risks are ever-changing in the ecosystem, and 2) the consequences of overlooking alerts that are not accurately triggered by the system are extremely high. The industry believes that the workforce number for the surveillance and monitoring team will remain unchanged, or possibly increase, at least for the next three years.

Industry participants also shared that the surveillance roles (trade and AML/CFT) are likely to converge in the next couple of years. With many of the tasks being automated, it will allow for the role to provide surveillance support across different regulations.

Skills Implication:

The skill sets that were reported to be critical in the next 3 to 5 years fall under the business and digital and data category. For instance, advanced digital acumen/literacy, data interpretation and analysis, and data storytelling will be essential to navigate through cutting edge technology, extract and decipher data/insights, connect the dots and reach a conclusion. Other critical business related skills are investigation, complex problem solving, and research – where incumbents ascertain evidence through different avenues, use logic and reasoning to uncover missing information, and ultimately resolve issues with new, unconventional or tailored solutions.

4. Findings

Overview of Medium Impact Roles

20 Job Roles

Augmentation

- ▶ Compliance Regulatory Reporting Officer
- ▶ Credit Risk Officer
- ▶ Data Analyst
- ▶ Data Scientist
- ▶ Finance Operations and Tax
- ▶ Financial Crime Compliance Investigation and Intelligence
- ▶ Financial Crime Data Analytics
- ▶ Human Resource Operations
- ▶ Internal Audit
- ▶ IT Applications and Software
- ▶ IT Operations Management
- ▶ IT Project Delivery
- ▶ IT Security
- ▶ IT Service Support
- ▶ IT Strategy and Architecture
- ▶ IT Testing/Audit and Quality Assurance
- ▶ Marketing and Communications Officer
- ▶ Operational Excellence Officer
- ▶ Paralegal
- ▶ Regulatory Change Management Officer

Implications on job roles

With some of the tasks being replaced, the roles will...

Spend less time on...

- ▶ Administrative processing
- ▶ Documentation and reporting
- ▶ Tracking and monitoring
- ▶ Data analysis and aggregation



Spend more time on...

- ▶ Insights generation
- ▶ Stakeholder management
- ▶ Data-driven decision making
- ▶ Complex case resolution
- ▶ Advisory

Implications on skills* (Skills differentiators)

- ▶ Data Interpretation and Analysis
- ▶ Data Storytelling
- ▶ Risk Awareness
- ▶ Stakeholder Engagement
- ▶ Automation Management

*These are based on general trends observed and do not represent the nature of all roles due to the diverse nature of roles across Enterprise. For specifics, consult each specific Job Dashboard to understand implication on the roles.

Compliance Regulatory Reporting Officer



Currently, the Compliance Regulatory Reporting Officer spends a significant amount of time extracting and collating data to meet the prescriptive reporting requirements of regulators. Going forward, the role is likely to utilise digital tools to extract and validate data. Depending on the size of the organisation or business line, there may still be reliance on manual extraction for certain data. The industry is increasingly looking to automate manual tasks and enable more accurate and faster responses, to ensure adherence to regulator requirements – given that the consequences of breaches can be significant.

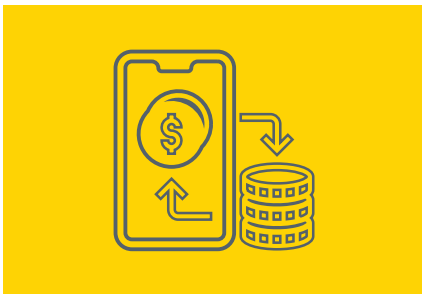
Regulatory reporting also requires ongoing engagement with both internal stakeholders to gather necessary information required, and regulators to resolve queries resulting from regulatory submissions. With the increasing use of data analytics and automation, job holders will be able to spend more time on the review of aggregated information, and to identify insights and communicate information to stakeholders. Moving forward, the nature of the role will therefore be focused more on stakeholder engagement and exercising judgment in validating and challenging outputs.

Skills Implication:

Job holders will require advanced digital acumen to utilize digital tools and automated systems to extract and compute data. Data interpretation and analysis skills will be required as job holders will need to be able to interpret data and extract key insights for follow-up action.

With regulatory reporting constantly evolving, change management skills will also be important to adapt to, and successfully drive the usage of increasingly automated tools to support reporting delivery. Human judgment, technical expertise and stakeholder engagement skills will remain critical to effectively balance the interests of various stakeholders and manage queries raised by senior management and regulators.

Credit Risk Officer



With increasing regulatory pressure and ongoing economic turbulence, FIs are making investments to strengthen their credit risk management capabilities. Specifically FIs are seeking to use analytics to gain better insights into their exposure to various types of credit risks, and consolidate risk assessment report findings for quicker analysis. The gains in efficiency enabled by technology will allow for an augmentation of the role to focus more time on strategic and policy implementation decisions.

While Advanced Analytics and machine learning can aid the execution of job tasks such as creating more complex and accurate models for stress testing – collaboration between business units and key stakeholders is necessary to determine thresholds. Human judgment will be needed to ensure alignment between various parties.

Skills Implication:

In the future this role will need to understand more complex models due to the increase in Advanced Analytics available to Credit Risk roles. This role will need to understand the data pipeline and how to improve the collection of information before conducting analysis. Automated tools can help to consolidate risk reports, but it will become the incumbent's responsibility to make sense of the information. In some cases, the data provided for this role will come in a more pre-packaged format, therefore it will be important for job holders to have the skills necessary to evaluate increasing amounts of data and understand the underlying implications of using those data sources. Credit Risk roles will need to enhance their business and financial acumen skills to think more commercially including understanding how new regulations will impact the business.

Compliance (Investigation and Intelligence, Data Analytics, and Regulatory Change Management)

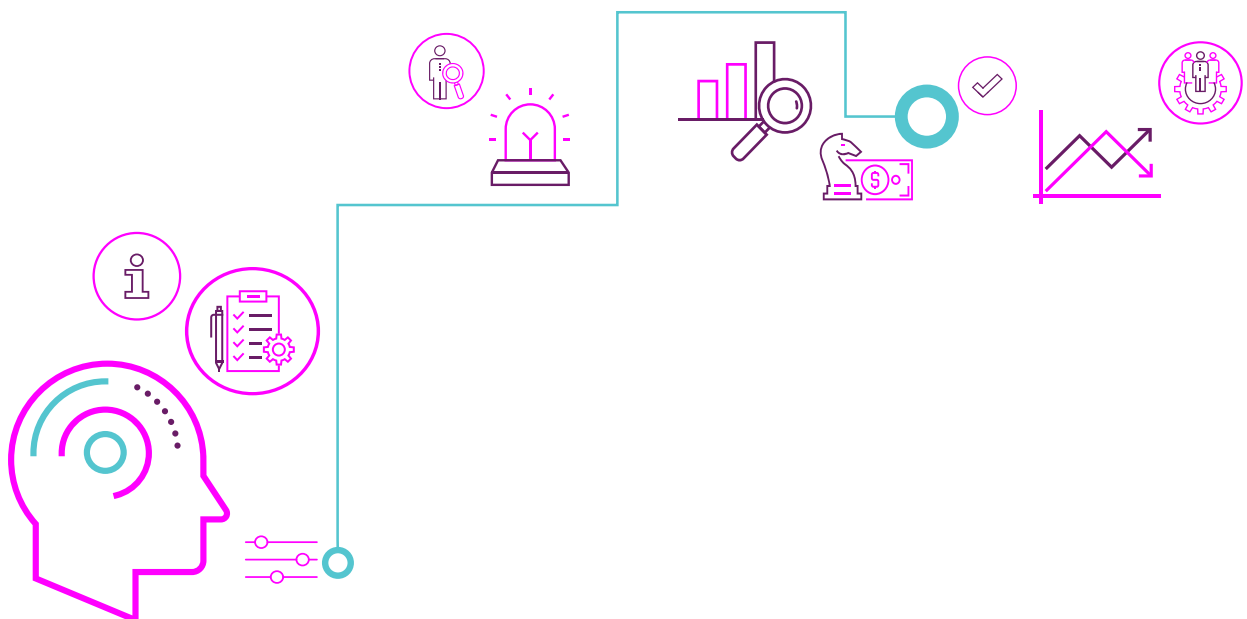


FIs today have set up dedicated Financial Crime Compliance (FCC) Investigation and Intelligence functions to monitor external alert networks as well as internal sources. The goal is to anticipate and prevent losses from emerging financial crime patterns. Ideally job holders can also build an ongoing process to extract intelligence from all available data on signals and trends to create actionable risk mitigation strategies before attacks begin.

As for the Regulatory Change Management role, while automated systems (powered by AI) allow FIs to track regulatory updates from multiple sources, deliver notifications to affected business units, and automatically run impact assessments, human judgment will remain key for this role. The critical skills moving forward will be influencing and negotiation as this role is expected to manage the relationship with regulatory bodies and industry associations.

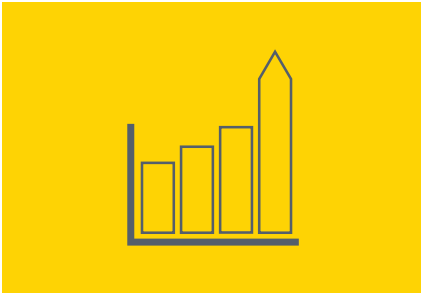
Skills Implication:

AI has been tapped on to make investigations more efficient. This role will gradually evolve, shifting from manual effort to acquire data to bespoke investigation strategies or methods to uncover the root cause of financial crime. On top of investigation skills, this role needs increased levels of data interpretation and analysis and data storytelling skills, as the FIs continue to advance on their analytics capabilities (i.e. improving predictive analytics techniques and social network analysis).



4. Findings

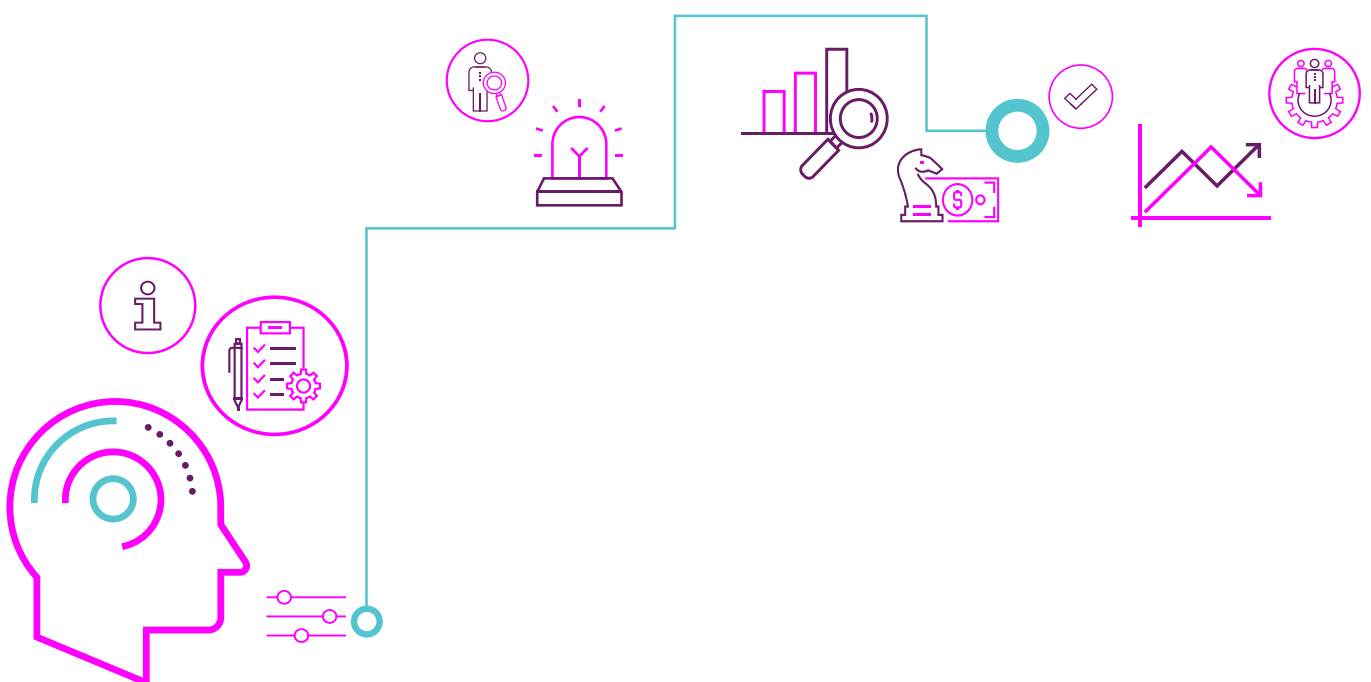
Data Analyst



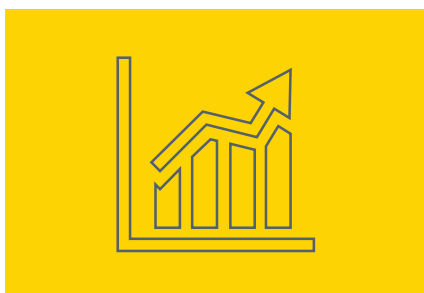
Today, this role spends a large proportion of its time collecting and interpreting statistical information to help FIs make better business decisions. This role however, is already leveraging automation tools to collate raw data in a faster and less error prone way, and data visualization tools to present findings to stakeholders in a more digestible manner. Moving forward, this role will be augmented by technology, and given automation opportunities in data gathering, there will be more time for higher order thinking and analysis in recommendations. Similar to the Data Scientist role, Data Analysts will be increasingly required to understand business needs to define the corresponding analyses and deliver data-driven insights that are relevant to the business.

Skills Implication:

Job holders will need to stay abreast of the latest technologies and analytics tools, and use these tools effectively. Skills such as business and financial acumen skills and lateral thinking will be useful for job holders to build business-specific solutions. A key skills differentiator for Data Analysts would be data storytelling skills, so that key messages can be accurately and effectively conveyed to gain buy-in and help drive decisions.



Data Scientist



Data Analytics topped the list for job posting trends in the Singapore banking sector between 2014 and 2017. This role is highly sought-after, with data science jobs frequently appearing on LinkedIn's list of most in-demand roles, globally.⁴⁹

The impact of data analytics and automation on this job role are rather unique. Data collation and integration of structured datasets that are high volume and time consuming in nature, could potentially be automated, freeing up Data Scientist's time to work on more complex algorithms. The process of converting raw information into data that can be easily understood (also known as data wrangling), cannot be replaced by AI, as such processes require human judgment to convert the data into insights that are useful for the organisation.

Skills Implication:

The underlying skills that will emerge as important in the future for this role are not only data and digital skills, but also business skills necessary to enhance what this role can deliver to the organisation. As an example, these roles will need to apply systems and lateral thinking to synthesise data into meaningful business cases. While deep technical expertise is critical for this role, understanding how the business works as well as the intricacies of the services and processes provided will enrich this role to be able to harness more information from data.

In essence, with AI automating lower-level tasks, the role of a Data Scientist also has to evolve to focus on the solutions for complex tasks that require human judgment. As a result, the combination of automation with human problem-solving will empower and augment, rather than threaten the role of a Data Scientist. This can be seen clearly with the need for increased data storytelling skills in the future, where the role will be able to showcase the insights drawn from the data combined with human judgment to enrich the advice that data roles provide to others in the organisation.

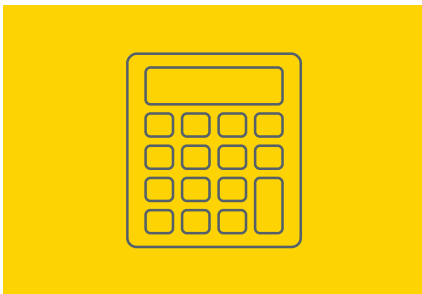


Industry example:

Large FIs are also gradually incorporating Data Scientists into the system to build machine learning models, to learn from evolving criminal behaviours and deliver a more sophisticated approach to dealing with financial crimes. HSBC Bank in the UK, for example, integrated analytics expertise, focusing on developing sophisticated machine language solutions to reform its compliance and operational risk team. The same applies for DBS Bank in Singapore.⁵⁰

4. Findings

Finance Operations and Tax



FIs have been implementing Enterprise Resource Planning (ERP) systems to integrate information, users and various processes for increased productivity. Today, more FIs are assessing the potential benefit from RPA solutions which will help FIs to realise cost savings by reducing high frequency tasks that require a lot of processing time.

As the finance function's repetitive and manual tasks are being automated, some FIs are creating centres of excellence focusing on strategic risks, financial analytics, forecasting, and building data-driven financial management. To that end, finance will take on a more strategic business advisory role, therefore, improved business and financial acumen skills will be one of the key priorities in the next few years.

Skills Implication:

In order to achieve measurable gains with the augmentation of data analytics and automation, job holders will need to have process excellence skills to be able to seek opportunities for improvement given the latest technologies available. This will be an opportunity for enhanced collaboration across business units to achieve success.

These roles will need to have strong lateral thinking skills to be able to work alongside systems and processes that offer increased speed and efficiency in performing tasks that were previously time consuming and prone to human errors. The value add for these roles will be when they are able to use enhanced consulting and advisory skills to be able to share information with the business. The workforce required to perform finance operations – such as reconciliation, account payable and receivable management – is expected to decline in the coming years.

Given that these roles will have access to increased data analytics and consolidated reports from automation tools, it will be important for job holders to enhance their data interpretation and analysis skills. The value add to the organisation will be maintaining the in-depth business and process knowledge to ensure that the results provided by systems are accurate and meaningful in how they are collected and presented to stakeholders.

Human Resource Operations



Human Resources (HR) comprises various components. The operational aspects of HR can be greatly bolstered by technology, while the strategic aspects of the role will be less impacted. Over time, this will lead to a shift towards more strategic and advisory related HR roles.

As HR teams adopt technology they will be able to filter candidates more quickly and efficiently ensuring that the right candidates are selected for the role. In addition organisations are adopting more HR digital self service platforms to handle basic requirements.

Overall this role will be augmented by technology with reskilling needing to take place, however, organisations are at different stages of the HR transformation journey. In the future, HR will require a blended approach that balances technology and the human touch. HR will need to adapt to be able to understand changes that are taking place due to data analytics and automation, leading to a new environment for hiring as well as defining hiring priorities and best practices on how to attract talent. HR will help to “mobilise intelligence”⁵¹ across the organisation as it adapts to the impact of data analytics and automation.

Skills Implication:

To achieve this, HR professionals will need to increase their advanced digital acumen/literacy skills to be able to use new HR software that is able to achieve the increased efficiency in the role. This goes hand in hand with data interpretation and analysis skills to allow HR to interpret Advanced Analytics and make recommendations based on what they are seeing in the data collected about candidates. All of these changes are linked to having increased change management skill sets to be able to adapt and advise the organisation about changes that are ongoing or emerging.

As advisors to the organisation, it will be important for HR professionals to fine tune their consulting and advisory skills to ensure that their insights are relevant to the business. This combined with more fine-tuned business and financial acumen skills will help to ensure alignment throughout the organisation in terms of desired objectives.

4. Findings

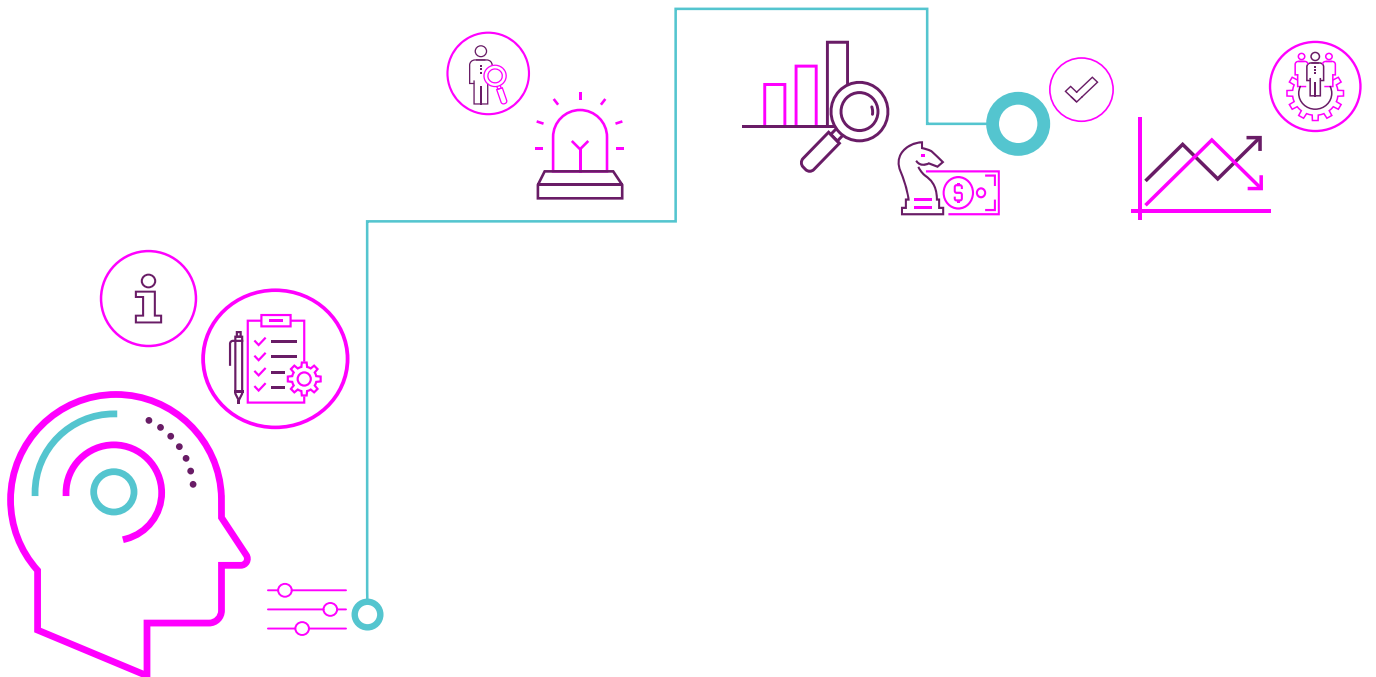
Internal Audit



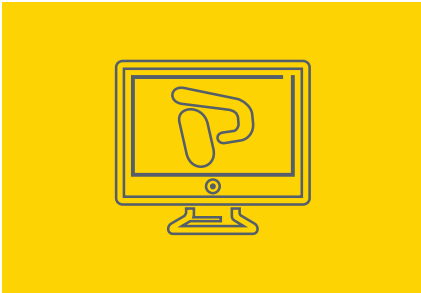
A proportion of the audit process can be augmented with RPA and AI tools to support the automation of manual processes and the use of simulations within a controlled environment. With this, the role would have more time to review results and manage exceptions identified, and be in a better position to identify and suggest improvements as part of its advisory and assurance services to the organisation. The role of human judgment, domain knowledge and stakeholder engagement capabilities will become increasingly important to improve the effectiveness of governance, risk management and control processes even as such tools are deployed across the organisation.

Skills Implication:

Job holders will need data interpretation and analysis skills, as well as complex problem solving skills to draw insights from various data sources and develop recommendations. Advisory skills will be a key differentiator as there will be a need for job holders to go beyond anticipating problems to also suggest improvements to organisation practices.



IT Applications and Software



With the support of technology, an IT Application and Software Developer will see a shift from rigorous process maintenance to an increased focus on innovation.

The demand for IT Application and Software Developers is on the rise across industries in Singapore. In 2017, it was reported that up to 42,000 IT professionals were needed for the sector in the next three years⁵². FIs are no exception, largely due to the rise of mobile payments and digital banking platforms that require more complex applications and software.

Currently, financial services institutions are tapping on Advanced Analytics and AI to create more complex applications with more built-in features. APIs also play an important role in expediting application and software development processes while also facilitating the integration of AI into these applications, allowing more complex built-in features (such as self-updating capabilities).

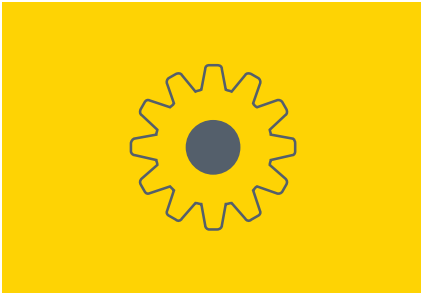
Skills Implication:

As applications and software become more complex, this role will require enhanced project management skills to work more collaboratively with other business units. Due to increasing cross function collaboration, stakeholder engagement skills will be vital to understand how best to manage varying expectations.

As the IT Applications and Software Developer role changes, business and financial acumen skill sets will also become more relevant given that this role will act as a connector between departments and functions. Many organisations shared that acquiring in depth business skills within technical roles is challenging but not impossible, and those job holders will be in high demand in the future.

4. Findings

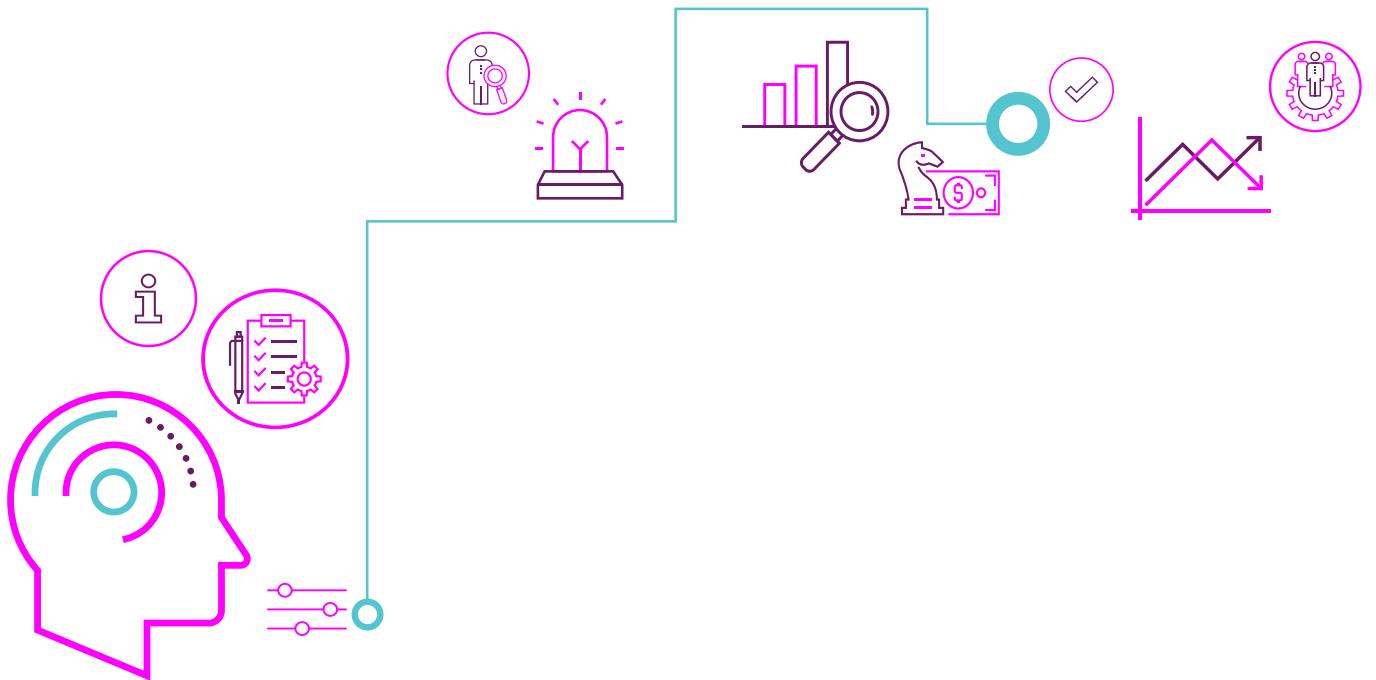
IT Operations Management



Today, this role is responsible for delivering reliable infrastructure through performance monitoring and overseeing routine installation of hardware. It is expected that this role will continue to facilitate the overarching operations and governance for IT. This role is expected to leverage AI capabilities to help optimise systems and provide enhanced recommendations.

Skills Implication:

IT Operations Management will need to infuse risk awareness skills into the operations functions, and given the changing nature of work within this function, change management and process excellence skills will also be necessary for the job holder to adapt to the changes that are taking place with the adoption of data analytics and automation.



IT Project Delivery



This role has already undergone many changes in terms of how IT projects are carried out. In the future it will remain critical that the job holder remains updated with the latest methodologies available to help deliver projects in the most efficient way possible. As departments collaborate more closely with IT teams this role will be a resource for the organisation to help determine how best to carry out projects. This role can be augmented by data analytics, and as agile and scrum methodologies become further engrained in the organisation this role will be pivotal to drive effective collaboration and strategies to achieve desired results.

Skills Implication:

Given the rapid changes taking place this role will need to be skilled in change management methodologies to advise on the best methods to deliver projects to the business. Skills such as stakeholder management and influencing and negotiation will become more important, as organisations move toward the adoption of agile and scrum methodologies and closer collaboration across different departments. Job holders will also need to ensure that they have the relevant business and financial acumen to work effectively with business units in implementing IT projects to address their needs. Like other IT roles, job holders will also need to be aware of new and emerging risks to develop plans and contingencies to avoid potential issues further along in the development process.

IT Security



As the nature of threats is becoming more advanced and increasingly complex, the IT Security role is more important than ever. While threat intelligence and detection skills exist in this role today, they will need to evolve and expand in the future due to the rapidly changing nature of potential threats. This can also be seen in the need for systems thinking skills which will help IT Security incumbents to understand how systems and processes work and identify and mitigate potential vulnerabilities. Organisations need to be able to address these new and emerging risks, as well as maintain existing security programmes. While some of the operational aspects of the IT security role can be aided by RPA and AI, there are limitations. As this role is looking at the end-to-end security governance framework and conducting assessments based on the information provided, it becomes much more challenging. This role will continue to need to pre-emptively search for potential perpetrators and vulnerabilities. In the future, it will be important to find talent that understands the tools and software available in the market to support their day-to-day activities.

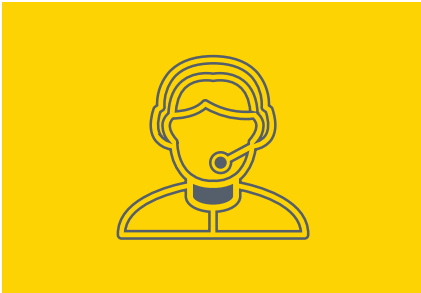
Skills Implication:

This role will need to continuously focus on cybersecurity and being able to handle and address the increasingly advanced online threats. Greater risk awareness skills will be important to understand new and emerging risks. In addition the job holder will need to be able to identify potential process and system risks to develop comprehensive cyber-attack prevention plans.

“

There's a talent shortage in the area of cybersecurity. We need security experts to think creatively, like a hacker [...] ⁵³

IT Service Support



As ecosystems have become more complex and integrated, service management will follow suit. The IT service support teams that oversee the organisations infrastructure such as databases and storage can be aided by digital solutions for improved monitoring.

While IT Service Support has the opportunity for automation – which is relatively simple to achieve – the complex cases will focus on how to use the improved monitoring capabilities to detect and flag items for further system investigation. Advanced Analytics can help to detect thresholds and prevent errors from becoming more severe, however, the monitoring component will never be eliminated. In addition to the improved capabilities of automation within this role, it will be necessary to increase their risk awareness skills to manage the benefits gained from automated systems with potential risks that arise from items not being caught by automated processes. While this role will be impacted by data analytics and automation, the industry believes that it will grow in workforce size.

Skills Implication:

IT Service Support continues to become more complex, therefore, understanding business needs and the underlying effects of certain decisions will require much higher order thinking skills. Given that the most basic cases will be handled through digital solutions, this role will have to focus more on problem solving, therefore, making it necessary to sharpen IT Service Support complex problem solving skills. As this role has additional capacity to take on new tasks, lateral thinking skills and process excellence will also be very relevant to continually look for opportunities for streamlining solutions.

4. Findings

IT Strategy and Architecture



Today, this role oversees the translation of business needs into technical system solutions. Moving forward, human judgment and expertise remain critical, with this role requiring data analytics to obtain new and unique business insights to inform the design of IT Strategy and Architecture. In addition, this role is required to work closely with all business units in order to anticipate future needs and requirements and ensure alignment of enterprise architecture to the business strategy. This role will need to stay abreast with new technologies as technical expertise is critical in the development of future state models.

For example, the lack of strong data governance can severely hamper efforts to deploy Advanced Analytics and thus, the extent of impact. As organisations continue to define their strategies in the future, more opportunities could possibly exist for increased impact of data analytics and automation on this role.

In addition, the rise of cloud computing could change how the IT department provides services. IT Architects will need to take a holistic view across the IT landscape and work with the relevant teams to develop and drive a robust strategy.

Skills Implication:

IT Strategy and Architecture requires in depth business knowledge and close collaboration with various business units. At the same time, there is a need for this role to have sufficient understanding of data analytics and automation. IT Strategy and Architecture roles will require increasing business and financial acumen skills to be able to take the technical knowledge they already possess and complement it with actual business cases to determine if there are potential security concerns that need to be addressed.

While the impact on this role is currently limited, job holders will need to ensure that they have strategic planning skills to be able to plan for the future and determine what changes might be necessary to initiate more data analytics and automation initiatives. Given that many organisations are still determining how cloud computing could be implemented in their organisation, this role will need to have risk awareness skills to be able to articulate potential risks associated with widespread adoption of cloud solutions.

IT Testing/Audit and Quality Assurance



Due to the sheer volume of new software and application releases in FIs today, it is placing unprecedented pressure on IT testing teams.⁵⁴ As an example, systems outages come at a high price. The Royal Bank of Scotland, for instance, learned an expensive lesson by receiving a 56m fine in 2012 when they experienced an IT outage that caused 12 million accounts to be frozen for days.⁵⁵ This technical issue became a wake-up call for business leaders across the globe.

As software becomes increasingly complex, so does risk. Therefore, instead of running tests to examine if the software and applications are working accordingly, testing teams have evolved to focus on trying to break them. They scrutinise the structural integrity, identify weaknesses in the software or systems and establish scenarios where systems are likely to fall apart, ultimately, developing solutions to strengthen systems.

One of the recent emerging roles that was identified in the IT testing space is a Test Architect role. The aforementioned local bank reported that the organisation is in the midst of building this capability internally as these skills are yet to exist in the market. These job holders will need to have change management skills to be able to prepare for and address issues that arise for changing the way that tasks were done previously to a newer way that incorporates automation.

DevOps and automation trends are reducing the need for manual interventions, leading to the role becoming more efficient. The Head of Technology and Operations in a local bank shared that with automation disrupting the testing space, the team is now able to handle a much larger volume of unit test cases. In the future, testing will also incorporate a more pre-emptive risk based approach.

Skills Implication:

IT Testing/Audit and Quality Assurance job holders will need to continue reskilling for automation management. As new types of automation tools become available they will help increase efficiency in testing, however, they will continue to need oversight to determine that automation processes are working properly and delivering the intended results.

It is also important for this role to possess data interpretation and analysis skills to be able to make sense of information that is system-generated. Given the increasing complexity of IT applications and software that FIs are using, IT testing roles will need to enhance their investigative skills to determine where potential problems may be occurring.

The skills necessary to be able to achieve these new tasks include threat intelligence and detection skills as well as risk awareness skills. Given the rise of new threats it is important that job holders understand the changing nature of threats and actively look to implement safeguards.

4. Findings

Key Observation for IT

While this study does not focus on cloud computing, we recognise that this technology could disrupt the future of IT and its workforce. Today, in Singapore, the adoption of cloud computing is not widespread in the industry. According to a survey conducted by Ernst & Young (EY) in late 2017⁵⁶, 63 per cent of Singapore financial controllers voiced their concerns over security and compliance risks of the cloud and reported these as major barriers to technology transformation. More than 90 per cent indicated that it is challenging to actively navigate data flows across different jurisdictions' privacy laws. Similarly, Microsoft Asia Pacific's survey of 1,200 IT leaders revealed there is a continued perception among business leaders that the cloud is less secure. However, on a positive note, more than 75% of IT leaders in Singapore believe that in the longer term, it will be safer being in the cloud than relying on traditional forms of IT.⁵⁷

With cloud computing, it is not often clear where data is residing, or at times, data may be stored in multiple locations. Some FIs are uncertain whether the privacy commitments they have made to their customers and job holders will be upheld by the service provider. Contract complications may arise if the cloud service provider operates in more than one jurisdiction where the exercise of data rights may vary. While FIs in Singapore may

currently be in the initial stages of cloud maturity, the industry is expecting adoption to pick up as hybrid cloud solutions are embraced.⁵⁸ However, a local FI – DBS Bank – has already embarked on a programme to reskill IT practitioners in cloud, collaborating with Amazon Web Services to enhance the technology skills of its job holders across technology innovation projects such as security, AI and data analytics.⁵⁹

What will happen to IT jobs in the financial sector as cloud adoption picks up? The demand for some traditional in-house IT jobs will likely decline in the coming years as a result of cloud computing, to name a few – Systems Administrator, Network Engineer, and Server Hardware Technician. With organisations moving their systems to the cloud, managing on-premise local area networks (LANs) or wide area networks (WANs), and installing servers in data centres will no longer be needed. While cloud computing brings about some degree of displacement, it will also open up new opportunities as the skills required to support this will evolve, such as adopting a DevOps approach, overseeing the security for shared networks, acquiring new skills to build applications in cloud environment and adopting software-defined infrastructure.

Marketing and Communications Officer



Customer preferences are changing in terms of how they receive and access information about products and services, and due to this, the nature of traditional marketing roles is evolving. Marketers need increased comfort levels in using digital platforms as a way to communicate with their customers. In the short term this role will be augmented by access to Advanced Analytics for better customer information and improved marketing campaigns.

Skills Implication:

The skills necessary to achieve the benefits from enhanced metrics will be data interpretation and analysis skills as well as data storytelling. Marketers will need to be able to make sense of data and determine how it will impact the business. While these skills will be more familiar to digital marketing professionals, given the convergence with traditional marketing roles, it will be important to ensure that all marketing professionals are able to harness the power of data analytics. Marketing roles will need to heighten their customer mindset skills to be able to deliver more customised and relevant content to customers.

In addition, the ability to receive information on marketing campaign performance will allow for more in depth analysis of return on investment, which will help to ensure that marketing efforts are yielding desired results. In the next three years, traditional marketing roles are likely to converge with digital marketing.

4. Findings

Operational Excellence Officer



Given the increase in Advanced Analytics, Operational Excellence officers will have access to more and more information in the future. This will lead to an augmentation of jobs tasks allowing job holders to be able to provide more information about areas for improvements, plans for implementation and ultimately metrics to track progress and status of projects.

Job holders will need to align to ensure they understand the business sufficiently to know where and how their decisions might impact the larger ecosystem.⁶⁰

Skills Implication:

The entire ecosystem for operational excellence is changing with an increased focus on understanding the customer mindset and working more collaboratively. In addition to these aspects, future job holders will also need to infuse a layer of risk awareness into their responsibilities. The skills associated with this job in the future will be strong data interpretation and analysis skills. This valuable information will provide context and business cases for adoption throughout the organisation. This will also create a need to have more consulting and advisory skills to communicate potential opportunities to various stakeholders in a meaningful way that results in action.

Paralegal



This role is responsible for many administrative activities related to legal operations. Many of these tasks are time consuming and require a lot of manual effort to gather information for others. Leveraging on AI-enabled software and RPA tools, this role will be augmented to be able to be more efficient. Job holders will instead be expected to take on new activities such as working with vendors to oversee and manage the use of digital tools that support business objectives. In the future, job holders will need a combination of legal and business knowledge, as well as advanced digital acumen/literacy.

Skills Implication:

Advanced digital acumen skills and lateral thinking skills will be important for job holders to evaluate technological tools and systems and determine how they could be incorporated by the business. Skills such as process excellence skills will become more important to be able to identify opportunities where potential improvements can be made. In addition, this role will also need to have heightened risk awareness and knowledge of risks, including cybersecurity risks, to be able to advise the business on potential issues that could arise out of new technological adoption.

4. Findings

Overview of Low Impact Roles

11
Job Roles

Complementary

- ▶ AML/CFT Policy Advisory
- ▶ Anti-Fraud, Bribery and Corruption Advisory
- ▶ Compliance Advisory
- ▶ Customer Experience Designer
- ▶ Digital Marketing Officer
- ▶ Digital Transformation
- ▶ Enterprise Risk Management
- ▶ Legal Counsel
- ▶ Liquidity Risk Officer
- ▶ Market Risk Officer
- ▶ Operational Risk Management

Implications on job roles

With technology supplementing the day-to-day, the roles will...

Be better able to...

- ▶ Identify insights to drive decisions
- ▶ Collaborate across functions
- ▶ Manage risks proactively
- ▶ Provide advisory and guidance

Implications on skills* (Skills differentiators)

- ▶ Data Interpretation and Analysis
- ▶ Advisory
- ▶ Lateral Thinking
- ▶ Systems Thinking
- ▶ Data Storytelling

**These are based on general trends observed and do not represent the nature of all roles due to the diverse nature of roles across Enterprise. For specifics, consult each specific job dashboard to understand implication on the roles.

Compliance (Policy Development and Advisory)



The importance of robust AML guidelines has increased over the past decade and the consequences of AML/CFT breaches are becoming more severe in Singapore. FIs have been faced with fines and withdrawal of bank licenses in serious cases and therefore this role is critical to ensure the implications of regulatory changes are in line with the business practices. As there is limited automation opportunity, the nature of this role is unlikely to change in the near future, but as criminal behaviours evolve and legislation becomes more stringent, Advanced Analytics could be used to support some of the decisions on guidelines.

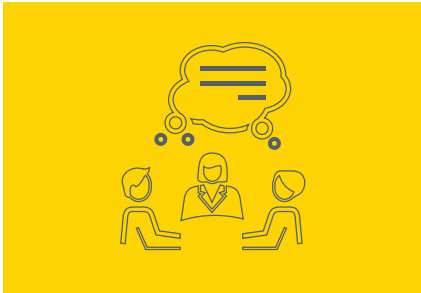
During industry validation sessions, FIs – both global and local – shared that they have integrated the relevant aspects of compliance and operational risk to minimise gaps and overlaps. In addition, compliance advisory is also moving away from being performed in a silo-manner. In other words, FIs are beginning to view various compliance risks from an enterprise-wide perspective, rather than individual business units.

With a standardised inventory of operational and compliance risks, and consistent risk, control and process taxonomy, FIs can obtain an integrated view across all risk types. The Compliance Advisory role will continue to play a strategic and important part in partnering with the business and providing guidance on the interpretation of regulatory requirements.

Skills Implication:

Critical skills required for this role are judgment related and involve higher order thinking – such as lateral thinking and advisory skills. As we gathered the views from the industry, complex problem solving and product awareness will continue to be critical in the next 3 to 5 years.

Customer Experience Designer



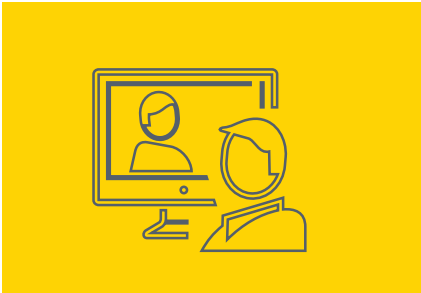
Today, this role is responsible for developing and implementing strategies aimed at improving customer relationships and satisfaction with the business, products and services, including incorporating feedback for continuous improvement. As customers' expectations are evolving this role must be able to help the business identify opportunities and enhance the customer experience.

The role is advisory in nature and requires in-depth business knowledge. The increasing availability of data and use of predictive analytics to determine customer preferences will enable firms to shape and customize the experience for each customer. Many organisations are also investing in digital applications and data analytics to collate and analyse information across multiple touchpoints which would otherwise be time intensive. Moving forward, data analytics will increasingly be used to identify common issues and root causes pertaining to quality of service across various platforms, so that the Customer Experience Designer can resolve key pain points quickly and effectively. Easy and timely access to data and customer insights will also allow the role to better gauge sentiment and allow for the curation of schemes and incentives to enhance customer experience, though human judgment and empathy will remain vital in successful execution.

Skills Implication:

This role will need complex problem solving and lateral thinking skills to be able to handle larger sets of data and connect the dots while staying focused on the big picture, as well as to address ever-changing customer expectations and preferences. In addition, key skills differentiators include data storytelling and influencing and negotiation skills. This will enable job holders to effectively convey messages and findings to different audiences and justify the rationale for recommendations.

Digital Marketing Officer

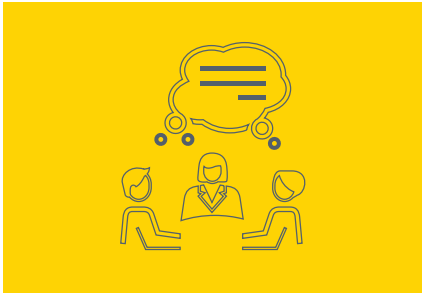


Today, this role is responsible for the realisation of the organisation's business strategies by driving its digital marketing programmes and implementing marketing content across all digital channels. Execution requires an innovative mindset coupled with deep product knowledge and business acumen to devise marketing plans that are in line with the organisation's branding. Moving forward, solutions with Advanced Analytics and AI capabilities will help to enhance the strategic planning and design of marketing campaigns. In addition, third-party software incorporated with machine learning and predictive analytics capabilities will be leveraged to enhance campaign effectiveness. Human judgment will remain critical, however, in utilising the insights to develop the most suitable marketing campaigns for various products.

Skills Implication:

This role will require data interpretation and analysis skills, to deliver actionable recommendations and influence business decisions and strategies. In addition, advanced digital acumen will be critical in the role to gain a strong understanding of how different solutions and features can be leveraged to support marketing efforts. The job holder will also need to possess skills to resolve basic technical issues arising from the use of different digital solutions or platforms to ensure seamless execution, and possess an in-depth understanding of the product portfolio to successfully develop robust marketing campaigns. This must be complemented with customer mindset skills, to understand clients' needs and incorporate insights into marketing related activities.

Digital Transformation



Digital Transformation job roles have become more common across FIs today, however, this role will evolve over time as such initiatives become embedded and integrated within the organisation.

Today, this role is responsible for creating and implementing an organisation's digital agenda, which includes developing its digital strategy and roadmap and identifying opportunities for digital solutions to be implemented. The use of Advanced Analytics and AI will help the role better understand the existing state of the business and infrastructure and plan for the adoption of digital solutions. However, human judgment, personal networks and relationships will remain critical to engage and meet the needs and requirements of the customer and business. In the longer term, this role could be subsumed or ingrained within other parts of the organisation.

Skills Implication:

Project management skills will need to be sharpened to engage with various stakeholders and drive large scale and complex projects that work with various parts of the business.

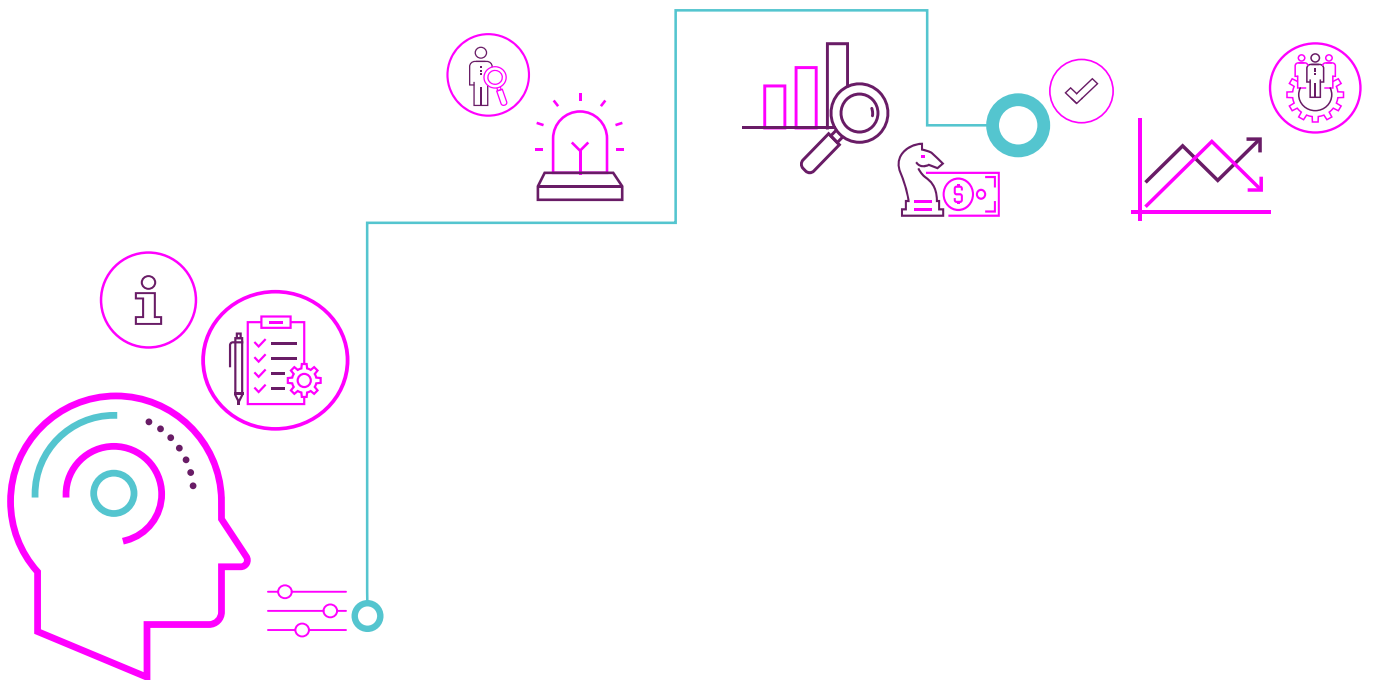
Job holders will need to have strong stakeholder engagement and influencing and negotiation skills, to liaise with various stakeholders and justify areas of priority for change. In addition, the job holder will need to adopt a customer mindset and have the ability to drive effective change with stakeholders to ensure that digital solutions are successfully implemented.

Enterprise Risk Management



Enterprise Risk Officers will need to enhance their analytics and computation modelling skills in the future and be able to evaluate the outputs of more complex models to determine if the results that have been generated by tools and systems are valid. Understanding model limitations will be necessary for this role to ensure that data is being used properly.

Skills Implication:
This role will need to gain new skills that understand data engineering and data storytelling to be able to understand the full data spectrum.



4. Findings

Legal Counsel



Legal departments are seeing ongoing changes to their roles as many of their activities can be automated to a certain extent. Templating software is already widely adopted to be used for documentation and reporting purposes. Even though institutions are seeing high adoption, the role will continue to need human judgment and expertise. Changing regulations along with new and emerging laws will require industry knowledge and expertise to be executed effectively.

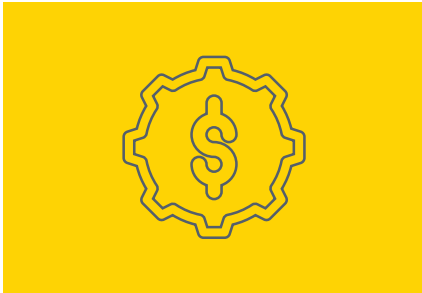
A future potential development would be the inclusion of Blockchain technology and Smart Contract adoption which would allow for contracts to be enforced without additional intermediation. If this becomes a reality, legal roles will need to improve their Advanced Digital Acumen/Literacy to be prepared for the types of changes that would take place.

Skills Implication:

Legal job holders could adapt to use tools which can expedite certain activities and allow more time for other analysis, essentially augmenting the function due to the available and relevant technology.

The skills associated with these changes will be reflected through the job holder's adaptability which exists as a foundational skill, however, this coupled with change management skills will help the role prepare better for the adoption of automation into legal departments in the future. Given the infusion of data analytics and automation across the organisation, legal teams will need to enhance their risk awareness skills to new and emerging risks that will arise. Another area that legal roles will need to enhance in terms of skills capabilities will be in cybersecurity skills, the understanding of cybersecurity and potential implications for the business will help to augment legal roles. Lateral thinking skills will also be important to be able to not only combine business and financial acumen together with data analytics and automation, but also to be able to identify how new and emerging risks can be mitigated.

Liquidity Risk Officer and Market Risk Officer



A noticeable change that has greatly improved the efficiency of risk management teams was the shift from spreadsheet solutions to RPA solutions that manage multiple data feeds and possess built-in calculation engines.

However, the nature of risks have also transformed. Despite the rise of analytics and automation, human judgment and expertise will continue to play a big part in challenging the automated analysis outputs and formulating confident decisions aligning to the risk strategies. The job tasks revolving around data collection, manual model development, and reporting will be reduced, if not removed, transforming the role of risk management.

While data analytics and automation can be used to assist the day-to-day, the determination of business risk thresholds and the development of risk frameworks require human judgment as well as in-depth business experience – especially amid the current geopolitical landscape and its anticipated dynamism in the coming decade.

Liquidity Risk job holders, for example, could in the future integrate data from markets, social media, and other new sources into analytics models that calculate probabilities of order flow scenarios. This additional data could also be used to compute the probability of each scenario and

generate the mandated regulatory required buffers and perform liquidity stress tests. While data analytics and automation may be used to assist in the data collection and stress testing process, Liquidity Risk job holders will also need to work closely with business to create a robust governance framework, redefine risk thresholds, propose appropriate appetite, and establish contingency funding plans.

Skills Implication:

In the future, Market and Liquidity Risk job holders will rely heavily on Advanced Analytics to make decisions, and this data driven approach will improve the role's efficiency. This role will continually need to enhance its programming and coding skills as analysis becomes more complex. In certain organisations programming and coding might be handled by different business units, however, the more understanding that this role possesses about how systems work the better. This role will continue to need to increase its business and financial acumen skills as a deeper business awareness will help to improve this job roles efficiency and increase overall risk management.

4. Findings

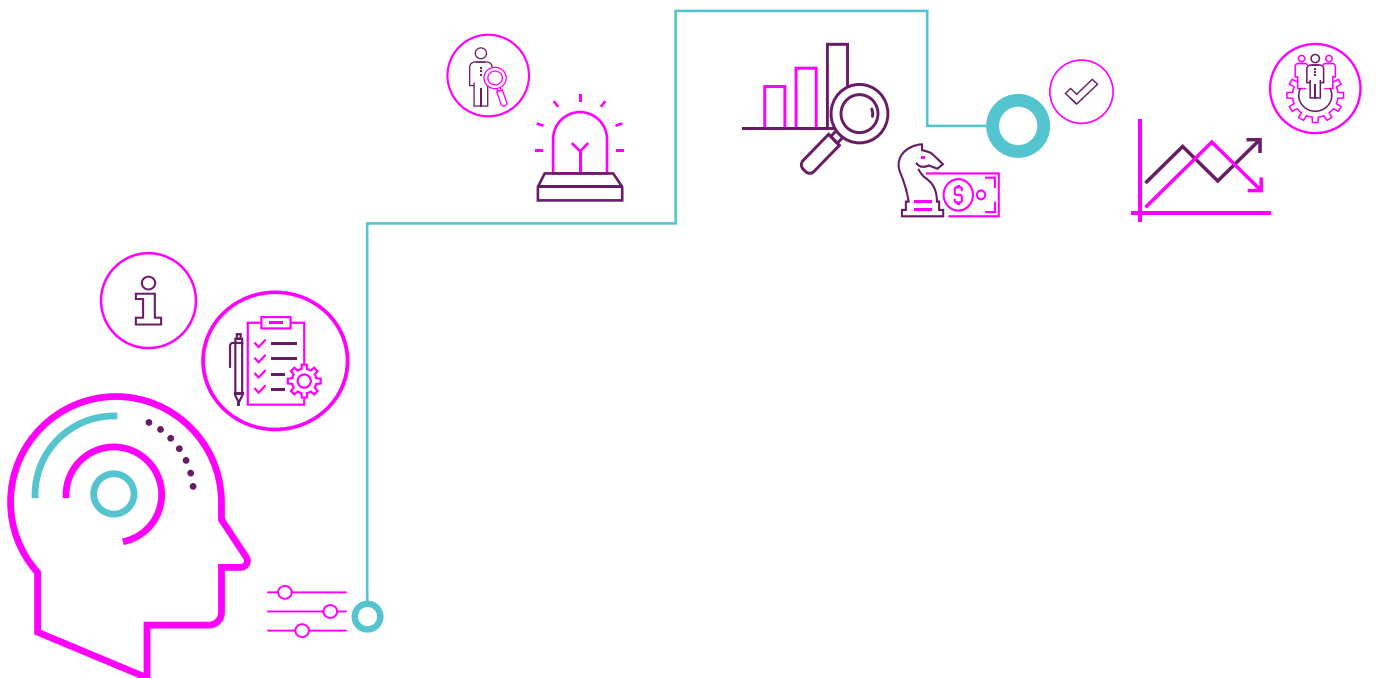
Operational Risk Management



Previously it was common for organisations to increase headcount in this job role to carry out the necessary tasks. This will change in the future where machine learning could be added into existing systems to help users generate more analysis, such as additional scenarios to address false positives, and ultimately reduce potential for data loss.

Skills Implication:

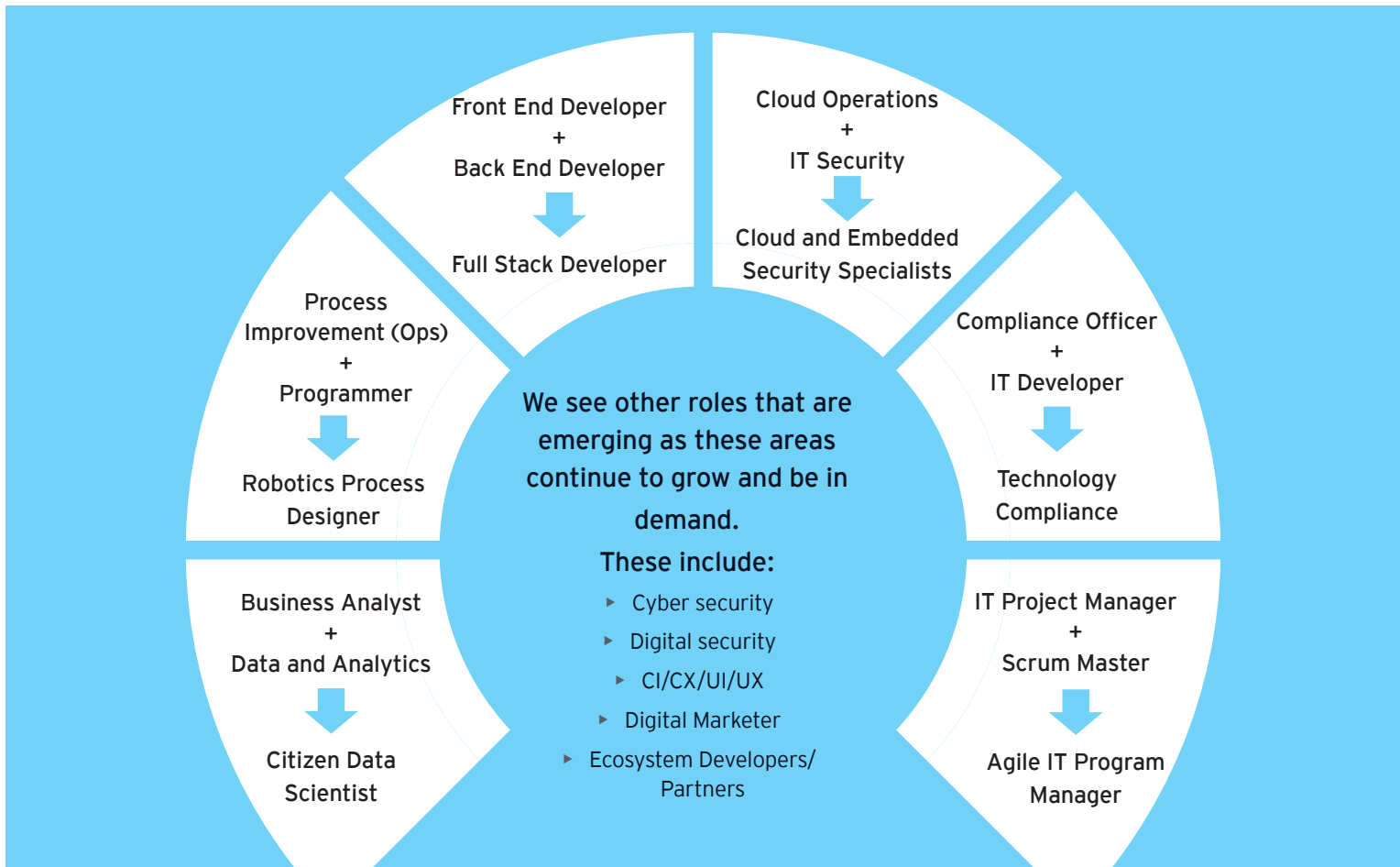
Future Operational Risk Management job holders will need to obtain process excellence skills to work on existing and new processes that are in place due to data analytics and automation. Along with this, there will need to be an open minded approach to carry out change initiatives, and an increased need to collaborate with job roles that execute the model development, as the models will become much more advanced. Due to the model complexity, Operational Risk job holders will be required to have enhanced data interpretation skills to evaluate model results and draw insights from that information to understand the underlying data and model constructs.





4. Findings

4.5 New and Emerging Roles in Financial Services



Data analytics and automation is also expected to create new and/or more roles in areas such as Information Technology, Data and Analytics, Business and Partnership Development, Compliance and Marketing. These roles differ from their traditional Enterprise job role counterparts discussed in the previous section as they require substantive, and often a different, set of skills. Examples of some of these roles are as follows:

Information Technology

IT Developers in the past specialised in either front or back-end web or application development. Today, demand for Full Stack Developers, those who can work on the front-end and back-end development needs, has surged due to the increase in use of online applications by many organisations. A substantial growth trend was also observed in the three-year historical job posting data in Australia, naming Full Stack Developer as one of the fastest growing jobs in the country.

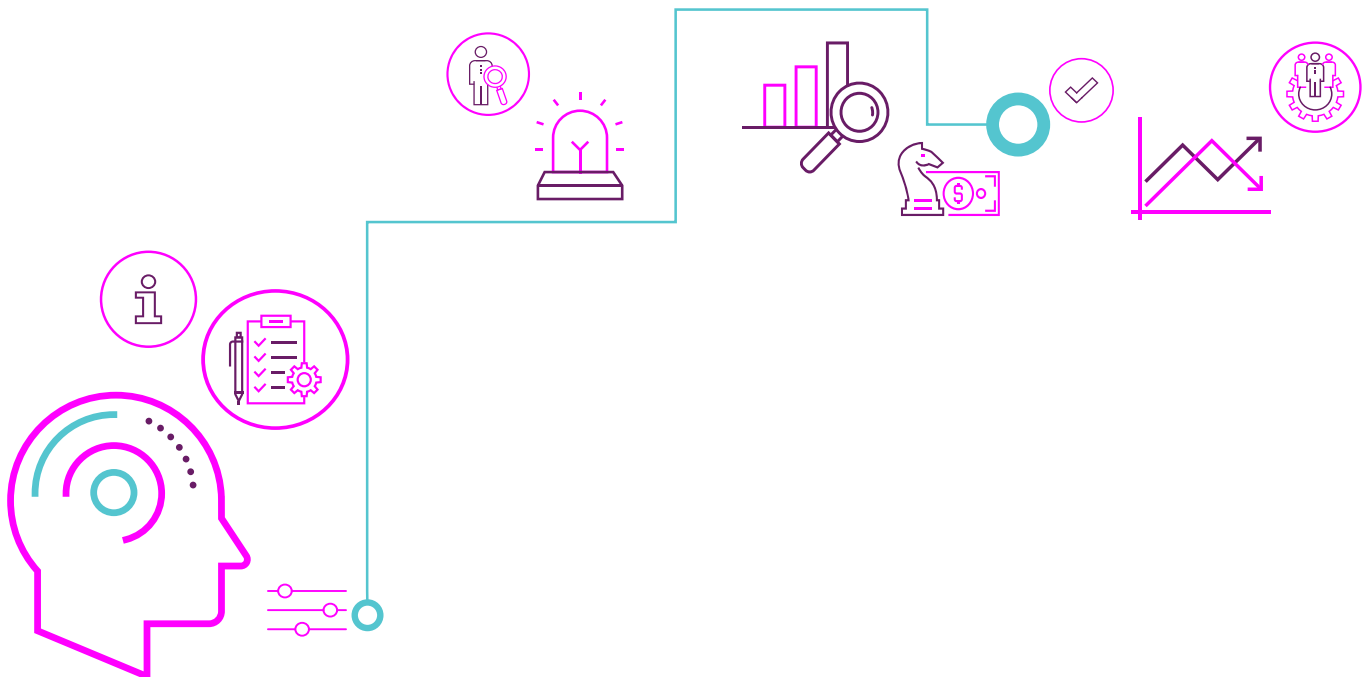
Another example is an IT Project Manager. Today, this role is expected to 'unlearn' the traditional methods of waterfall implementation and adopt new skills of an Agile IT Project Manager who is able to time-box project tasks into phases called "sprints" and prioritise deliverables based on business value determined by users. While the importance of this role is growing, many FIs report difficulty attracting and hiring such expertise.

A global bank operating in Singapore shared that waterfall implementation is currently outsourced in their organisation. In Singapore, they have created 80 scrum teams – with each team comprising a programmer/coder, product owner and operations/process owner. The teams run individual projects that involve real time testing and development, with clear objectives to be met in 15-day sprints. A product that typically took six to nine to launch, had been reduced to a maximum of 2 months with the agile/scrum approach.

New roles within IT Security will also emerge. The increased use of cloud computing comes with risks, hence, the need for cybersecurity will intensify in the coming years. Moving away from the sole focus on IT Security knowledge, cloud security specialists with cloud platform expertise are highly sought today. These platform-specific skills are critical in understanding how cloud service providers implement security.

One of the London-based FIs operating in Singapore also shared their experience in seeing the need for the business analyst role to transform. Traditionally, business analysts possess a strong understanding of technology knowledge, however, they have historically lacked the product expertise and in-depth understanding of the business, resulting in developing products that are not fit for purpose. On the other extreme, business analysts who possess robust product knowledge, but lack the technical skills to integrate digitisation into the products that are enticing to customers. FIs are facing difficulty in finding talent who strike an appropriate balance between the capabilities.

Last but not least, data engineers who play a big part in an organisation's data analytics aspirations have also evolved. Increasingly, FIs are turning to data engineers to help them set-up and run big data platforms. These individuals are expected to possess strong programming or software engineering experience, and expertise in big data frameworks – such as Hadoop.



4. Findings

Data And Analytics

Harvard Business Review once named Data Scientist, “the sexiest job of the 21st Century”, reflecting the demand for the job in 2012.⁶¹ This demand continues to exist, with LinkedIn reporting Data Scientists as the fastest growing job in Singapore, with demand for Data Scientists surging 17 times.⁶²

With the demand for Data Scientists beyond supply, organisations are seeking solutions. In 2017, Gartner published a report introducing the Citizen Data Scientist role (also known as Data Science Translator in some firms). Gartner defined this role as a professional who, “creates or generates models that use advanced diagnostic analytics or predictive and prescriptive capabilities, but whose primary job function is outside the field of statistics and analytics”.⁶³

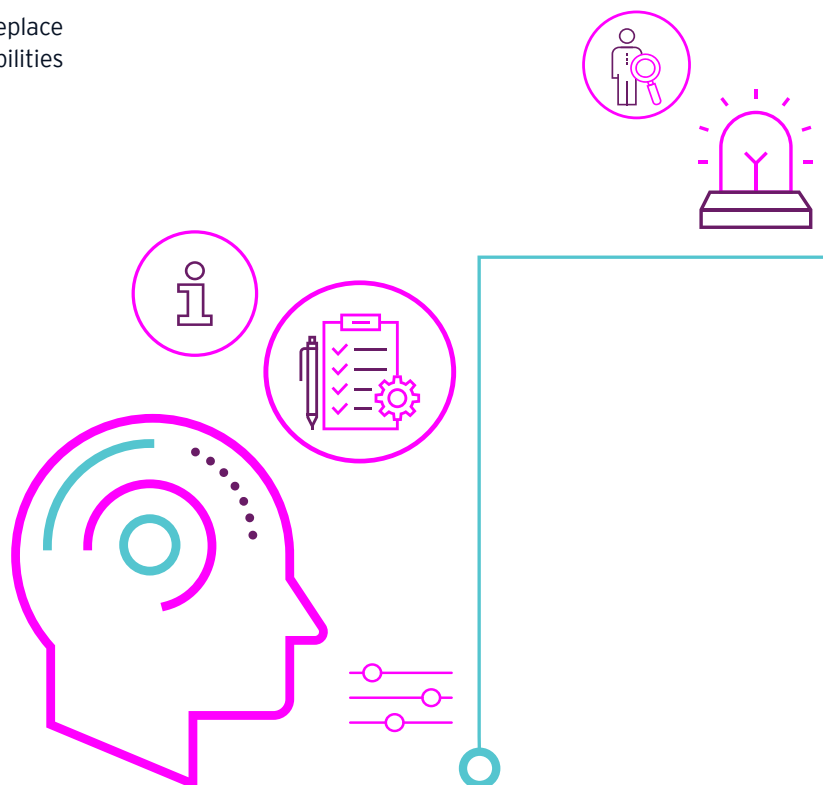
For example, engineers who bring a background in mathematics, statistics and modelling can employ their skills to extract more value from existing analytics solutions.

Simultaneously, solutions providers are rapidly improving their products in order to better support these Citizen Data Scientists. While some technical skills are critical, it is worth noting that this role is valued for its soft skills – being able to translate complex and technical subjects into simple and compelling insights for all stakeholders in the organisation.

We should note that the citizen approach does not replace the multi-disciplinary and end-to-end analytics capabilities of a full Data Scientist.

Business And Partnership Development

Customers are expecting more personalised products and services from FIs, and business development officers need to adapt. Therefore, customer expectations have compelled FIs to create a new role called Ecosystem Developers (or partners). This role supports the business development officer by creating partnerships that are larger and embedded further upstream. They create opportunities for non-traditional partnerships – such as bank-telco and insurer-post office strategic partnerships. The importance of Ecosystem Developers will grow as FIs collaborate with different industries to stay competitive. This role will need some hard skills such as how to analyse data effectively, where has the data come from and does it tell the full story in order to effectively determine future partnerships.



Compliance

The compliance profession will continue to evolve. This profession will likely require an even greater level of technological expertise, bringing to life the role of the Technology Compliance Officer.

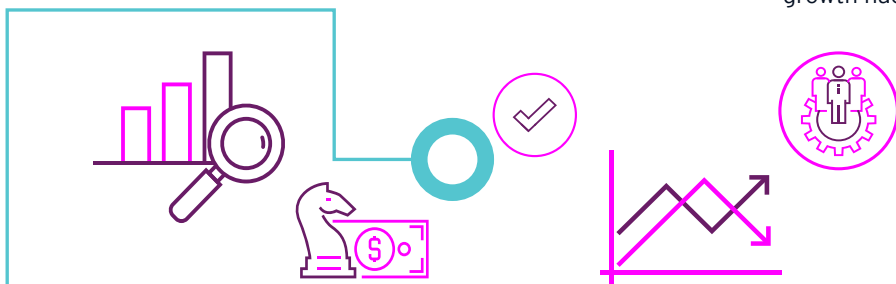
As mandatory regulations governing cybersecurity, data security, data access, and usage are increasingly complex Compliance officers must understand how to adhere to requirements. In addition, with strong IT experience and knowledge, Compliance Officers can mediate between users and the IT team by translating the user needs into IT requirements that meet the regulatory guidelines.

Marketing

The marketing role is transforming radically as more and more customers are consuming digital content today. Inevitably, traditional marketing executives will need to fully transform into digital marketers who have both traditional and digital marketing capabilities.

Taking a step further, FIs are starting to adopt the way start-ups and technology organisations work. To this end, some FIs have started to recruit for the role of a “growth hacker”, a hybrid of marketer and programmer, who is agile, can work in a small team, and is not afraid to take risks and focus on business growth in the absence of large marketing budgets. While growth hacking is uncommon in banking today, for the past decade they have been generating success stories for many well-known (non-financial service) organisations, such as PayPal, Facebook and Airbnb.

Similar to a digital marketer, they typically opt for techniques like search engine optimisation and social media marketing, however, the growth hacker focuses on more than just customer acquisition and the marketing techniques are leveraged in a way that is low in cost and produces effective outputs. It is important to keep in mind that, depending on the business strategy, company direction and culture, a growth hacker may or may not be needed in an organisation.



5. Potential Interventions

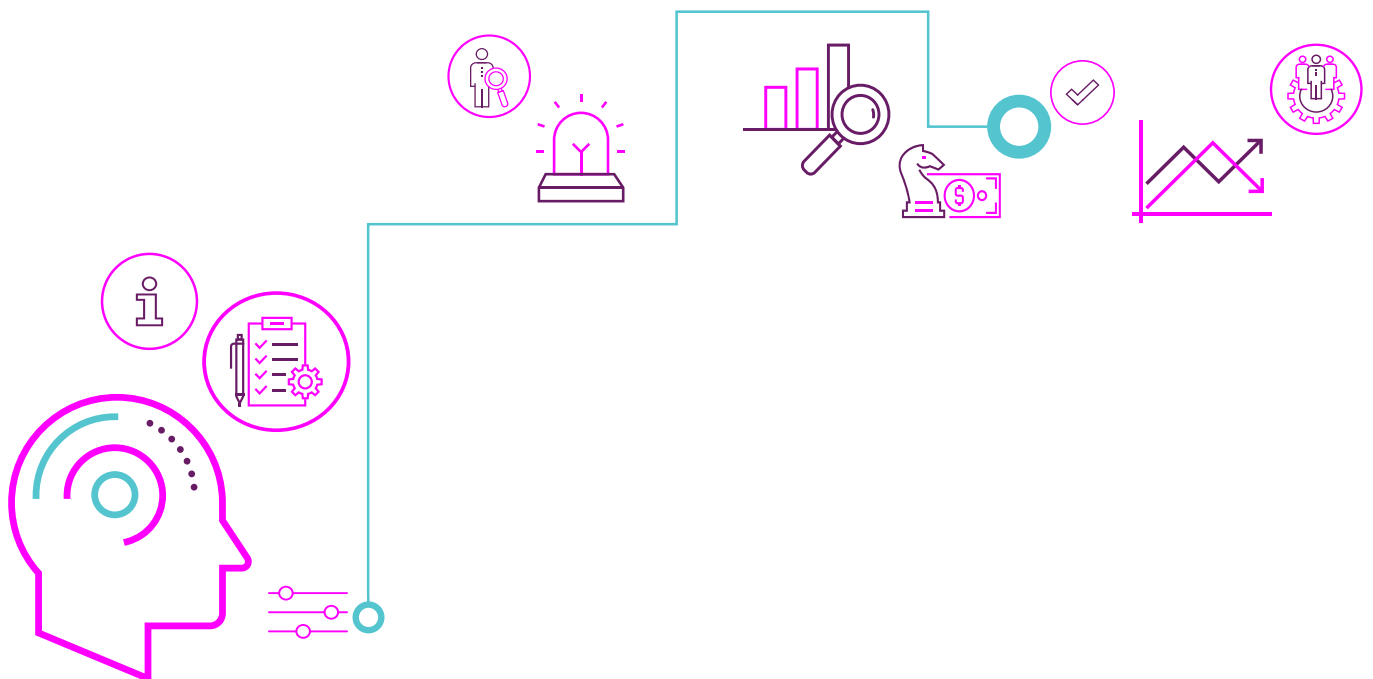
Introduction

With rapid changes in the industry, skills critical for the future workforce revolve not only around technical skills to use technology, but the accompanying skills to work alongside technology. Given this, there is a need to stay abreast with technology to manage and make sense of data analytics and automation (or technology tools). Fundamental digital skills will serve as the basis, but there is a need to enable the workforce to continuously acquire “add-on” skills, and integrate their unique business and domain knowledge to effectively respond to uncertainty and change.

To facilitate this, there is a need for industry (FIs and professionals) and education (training providers and education institutions) to collaborate more closely in identifying the skills needed as they emerge and evolve, and in designing and delivering training programmes in a timely manner – both to students as well as professionals already in the workforce.

To better cater to professionals already in the workforce, there is a need to explore new learning pedagogies, create more flexible learning pathways and introduce new delivery methods that would motivate and aspire individuals to embrace lifelong learning as well as facilitate this process. To accelerate this process, there is a role that government can play in coordination and alignment of interests among different stakeholders, as well as the introduction of relevant interventions to facilitate system-wide changes necessary to develop a future-ready workforce.

Based on this study, we outline potential interventions that can be taken across 4 key groups of stakeholders:- Government, Training Providers/Education Institutions (TP/EIs), Financial Institutions (FIs) and Individual Job Holders.



A Call To Action



Government

- ▶ Explore opportunities to facilitate the setting up of open-sourced learning ecosystems by providing framework and guidelines needed to establish shared recognition mechanisms for learning skills
- ▶ Encouraging skills and capability uplift opportunities beyond traditional learning and certification systems by providing recognition and support to alternative sources and motivating greater adoption by industry, education and individuals
- ▶ Place emphasis and focus on driving adoption of common baseline skills for digital-related tasks by leveraging on pre-existing government initiatives



Training Providers/Education Institutions

- ▶ Collaborate with FIs and financial services professionals via tri-partite platforms or industry-education sharing platforms to gain information for guiding curriculum design to increase market relevancy
- ▶ Review existing curriculum design and implementation processes to be more agile and flexible to changing needs to enable greater speed to market to stay in line with market talent needs as it transforms
- ▶ Make learning and skilling opportunities more accessible to students and those in full-time work through providing relevant and easily consumable content



Financial Institutions

- ▶ Recognise value that can be derived from collaboration with education sectors or adoption of non-traditional learning mechanisms and platforms.
- ▶ Take initiative to invest in opportunities to reskill the workforce through cooperation with TP/EIs
- ▶ Implement initiatives within respective organisations to develop and inculcate culture of flexible learning within the workforce



Job Holders

- ▶ Take the lead on personal and professional development through recognition of need for lifelong learning
- ▶ Adoption of a growth mindset to motivate self to constantly seek out new learning opportunities
- ▶ Keep abreast of the impact of data analytics and automation within job roles and take advantage of opportunities and platforms available to adapt more readily

5. Potential Interventions

Government

Preparing the future workforce to adapt and thrive with rapidly transforming jobs requires the participation and support of many stakeholders. We encourage the government to play a larger role in facilitating this collaboration, by driving and shaping industry alignment.

1. Providing the framework and guidelines to set up an open-sourced learning ecosystem through establishment of country-wide (and even regional/global) shared recognition mechanisms for learning skills through various means.

Given that industry certifications and accreditations can often be highly specific and time consuming to achieve, there is value in a more flexible certification mechanism that rewards and acknowledges the participation and efforts of individual job holders in picking up new skills. An open-sourced system will enable TPs/EIs, and FIs to create their own learning opportunities to offer certifications that are mutually recognizable and have an agreed “value” across the sector and country assuming they are aligned to specific requirements and standards – which can be set jointly by the industry and the government as a starting point. This creates flexible learning pathways for job holders to build skills from a variety of sources, without having to adhere to traditional certifications and/or learning routes – particularly useful for picking up new and emerging skills that may not be fully established yet. With an open ecosystem, even small firms can focus on offering training and learning opportunities which will be recognisable – making it appealing for individuals to access them.

Without creating a mandate, recognition and support from the government will help encourage adoption across sectors – as the effectiveness of such open recognition systems is dependent on enough players adopting it. This would support the portability of skills across lifelong learning journeys for individual job holders.

As an example, the openbadges.org platform offers verifiable and portable digital badges that recognize the possession of skills and achievements across the world. To date, thousands of organisations have aligned themselves to this “unofficial” certification. Individuals with these badges can showcase to their employers or future employers that they have these “qualifications” which are recognised due to the platform’s adherence to defined specifications – making it portable regardless of origin or country. They represent achievements beyond just traditional skill sets, but also community involvement, participation and new skills not yet recognised by traditional certification systems.

2. Focusing on driving the adoption of common baseline skills for digital-related tasks across job roles by aligning with and leveraging on pre-existing government initiatives

In line with its Smart Nation agenda, the Singapore government can take a proactive and direct role in focusing on digital skills development and encouraging training providers/education institutions to focus on foundational skills to facilitate this, enabling a divide and conquer approach in jointly uplifting the capabilities of the workforce.

While a variety of skills are required for job holders to successfully navigate the transformation of their respective job roles, the government can place more of its efforts towards helping job holders become more tech-enabled in preparation for future roles. This could include (a) communicating changes in workforce and skills trends to increase awareness – to motivate individuals to more actively develop themselves, and (b) putting in place incentives and opportunities to help encourage adoption by individual job-holders.

Specific to this study, as the party without distinct interests in any organisation, the government can encourage the industry and workers to focus on acquiring those skills that were commonly identified across job roles that would be relevant for tasks of the future rather than focus on specific job roles, titles, or career paths which can often differ by organisation. By focusing on developing such skills in individuals, it equips current and future job-holders with capabilities that extend beyond a specific career path or organisation, and enhances job portability. These recommendations are closely aligned to existing initiatives from SkillsFuture Singapore and Workforce Singapore to encourage upskilling (e.g. provision of skills future credits). Great work is already being done and can be leveraged upon to bring greater and more rapid change to the industry.

Training Providers/Education Institutions (TP/EIs)

TP/EIs face challenges in keeping their curriculums up-to-date to equip the current and future workforce (students) with the skills required by the market as these are evolving at a rapid pace. This is particularly evident with the digital skills required to support new digitally-focused business operating models as FIs rapidly transform their business. Typical curriculum planning processes are often lengthy and involve multiple stage gates – leading to a long runway to roll out new courses. Representatives from local tertiary institutions have shared how more can be done to allow for faster review and redesign of curriculum to keep pace and ideally be ahead of changes in the sector.

1. TP/EIs need to work more closely with FIs and finance professionals via tri-partite platforms or regular industry-education information sharing to guide curriculum design to increase speed to market and relevancy.

This may be established by setting up shared councils/steering committees focused on getting TP/EIs up to speed on how FIs are transforming and their corresponding skill needs. This will enable TP/EIs to better reflect changes in their curriculum designs, as well as design and implement future-focused learning road maps that are guided by actual scenarios and skill needs of the industry.

2. TP/EI should review their curriculum design and implementation process to be more agile and flexible to changing needs, as well as provide greater accessibility to students and those in full-time work.

This may require education courses to comprise two tracks:

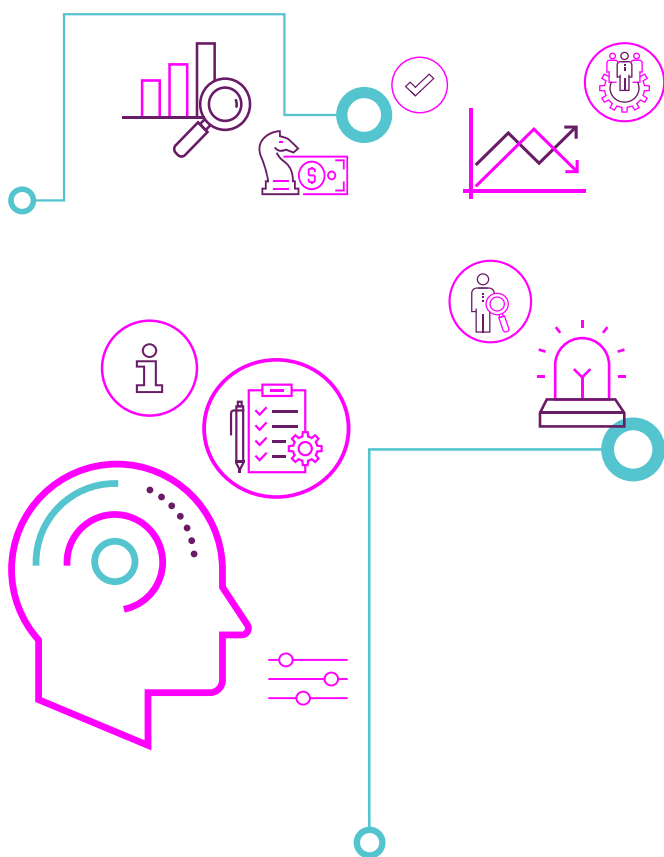
Foundation skills – forming a core curriculum track to equip students at a tertiary level over the course of 2-3 years. This should be reviewed on a yearly basis to ensure it remains relevant.

Emerging skills – which can complement foundational skills as modular add-ons, and can be in the form of short-form workshops, evening modules, e-learning etc. As is already the practice of some local institutions, these skills can be accessed ‘buffet style’ to allow ease of access and multi-disciplinary learning not limited to a specific occupation but rather tailored to tasks and skills. These can be made accessible to both students and those in the current workforce who are keen to pick up new skills.

Short modular courses also have the advantage of enabling a quicker turnaround in developing and deploying these courses as the overall scope is lessened. Furthermore, content can be refreshed more easily – particularly if these courses are attended or taught by working professionals who can provide immediate and direct feedback as the industry transforms.

Agreements can be put in place to collaborate with industry to deliver these modules themselves (especially if modules exist within industry academies etc.), or to get the content from industry and for each TP/EI to convert into their own formats for delivery. A tripartite platform/industry-wide council can help to centralise and facilitate this process to ensure it is not only big TP/EIs and FIs who are involved.

TP/EIs need to identify ways to design and execute these short courses within more narrow time frames to ensure they are taught to job holders/students when relevant. This may even require a divide and conquer approach – with TP/EIs taking on specific courses, and allowing their students to learn across TP/EIs through shared and mutually recognised courses – reducing the load on single TP/EIs.



5. Potential Interventions

Financial Institutions (FIs)

As the employers of the workforce, FIs are challenged to transform their businesses to keep up with technology and digital tools to better provide for their customer bases. Alongside such business change, FIs are starting to realise that the benefits of investing internally to develop talent with the right type of skills that are needed by the jobs emerging from the digital transformation far outweigh the short-term costs.

1. Invest in reskilling through design collaboration with TP/EIs.

FIs can be a valuable resource in helping TP/EIs more quickly refresh and design curriculums and deploy courses and learning modules to market. This will enable current and future job holders to pick up relevant skills - providing FIs with a greater talent pool of individuals equipped with the right skills. FIs can contribute feedback on the anticipated future skills, as well as domain and industry knowledge that will enable job holders to better contextualise and apply newly acquired capabilities.

FIs can also provide industry/domain internships/ apprenticeships that can be combined with theoretical learning so that the pool of talent comes equipped with an understanding of how their skills can be applied.

2. Develop and inculcate culture of flexible learning within the workforce

FIs can drive the development of flexible learning cultures and lifelong learning curiosity amongst their employees through various means of supporting and facilitating this push to reskill and upskill. This includes recognising and contributing to the open-sourced recognition programmes such as the Open Badge and non-traditional learning pathways that may emerge beyond established TP/EIs.

FIs can encourage their own workforce to embrace flexible learning opportunities - creating their own cultures of learning and to make use of available learning platforms, including by incentivizing employees that do through internal reward and recognition. Further opportunities for learning can be provided by FIs such as by encouraging redeployment and cross-disciplinary attachments that encourage employees to pick up new skills. While this may be done to some extent in FIs currently, there is a need to determine how this can be scaled to their workforce instead of only a select sample. Opportunities for secondments outside of the organisation - for example with local FinTech firms or FinLabs can be beneficial to expose staff to digital projects and digital transformation work, allowing them to apply and embed these skills.

FIs can examine how future work trends, data analytics and automation will impact the roles within the organisation, and use that to engage in strategic workforce planning to ensure the right capabilities are in place. Accompanied by conducting learning audits, this would strategically help the organisation detect gaps that need to be addressed by organisational learning culture initiatives.

Job Holders

For an individual, the widespread integration of data analytics and automation will inevitably change the constructs of jobs and career paths across the sector. Given that current and future job holders will be the most directly impacted as end-users of digital tools and or changing job tasks, there is a strong need for them to be aware of the skills trends for future jobs and understand how they can differentiate themselves by equipping themselves with the right skills.

1. Adopt a growth mindset

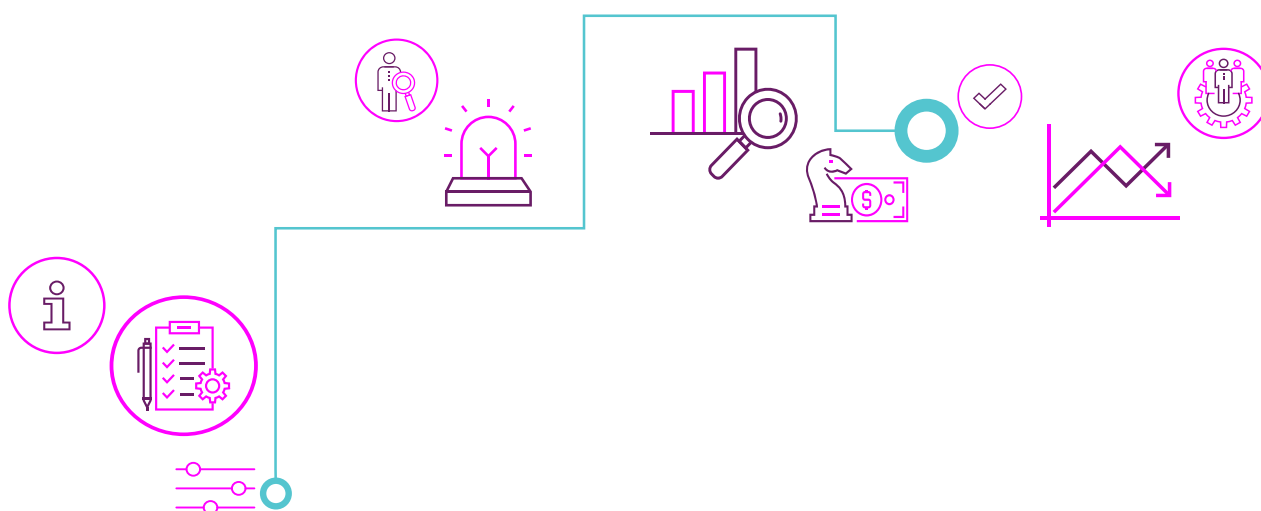
With many workforce reports highlighting how roles may be displaced or augmented in the near future, up-skilling and re-skilling will be the new norm and necessary. Therefore, current and future job-holders will need to embrace a culture of agile lifelong learning as it becomes key to survival in the future way of work. Job-holders must realise that the jobs and career paths of the future may not be as static as it was previously. Instead, specific skill sets may become more in demand as businesses and jobs transform with the increased use of data analytics and automation. As such, being comfortable and actively seeking opportunities to reskill according to industry needs will greatly assist in maintaining their employability. Job holders must ensure that their “supply” of skills match the current and future “demands” of the financial services sector (or beyond).

Different kinds of work are likely to arise with more digital integration and transformation, which may require job holders to stay abreast of the latest trends and be comfortable with adapting to rapidly changing tools. Job-holders must be willing to invest the time and effort to reskill as needed to comfortably use digital tools and work alongside technology, while capitalizing on their uniquely “human” skill sets that can fuel innovation and collaboration.

2. Keep abreast of the impact of data analytics and automation within the job role and take advantage of platforms that are built to support job holder’s transitions

This study shows that many roles will face some level of augmentation or change. As an employee, it is important to understand and stay aware of changes in the sector, career opportunities and individual job roles. It will be crucial for the job holder to anticipate how their jobs may change and identify the right opportunities and areas of interest that can act as transition platforms or prepare them to take on changing job tasks.

While the ecosystem comprising of the government, TP/ EIs, and FIs can all play their part to facilitate and provide opportunities to help individual job holders thrive within this digital transformation period, it is up to the individual job holders themselves to grasp and act on them. Job holders must be willing to spend the time to reskill themselves to stay ahead of the curve and prepare for this inevitable move towards working with and alongside digital technology - and hone their skills accordingly.





Summary

Harnessing new skill sets that will adapt and work alongside data analytics and automation is inevitable. Today's workplace has seen the emergence of roles that did not exist a decade ago. This serves to highlight that the skills needed tomorrow may replace those in demand today. Organisations must realise that they can no longer develop skills benchmarked on historical successes. Failure to address the demands of new skills due to data analytics and automation could hinder growth in talent.

In summary this report will benefit the industry in four critical ways...



Government

To support both employers and the job holders across the sector, this study will provide guidance on the targeted development initiatives required, and the timeframe for the evolution of critical skills.

The study will provide input to the Government on how to facilitate the development of the workforce in line with the impact of data analytics and automation



Training Providers/ Education Institutions

This study will provide guidance for the development of curriculum to more effectively support the evolving training needs for the financial services sector.

It will provide clarity to training providers and education institutions on where to focus their efforts based on skills trends, expected skills differentiators and how job tasks will evolve over the next 3-5 years.



Financial Institutions

This study will enable organisations to "see around the transformation corners", providing clarity into where and how job roles will shift in size and nature, allowing for more strategic development spend, effective talent pipelining and a clearer ability to manage supply and demand in the Singapore employment landscape.



Job holders

This study will provide rich insights for individuals currently within, and those looking to join the industry, helping them to see how their roles or careers will change, be enhanced or remain stable in the next 3-5 years.

It will also provide clarity into the future skills required and potential career pathways, promoting a self-development mindset across the sector.



6. References

1. 121 roles is inclusive of roles duplicated across subsectors.
2. Defining the new drivers of customer engagement, Ernst & Young (2017).
3. The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies, Erik Brynjolfsson & Andrew McAfee (2014)
4. To ensure the full value of the technology trends are delivered, the study takes into account the technology enablers such as Digital Applications, Blockchain, Application Processing Interface (API), Cloud Technology, and Internet of Things (IoT), where applicable
5. Capital Markets: innovation and the FinTech landscape, Ernst & Young (2016).
6. Financial Services: Connected?, Ernst & Young (2017).
7. Capital Markets: innovation and the FinTech landscape, Ernst & Young (2016)
8. Capital Markets: innovation and the FinTech landscape, Ernst & Young (2016)
9. Capital Markets: innovation and the FinTech landscape, Ernst & Young (2016)
10. Machine Learning: What it is and why it matters, SAS Institute (2019). Retrieved from https://www.sas.com/en_us/insights/analytics/machine-learning.html
11. 121 roles is inclusive of roles duplicated across subsectors.
12. Industry Quote
13. Why DBS bank is going all-in on big data, Global Finance (6 July 2017). Retrieved from <https://www.gfmag.com/topics/sponsored-content/why-dbs-bank-going-all-big-data>
14. UOB's 2 new robot employees cut data processing time by over half, The Straits Times (22 Nov 2017). Retrieved from <https://www.straitstimes.com/business/banking/uobs-2-new-robot-employees-cut-data-processing-time-by-overhalf>
15. Human-Machine Collaboration: Humans helping machines helps humans, Accenture (2018). Retrieved from <https://www.accenture.com/gb-en/blogs/blogs-humanmachine-collaboration>
16. The changing face of branch banking, DBS Newsroom (n.d). Retrieved from https://www.dbs.com/newsroom/branch_banking/default.page
17. Trade Digitisation – The path to win-win, DBS (n.d.). Retrieved from <https://www.dbs.com.sg/corporate/wc-articles/trade-digitisation.page>
18. Japanese bank introduces robot workers to deal with customers in branches, The Guardian (4 Feb 2015) Retrieved from <https://www.theguardian.com/world/2015/feb/04/japanese-bank-introduces-robot-workers-to-deal-withcustomers-in-branches>
19. OCBC Bank to reduce teller jobs by half within two years with strong digital push at branches, OCBC Media Release (23 July 2018). Retrieved from <https://www.ocbc.com/group/media/release/2018/ocbc-bank-to-reduce-teller-jobsby-half-within-two-years-strong-digi-push.html?>
20. 90% of Singaporeans prefer cash payments: PayPal, Today Singapore (2017)
21. Artificial Intelligence applications for lending and loan management, Emerj Artificial Intelligence Research (2018). Retrieved from <https://emerj.com/ai-sector-overviews/artificial-intelligence-applications-lending-loan-management/>
22. Industry Quote
23. Industry Quote
24. Redefining Corporate Banking Relationships in a DigitalWorld, BCG (2018). Retrieved from <https://www.bcg.com/en-sea/publications/2018/redefining-corporate-bankingrelationships-digital-world.aspx>
25. Industry Quote
26. DBS launches first-of-its-kind online Letter of Credit service, DBS Newsroom (24 January 2017)

27. Toward a Future-Proof Product Control Function, Cognizant (April 2014). Retrieved from <https://www.cognizant.com/whitepapers/Toward-a-Future-Proof-Product-Control-Function.pdf>
28. Remisier ups her game to serve tech-savvy clients, The Straits Times (July 18 2015). Retrieved from <https://www.straitstimes.com/business/economy/remisier-ups-her-gameto-serve-tech-savvy-clients>
29. Industry Quote
30. Definition: Financial Information exchange (FIX) is an electronic communications protocol for real-time information exchange; and is used extensively by buy and sell-side firms to communicate trade information.
31. Goldman Set Out to Automate IPOs and It Has Come Far, Really Fast, Bloomberg (13 Jun 2017). Retrieved from <https://www.bloomberg.com/news/articles/2017-06-13/goldman-set-out-to-automate-ipos-and-it-s-come-farreallyfast>
32. Gartner Predicts Our Digital Future, Gartner (6 Oct 2015). Retrieved from <https://www.gartner.com/smarterwithgartner/gartner-predicts-our-digital-future/>
33. Wall Street analysts are predicting their own grim fate, Business Insider Singapore (29 Aug 2016). Retrieved from <https://www.businessinsider.sg/equity-research-analystsface-uncertain-future-2016-8/>
34. Capital Markets: Innovation and the FinTech landscape, Ernst & Young (2016)
35. Here's why robo-advisors won't replace human financial advisors, CNBC (2018). Retrieved from <https://www.cnbc.com/2018/06/06/heres-why-robo-advisors-wont-replacehuman-financial-advisors.html>
36. The future of banking integrates high-touch with hightech, The Financial Brand (27 Sept 2017). Retrieved from <https://thefinancialbrand.com/67767/bankingbranchesdigital-technology-experience-trends/>
37. Blue Prism Robotic Process Automation, Blue Prism. Retrieved from https://www.blueprism.com/uploads/resources/Migration_EN_RPA-GovernmentBrochure_181231_210301.pdf
38. How BNY Mellon became a pioneer in bots, American Banker (25 Aug 2016). Retrieved from <https://www.americanbanker.com/news/how-bny-mellon-became-a-pioneer-in-bots>
39. AlgoTrader overview, AlgoTrader (2018). Retrieved from <https://www.algotrader.com/product/overview>
40. AlgoTrader Features, AlgoTrader (2018). Retrieved from <https://www.algotrader.com/features/>
41. AI cannot totally replace humans in assessing claims, Asia Insurance Review (14 Jun 2017). Retrieved from <http://www.asiainsurancereview.com/News/View-NewsLetter-Article?id=39427&Type=eDaily>
42. Allianz moves towards digital agency model, Marketing Interactive (18 Jul 2016). Retrieved from <http://www.marketing-interactive.com/allianz-moves-towards-digital-agency-model/>
43. Industry Quote
44. AIA Hong Kong Launches Industry-First "AIA ICARE Self Help Service Kiosk", AIA (14 Nov 2016). Retrieved from <https://www.aia.com.hk/en/about-aia/media-centre/pressreleases/2016/aia-hong-kong-launches-industry-first-aia-icare-self-help-service-kiosk.html>
45. AXA turns Insurance-as-a-Service a reality by launching region's first partner transactional API, AXA (13 Nov 2017). Retrieved from <https://www.axa.com.sg/latest-news/axa-turns-insurance-as-a-service-a-reality-by-launching-regions-first-partner-transactional-api>
46. AXA Singapore to bring insurance-as-a-service model to Asia, Insurance Business Asia (14 Nov 2017) Retrieved from <https://www.insurancebusinessmag.com/asia/news/breaking-news/axa-singapore-to-bring-insuranceasaservicemodel-to-asia-84732.aspx>

6. References

47. Industry Quote
48. Combating Financial Crime – Working Together, Working Smarter (Speech by Mr. Chua Kim Leng), MAS website, 2017. Retrieved from <http://www.mas.gov.sg/News-and-Publications/Speeches-and-Monetary-Policy-Statements/Speeches/2017/Combating-Financial-Crime-Working-Together-Working-Smarter.aspx>
49. LinkedIn's fastest-growing jobs today are in data science and machine learning, Forbes (Dec 11, 2017) - Retrieved from <https://www.forbes.com/sites/louiscolombus/2017/12/11/linkedin-fastest-growing-jobs-today-are-in-data-science-machine-learning/#7247cacb51bd>
50. HSBC hired an analytics expert to shape up its compliance team, eFinancial Careers (24 Jan 2018). Retrieved from <https://news.efinancialcareers.com/uk-en/306409/hsbc-hired-analytics-expert-shape-compliance-team>
51. Transforming talent. The banker of the future. Ernst & Young (2016). Retrieved from [https://www.ey.com/Publication/vwLUAssets/ey-transforming-talent-the-banker-of-the-future-global-banking-outlook/\\$FILE/ey-transforming-talent-the-banker-of-the-future-global-banking-outlook.pdf](https://www.ey.com/Publication/vwLUAssets/ey-transforming-talent-the-banker-of-the-future-global-banking-outlook/$FILE/ey-transforming-talent-the-banker-of-the-future-global-banking-outlook.pdf)
52. 42,000 IT professionals needed over next 3 years, Today (2017). Retrieved from <https://www.todayonline.com/singapore/42000-ict-professionals-needed-over-next-3-years-yaacob>
53. Industry Quote
54. Banks urged to automate testing, Atoma Technologies (4 Sept 2017). Retrieved from <https://www.atoma.tech/banks-urged-to-automate-testing/>
55. Regulators fine Royal Bank of Scotland 56m for IT failure, Financial Times (21 Nov 2014). Retrieved from <https://www.ft.com/content/3e8d7d5e-7084-11e4-9129-00144feabdc0>
56. Data security, data ownership and the use of cloud technology are stirring uncertainty among global and Singapore CFOs, Ernst & Young (4 Dec 2017). Retrieved from <https://www.ey.com/sg/en/newsroom/news-releases/news-ey-data-security-data-ownership-and-the-use-of-cloud-technology-are-stirring-uncertainty-among-global-and-singapore-cfos>
57. Microsoft survey: IT leaders in Asia are prioritizing hybrid cloud to transform IT, Microsoft (24 Nov 2016). Retrieved from <https://news.microsoft.com/apac/2016/11/24/microsoft-survey-it-leaders-in-asia-are-prioritizing-hybrid-cloud-to-transform-it/>
58. IDC MaturityScape Benchmark: Cloud in Banking in Asia/Pacific, International Data Corporation (17 March 2017). Retrieved from <https://www.idc.com/getdoc.jsp?containerId=prAP42386217>
59. DBS collaborates with cloud leader Amazon Web Services to deepen cloud engineering talent pool, DBS Newsroom (21 Nov 2017). Retrieved from https://www.dbs.com/newsroom/DBS_collaborates_with_cloud_leader_Amazon_Web_Services_to_deepen_cloud_engineering_talent_pool
60. Operational excellence, disrupted, Ernst & Young
61. Data Scientist: The Sexiest Job of the 21st Century, Harvard Business Review (2012). Retrieved from <https://hbr.org/2012/10/data-scientist-the-sexiest-job-of-the-21st-century>
62. Demand for data scientists in Singapore surged 17 times: LinkedIn, Singapore Business Review (6 Sep 2018). Retrieved from <https://sbr.com.sg/hr-education/news/demand-data-scientists-in-singapore-surged-17-times-linkedin>
63. Gartner says more than 40 percent of data science tasks will be automated by 2020, Gartner (16 Jan 2017). Retrieved from <https://www.gartner.com/en/newsroom/press-releases/2017-01-16-gartner-says-more-than-40-percent-of-data-science-tasks-will-be-automated-by-2020>
64. The Future of Jobs report 2018, World Economic Forum (2018). Retrieved from http://www3.weforum.org/docs/WEF_Future_of_Jobs_2018.pdf



7. Appendix



7.1 Job Dashboards

7.2 Industry Participants

7.3 Skills Taxonomy



Subsector: Retail Banking

Job Family: Sales and Distribution

Impact Level

Today, this role is responsible for selling and advising customers about insurance product offerings.

High Impact

Consolidated Activities

	Today	Future
Insurance product marketing and sales	Task has low decision latitude as products are often generic across segments and not specialised to customer needs. Sales are not targeted to specific types of customers but offered more broadly to various customer segments.	Advanced Analytics can be used to generate customer profiles for more targeted outreach for specific groups who are most interested in purchasing insurance products via banking channels. AI will be able to help identify patterns and recommend products and services for better bundling opportunities.
Insurance product knowledge	Task is advisory in nature. Product updates will pass through traditional channels to update the job-holder on changes and updates to specific products. Understanding and sharing information with customers requires human judgment.	Chatbots will be able to provide information about product offerings, allowing for less manual intervention for basic queries. Complex cases will be passed along to Bancassurance Officers for further evaluation and assistance.

In the next

3-5 years ...

Moving forward, this role will evolve to market and sell other products and services rather than solely focusing on a singular product. This broader product and service portfolio will help to address customer needs and enhance customer experience in that they will be able to get a variety of financial planning items from a single source.

Skills Differentiators:

- ▶ **Lateral Thinking:** Job holders will be required to be able to search for opportunities to create differentiated product experience for customers by adapting sales strategies to combine recommendations based on customer preferences, and considering other relevant products of interests.
- ▶ **Product Awareness:** Having product knowledge across multiple types of products within a portfolio would be more common than having a single product focus, enabling the role to provide more comprehensive service experience to customers.
- ▶ **Advisory:** Understanding customers better due to Advanced Analytics will allow for more individualized, relevant and useful information to be shared.
- ▶ **Customer Mindset:** The job holders will be able to leverage on Advanced Analytics to understanding customer purchasing habits, anticipate customer needs and use customer life stage knowledge to create more proactive outreach for potential sales.
- ▶ **Data Interpretation and Analysis:** Making sense of data provided to the role will be necessary, while a change of mindset required to apply existing sale skills to drive efficiency within new scopes for the role.





Subsector: Retail Banking

Job Family: Sales and Distribution

Impact Level

Today, this role is responsible for managing branch service delivery, and the effective design of the role's workflow to drive teller efficiency, and deploy new technologies to improve branch efficiency.

High Impact

Consolidated Activities

	Today	Future
Process Efficiency and Improvements	Execution requires human judgment to ensure optimisation of resources.	RPA can be leveraged to help collect data at different stages of the workflow process for further analysis to provide insights or suggestions for areas of improvement.
ATM/VTM Network Tracking	Execution requires frequent checks to ensure adherence to uptime and availability standards. Banks are using automated monitoring systems with real time dashboards to oversee the availability of bank's ATM network to its customers.	The role will continue to leverage automated monitoring systems with real time dashboards to effectively monitor large groups of ATMs/VTMs, and automatically prioritise maintenance during downtime.
Customer Feedback Management	Execution is supported by technology, such as video banking/chat bots replicating the experience of interacting with a physical personnel while increasing convenience.	Advanced Analytics can provide insight on future customer needs, and allow more automated banking channels to be offered to customers.
Self-service or Automated Banking Channels Improvement	N/A	Contribute to innovation and new service opportunities in the ATM/VTM space, and drive the delivery of enhanced functionality for customers.

In the next

3-5 years ...

As banks are determining how best to change their branch footprint, this role will see a transition in responsibilities with an increasing shift towards digital banking platforms and management of customer experiences for improved services over competitors.

Skills Differentiators:

- ▶ **User Experience Design:** The job holder will need to be able to display understanding of the omni-channel banking interactions and help to deliver an experience that is aligned to customers' expectations.
- ▶ **Data Interpretation and Analysis:** Being able to make sense of data analytics and determine how it fits into existing business processes will be necessary to ensure that established business operational processes are not compromised with the infusion of Advanced Analytics.
- ▶ **Process Excellence:** Using enhanced monitoring systems, the job holder will bring new information to achieve new levels of efficiency and drive implementation of improvements.
- ▶ **Customer Mindset:** Advanced Analytics will offer insights on customer preferences and needs, allowing the job holder to tailor processes and experience that are aligned to customers' expectations.
- ▶ **Change Management:** The job holder will have the mindset and ability to adapt to and drive effective change – to ensure the successful adoption of digital solutions across organisation and customer segments.





Subsector: Retail Banking

Job Family: Sales and Distribution

Impact Level

Today, this role is responsible for accurately processing routine bank transactions at a bank. These transactions include cashing cheques, depositing money, and collecting loan payments.

High Impact

Consolidated Activities

	Today	Future
Frontline Counter Transactions Support	Execution of task is tedious and repetitive. Despite handling some transactions for non-digital users today, most daily transactions are already handled digitally. Automated tellers as well as online/mobile platforms are already facilitating the completion of payment services, complex transactions and money management functions.	Transaction support at branch will likely cease to exist as bank branches become transformed. This task is likely to become automated, and in future, this technology may allow more complicated transactions to be addressed and supported.
Customer Assistance and Feedback Management	Execution is supported by technology. Video banking/chat bots replicate the experience of interacting with a physical personnel while increasing convenience.	Advanced Analytics can provide insight on future customer needs and allow more tailored services to be offered to customers.
Digital Assistance	Execution has already been incorporated with technology. Tellers are increasingly providing non-traditional support to customers – including familiarising customers with the new apps and/or new features within online banking.	This role will continue to provide assistance to new or existing digital users.
Product Advisory	Execution of task is advisory-driven and requires deep product knowledge and expertise.	This role will be able to respond to queries from walk-in customers with regards to all products or services offered by the bank.

In the next
3-5 years ...

Due to the transformation of the branch footprint, Branch Tellers roles will continue to shift significantly in the coming years. There will be an opportunity for digital ambassadors to assist with some branch related items as well as the opportunity to see a shift of tellers to more product and sales related roles as they expand their knowledge and experience.

Skills Differentiators:

- ▶ **Customer Mindset:** Advanced Analytics will offer insights on customer preferences and expectations, allowing the job holder to tailor recommendations to customer needs.
- ▶ **Advanced Digital Acumen/Literacy:** In order to transition into digital ambassador roles, the job holder will need to be proficient in using technology in a business capacity to help others.
- ▶ **Targeted Technical Sales:** In order to take on a sales-focused role in the future, the job holder will need to be able to leverage insights to customise services that address unique customer needs and finalise sales.
- ▶ **Advisory:** With the shift in activities for this role, the job holder will need to be able to communicate efficiently and provide advisory services to customers beyond the scope of basic transactions.
- ▶ **Change Management:** The job holder will have the mindset and ability to drive effective change, and quickly adapt to and become comfortable with new tools and systems will help to ensure continuity of service.





Subsector: Retail Banking

Job Family: Business Assurance

Impact Level

Today, this role is responsible for performing validation of completeness and accuracy of Know Your Customer (KYC) documentation and ensure that KYC for new and existing accounts is in compliance with local regulations and organisational policies.

High Impact

Consolidated Activities

	Today	Future
Client Document Collection and Validation	Task is administrative in nature and requires low decision latitude. Execution of task can involve manual entry of information based on paper forms leading to time consuming processes.	AI bots can perform repetitive tasks – such as communicating with customers, analysing their responses using Natural Language Processing (NLP) – critically saving time and resources needed to run KYC process.
High-risk Clients Identification	Execution can be manual and paper-intensive. Many banks are leveraging software and data subscription license to filter documents relating to bank's criteria for sanctions, PEPs, legal issues, adverse media, source of wealth and biographical information.	Based on pattern recognition techniques coupled with unstructured text analysis, AI-powered technologies can help to identify high-risk customers who need to be screened with Enhanced Due Diligence (EDD).
Keep Abreast of Regulatory Changes	Task requires human oversight and judgment to determine how regulations will effect KYC processes and their completion in a timely fashion.	Cognitive engines can analyse high volumes of regulatory changes and ensure that a business is alerted to the latest policies. NLP can select specific segments within the regulatory documents and disseminate to relevant departments.

In the next
3-5 years ...

The infusion of automation and AI into this role will help with the more repetitive and simple tasks, allowing the role to focus on investigating high risk clients and other complex tasks. Providing oversight to new systems will ensure that they are functioning properly and providing the correct results.

Skills Differentiators:

- ▶ **Change Management:** Adapting to and communicating changes to pre-existing processes will require changes within the role, as well as educating the business to align on new efficiencies while maintaining the integrity of the process.
- ▶ **Lateral Thinking:** Using knowledge of best practices, the job holder will need to ensure that process and outcomes are aligned and supported by technology, while focusing awareness on other factors that may require additional attention, such as new and emerging risks.
- ▶ **Advanced Digital Acumen/Literacy:** Using digital tools available will require a willingness to adapt, an understanding of how to derive value from them, and ability to work alongside to provide human oversight.
- ▶ **Process Excellence:** As automation becomes more ingrained in the role, there will be more opportunities to improve the overall processes – resulting in an improvement of the customer experience.
- ▶ **Data Interpretation and Analysis:** Leveraging on data will help to improve efficiency for the job-holder, but further analysis and understanding will be required to verify that data provided via automated systems is accurate and reflective of needs.





Subsector: Retail Banking

Job Family: Loan and Credit Operations

Impact Level

Today, this role is responsible for overseeing customer creditworthiness within regulatory guidelines, reviewing documentation, ensuring reasonable loan limit granting, developing debt payment plans, as well as completing and processing loan contracts and payments.

High Impact

Consolidated Activities

	Today	Future
Pre-approval and documentation	Task is high volume and repetitive. RPA can allow customer data to be collected more quickly and reliably while identifying applications that are ready for decisions from those that need additional information.	AI-powered technologies can be used to assess customer creditworthiness based on their transaction data. Centralised data repositories (i.e., MyInfo) can speed up the process.
Document validation	Execution of task is document intensive and high in volume, therefore making the task time consuming.	Automation will continue to enable and/or speed up the retrieval of applicants' financial documents from direct sources, mitigating the risk of data manipulations on the application. This would increase transparency and compliance in the fraud assessment process of the task.
Credit analysis for loan decisions	Execution of task is high in volume and has been made more efficient by technology.	In the future, machine learning can comb through an individual's digital footprint (social media, browsing history) to provide insights into one's creditworthiness. However, this could be a challenge to achieve due to data privacy laws.
Post-disbursement services	Execution of task can be supported by technology.	Advanced Analytics could be used to develop personalised customer treatment strategies.

In the next

3-5 years ...

This role will continue to be responsible for overseeing and facilitating the credibility and trustworthiness of customer transactions. However, automation is likely to speed up administrative tasks involved and tighten the credibility screening process to ensure stricter due diligence and compliance for the bank.

Skills Differentiators:

- ▶ **Advisory:** The job holder will need to develop skills to apply the right advisory strategy to engage with internal customers in different situations, and provide guidance to business units that can be passed along through various channels to improve customer interactions.
- ▶ **Complex Problem Solving:** The job holder will display the ability to resolve complex customer cases and leverage available resources to develop and execute solutions.
- ▶ **Data Interpretation and Analysis:** The job holder will need to be skillful in interpreting data to gain better understanding of the entire credit and loan landscape and extract key insights for recommendations, decisions or actions in other parts of the value chain (e.g., product management).
- ▶ **Process Excellence:** With good understanding of existing operations, the job holder can help to highlight the root cause of process inefficiencies and identify the right processes that require automation.
- ▶ **Automation Management:** The job holder will possess technical capabilities to provide oversight and look for potential improvements as well as resolve basic problems as they arise.





Customer Service/Call Centre Representative

Subsector: Retail Banking

Job Family: Customer Service

Impact Level

Today, this role is responsible for interacting with customers and handling inquiries for all product and service-related issues via various channels, including complaint resolution.

High Impact

Consolidated Activities

	Today	Future
Customer inquiries support	Tasks are high volume and repetitive. Many banks have started to leverage chatbots to support responses to basic or frequently asked queries. Moving away from phone calls, banks are also using live chat to support more complicated queries.	Cognitive computing will further enable chatbots to have a certain level of intelligence in communication, providing a seamless interaction between customers and digital platforms, including a shorter time to resolve inquiries.
Product, service or account knowledge	Simple account information is already automated today. However, human intervention may be needed as customers seek clarifications on products and services.	Advanced Analytics along with AI can help to synthesise client profiles to provide more targeted opportunities for potential cross sales and up-sales. This will allow for more tailored conversations to particular customer needs.
Issue and feedback reporting	Execution of task is repetitive and time consuming.	Advanced Analytics will allow for more frequent reporting to identify issues and pain points earlier, helping to improve the customer experience.
Administrative activities (customer data collection)	Execution of tasks is high volume and repetitive. RPA helps to streamline processes around data collection and input.	This can be further facilitated by APIs which will lead to more inter-connectivity between systems and reduce repetitive tasks.

In the next

3-5 years ...

This role will be part of an omni-channel approach to providing a positive customer experience across multiple platforms. Given that simple queries will be resolved via digital channels, this role will focus on more complex cases, as well as provide more sales and product advice to customers.

Skills Differentiators:

- ▶ **Complex Problem Solving:** The job holder will display the ability to respond to complex customer cases and understand underlying issues, in addition to being empowered to deliver solutions to enable continuity of service for customers.
- ▶ **Technology Troubleshooting:** The job holder will handle basic troubleshooting to assist customers with digital application support.
- ▶ **Data Interpretation and Analysis:** The skills to make sense of quantitative and qualitative data to improve customer experience will be essential.
- ▶ **Customer Mindset:** Being able to understand clients needs, objectives, and to resolve complex customer-centric problems is vital.
- ▶ **Product Awareness:** The job holder will possess in-depth product knowledge to be able to explain the features of different products and services and how are they applicable to client's needs.





Subsector: Retail Banking

Job Family: Unit Trust Operations

Impact Level

Today, this role is responsible for Unit Trust sales and fund administration, including monitoring and reporting on the fund performance.

High Impact

Consolidated Activities

	Today	Future
Subscription/Redemptions	Execution is enabled by digital self-service platforms and is supported by human advisory services.	Advanced Analytics and AI can help recommend Unit Trust offerings to customers with more accuracy, as Advanced Analytics is able to provide insights into the customer's risk appetite and profile.
Order input and maintenance	Execution is document intensive and fairly standardised in terms of information required to be collected from customers.	RPA will enable quicker input of information with less administrative errors. APIs will also help to streamline information collection with increasing system connectivity.
Monitoring, reporting and reconciliation	Execution is repetitive and time consuming, as it requires ongoing maintenance.	RPA will help to consolidate information for review. AI can assist in monitoring and identifying the role when abnormalities are detected.
Risk and return analysis	Task is advisory in nature, as different customers have different expectations and risk thresholds. Execution of task leverages on analytical thinking skills.	Advanced Analytics can help create customer segments with similar expectations. Human judgment will still be necessary to analyse fund details and communicate that information to customers.

In the next

3-5 years ...

This role will evolve as customer preferences are changing in terms of how they purchase Unit Trust products given the increase in digital channels. It is likely that this role will converge with other product sales roles, increasing the portfolio of products that this role can sell and provide advisory services for.

Skills Differentiators:

- ▶ **Data Interpretation and Analysis:** The job holder will possess skill to draw insights (e.g., customers' preference) from the data and connect it to actionable plans to result in improved selling capabilities.
- ▶ **Advisory:** As this role takes on additional product types, they will play more of an advisory role to their customers. The job holder will display ability to communicate effectively with customers, ensuring that products suit their needs and address the concerns that they have.
- ▶ **Targeted Technical Sales:** The job holder will leverage results from Advanced Analytics to improve customer targeting. This would lead to more sales conversions due to an improved understanding of customer needs.
- ▶ **Lateral Thinking:** The job holder will demonstrate the ability to think out of the box when confronted with new findings, and determine a more holistic approach to making decisions.
- ▶ **Product Awareness:** As this role converges with other product sales roles, in depth understanding across product types will be necessary to ensure a balanced approach to sales.





Subsector: Retail Banking

Job Family: Sales and Distribution

Impact Level

Today, this role is responsible for managing mortgage sales, including sourcing for clients, providing advice and building relationships for future referrals.

High Impact

Consolidated Activities

	Today	Future
Mortgage Loan Advisory	Execution is advisory in nature. Some banks today use chatbots to answer commonly asked questions regarding home loans (e.g., eligibility, documents required) or other general queries about home and renovation loans.	Chatbots will continue to be improved in probing questions to better understand customers' query, and accurately assign different queries to human specialists.
New Customer Acquisition	Execution of task used to be reactive and require human intervention. Banks are gradually leveraging technology – such as using chatbots to provide instant replies, which helps maintain customer engagement with the bank in a more comprehensive manner.	Advanced Analytics and AI can help to identify customer behavioural trends and track their purchasing habits (via website visits, social media footprint). Predictive analytics could help to signal when a customer is considering a property purchase, revealing the best times for sales outreach versus previous methods of cold-calling to drive sales generation.

In the next

3-5 years ...

This role will continue to be responsible for providing support for the bank's mortgage service. However, this role will become increasingly augmented as RPA, AI, and Advanced Analytics are used to assist this role in understanding customer profiles and addressing client queries. Similar to other product sales roles in the future, having a diverse portfolio of product types will help to ensure that this role can adapt to any type of sales responsibilities.

Skills Differentiators:

- ▶ **Data Interpretation and Analysis:** To leverage on insights from Advanced Analytics, the job holder will need to be able to process data and use it in meaningful ways to help close sales and continue to connect those insights to the business process.
- ▶ **Complex Problem Solving:** The job holder will need to examine complex problems that are escalated for review, and search for necessary information while working alongside digital tools to develop and execution solutions.
- ▶ **Advisory:** The job holder will need to further develop this skill to apply the right advisory strategy to engage with clients in different situations.
- ▶ **Lateral Thinking:** The job holder will demonstrate the ability to think out of the box and to connect various components to offer differentiated services compared to competitors.
- ▶ **Product Awareness:** In addition to customer insights gathered, the job holder will possess robust understanding of various products to deliver targeted recommendations to their customers.





Subsector: Retail Banking

Job Family: Transaction Operations

Impact Level

Today, this role is responsible for transaction processing duties related to fund transfer and clearance, including verification and compliance of transactions.

High Impact

Consolidated Activities

	Today	Future
Transaction Processing	Execution requires human judgment to ensure optimisation of resources.	APIs will help to work towards seamless connectivity between systems for increased ease in transferring information. In the longer term, Blockchain could potentially further disrupt this role.
Statement Preparation and Issuance	Execution of task is repetitive and document intensive. Digital channels allow for real-time tracking of customers' account activity.	Automated systems will be able to monitor customer profiles and customise statements according to customer needs.
Reconciliation reporting and monitoring	Execution of task has low decisional latitude. Technology can be leveraged on to automate this task.	APIs can facilitate direct communication between the transaction processing and finance systems, while cross functional APIs will help with sharing information in real-time. Blockchain could also eliminate inefficiencies arising from reconciliation timeframes.

In the next

3-5 years ...

This role will require less people to handle the current set of activities, due to data analytics and automation. Those that remain in this function will provide oversight for new systems and help to continue to improve and streamline the process. When exceptions arise, this role will need to be prepared to handle these cases as well.

Skills Differentiators:

- ▶ **Automation Management:** The job holder will possess technical capabilities to oversee the various automated processes and look for potential improvements to ensure that tools/machines are delivering the expected outputs.
- ▶ **Technology Troubleshooting:** Job holder will need to display the ability to resolve basic technical issues and provide guidance on what needs to be escalated to relevant business units to ensure minimal operation disruption.
- ▶ **Business and Financial Acumen:** The job holder will possess commercial awareness to work effectively with business units in developing key operation requirements and addressing business needs.
- ▶ **Process Excellence:** With good understanding of existing operations, the job holder can help to highlight the root cause of process inefficiencies and identify the right processes that require automation.
- ▶ **Risk Awareness:** While new systems and tools will help to achieve new levels of efficiency, the job holder will need to be aware of associated risks, to ensure that appropriate actions are taken to avoid unnecessary threats.





Subsector: Retail Banking

Job Family: Relationship Management

Impact Level

Today, this role is responsible for advising and selling financial products and services to new and existing customers and building relationships for future engagement.

Medium Impact

Consolidated Activities

	Today	Future
Customer Product and Service Advisory	Task is advisory in nature. Digital platforms are used to facilitate conversations between banks and customers.	Advanced Analytics and machine learning will allow for more targeted advice on products or services while automation can help to direct customers to the most appropriate resource based on the nature of enquiry.
Cross Sell and Upsell Product Portfolio	Execution requires deep product and service knowledge. Most of the time, execution involves human judgment to make recommendations to customers.	Advanced Analytics will help to create robust customer profiles and facilitate classification of customers into segments (such as retention, migration, expansion, acquisition, and/or reprioritization) to lead to more informed conversations.
Relationship Building and After-sales Support	Task is advisory-based but can be supported by technology. Chatbots and digital channels allow customers to obtain answers to generic questions.	Robo-advisors with more advanced AI technology will be able to provide more personalised support based on the customers' profile and historical data. However, it is important to note that robo-advisors will not replace the job of the Relationship Manager, rather it would complement their day-to-day activities.

In the next

3-5 years ...

This role will continue to be responsible for building and maintaining relationships with the bank and its customers. This role will be augmented to be able to work with a larger portfolio. With Advanced Analytics, they will be able to better understand customer profiles and improve customization, including tailoring of services to more specific customer segments.

Skills Differentiators:

- ▶ **Advisory:** The job holder will display the ability to apply the right advisory strategies to engage and deepen connections with clients in different situations.
- ▶ **Change Management:** Adapting to customer needs and expectations will be necessary to help incorporate the use of digital tools, and also offer more personalized services for customers
- ▶ **Advanced Digital Acumen/Literacy:** Understanding the underlying parameters of chatbot and AI enabled solutions will allow for the role to seek opportunities to further leverage these advanced technologies in customer servicing.
- ▶ **Data Storytelling:** The job holder will need to be able to create and disseminate relatable and compelling anecdotes based on data in a manner that will resonate with customers.
- ▶ **Customer Mindset:** This enables the job holder to tailor recommendations that best meet clients' needs.





Subsector: Retail Banking

Job Family: Product Management

Impact Level

Today, this role is responsible for researching market trends, conducting competitor analysis, overseeing overall product development/management, and determining product positioning, target market and pricing.

Medium Impact

Consolidated Activities

	Today	Future
Research Market Opportunities	Execution is time intensive and requires manual effort to collate and interpret information from a variety of sources.	Advanced Analytics along with AI can be used to gather and synthesise information from multiple sources for quicker reviewing to understand market trends better.
New Product Creation and Product Maintenance	Execution of task requires human judgment and decision making to shape the product portfolio and differentiate it from competitors.	Advanced Analytics will lead to selection of products that are more tailored to customer segments, while digital platforms will make it easier for customers to research and compare products.
Product Monitoring and Reporting	Execution is repetitive, high volume and time intensive as an ongoing procedure.	RPA can aid in monitoring various sources to gain deeper insights into product performance. Sentiment analysis on digital and social media sites can help to gather information for product service and improvements that are necessary.

In the next

3-5 years ...

Products are rapidly changing due to evolving customer needs. This role will leverage Advanced Analytics to gain stronger customer insights and enhance collaboration to ensure that relevant business units are included into decisions and execution related processes.

Skills Differentiators:

- ▶ **Data Storytelling:** The job holder will need to be able to disseminate and be persuasive in communicating key messages from research or analysis to ensure that information resonates with audiences and influences them into action.
- ▶ **Customer Mindset:** This enables the job holder to create products that best meet their clients' requirements, and align with strategy defined by the firm.
- ▶ **Project Management:** The job holder will stay abreast with new methodologies/techniques of project management to carry out and follow through the project life cycle in the most effective manner.
- ▶ **Influencing and Negotiation:** The job holder will display ability to persuade others with their point of view and qualitative and quantitative information on what they recommend to enable product improvements and innovation.
- ▶ **Stakeholder Engagement:** The job holder will bring together various business units with diverse perspectives to enhance product creation, and be able to manage and align stakeholders to meet the intended objectives.





Subsector: Corporate Banking

Job Family: Operations

Impact Level

Today, this role oversees the structured loans within the corporate banking business and is responsible for providing credit documentation, administration and operational support.

High Impact

Consolidated Activities

	Today	Future
Credit Documentation	Execution involves validation of loan documentation, ensuring that documentation is complete as per the bank policy and credit approvals are obtained by the credit committee.	AI enabled tools will be leveraged to automate the validation process, and offer quick acknowledgment to the RMs and applicants regarding missing documents, approvals/rejections, and improve communication between banks and clients.
Credit Application Processing	Execution involves processing approved credit applications, and is typically time consuming and high in volume. Many banks are leveraging STP to execute SME loan applications electronically.	As the full potential of STP in lending applications is realised, this role will shift their focus towards providing oversight, managing exceptions, and troubleshooting to ensure smooth execution.
Loan Disbursement and Other Credit Administration	Execution is administrative, involves preparation of payment instructions and notification letters.	Blockchain technology could be leveraged to support the disbursement of funds.

In the next

3-5 years ...

The increasing use of AI enabled tools and STP will reduce the mundane documentation and processing tasks as they can be automated. This role will provide oversight, investigate complex cases, and leverage analysis outcomes to further enhance the processing of credit analysis.

Skills Differentiators:

- ▶ **Process Excellence:** With good understanding of operations, the job holder can help to highlight root causes of process inefficiencies and identify the right processes that require automation.
- ▶ **Advanced Digital Acumen/Literacy:** The job holder will possess strong understanding on how advanced digital solutions can be leveraged and learn the technical features to support the operations.
- ▶ **Complex Problem Solving:** The job holder will need to examine sophisticated cases that are escalated and leverage available resources to develop and execute solutions.
- ▶ **Systems Thinking:** The job holder will possess strong understanding of how systems work over time and within the context of larger systems, ensuring successful implementation/integration of technology solutions.
- ▶ **Change Management:** The job holder will have the mindset and ability to drive effective change, ultimately improving the adoption of AI/digital solutions to support day-to-day operations.





Subsector: Corporate Banking

Job Family: Sales

Impact Level

Today, this role is responsible for generating new business opportunities, working closely with Relationship Managers (RMs) to deliver services and products that are most suitable for clients.

SME: ██████████ High Impact

Commercial/Corporate: ██████████ Medium Impact

MNC/FI/NBFI: ██████████ Low Impact

Consolidated Activities

	Today	Future
Product Portfolio Management	Execution requires regular competitor benchmarking and market research.	For SME banking, banks will use Advanced Analytics to move towards the next level of customisation by bundling products and services based on client's preferences, and improve their advice with additional data points e.g., industry/global economic data.
Product Advisory and Recommendation	Execution is advisory-based, product sales teams will work closely with RMs to recommend commoditised products that are most suitable for clients.	AI-tools will be used to carry out analyses of corporates' transaction flows, payables/receivables, assets and liabilities. This information can enable banks to provide personalised advice on bill payment, hedging strategies, financial balance sheet management, and other investment advice. However, the products demanded by MNC Regional HQ/Treasury Centres/NBFI are more complex and bespoke. Hence, product advisory will remain high touch.
Cross Selling Strategies	Execution is driven by the rudimentary understanding of the current relationship. It involves basic data analytics, but many fail to paint a full picture due to the fragmented data sources across business silos.	Obtaining a full view of the client – including account level and behavioural attributes such as fees, revenues, profitability, channel usage etc., coupled with sophisticated data modelling, can result in a better understanding for relationship expansion.

In the next
3-5 years ...

Digital portals will continue to drive the sales and advice for products that are high volume and lower risk. This role will leverage rich insights gathered through analyses to develop proactive sale strategies and improve their advice – tailoring to the unique needs of their clients.

Skills Differentiators:

- ▶ **Advisory:** The job holder will continue to display the ability to apply the right advisory strategies to engage with clients in different situations.
- ▶ **Stakeholder Engagement:** The job holder will be highly skilled to liaise with internal and external stakeholders; effectively eliciting stakeholders' views and developing consensus.
- ▶ **Influencing and Negotiation:** The job holder will display confidence in presenting and justifying the rationale for design recommendations, and gain buy-in from relevant stakeholders.
- ▶ **Data Interpretation and Analysis:** The job holder will analyse and interpret quantitative and qualitative data to extract key insights for recommendations, decisions or actions.
- ▶ **Data Storytelling:** The job holder will demonstrate the ability to disseminate key messages/findings in a compelling, impactful, and easy-to-understand manner to audiences with varying levels of subject matter knowledge.





Relationship Manager

Subsector: Corporate Banking

Job Family: Relationship Management

Impact Level

Today, this role is responsible for exploring new business potential, identifying client needs, and evaluating credit risk strategies to achieve a balanced stance for corporate clients and the bank.

SME: High Impact

Commercial/Corporate: Medium Impact

MNC/FI/NBFI: Low Impact

Consolidated Activities

	Today	Future
New Business Identification	Execution involves personal networks. Relationship Managers (RMs) work closely with the coverage team to drive efforts to expand the business with existing clients. They are gradually moving away from “reactive product pusher”.	RMs will continue to work collaboratively with all coverage and product stakeholders to develop new profitable businesses. The role will maintain strong working relationships with other lines of business to achieve cross-selling objectives.
Client Relationship Management	Execution is relatively high touch, but can be supported by technology.	Virtual RMs can be made available via digital platforms, helping to maintain the relationship element while driving down cost-to-serve. It also empowers clients with the tools to self-serve.
Credit/Risk Profile Evaluation	Execution involves preparing thorough financial analysis and regular credit reviews in accordance to the bank’s guidelines. Typically focusing on only a handful of credit attributes.	Machine learning can be used to analyse large data sets from various sources, allowing banks to model credit risk for clients in a more accurate manner. Digital applications can also be leveraged to provide greater transparency around credit access.
Loan Syndication	Execution of task requires close collaboration with regional RMs to originate syndication deals, and involves negotiation with clients and syndicate partners.	While blockchain could help banks to better track activities and comply with requirements related to syndicated loans, the technology is still being developed for this use case. Human intervention and judgment will remain critical in carrying out the task in the near future.

In the next **3-5** years ...

RPA and AI will be leveraged to include more credit attributes in the analysis, reducing the risks while improving the speed of analysis. This role will provide oversight, investigate complex cases, and leverage analysis outcomes to further enhance the process of credit analysis.

Skills Differentiators:

- ▶ **Lateral Thinking:** The job holder will be required to handle larger sets of data. Hence, the ability to ‘connect-the-dots’ and stay focused on big picture will remain important.
- ▶ **Advisory:** The job holder will need to continue to display the ability to apply the right advisory strategies to engage with various business units.
- ▶ **Advanced Digital Acumen/Literacy:** The job holder will gain strong understanding on AI tools and how advanced solutions and features can be further leveraged/enhanced to support day-to-day tasks.
- ▶ **Data Interpretation and Analysis:** The job holder will need to be skillful in interpreting data to extract key insights for recommendations, decisions or actions.
- ▶ **Influencing and Negotiation:** The job holder will have the ability to display confidence in presenting and justifying the rationale for the recommendations or solutions, and gain buy-in from the relevant stakeholders.





Subsector: Corporate Banking

Job Family: Operations

Impact Level

Today, this role is responsible for end-to-end processing of Letters of Credit (LOC), conducting transaction monitoring in accordance with bank/regulatory guidelines, and delivering cash management services to commercial customers.

High Impact

Consolidated Activities

	Today	Future
Trade Documents Validation	Execution is rule based and can be enhanced by technology. AI tools are used to extract a range of data and, automatically enter into the Finance of International Trade Automated System for approval.	AI technologies will continue to be leveraged to shorten the time taken to process requests for LOC. Human judgment will still be required to review information prior to final approval.
Compliance Screening	Execution is data intensive. Effective screening requires experienced personnel who are able to recognise red flags.	AI can automate compliance screening, allowing for vast amounts of web content to be screened, while enhancing the screening process by allowing assessments to be made against global and regional trade finance rules and regulations.
Transaction Processing	Execution is high volume and prone to errors. RPA can assist with transaction processing, however, many documents are still paper based requiring manual processing. Payment instructions from clients can be unsystematic and in different formats.	For payment processing, service externalisation could be used to engage in the service delivery process (e.g., upload payment files through APIs, automated error checks and reconciliation via cognitive technologies etc.), to shorten processing time. For trade finance, an element of human judgment will still be needed to review documentation for regulatory implications and to ensure that complex regulations are adhered to.

In the next

3-5 years ...

When most of the documentary handling tasks are relieved with the implementation of open account trade, this role will spend the bulk of their time on validation, providing oversight, managing exception cases, and driving the technology implementation in accordance with the bank's strategy.

Skills Differentiators:

- ▶ **Data Interpretation and Analysis:** The job holder will need to be able to interpret data to extract key insights to inform strategies, recommendations, decisions or actions.
- ▶ **Process Excellence:** With good understanding of operations, the job holder can help to highlight root causes of their process inefficiencies and identify the right processes that require automation.
- ▶ **Systems Thinking:** The job holder will possess strong understanding of the operations of various systems and how they operate within the context of the larger systems, ensuring successful implementation/integration of technology solutions.
- ▶ **Advanced Digital Acumen/Literacy:** The job holder will upskill to be proficient in using advanced digital tools and gain strong understanding on how different solutions and features can be further leveraged to support operations.
- ▶ **Change Management:** The job holder will have the mindset and ability to drive effective change, ultimately improving the adoption of AI/digital solutions to support their day-to-day operations.





Subsector: Corporate Banking

Job Family: Relationship Management

Impact Level

Today, this role is responsible for credit proposals for corporate borrowers, including conducting credit reviews, performing financial analysis on companies and handling credit requests from Relationship Managers (RMs).

Medium Impact

Consolidated Activities

	Today	Future
Credit Analysis (Financial Evaluation)	Execution is strongly relation-based and paper-intensive. In recent years, banks have been gradually moving toward sophisticated credit assessment models to assess corporate credit-worthiness. With the rise of RPA, manual data entry into financial spreading software has been nearly eliminated.	While AI and big data can be used to predict risks at an early stage, unlike listed/large corporations, SME related information is not readily available on open sources. Human judgment (supplemented by analysis) is required to make sound and well-reasoned credit recommendations by balancing risk and business needs.
Credit Proposal and Approval	Execution involves paper intensive processes, once completed approval can also take a long time.	Lending decisions will be improved using Advanced Analytics. Automated decision engines will identify loan contract non-compliance, risk assessment of payment default, and approve loan applications that meet the established credit criteria with little manual intervention.
Handle Credit Requests and Renewal	Execution involves paper intensive processes that are time consuming.	With the use of AI, accurate information will be provided to the right stakeholders in the correct format. This will reduce touchpoints and turnaround time. For complex loan requests, human analysis and judgment will be required.

In the next
3-5 years ...

RPA and AI can be leveraged to include more credit attributes in the analysis, reducing the risks while improving the speed of analysis. This role will provide oversight, investigate complex cases, and leverage analysis outcomes to further enhance the process of credit analysis.

Skills Differentiators:

- ▶ **Advanced Digital Acumen/Literacy:** The job holder will upskill to be proficient in using advanced digital tools and gain a strong understanding on how different solutions features can be further leveraged to support the operations.
- ▶ **Data Interpretation and Analysis:** The job holder will analyse and interpret quantitative and qualitative data to extract key insights for recommendations, decisions or actions.
- ▶ **Project Management:** The job holder will possess skills to develop execution plans to meet assignment objectives, and the agreed upon milestones and deadlines.
- ▶ **Stakeholder Engagement:** The job holder will be highly skilled to liaise with internal and external stakeholders; effectively eliciting stakeholders' views and developing consensus.
- ▶ **Investigation:** The job holder will display the ability to use various techniques to gather and ascertain information that inform the financial strength of a client.





Subsector: Corporate Banking

Job Family: Business Management

Impact Level

Today, this role is responsible for business process improvement, and other business related initiatives, and overseeing the first line governance issues, risk management and compliance matters.

Medium Impact

Consolidated Activities

	Today	Future
Business and Strategy Support	Execution requires close collaboration with key stakeholders.	While data analytics can help to guide the annual planning and forecasting, human intervention and judgment remain critical in the development and production of strategic plans for the business.
Business and Individual Scorecard Development	Execution requires close collaboration with key stakeholders.	Advanced Analytics may enhance the role by supporting the decision-making process in determining business metrics/targets.
Business and Regulatory Requirements Adherence	Execution requires close collaboration with other business units across risk, compliance, operations, finance etc. Execution can also be supported by technology to improve accuracy.	Digital platforms can provide real-time monitoring and tracking of internal controls, and predictive analytics can be used to predict potential gap or non-adherence to the controls.
Business Risk Management	Execution can be supported by technology and improve accuracy.	Predictive analytics can be leveraged to determine potential business risks. However, human judgment is key in deriving mitigating solutions to ensure all risks are managed effectively.

In the next

3-5 years ...

This role will leverage digital and Advanced Analytics tools to replace the routine tracking tasks, allowing them to spend more time on higher value tasks – i.e., extracting business-relevant insights from data to support robust recommendations and decision making.

Skills Differentiators:

- ▶ **Project Management:** The job holder will display the ability to apply the appropriate principles for the planning and managing of a wide variety of projects to ensure that project objectives are met.
- ▶ **Stakeholder Engagement:** The job holder will need to be able to coordinate and maintain productive working relationships with stakeholders, in order to deliver rollout of initiatives and projects.
- ▶ **Change Management:** The job holder needs to possess robust knowledge and skills to assist the bank in making successful transitions in new initiatives.
- ▶ **Lateral Thinking:** The job holder will demonstrate the ability to connect the dots using all the data available and analyse results, enabling the job holder to see the big picture of how different initiatives are brought together to improve the operations or grow the business.
- ▶ **Risk Awareness:** The job holder will possess in-depth knowledge of risk policies to maintain strict compliance of all initiatives and ensure the level of risk is communicated effectively to key stakeholders.





Subsector: Corporate Banking

Job Family: Middle Office

Impact Level

Today, this role is responsible for onboarding new corporate clients, and ensuring that they are well-equipped to use the products and services.

Medium Impact

Consolidated Activities

	Today	Future
Document Preparation and Collection	Execution is high volume and document-intensive. RPA can facilitate faster data entry.	There is an opportunity to digitise the onboarding process end-to-end. Digital channels can help to streamline and accelerate data gathering process, support e-signatures and reporting, ultimately, leading to improved client onboarding.
Account Opening	Execution is automated. Online account opening services can pre-populate forms on behalf of the clients and eliminate the need for unnecessary form-filling and data entry.	Digital platforms will continue to be leveraged. Human intervention is required to provide oversight, manage complicated cases, and address issues that are hindering onboarding.
Training Facilitation	Execution involves providing hands-on product training to clients, and ensuring end users are capable of utilising products.	Banks will increasingly rely on digital/self service platforms that support online and personalised training to end users anywhere, anytime.

In the next

3-5 years ...

With the rise of self-service platforms, job holders will increasingly leverage technology to onboard clients.

Skills Differentiators:

- ▶ **Project Management:** The job holder will need to deliver the objectives of the engagement, manage working groups, and deliver projects in a consistent manner.
- ▶ **Complex Problem Solving:** The job holder will ensure products are implemented and examine complex problems that are escalated to leverage available resources to develop and execute solutions.
- ▶ **Advanced Digital Acumen:** On-going upskilling will be required to ensure the job holder is familiar with new electronic platforms, and capable of using advanced AI-tools.
- ▶ **Process Excellence:** With good understanding of the existing operations, the job holder can help to highlight the root cause of their process inefficiencies and identify the right processes for automation.
- ▶ **Change Management:** The job holder will have the mindset and ability to drive effective change to ensure the client can successfully adopt digital solutions to support their day-to-day operations.





Subsector: Corporate Banking

Job Family: Middle Office

Impact Level

Today, this role serves as the primary contact person for clients and is responsible for operational enquiries and maintenance activities through the full client lifecycle with the bank.

Medium Impact

Consolidated Activities

	Today	Future
Enquiry, Complaint and Service Related Communications	Execution is hands-on and typically involves handling a high volume of calls.	Digital channels may be used as the initial contact point for clients to reach out for assistance. Leveraging the data collected through digital platforms, AI and Advanced Analytics will help to identify trends and trigger proactive alerts to prevent client complaints.
Due Diligence and Conformity Check	Execution is high volume and the procedure can be cumbersome and time-consuming with job holders relying heavily on spreadsheets and manual processes.	Self-service digital channels, centralised storage of client documents and rule-based workflow engines can help to assess whether regulatory changes will impact clients and shorten the turnaround time of the process.

In the next

3-5 years ...

Digital platforms will enable a "self-service" feature to enhance the client experience. Job holders will focus on providing oversight, managing escalated cases, and proactively managing the client experience through the analysis of collected data.

Skills Differentiators:

- ▶ **Data Interpretation and Analysis:** The job holder will display the ability to interpret data and extract key insights for decisions, recommendations or actions.
- ▶ **Advanced Digital Acumen/Literacy:** The job holder will upskill to be proficient in using advanced digital tools and gain a strong understanding of how advanced technology solutions can be used including understanding the features available to be leveraged/enhanced to support the business.
- ▶ **Customer Mindset:** The job holder will need to be closer to the customer to better understand their concerns, and put together solutions to resolve their queries.
- ▶ **Technology Troubleshooting:** The job holder will need to display the ability to assist clients in resolving basic technical issues on self-service platforms.
- ▶ **Process Excellence:** With good understanding of the existing operations, the job holder can help to highlight the root cause of process inefficiencies and identify the right processes that require automation.





Product Management

Subsector: Corporate Banking

Job Family: Product Management

Impact Level

Today, this role is responsible for identifying product development or refinement opportunities based on competitor benchmarking and research (market and consumer).

Medium Impact

Consolidated Activities

	Today	Future
Product Monitoring and Reporting	Execution requires regular evaluation of the existing product portfolio and involves data analysis and drafting of concise findings/recommendations.	Real-time monitoring and reporting can take place, with AI helping to pro-actively identify products that are under-performing.
Consumer and Competitive Market Research	Execution is time consuming, but can be supported by technology when clear strategies are established. Research outcomes are used to drive the identification of new product development or product refinement opportunities. Hence, human judgment is required.	Advanced Analytics provides real-time insights into consumer behavior and preferences, enabling targeted product development for specific client channels. Availability of alternative data sources will also enhance analysis capabilities, allowing better insights for decision-making.
Business Case Development	Execution requires close partnership with various stakeholders within the bank to review product specifications and understand the business requirements for new products.	Human intervention will remain critical to foster the close collaboration with other functions to deliver a strong business case for decision and implementation.

In the next

3-5 years ...

This role will use AI and Advanced Analytics tools to obtain real-time tracking of product performance and accelerate market research and competitor benchmarking. They will leverage the insights obtained to inform opportunities for new products and improve existing solutions.

Skills Differentiators:

- ▶ **Data Interpretation and Analysis:** The job holder will need to be skillful in interpreting data to extract key insights for recommendations, decisions or actions.
- ▶ **Project Management:** The job holder will possess skills to deliver assignment objectives, key requirements and gain support from key stakeholders to implement actions within the agreed deadlines.
- ▶ **Advanced Digital Acumen/Literacy:** The job holder will gain a strong understanding on how solutions and the technical features can be further incorporated in the product management process.
- ▶ **Business and Financial Acumen:** The job holder will possess commercial awareness to work effectively with business units and senior management in developing key requirements for various solutions/products that are aligned with the business strategy.
- ▶ **Change Management:** The job holder will have the mindset and ability to drive effective change, ultimately improving the adoption of AI/digital solutions to support their day-to-day operations.





Credit Recovery Manager

Subsector: Corporate Banking

Job Family: Credit Recovery

Impact Level

Today, this role is responsible for timely planning and execution of recovery strategies for delinquent corporate accounts, with the objective to minimise credit losses and maximise recoveries.

Low Impact

Consolidated Activities

	Today	Future
Repayment Negotiation	Execution involves contact with clients to negotiate repayment arrangements.	Leverage Advanced Analytics to inform realistic alternative repayment plans catering for different client concerns. Digital platform will be used to deliver a seamless experience to the clients.
Account/Loan Restructuring	Execution is typically reactive and the task is carried out when payment issue arises. It involves detailed analysis to perform account restructuring and derive action plans to mitigate credit losses.	AI enabled tools will be used to assist in the identification of clients who should receive restructuring offers, taking into account clients' income, transactions, outstanding debt and other circumstances, a predictive analytics tool will put forth an offer that is most suitable for the client.
Remedial Strategies Development	Execution involves working with stakeholders (including legal) to make recommendations for credit or special actions. Leveraging data, human judgment is required in evaluating the various options against an acceptable risk profile to maximise bank recoveries.	Advanced Analytics will be used to better understand clients and predict their behaviours during delinquency, in order to prioritise strategies to maximise recovery.

In the next

3-5 years ...

Advanced Analytics and AI solutions will be used to improve recommendations for credit recovery. Human intervention will remain critical to work closely with different stakeholders in the development and evaluation of strategies that minimise delinquent loans.

Skills Differentiators:

- ▶ **Influencing and Negotiation:** The job holder will have the ability to display confidence in presenting and justifying the rationale for recommendations or solutions, and gain buy-in from relevant stakeholders.
- ▶ **Data Interpretation and Analysis:** The job holder will need to be skillful in interpreting data to extract key insights for recommendations, decisions or actions.
- ▶ **Risk Awareness:** The job holder will possess deep understanding of risk to balance the objective to maximise returns against the bank's acceptable risk parameters.
- ▶ **Stakeholder Engagement:** The job holder will be highly skilled to liaise with internal and external stakeholders; effectively eliciting stakeholders' views and developing consensus.
- ▶ **Advanced Digital Acumen/Literacy:** The job holder will gain strong understanding of AI tools and how advanced solutions and features can be further leveraged/enhanced to support day-to-day operations.





Subsector: Corporate Banking

Job Family: Product Management

Impact Level

Today, this role is responsible for researching market trends, competitor analysis, determining a product's positioning, target market, pricing, and overall product development and management.

Low Impact

Consolidated Activities

	Today	Future
Product Risk Management	Execution involves financial risk assessment and analysis to enhance risk discovery and mitigation.	Advanced Analytics will be leveraged to better identify risk parameters to facilitate the proactive management of stakeholders to determine risk appetite and policies most suitable for the bank, and implement strategic partnerships and solutions for risk mitigation, such as credit insurance or multilateral development programs.
Products Design and Enhancement	Execution requires deep technical knowledge, innovative mindset, and a high level of judgment to design and assess interventions for over- and under-performing products.	While product design requires innovative mindset, AI and Advanced Analytics will support "what-if" analysis and scenario testing to ensure effective product design.
Pricing Strategies and Policies	Execution involves regular analysis and market research to understand market pricing and cost trends across different customer segments.	More data points (e.g., customer behaviours dynamics, value, transaction activities, price sensitivity, risk, etc.) can be incorporated into analysis to enable banks to significantly improve their pricing strategies.
Training Material and Sales Collateral Development	Execution requires close working relationships with various stakeholders across the business value chain (not limited to Sales, Marketing, and the Middle Office).	Human judgment and expertise remain critical in fostering the close collaboration with different stakeholders to ensure that training of new/refined product capabilities are delivered to the wider teams and the product is clearly presented or explained in line with marketing guidelines.

In the next

3-5 years ...

This role requires deep technical expertise, knowledge and judgment. Data and technology will be leveraged to augment the product design or refinement decisions.

Skills Differentiators:

- ▶ **Project Management:** The job holder will possess skills to deliver assignment objectives, key requirements and gain support from key stakeholders to implement actions within the agreed upon deadlines.
- ▶ **Influencing and Negotiation:** The job holder will display confidence in presenting and justifying the rationale for the design recommendations, and gain buy-in from relevant stakeholders.
- ▶ **Stakeholder Engagement:** The job holder will be highly skilled to liaise with internal and external stakeholders; effectively eliciting stakeholders' views and developing consensus.
- ▶ **Customer Mindset:** This enables the job holder to curate solutions that best meet their clients' requirements, as well as align with strategies defined by the firm.
- ▶ **Data Storytelling:** With more information gathered and analysed, the job holder will possess skills to effectively convey findings/messages to different audiences.





Subsector: Investment Banking

Job Family: Trade Management

Impact Level

Today, this role is responsible for clearing, settlements, margin and collateral management as well as follow-up and regulatory obligations and corporate actions.

High Impact

Consolidated Activities

	Today	Future
Trade Clearing and Settlement	Execution is rule-based, high volume, and document intensive all of which can be enabled by technology. RPA and workflow automation tools are leveraged to automatically update accounts and monitor adherence to payment agreements.	Distributed ledger technology (blockchain) could fundamentally transform transaction documentation, resulting in the redundancy of reconciliation that is performed today, therefore reducing settlement risks.
Collateral and Margin Management	Execution of tasks is tedious and involves manual collation of data from multiple sources e.g., collateral management often involves fragmented processes as it relies on many tools and software. Banks have started to leverage RPA to handle margin management.	RPA solutions combining machine learning skills will continue to be used in addressing margin calculation, margin calls and valuation (i.e., using machines to interpret unstructured emails) and automatically populate terms into margin call management systems. Despite automation, human intervention will be required for complex exception cases.

In the next

3-5 years ...

This role will switch from delivering routine tasks, to exception management, driving initiatives that focus on automating trade support, and facilitating decisions in reducing counterparty credit risk. Human judgment and the ability to design creative solutions will be required.

Skills Differentiators:

- ▶ **Automation Management:** The job holder will upskill to oversee automated systems, ensuring that operations requirements are met and focus on the continuous improvement of machines.
- ▶ **Advanced Digital Acumen/Literacy:** On-going upskilling will be required to ensure job holders are familiar with new electronic platforms, and capable of using advanced AI-tools.
- ▶ **Process Excellence:** With good understanding of the existing operations, the job holder can help to highlight the root cause of process inefficiencies and identify the right processes that require automation.
- ▶ **Complex Problem Solving:** The job holder will need to examine complex problems that are escalated and leverage available resources to develop and execute solutions.
- ▶ **Risk Awareness:** Deep understanding of risk and control remain critical. By removing manual processes the job holder can focus to support the management of counterparty credit risk.





Subsector: Investment Banking

Job Family: Operations

Impact Level

Today, this role oversees management reporting i.e., daily and monthly P&L, and trading desk balance sheet, and is responsible for the monitoring of trades in the portfolios to ensure it is within a specified remit.

High Impact

Consolidated Activities

	Today	Future
P&L Production and Analysis	Execution is repetitive, rule-based and high volume. Many banks have outsourced the P&L production efforts to external service providers. If kept internally, RPA can automate P&L, balance sheet control and month-end attestation, as well as daily reconciliations of source system to general ledger and sub-ledgers.	Banks will continue to explore the outsourcing opportunities for this task. The industry is anticipating that an acceleration in outsourcing could take place due to FRTB (2019) which could bring stringent requirements such as tests being performed at desk level on a daily basis, as well as at lower levels of granularity and 250 days of historical data to be available for back testing. If kept internally, this process could also be enabled by the use of APIs.
Trading Discrepancy Monitoring	Rule-based and repetitive activities require some technical expertise and knowledge. Banks are leveraging actual trades executed, comparing them with market news and other data available to track trading discrepancies.	Banks will continue to leverage analytics, in particular predictive and real-time tracking, to identify sub-optimal trading strategies and market abuse.

In the next

3-5 years ...

In order to achieve a more cost-effective option for P&L compilation, especially with more stringent regulations, key tasks will be outsourced. With their risk controls/reporting expertise, this role will provide oversight and could potentially take on risk management roles.

Skills Differentiators:

- ▶ **Risk Awareness:** Deep understanding of risk and control remain critical. The job holder will focus on implementing new regulatory requirements, resolving trade/P&L discrepancies and reducing operational risk through process efficiency.
- ▶ **Lead Virtual Team:** This skill will become increasingly important as outsourcing trends persist.
- ▶ **Data Interpretation and Analysis:** Job holder will need to be able to decipher data to uncover hidden insights and help to generate more intelligent decisions.
- ▶ **Business and Financial Acumen:** Financial and accounting skills will continue to be vital for the job holder to oversee balance sheet and P&L analysis.
- ▶ **Process Excellence:** With a strong focus on process improvement and system enhancement, the job holder will continue to focus on the implementation of effective process controls and process re-engineering opportunities to improve areas of inefficiencies.





Subsector: Investment Banking

Job Family: Sales/Distribution

Impact Level

Today, this role is responsible for the development of bespoke financial instruments for clients, which include structuring new products by combining various underlying types of assets to create tailored products with different risk and return rates.

High Impact

Consolidated Activities

	Today	Future
Transaction Execution/ Reporting	Execution is repetitive and rule-based in nature and has been taken over by technology. Digital applications can handle the entire process with fully integrated systems, regardless of the time of day. Clients can also have access to all their information instantaneously.	Advanced Analytics can be applied on past transactions to determine the insights that allow for customisation of client interactions.
Financial Advisory and Relationship Management	Execution requires human judgment, interaction, frequent networking and deep technical, subject matter knowledge.	Digital platforms could allow this service to be provided more comprehensively. Such as providing financial advice in an easy-to-understand manner, exchanging market views, and using data to tailor advice to specific clients.

In the next

3-5 years ...

The traditional Remisier role will likely cease to exist. This role will transform from an agent of stockbroking and share trading, who carries out trade execution for clients, to a trusted advisor and expert in recommending investment decision to their clients.

Skills Differentiators:

- ▶ **Advisory:** In order to play a bigger role in offering personalised advice, other than the provision of “execution-related advice”, the job holder in this role will need to understand the structure of the advisory process and choose the right strategy for different situations.
- ▶ **Data Interpretation and Analysis:** With more and more information being made available, the Remisier will need to understand how to use this information to help with their objectives.
- ▶ **Research:** The job holder will be expected to conduct more in-depth research to keep up-to-date on the market landscape.
- ▶ **Influencing and Negotiation:** The job holder will need to be proactive in influencing potential customers, by leveraging various platforms to showcase their expertise, and deepen connections with clients.
- ▶ **Risk Awareness:** The job holder will need to possess strong risk management skills to understand associated risks present in products, and judge whether an investment is suitable for the client.





Subsector: Investment Banking

Job Family: Trade Management

Impact Level

Today, this role sits in the middle office, overseeing trade support. It is responsible for the processing of trades covering the validation, enrichment, and affirmation of trades and ensuring that all controls are in place.

High Impact

Consolidated Activities

	Today	Future
Trade Booking	Job holders assist the front office in ad-hoc booking requests and update the middle office systems. Some banks are already using RPA and workflow automation tools.	In the future this could either be done effortlessly by Traders, or automated entirely.
Trade Enrichment	Execution is document-intensive. Some banks have already automated trade enrichment related tasks.	APIs can enable access to new data sources of additional trade-related information across relevant systems.
Trade Affirmation/ Confirmation	Execution involves issuance of trade confirmation, reporting trade to regulatory authorities, and issuing settlement instructions. Often, STP is applied. For paper-based documents, technology like OCR can enable similar changes.	RPA will continue to be used, enabling automated verification of trade details with counterparties for transactions involving electronic confirmation. Blockchain could also help to streamline the order-to-settlement process and significantly reduce the amount of work.
Pre- and Post-Trade Analytics	Advanced Analytics are applied to model capital, balance sheet and tax impacts pre-trade to better understand the actual trades executed, and gain insights into areas for profit generation.	Taken to the next level, analysis could be performed in real time – alerting the Trader if they appeared to not act appropriately in response to economic or sentiment analysis.
Governance and Control	Execution involves ensuring trades are booked timely on the trade date and anomalous trading activities are escalated and investigated.	The job holder will continue to oversee the control of trading and propose enhancements to improve processes.

In the next

3-5 years ...

Most of the tasks (except trading control) performed by this role will be automated. As complex/exotic trades will continue to be too complicated to automate, this role will continue to contribute in a complex transaction – focusing on structure/documentation of complex trades.

Skills Differentiators:

- ▶ **Automation Management:** As automation takes place, the job holder will upskill to oversee systems, ensuring that operations requirements are met before seeking continuous improvement opportunities.
- ▶ **Advanced Digital Acumen/Literacy:** On-going upskilling will be required to ensure job holders are familiar with the new electronic platforms, and capable of using advanced AI-tools.
- ▶ **Process Excellence:** With good understanding of the existing operations, the job holder can help to highlight the root cause of process inefficiencies and identify the right processes that require automation.
- ▶ **Data Interpretation and Analysis:** The job holder will need to be skillful in interpreting data to extract key insights for recommendations, decisions or actions.
- ▶ **Complex Problem Solving:** The job holder will need to examine complex problems that are escalated and leverage available resources to develop and execute solutions.





Subsector: Investment Banking

Job Family: Sales and Trading

Impact Level

Today, this role is responsible for the buying and selling of various financial assets for investors and clients, making prices, executing trades and seeking to maximise assets and/or minimise risk.

Liquid Assets: ██████████ High Impact
 Illiquid Assets: ██████████ Medium Impact

Consolidated Activities

	Today	Future
Trading Strategy and Risk Management	The continuous increase of electronic trading and enhanced regulatory requirements for transparency, extending to other asset classes beyond equities, has resulted in convergence of trading techniques across asset classes.	Machine learning algorithms – using a vast array of social networking data/public data sets can be used to discover breaking news and emerging trends – will continue to support trading strategies. Human judgment will remain critical in deciphering analysis, addressing nuances, and filtering relevant information to be shared with different stakeholder groups.
Trade Execution	Liquid assets (i.e., equities) are already heavily automated with algorithms working behind trade execution. The option to implement trade execution platforms as a service is also available, offering clear attribution of trading costs, delivering sophisticated risk management at lower costs. This offers transparency that is compliant with MiFID II and trading rules. New technology is also available, which enhances the effectiveness of conversations with clients.	With the use of deep learning, recommendations that best fit client's needs and the bank's balance sheet can be generated. Banks will also leverage cloud-based (encrypted) voice messaging to eliminate the expenses associated with legacy tele-communication systems. It is important to note that voice communication will remain critical as it continues to help Traders to convey nuances and build trust-based relationships with their stakeholders. Hence, human intervention will remain critical.

In the next

3-5 years ...

Traders (Liquid assets) could be replaced by technologists as electronic trading gains traction. The job holder may upskill to trade illiquid assets, or upskill with programming and coding skills to transition to quantitative focused roles.

Skills Differentiators:

- ▶ **Lateral Thinking:** Demonstrating the ability to think outside of the box when confronted with a piece of news or research findings will remain important.
- ▶ **Customer Mindset:** The key focus of a Trader is to serve clients. Therefore, for the job holder to move into sales, a strong understanding of, and ability to resolve complex customer-centric problems will be necessary.
- ▶ **Programming and Coding:** With the deep expertise in trading, the job holder could upskill with coding skills to transition into a quantitative role.
- ▶ **Advisory:** Moving into a sales role, the job holder will need to further develop this skill to apply the right advisory strategies to engage with clients in different situations.
- ▶ **Data Storytelling:** The job holder will need to be able to disseminate key messages and findings from research and analysis in a compelling, impactful, and easy-to-understand manner to audiences with varying levels of interest.





Subsector: Investment Banking

Job Family: Corporate Finance

Impact Level

Today, this role is responsible for the origination, structuring and syndication of clients' financial needs, including advisory, divestitures, capital raising, M&A, structured financing, project financing, etc.

Medium Impact

Consolidated Activities

	Today	Future
Relationship Management and Deal Origination	Execution requires networking to build relationships, and leveraging those networks to acquire information that is not publicly available.	Leveraging personal networks will continue to be critical. However, the process of searching for a buyer could be streamlined with automation, which would enable scanning through annual reports, press releases, and other sources to determine potential deal sources and leads.
Deal Structuring and Financial Modelling	Execution requires deep technical knowledge and a high level of judgment to handle bespoke and complex services.	Building on the success of automation of IPO processes via RPA embedded in digital platforms, banks are expanding this strategy to corporate mergers.
Syndication and Stakeholder Management	Execution requires personal networks and relationships.	While digital applications can be used to send instantaneous updates to clients on deal pricing, size and timing, the cultivation of relationships between stakeholders will continue to require human input.

In the next

3-5 years ...

There will continue to be opportunities to relieve some of the manual tasks that are part of this role. However, human input will remain critical as part of the valuation process.

Skills Differentiators:

- ▶ **Data Interpretation and Analysis:** Being able to analyse complex data sets, and have the ability to quickly draw insightful conclusions from the data are skills that will be essential for the job holder.
- ▶ **Lateral Thinking:** The job holder will demonstrate the ability to connect the dots using all the data available and analyse results, enabling the job holder to see the big picture of how different initiatives are brought together to improve decision making.
- ▶ **Global Perspectives:** As cross-border transactions happen regularly, a robust understanding of the global market/economy and the corporate landscape is important.
- ▶ **Analytics and Computational Modelling:** Despite automation, the job holder will continue to demonstrate solid financial modelling and valuation skills.
- ▶ **Influencing and Negotiation:** Impeccable negotiation skills will continue to be vital for this role to succeed.





Subsector: Investment Banking

Job Family: ECM/DCM

Impact Level

Today, this role is relationship-centric, using RPA to automate non-core tasks, and Advanced Analytics to provide insights to enhance the robustness of decisions.

Medium Impact

Consolidated Activities

	Today	Future
Relationship Management and Deal Origination	Execution requires personal networks and relationships. Machine learning (AI) is being considered for predicting the clients' best position for follow-on bond/loan offerings.	Sentiment analysis can support the prioritisation of client outreach efforts.
Deal Structuring and Advisory	Execution requires deep technical knowledge and a high level of judgment to handle bespoke and complex services.	Predictive analytics with access to new sources of data can help in the timing and structuring of deals such as helping to understand how a potential bond issuance is being perceived.
Deal Syndication and Loan Origination	Execution requires the development of strong personal networks and relationships. Today, RPA is being explored to expedite compilation of information.	Digital platforms can improve the efficiency of price-setting via auction models and innovations that improve the connection between the issuers and dealers, allowing them to exchange data more efficiently.
Sales and Placement Support	Execution requires personal networks/relationships but can be enabled by technology.	Cloud-based content automation solutions can enable faster/automated creation of prospectus', term sheets, sales memos, etc.

In the next

3-5 years ...

This role will continue to be responsible for the origination, structuring, advisory and syndication in debt capital raising efforts of clients. It also includes sales support for marketing and distribution of debt securities.

Skills Differentiators:

- ▶ **Data Interpretation and Analysis:** The job holder will possess skills to interpret markets and results of the analysis for further action.
- ▶ **Influencing and Negotiation:** The job holder will pitch their ideas on debt issuances to their clients, delivering impactful exchanges and discussions to obtain buy-in.
- ▶ **Advanced Digital Acumen/Literacy:** Whilst proficiency in valuation and modeling remains critical, the job holder must upskill to leverage more advanced technology which will allow the processing of larger data sets.
- ▶ **Advisory:** The skill will continue to be critical as the key focus of this role is to deliver data-driven advice to organisations, sovereigns, or agencies to raise debt.
- ▶ **Stakeholder Engagement:** The job holder will need to be able to develop a strong network of internal and external contacts, as well as balance the interests of complex stakeholders.





Subsector: Investment Banking

Job Family: Research

Impact Level

Today, this role is responsible for providing insightful advice based on the application of economic theory and knowledge, particularly in the behavior of the aggregate economy covering various phenomena.

Medium Impact

Consolidated Activities

	Today	Future
Secondary Research (e.g., economic reports, monetary policy shifts)	Execution is rule based and document intensive by nature, and traditionally, time consuming to execute.	APIs can enable faster and in some cases, real-time access to information. AI (NLP) is able to decode large volumes of information, reducing the effort associated with manual research activities.
Economic Modelling and Analysis	Execution requires technical expertise/knowledge, and can be enabled by technology.	Machine learning is seen to develop complex economic models – such as predictions about economic growth. Automated quantitative capabilities will help to answer questions more rapidly.
Economic Outlook Insights and Report Generation	Execution requires deep technical knowledge. It is advisory in nature but there are aspects that can undergo straight-through processing.	AI (Natural Language Generation) has the potential to generate reports and commentary, but there are limitations as these models are less likely to account for irrational and out of the 'norm' behaviours and trends.

In the next

3-5 years ...

Given that data mining and manual research tasks are being completed more rapidly than before, this role will be able to focus on incorporating subjective data and irrational phenomenon to increase the robustness of the data-driven models.

Skills Differentiators:

- ▶ **Data Storytelling:** The job holder will be required to present results in a manner which is persuasive as well as easy to understand to ensure that arguments/analysis outcomes are readily accepted.
- ▶ **Advisory:** Even with the inclusion of data analytics and automation, it will still be critical for the job holder to provide economic advice and recommendations.
- ▶ **Programming and Coding:** Coding proficiency will allow the job holder to run or evaluate complex mathematical models and simulations. The job holder will be required to continue learning new programming languages.
- ▶ **Analytics and Computational Modelling:** Solid quantitative modeling skills are the foundation skills required for this role, and they will continue to be important despite advancement in automation. Instead of utilising Excel, this role may instead leverage advanced statistical tools to build/maintain econometrics models. Hence, **advanced digital acumen/literacy** may be important in the future.





Subsector: Investment Banking

Job Family: ECM/DCM

Impact Level

Today, this role is relationship-centric, with RPA solutions automating non-core tasks and Advanced Analytics providing insights into data-driven origination opportunities.

Medium Impact

Consolidated Activities

	Today	Future
Relationship Management and Deal Origination	Execution requires leveraging personal networks and relationships. Machine learning is now being used in predicting recommendations for clients who are best positioned for follow-on equity offerings.	Sentiment analysis can further support the prioritisation of client outreach efforts.
Deal Structuring and Advisory	Execution requires deep technical knowledge and a high level of judgment to handle bespoke and complex services.	Predictive analytics with access to new sources of data can help in the timing and structuring of deals.
Deal Syndication and Underwriting	Execution requires personal networks and relationships, especially with other banks in underwriting efforts. RPA can expedite compiling information.	Distributed ledger technology* could present an opportunity to directly issue shares with less costs and friction.
Sales, Placements and Post-IPO Support	Execution requires personal networks/relationships, but can be enabled by technology. Standardised pitch book templates are available today, but not favoured by clients and bankers mainly due to the perception of 'recycling' presentation materials.	Machine learning can be used in the post-IPO support phase.

In the next

3-5 years ...

This role will be responsible for the origination, structuring, advisory and syndication in equity capital raising efforts of clients. It will also include sales support for the marketing and distribution of equity securities.

Skills Differentiators:

- ▶ **Data Interpretation and Analysis:** The job holder will possess the ability to interpret markets and results of analysis for further actions and enhanced decision making.
- ▶ **Influencing and Negotiation:** The job holder will need to be able to defend the validity of their ideas and ultimately bring together the parties that are part of the transaction.
- ▶ **Advanced Digital Acumen/Literacy:** While proficiency in modelling and calculations remains critical, job holder must upskill to leverage more advanced technology to process larger data sets.
- ▶ **Project Management:** Equity syndication requires strong project management skills to follow through with deal execution processes and work effectively with different parties both internally and externally.
- ▶ **Stakeholder Engagement:** The job holder will need to be able to develop a strong network of internal and external contacts, as well as balance interests of complex stakeholders.



*Proof of concepts have taken place with issuance in private markets



Subsector: Investment Banking

Job Family: Quants

Impact Level

Today, this role implements complex mathematical models to evaluate financial instruments or markets, as well as calculate accounting adjustments and validate models to ensure regulatory fit.

Medium Impact

Consolidated Activities

	Today	Future
Trading Model Validation	Execution focuses on ensuring the quantitative models fit within regulatory requirements, including managing the library of existing code. In some countries, these tasks have already been offshored to lower cost centres.	The offshoring trend will continue to reduce the need for this role to perform trading model validation.
Product/Price Valuation and Verification	Execution requires technical expertise and knowledge, but it can be enabled by technology. The current landscape of Independent Price Verification (IPV) systems comprise largely of in-house, End-User Computing (EUC) solutions that lack clear control and transparency.	RPA or cloud-based service providers can help managers to source different prices from a variety of sources. Collating, ranking and defining those prices in a central repository where records can easily be audited. Advanced Analytics can leverage the new sources of data to predict and evaluate assets.
Trading Model Development	Execution involves close collaboration with traders and the technology team to build trading tools.	With AI, this will be a new task for the role. This job role will support and possibly lead the development of trading algorithms and work closely with technology specialists to contribute to alpha generation on a systematic trading desk.

In the next

3-5 years ...

This role will evolve as trading desks are increasingly being automated. As there is a shift away from model validation, the job holder will lead the development of trading algorithms, working closely with traders and technology specialists to develop trading tools.

Skills Differentiators:

- ▶ **Analytics and Computational Modelling:** This skill will remain important in the construction of mathematical models designed to provide insight into complex financial systems.
- ▶ **Programming and Coding:** Fluency in programming languages (e.g., C++, Python, Perl, Java etc.) will be vital to develop and implement mathematical models.
- ▶ **Risk Awareness:** Solid understanding of various types of financial risk is indispensable for this role.
- ▶ **Technology Design:** Close collaboration with the technology team in designing appropriate systems to run the developed models, requires the job holder to have a basic proficiency in technology design to facilitate an effective partnership.
- ▶ **Advanced Digital Acumen/Literacy:** In addition to advanced excel skills, the job holder should have expertise in advanced statistical analysis software or other tools.





Subsector: Investment Banking

Job Family: Research

Impact Level

Today, the job holder in this role conducts fundamental analysis on companies or asset classes to provide institutional clients, retail clients and in-house Traders with in-depth research and analysis.

Medium Impact

Consolidated Activities

	Today	Future
Primary Research	Execution requires engaging with personal networks/relationships to gather information that is not publicly available.	In the longer-run, advanced AI technologies such as facial recognition may help to support the process of and generation of differentiated/alternative interpretations of information.
Secondary Research	Execution is repetitive and can be enabled by technology.	Advanced Analytics engines can mine unstructured data from non-traditional sources and combine the results with structured data (e.g., earnings data, company reports).
Financial Modelling and Analysis	Execution requires technical expertise/knowledge and can be enabled by technology. Machine learning is seen to develop complex financial models.	Automated quantitative capabilities will answer questions within minutes, where they once would have taken days to research.
Business Development and Report Generation	Execution is advisory in nature, but there are aspects that can undergo straight-through processing. RPA is used for the generation of research reports in standardised formats.	Communication via digital platforms enables targeted push-research. AI (natural language generation) also has the potential to generate reports and commentary.

In the next
3-5 years ...

As the repetitive data gathering tasks are replaced, this role will evolve to become more advisory. As such, the job holder will be able to focus on various industries or select a specialised area to provide differentiated and value-added ideas.

Skills Differentiators:

- ▶ **Advisory:** The ability to deliver high quality and value-added advice, based on an objective interpretation of clients' contexts as well as their specific needs will be critical.
- ▶ **Data Storytelling:** The job holder will need to be able to disseminate key messages/findings from research/analysis in a compelling, impactful, and easy-to-understand manner to audiences with varying levels of interest.
- ▶ **Lateral Thinking:** The job holder will be required to handle larger data sets and will therefore need to be able to 'connect-the-dots' whilst staying focused on the big picture.
- ▶ **Advanced Digital Acumen/Literacy:** As banks gradually move away from excel-based tools, job holders will need to become proficient in using advanced statistical analysis software or other tools.
- ▶ **Data Interpretation and Analysis:** The analysis and interpretation of both quantitative and qualitative data will be a critical.





Subsector: Investment Banking

Job Family: Operations

Impact Level

Today, this role is responsible for controlling and overseeing the bank's capital and liquidity, and ensuring that the bank remains financially stable to support various business activities.

Medium Impact

Consolidated Activities

	Today	Future
Capital Review and Monitoring	Apart from using RPA, treasury management systems via cloud-based solutions are available for reducing cost and harmonising processing.	Banks will increasingly deploy analytics solutions across repositories of information to provide a near-real time view of cash flow positions and liquidity in order to support decision-making (e.g., banks will leverage data such as foreign exchange, market value assumptions, rates and spread to conduct analytics for insights into stress testing or interest rate risk management). Open API services can be utilized to help to meet the need for working capital.
Business and Stakeholder Liaison	Execution requires liaising with external stakeholders (e.g., regulators) as well as different business units within the bank to discuss implications of trading activities on the bank's capital. In addition execution requires providing advice on how capital and liquidity within the bank are regulated and controlled.	Analytics can be leverage to uncover hidden insights with regards to the bank's liquidity, capital position, balance sheet etc., and real-time tracking can be used to ensure that business and regulation requirements are met. Human judgment will remain critical in liaising with regulators and collaborating with different parts of the business.

In the next
3-5 years ...

This role will leverage sophisticated analytics solutions with the incorporation of larger data sets to better manage the bank's capital and liquidity, ensuring that the bank can better withstand potential future market stressors.

Skills Differentiators:

- ▶ **Data Interpretation and Analysis:** The increasingly complex data and analytics will require sophisticated translation of findings into sound decisions/actions.
- ▶ **Data Storytelling:** The availability of more data requires the job holder to be able to disseminate insights in a clear and compelling manner to audiences with varying levels of interest.
- ▶ **Strategy Planning:** In addition to a data-driven mindset, this skill will be required as the job holder needs to present a strategy to manage cash flow, funding, FX requirements and money market placements.
- ▶ **Stakeholder Engagement:** The job holder will be highly skilled to liaise with internal and external stakeholders; effectively eliciting stakeholders' views and developing consensus.
- ▶ **Risk Awareness:** In-depth risk knowledge remains critical for the job holder to oversee FX, hedging, financial risks, financial instruments, credit risk etc.





Subsector: Investment Banking

Job Family: Sales and Trading

Impact Level

Today, this role is responsible for sourcing and building long-term relationships with buy-side clients (asset management firms, wealth managers and high net worth individuals (HNWIs) to trade with the bank.

Low Impact

Consolidated Activities

	Today	Future
Relationship Management	Execution requires personal networks/ relationships and can be enabled by technology. Today, many conversations are carried out via phone or Bloomberg terminals throughout the day.	Despite the rise of electronic platforms/ channels, IM chats or emails, voice communications will continue to play an important role in pre- and post-trade interactions, as it is perceived to be more personal, and it helps to convey nuances, build trust and develop stronger relationships with clients.
Trading Advisory	Execution requires personal knowledge of their clients to put forth trade ideas that best fit client's needs.	AI-powered tools can be implemented to track and listen to conversations with clients or monitor inboxes and electronic platforms for clients' messages, examine their trades, suggest additional sales, and anticipate future requests.
Trade Orders Dissemination	Execution involves communicating client demands for pricing to Traders and Structurers.	

In the next

3-5 years ...

This role will continue to rely on high-touch channels for client communications. AI-powered tools will be used to support client interactions, allowing job holders to approach clients with data-driven trade recommendations and helping them to decide future actions.

Skills Differentiators:

- ▶ **Lateral Thinking:** Apart from deep sector, product or solutions expertise the job holder will need to incorporate more (and potentially diverse) information/insights into developing trading ideas that differentiate themselves from others.
- ▶ **Influencing and Negotiation:** While pitching trade ideas to clients, such skills will be critical for job holders to align to their clients way of thinking.
- ▶ **Advanced Digital Acumen/Literacy:** The job holder needs to be constantly upskilled to operate using new electronic-trading tools, as well as advanced AI-tools.
- ▶ **Data Interpretation and Analysis:** While computation and analysis can be performed using technologies, the job holder needs to be skillful in interpreting data to extract key insights for recommendations, decisions or actions.
- ▶ **Advisory:** With deep knowledge of market, customer, product etc., the job holder will have the ability to apply the right advisory strategy to provide trading advice to clients.





Subsector: Investment Banking

Job Family: Relationship Management

Impact Level

Today, this role is responsible for client sourcing, establishing long-term relationships with clients, providing financial advisory based on client's needs, and evaluating market conditions, etc.

Low Impact

Consolidated Activities

	Today	Future
Client Acquisition	Execution requires personal networks/relationships, but can be enabled by technology. Predictive analytics can be used to understand the highest performing client relationships thus, assisting to prioritise client outreach efforts.	Behavioural analytics from previously untapped (virtual deal rooms, industry partners) can help in client prioritisation decisions.
Relationship Management and Advisory	Execution requires personal networks/relationships but in some instances, can be supported by technology.	Digital client engagement platforms (with an option for self-service, targeted almost realtime push notifications, etc.) can enhance the customer experience and reduce attrition.
Deals Origination and Execution	Execution requires personal networks and relationships, especially in gathering information that is not publicly available. This can also be enabled by technology.	Machine learning can be used to help determine the client's best position for follow-on capital raising offerings. Cloudbased digital applications that are mobilefriendly can also help to reduce internal communications or coordination efforts. However, the overall nature of this task is seen to remain humancentered.

In the next
3-5 years ...

This role will continue to front the bank's offerings to clients. The job holder will leverage analytics capabilities, and make use of the richness of the available data in the bank to establish or maintain effective relationships, and decide on the best actions to take in response to their clients' needs.

Skills Differentiators:

- ▶ **Global Perspective:** In order to drive innovation in the solutions offered to clients, the job holder must be deeply attuned to regional and global trends.
- ▶ **Customer Mindset:** This is vital for the job holder to curate solutions that best meet their clients' requirements, as well as align with the bank's strategy.
- ▶ **Influencing and Negotiation:** The job holder must be able to handle various situations with objectives of obtaining buy-in and maintaining client relationships.
- ▶ **Data Storytelling:** With increased accessibility to information, this skill is becoming more important in order to effectively convey findings and messages to different audiences.
- ▶ **Lateral Thinking:** The ability to incorporate information collated from different sources into client advice or solutions will be vital.





Subsector: Investment Banking

Job Family: Product Origination

Impact Level

Today, this role is responsible for the development of bespoke financial instruments for clients, which include structuring new products by combining various underlying types of assets to create tailored products with different risk and return rates.

Low Impact

Consolidated Activities

	Today	Future
Product Origination and Management	Execution requires deep technical knowledge to handle bespoke and complex products/services. High levels of judgment are necessary as client needs may not be straightforward. Predictive analytics powered by new sources of information can support the structuring of a product that better meets the needs of customers.	AI can be deployed to structure products, monitor performance of products and support the pricing of new/existing products. However, given the bespoke nature of solutions, the question has been raised around if this technology investment would have the necessary scale to justify the initial investment.
Product Pricing Development	Execution includes collaborating with sales teams to provide market analysis, and with trading teams to improve upon pricing and risk management.	While data analytics can be leveraged to determine optimal pricing strategies, human judgment will remain critical in aligning with the bank's overall objectives and strategies.

In the next

3-5 years ...

Given the highly bespoke nature of the services provided by the job holder, there will be minimal opportunities to automate tasks. However, this role will need to possess multi-asset expertise in a cross-asset structure instead of solely focusing on a single asset class.

Skills Differentiators:

- ▶ **Data Interpretation and Analysis:** The ability to interpret financial or risk analytics, and leverage insights for product and pricing recommendations will be essential.
- ▶ **Advanced Digital Acumen/Literacy:** The job holder needs to be constantly upskilled to operate using advanced AI-tools.
- ▶ **Programming and Coding:** Whilst coding skills are not compulsory today, they will increasingly become an advantage when assisting with market analysis and the pricing of products.
- ▶ **Influencing and Negotiation:** The job holder will need to have the ability to display confidence in presenting and justifying the rationale for their proposed solutions, as well as gain buy-in from relevant stakeholders.
- ▶ **Advisory:** With deep knowledge of the instruments, market, customer etc., the job holder will have the ability to apply the right advisory strategies to provide pricing recommendation to stakeholders.





Subsector: Private Banking

Job Family: Trade Management

Impact Level

Today, this role sits in the middle office, overseeing trade support. It is responsible for the processing of trades covering the validation, enrichment, and affirmation of trades, and ensuring that all controls are in place.

High Impact

Consolidated Activities

	Today	Future
Trade Booking	Job holders assist the front office in ad-hoc booking requests and update the middle office systems. Some banks are already using RPA and workflow automation tools.	In the future this could either be done effortlessly by Traders, or automated entirely.
Trade Enrichment	Execution of task is document-intensive. Some banks have already automate trade enrichment related tasks.	APIs can enable access to new data sources of additional trade-related information across relevant systems.
Trade Affirmation/ Confirmation	Execution involves issuance of trade confirmation, reporting trade to regulatory authorities, and issuing settlement instructions. Often, STP is applied. For paper-based documents, technology like OCR can enable similar changes.	RPA will continue to be used, enabling automated verification of trade details with counterparties for transactions involving electronic confirmation. Blockchain could also help to streamline the order-to-settlement process and significantly reduce the amount of work.
Pre- and Post-Trade Analytics	Advanced Analytics are applied to model capital, balance sheet and tax impacts pre-trade to better understand the actual trades executed and to gain insights into areas for profit generation.	Taken to the next level, analysis could be performed in real time – alerting the Trader if they appeared to not act appropriately in response to economic or sentiment analysis.
Governance and Control	Execution involves ensuring trades are booked timely on the trade date and anomalous trading activities are escalated and investigated.	The job holder will continue to oversee the control of trading and propose enhancements to improve processes.

In the next

3-5 years ...

Most of the tasks (except trading control) performed by this role will be automated. As complex/exotic trades will continue to be too complicated to automate, this role will continue to contribute in a complex transaction – focusing on structure/documentation of complex trades.

Skills Differentiators:

- ▶ **Automation Management:** As automation takes place, the job holder will upskill to oversee systems, ensuring that operations requirements are met before seeking continuous improvement opportunities.
- ▶ **Advanced Digital Acumen/Literacy:** On-going upskilling will be required to ensure job holders are familiar with the new electronic platforms and capable of using advanced AI-tools.
- ▶ **Process Excellence:** With good understanding of the existing operations, the job holder can help to highlight the root cause of process inefficiencies and identify the right processes that require automation.
- ▶ **Data Interpretation and Analysis:** The job holder will need to be skillful in interpreting data to extract key insights for recommendations, decisions or actions.
- ▶ **Complex Problem Solving:** The job holder will need to examine complex problems that are escalated and leverage available resources to develop and execute solutions.





Subsector: Private Banking

Job Family: Trade Management

Impact Level

Today, this role is responsible for clearing, settlement, margin and collateral management as well as follow-up and regulatory obligations including corporate actions.

High Impact

Consolidated Activities

	Today	Future
Trade Clearing and Settlement	Execution is rule-based, high volume, document intensive and can be enabled by technology. RPA and workflow automation tools are leveraged to automatically update accounts and monitor adherence to payment agreements.	Distributed ledger technology (Blockchain) could fundamentally transform transaction documentation resulting in the redundancy of reconciliations that are performed today, as well as reduction in settlement risk.
Collateral and Margin Management	Execution is tedious and involves manual collation of data from multiple sources e.g., collateral management involves fragmented processes as it relies on many tools and software. Banks have begun to leverage RPA tools to handle margin management.	RPA solutions combining machine learning skills will continue to be used in addressing margin calculation, margin calls and valuation – e.g., using machines to interpret unstructured emails, and automatically populating terms into margin call management systems. Despite automation, human intervention would remain relevant for complex exception cases.

In the next

3-5 years ...

This role will switch from delivering routine tasks to exception management, drive initiatives that focus on automating trade support, and facilitate the decisions in reducing counterparty credit risk – where human judgment and creative solutions are required.

Skills Differentiators:

- ▶ **Automation Management:** The job holder will upskill to oversee the automated systems, ensuring that operations requirements are met, and focusing on the continuous improvement of machines.
- ▶ **Advanced Digital Acumen/Literacy:** On-going upskilling will be required to ensure job holders are familiar with the new electronic platforms and capable of using advanced AI-tools.
- ▶ **Process Excellence:** With good understanding of the existing operations, job holders can help to highlight root causes of process inefficiencies and identify the right processes that require automation.
- ▶ **Complex Problem Solving:** The job holder will need to examine complex problems that are escalated and leverage available resources to develop and execute solutions.
- ▶ **Risk Awareness:** The job holder will possess a deep understanding of risk and control by removing manual processes, the job holder can focus to support the management of counterparty credit risk.





Subsector: Private Banking

Job Family: Sales and Trading

Impact Level

Today, this role is responsible for putting forth trading strategies and overseeing the trades completed by brokers/dealers.

High Impact

Consolidated Activities

	Today	Future
Trade Execution	Execution desks manually take orders on trading platforms – such as keying in information, sending requests for quotation etc. Job holder also focuses on monitoring trade execution and ensures the completion of trades performed by third party broker/dealers. Some banks have begun to implement trading-enabled applications – allowing clients to execute simple investments – e.g., equities, spot FX, exchange-traded funds.	Trade orders can be fed into trading systems in a straight-through-processing (STP) manner. Trading functionality can also be incorporated into private banking (mobile) applications allowing high net worth (HNW) clients to execute orders for a range of asset classes in different markets.
Trading Options and Strategy Development	Execution involves discussion of trading options and strategies with clients, keeping abreast of market news, conditions, new trading strategies and/or techniques.	Leveraging AI-powered solutions, recommendations that best fit the client's needs can be generated.
Transaction Cost Analysis (TCA)	Execution involves focusing on evaluating transaction costs of various trading strategies and monitoring the commission paid to brokers/dealers – to gauge the effectiveness of their trade execution over time.	The rise of algorithmic trading has generated large volumes of data and a wider variety of trade analytics tools that will be able to do quick analysis of results. *For hedge funds, analysis will continue to run on in-house/proprietary tools due to the more complex requirements.

In the next

3-5 years ...

The increased use of self-service platforms and STP will impact the role. The job holder could upskill to trade illiquid assets.

Skills Differentiators:

- ▶ **Advanced Digital Acumen/Literacy:** The job holder will possess robust knowledge of various trading systems and platforms, and stay up-to-date on new tools.
- ▶ **Lateral Thinking:** The job holder will demonstrate the ability to think outside of the box when confronted with a piece of news or research findings that were not previously available.
- ▶ **Customer Mindset:** The job holder will possess strong skills to understand client needs and recommend appropriate trading options and strategies given individual preferences.
- ▶ **Data Storytelling:** The job holder will display the ability to disseminate proposed strategies in a clear and concise manner to a variety of audiences (i.e., clients and brokers).
- ▶ **Analytics and Computational Modelling:** The job holder must be able to analyse the past and predict future price trends, patterns and other indicators to help interpret the market and identify trading opportunities.





Subsector: Private Banking

Job Family: Transaction Operations

Impact Level

Today, this role is responsible for transaction processing duties related to fund transfer and clearance, including the verification and compliance of transactions.

High Impact

Consolidated Activities

	Today	Future
Transaction Processing	Execution is rule based. Digital banking platforms will be able to handle transactions, RPA can serve to automate the process and review for errors.	APIs will help to work towards seamless connectivity between systems for increased ease of transferring information. In the longer term, blockchain could potentially further disrupt this role.
Statement Preparation and Issuance	Execution is repetitive and document intensive. Digital channels will allow for real-time tracking of customer account activity.	Automated systems will be able to monitor customer profiles and customise statements according to customer needs.
Reconciliation reporting and monitoring	Execution has low decisional latitude. Technology can be leveraged to automate this task.	APIs can facilitate direct communication between the transaction processing and finance systems, while cross functional APIs will help with sharing information in real-time. Blockchain could also eliminate inefficiencies arising from reconciliation timeframes.

In the next

3-5 years ...

This role will require less people to handle the current set of activities, due to data analytics and automation. Those that remain in this function will provide oversights of new systems and help to continuously improve and streamline processes. When exceptions arise this role will need to be prepared to handle these cases as well.

Skills Differentiators:

- ▶ **Automation Management:** The job holder will possess technical capabilities to oversee the various automated processes and look for potential improvements to ensure the tools/machines are delivering the expected outputs.
- ▶ **Technology Troubleshooting:** Job holder will need to display the ability to resolve basic technical issues and provide guidance on what needs to be escalated to the relevant business units to ensure minimal operational disruption.
- ▶ **Business and Financial Acumen:** The job holder will possess commercial awareness to work effectively with business units in developing key operation requirements and addressing business needs.
- ▶ **Process Excellence:** With good understanding of the existing operations, the job holder can help to highlight the root cause of process inefficiencies and identify the right processes that require automation.
- ▶ **Risk Awareness:** While new systems and tools will help to achieve new levels of efficiency, the job holder will need to be aware of the associated risks, to ensure that appropriate actions are taken to avoid unnecessary risks.





Assistant Relationship Manager

Subsector: Private Banking

Job Family: Client Servicing

Impact Level

Today, this role is responsible for supporting the Private Banker to assist in client servicing and also growing the Private Banker portfolio.

Medium Impact

Consolidated Activities

	Today	Future
Account Management or Maintenance	Execution involves handling of account opening requests, account closures, updates, and other account servicing related requests and verifying transactions and authorisations.	Digital account opening services with verification and authentication that happens in real-time can improve the overall task process. In addition, mobile/smart phone account access allows clients to update their account automatically.
Client Administration	Execution involves tracking and following-up on outstanding documentation, client outstanding fee payments, verifying transactions, etc.	Self-service solutions will be implemented for clients to take actions on their own, without the need to liaise with Private Bankers. With the availability of self-service portals, banks can further understand the clients' needs by applying analytics to evaluate clients actions and behaviours.
Ad-hoc Client Requests	Focus is on adhering to clients instructions received via written/voice communications.	

In the next
3-5 years ...

With the idea of self-service being widely accepted as an industry norm from the perspective of RMs and high-net-worth clients, two scenarios could take place, the job scope of Assistant Relationship Manager (ARM) will take on a larger advisory role, or the role of the traditional ARM will gradually not be necessary.

Skills Differentiators: (for potential convergence with Junior Relationship Managers):

- ▶ **Analytics and Computational Modelling:** The job holder will display the ability to perform financial and statistical analysis to evaluate market trends and the potential impact on client's portfolio will be important.
- ▶ **Customer Mindset:** The job holder possess strong skill to understand clients needs and resolve complex customercentric problems is vital.
- ▶ **Product Awareness:** The job holder will possess robust understanding of various financial and investment products of different asset classes available in the bank.
- ▶ **Advisory:** The job holder will apply the right advisory strategy to provide simple investment advice to clients.
- ▶ **Advanced Digital Acumen/Literacy:** The job holder will upskill to operate using new digital tools to supplement their day-to-day operations, and provide assistance or guidance to clients in navigating through self-service portal.





Subsector: Private Banking

Job Family: Business Management

Impact Level

Today, this role is responsible for managing all aspects of the business – including strategy and execution, growth and change initiatives, as well as cost and sales management.

Medium Impact

Consolidated Activities

	Today	Future
Organisation-wide Initiative Roll-out	Execution requires close collaboration with stakeholders across the business to design and implement initiatives – e.g., development of new products, deal pipelines, and sales improvement.	Close collaboration and partnership remain critical. However, AI-tools/digital platforms that enable real-time status update and risk analysis/response planning will be able to support the tedious implementation process.
Cost Management	Cost-transparency solutions are being leveraged to make costs more transparent to the business.	In addition to cost transparency solutions, banks will increasingly use predictive analytics to be cost efficient.
Business Resilience	Banks are gradually adopting cloud-based solutions – mainly to replace spreadsheets, emails and phone calls which are typically used to coordinate activities during critical periods, and real-time tracking of status during disruption.	Cloud-based solutions will continue to be leveraged. Advanced Analytics and predictive analytics can be used to detect early warning of issues that could severely affect the business – ranging from geo-political events to internal disruptions.
Management Reporting	Execution can be repetitive and time consuming – as it requires the job holder to conduct analysis, translate the data/results into narratives and recommendations.	With a major influx of data that needs to be evaluated, banks will gradually leverage AI and natural language generation (NLG) technology to automate routine analysis and generate data-rich insights.

In the next

3-5 years ...

This role will leverage AI-powered tools to replace the mundane tasks, allowing them to play a more strategic role and have more time to spend on higher value activities – e.g., extracting business-relevant insights from data to support robust recommendations and decision making.

Skills Differentiators:

- ▶ **Project Management:** The job holder will display the ability to apply the appropriate principles for planning and managing a wide variety of projects to ensure that the objectives are achieved.
- ▶ **Stakeholder Engagement:** The job holder will need to be able to coordinate and maintain productive working relationships with stakeholders, in order to deliver roll-out out of initiatives and projects.
- ▶ **Change Management:** The job holder needs to possess robust knowledge and skill to assist the bank in making successful transitions.
- ▶ **Lateral Thinking:** The job holder will demonstrate the ability to connect the dots using all the data available, enabling the job holder to see the big picture of how different initiatives are brought together to improve the operations or grow the business.
- ▶ **Risk Awareness:** The job holder will possess in-depth knowledge of risk policies to ensure strict compliance of all initiatives and that the level of risk is communicated effectively to key stakeholders.





Subsector: Private Banking

Job Family: Product Management

Impact Level

Today, this role is responsible for structuring complex financing, and works closely with RMs, credit risk, and legal teams, to ensure credit related issues are addressed and credit solutions are tailored to the needs of clients.

Medium Impact

Consolidated Activities

	Today	Future
Credit Requests Analysis	Execution involves analysis and structuring of credit requests which are typically high volume and time consuming.	AI and advanced analytical tools will be leveraged to accelerate the processing of credit requests.
Credit Product Advisory/Sales Support	With strong understanding of various product features, job holders will work with RMs to deliver creative and innovative credit solutions to satisfy clients' requirements and promote different credit products. Execution of tasks can be enabled by technology.	Robo-advisors will be able to facilitate the product sales and advisory process – e.g., overview of credit products, high level recommendations based on client's need requirements. As a follow up, job holder will continue to partner/collaborate with RMs to follow-up and offer personalised credit solutions based on customised needs.
Credit Product Development	Execution requires job holder to provide technical input into development, scoping and implementation of new credit products.	With the availability of robo-advisors, more data will be collected and banks can further understand their clients' needs by applying Advanced Analytics to evaluate the actions and behaviours, and subsequently, refining credit products to ensure attractiveness.

In the next

3-5 years ...

This role will leverage AI-powered and Advanced Analytics tools to accelerate the credit structuring process. Nonetheless, close partnership with different stakeholders will remain important throughout the process.

Skills Differentiators:

- ▶ **Lateral Thinking:** The job holder must possess sound understanding of market, product, and regulatory policies etc., the ability to 'connect-the-dots' and stay focused on big picture will be critical.
- ▶ **Advanced Digital Acumen/Literacy:** As banks gradually move away from Excel-based tools, the job holders will need to upskill to be proficient in using advanced statistical analysis software or other tools.
- ▶ **Data Interpretation and Analysis:** The skills to analyse and interpret quantitative and qualitative data and subsequently translate insights into recommendation, will be essential.
- ▶ **Stakeholder Engagement:** The job holder will maintain productive working relationships with internal and external stakeholders to facilitate the growth of the bank's credit business.
- ▶ **Risk Awareness:** It is crucial for the job holder to support the growth of the credit business across the bank to enable achievements of credit income generation in a risk conscious manner.





Subsector: Private Banking

Job Family: Research

Impact Level

Today, this role is responsible for providing insightful advice based on the application of economic theory and knowledge, particularly in the behavior of the aggregate economy covering various phenomena.

Medium Impact

Consolidated Activities

	Today	Future
Secondary Research (e.g., economic reports, monetary policy shifts)	Execution is rule based and document intensive by nature, and traditionally, time consuming to execute.	APIs can enable faster and in some cases, real-time access to information. AI (NLP) is able to decode large volumes of information, reducing the effort associated with manual research activities.
Economic Modelling and Analysis	Execution requires technical expertise/knowledge, and can be enabled by technology.	Machine learning is seen to develop complex economic models – such as predictions about economic growth. Automated quantitative capabilities will help to answer questions more rapidly.
Economic Outlook Insights and Report Generation	Execution requires deep technical knowledge. It is advisory in nature but there are aspects that can undergo straight-through processing.	AI (NLG) has the potential to generate reports and commentary, but there are limitations as these models are less likely to account for irrational and out of the 'norm' behaviours and trends.

In the next

3-5 years ...

Given that data mining and manual research tasks are being completed more rapidly than before, this role will be able to focus on incorporating subjective data and irrational phenomenon to increase the robustness of the data-driven models.

Skills Differentiators:

- ▶ **Data Storytelling:** The job holder will be required to present results in a manner which is persuasive as well as easy to understand to ensure that arguments/analysis outcomes are readily accepted.
- ▶ **Advisory:** Even with the inclusion of data analytics and automation, it will still be critical for the job holder to provide economic advice and recommendations.
- ▶ **Programming and Coding:** Coding proficiency will allow the job holder to run or evaluate complex mathematical models and simulations. The job holder will be required to continue learning new programming languages.
- ▶ **Analytics and Computational Modelling:** Solid quantitative modeling skills are the foundation skills required for this role, and they will continue to be important despite advancement in automation. Instead of utilising Excel, this role may instead leverage advanced statistical tools to build/maintain econometrics models. Hence, **advanced digital acumen/literacy** may be important in the future.





Subsector: Private Banking

Job Family: Portfolio Management

Impact Level

Today, this role is responsible for portfolio construction, asset allocation and managing client portfolios according to client investment goals and parameters.

Medium Impact

Consolidated Activities

	Today	Future
Client Portfolio Management	Execution can be tedious due to the high volume e.g., usage of spreadsheets in portfolio tracking. Some banks are already offering real-time aggregated investment portfolio reporting for their clients.	Apart for accessing portfolio analysis or reports using smartphones and tablets, implementation of advanced digital tools will also enable clients to share their financial activities with financial advisors/private banker in real time, facilitating the dynamic portfolio management.
Portfolio Construction	Execution requires expertise/knowledge. This role partners with Financial Planners to tailor portfolio management solutions/strategies and distribute targeted presentations to clients.	Algorithmic automation will be used to streamline the decision-making process by filtering the vast investment ideas against clients' investment parameters (not limited to risk tolerance and time horizon).
Client Materials Development	RPA solutions can enable the extraction of data from multiple sources and assemble presentation materials, and sophisticated visualisation tools that can show complex relationships between news in the context of a portfolio are available to enable the role to make better informed decisions.	While there are opportunities to further automate the material development process, human intervention will remain critical as the information needs to be personalised and show how the suggestions will move the clients closer to achieving their goals.

In the next

3-5 years ...

While algorithms can help to manage a portfolio, human intervention will remain critical for this role. Data analytics and digital tools will be leveraged to deliver robust and timely recommendations, and effectively illustrate the value that can be delivered to clients.

Skills Differentiators:

- ▶ **Advanced Digital Acumen/Literacy:** The job holder will continuously upskill to be proficient in using sophisticated software/programs.
- ▶ **Data Interpretation and Analysis:** The skills to analyse and interpret quantitative and qualitative data and subsequently translate it into insights and investment recommendations will remain essential.
- ▶ **Lateral Thinking:** The job holder will demonstrate the ability to connect the dots using all the data available, enabling the job holder to see the big picture of how a new piece of information can affect the performance of the portfolio.
- ▶ **Stakeholder Engagement:** The job holder will maintain productive working relationships with internal and external stakeholders to deliver effective portfolio management strategies.
- ▶ **Customer Mindset:** This is vital for the job holder to tailor solutions that will help their clients to move closer to achieving their investment goals in a given timeframe.





Subsector: Private Banking

Job Family: Research

Impact Level

Today, the job holder in this role conducts fundamental analysis on companies or asset classes to provide institutional clients, retail clients and in-house Traders with in-depth research and analysis.

Medium Impact

Consolidated Activities

	Today	Future
Primary Research	Execution requires engaging with personal networks/relationships to gather information that is not publicly available.	In the longer-run, advanced AI technologies such as facial recognition may help to support the process of and generation of differentiated/alternative interpretations of information.
Secondary Research	Execution is repetitive and can be enabled by technology.	Advanced Analytics engines can mine unstructured data from non-traditional sources and combine the results with structured data (e.g., earnings data, company reports).
Financial Modelling and Analysis	Execution requires technical expertise/knowledge and can be enabled by technology. Machine learning is seen to develop complex financial models.	Automated quantitative capabilities will answer questions within minutes, where they once would have taken days to research.
Business Development and Report Generation	Execution is advisory in nature, but there are aspects that can undergo straight-through processing. RPA is used for the generation of research reports in standardised formats.	Communication via digital platforms enables targeted push-research. AI (natural language generation) also has the potential to generate reports and commentary.

In the next

3-5 years ...

As the repetitive data gathering tasks are replaced, this role will evolve to become more advisory. As such, the job holder will be able to focus on various industries or select a specialised area to provide differentiated and value-added ideas.

Skills Differentiators:

- ▶ **Advisory:** The ability to deliver high quality and value-added advice, based on an objective interpretation of clients' contexts as well as their specific needs will be critical.
- ▶ **Data Storytelling:** The job holder will need to be able to disseminate key messages/findings from research/analysis in a compelling, impactful, and easy-to-understand manner to audiences with varying levels of interest.
- ▶ **Lateral Thinking:** The job holder will be required to handle larger data sets and will therefore need to be able to 'connect-the-dots' whilst staying focused on the big picture.
- ▶ **Advanced Digital Acumen/Literacy:** As banks gradually move away from excel-based tools, job holders will need to become proficient in using advanced statistical analysis software or other tools.
- ▶ **Data Interpretation and Analysis:** The analysis and interpretation of both quantitative and qualitative data will be a critical.





Subsector: Private Banking

Job Family: Wealth Planning

Impact Level

Today, this role is responsible for developing and implementing wealth plans for private clients to help them meet their personal objectives.

Medium Impact

Consolidated Activities

	Today	Future
Credit Requests Analysis	Banks are using financial planning software to perform tax analysis, estate planning and modelling scenarios for alternative plans.	In using AI tools to support the analysis of data to determine client's financial status, anticipate expenditures and forecast income patterns, it will enable the role to provide recommendations in a proactive manner.
Financial Advice	Execution involves discussion on investment performance, economic, and market trends as well as customised planning strategies based on client's investment objectives, risk tolerance and asset allocation. The process is largely human-centered. Banks are seeing the opportunity to leverage technology to facilitate the process.	A hybrid model (human advice and robo-advisors) will be used to enhance service delivery to clients. Incorporated with filtering tools/probing questions to learn about clients decision factors, online portals will be able to offer general information about the products or simple advice that will best fit the client's demographics, goals, and needs.

In the next

3-5 years ...

While this role will be augmented with the implementation of advanced tools, they are expected to be hands-on in the design process, assist in on-going review to ensure appropriateness, and understand the assumptions and logic embedded in the algorithms.

Skills Differentiators:

- ▶ **Automation Management:** This is critical for the job holder to oversee the automated systems, ensuring that logic rooted in the algorithms is accurate, and focus on opportunities for continuous improvement.
- ▶ **Customer Mindset:** Being able to understand clients needs, objectives, and to resolve complex customer-centric problems will continue to be vital.
- ▶ **Advanced Digital Acumen/Literacy:** The job holder will continuously upskill to be proficient in using advanced statistical analysis software and other digital tools.
- ▶ **Data Interpretation and Analysis:** The job holder will need skills to analyse and interpret quantitative and qualitative data to subsequently translate that into insights and recommendations.
- ▶ **Influencing and Negotiation:** The job holder will demonstrate the ability to disseminate and if necessary, defend the validity of their ideas; ultimately, aligning with the client's way of thinking.



RPA



Advanced Analytics



AI



Subsector: Private Banking

Job Family: Relationship Management

Impact Level

Today, this role is responsible for sourcing new clients and developing a deep understanding of client segments, including client dynamics and challenges.

Low Impact

Consolidated Activities

	Today	Future
New Business and Client Acquisition	Execution is relationship-based. In order to build a sustainable client portfolio, bankers will work towards gaining client's trust and look out for their clients' interests.	A hybrid model (human advice and robo-advisors) can be used to enhance service delivery to clients. Robo-advisors can help to expand the client base, but private banking is a "human business" – focusing on building relationships and gaining trust from clients.
Client Relationship Management	Execution requires personal networks and involves frequent face-to-face meetings with clients to define investment goals.	Robo-advisors will be able to provide simple advice to clients – i.e., sharing of latest market insights, overview of investment products, leaving the private bankers to follow-up and offer more sophisticated advice based on client's customised needs.
Portfolio Management and Investment Advice	Execution involves working closely with other stakeholders (i.e., Financial Planners) within the firm to create individualised investment strategies for clients.	This will be enabled by technology, with predictive analytics assisting this role to conduct trend analysis on financial products and market information, providing clients with targeted product recommendations.

In the next

3-5 years ...

With the rise of inter-generational wealth shifts, this role will be expected to adopt a digital mindset and perform in a "high touch, high tech" environment.

Skills Differentiators:

- ▶ **Influencing and Negotiating:** This skill is essential for the job holder to disseminate and if necessary, defend the validity of their ideas, ultimately, helping to align with the client's way of thinking.
- ▶ **Advanced Digital Acumen/Literacy:** The job holder will upskill to operate using new digital tools to supplement their day-to-day operations.
- ▶ **Product Awareness:** The job holder will possess in-depth financial product knowledge to be able to explain how different investment products are structured and how are they applicable to their client's needs.
- ▶ **Advisory:** The job holder will need to apply the right advisory strategy to provide investment advice to their clients.
- ▶ **Customer Mindset:** The job holder will need to use Advanced Analytics to enhance their client understanding and develop insights and recommendations that are customised to their needs.



Subsector: Asset Management

Job Family: Client Servicing

Impact Level

Today, this role is responsible for all operational aspects of client service, from onboarding to managing transitions, as well as handling enquires on fund performance and report dissemination.

High Impact

Consolidated Activities

	Today	Future
KYC Check	Execution is laborious as the existing onboarding systems enforce one-size-fits-all checklists for KYC information collection.	AI powered systems would incorporate a high number of attributes into screening processes, enabling a holistic view and providing a more reliable outcome. In addition, API and cloud-based solutions can enable automated data cleansing, remediation and monitoring to improve onboarding time.
Client Servicing	Execution of task can be supported by technology. Business intelligence tools are used to provide real-time dashboards of client portfolios, helping this role navigate data to address first-level questions in a targeted manner, enhancing the client dialogue.	Leveraging self-service portals and chatbots, clients are able to obtain answers to basic inquiries without human intervention. However, due to the highly bespoke nature of Asset Management clients, the use of Chatbots have not been widely tested today, in comparison to other sectors.
Transition Management	Execution of task requires deep technical knowledge and human judgment.	Technology is not likely to impact the execution of this task as deep technical knowledge and human judgment remain critical.

In the next

3-5 years ...

Digital platforms will enable clients to view portfolios and check status' in real-time, allowing a "self-service" feature to enhance the client experience. They will focus on more strategic/complicated tasks – i.e., transition management.

Skills Differentiators:

- ▶ **Stakeholder Engagement** The job holder will be highly skilled to liaise with internal and external stakeholders, effectively eliciting stakeholders' views and developing consensus.
- ▶ **Advanced Digital Acumen/Literacy:** Apart from upskilling to be proficient in using advanced digital tools, the job holder will need to gain strong understanding on machine/deep learning powered solutions and how technology solutions and its features can be further leveraged/enhanced to support the business.
- ▶ **Customer Mindset:** The job holder will need to be closer to the customer to better understand their needs, concerns, and put together solutions to resolve their queries.
- ▶ **Risk Awareness:** It is important for the job holder to possess strong risk acumen to understand AML typologies and high risk client types.
- ▶ **Technology Troubleshooting:** The job holder will need to display the ability to assist clients in resolving basic technical issues on self-service platforms.





Subsector: Asset Management

Job Family: Fund Accounting

Impact Level

Today, this role is responsible for the preparation and reporting of fund financial statements, and monitoring cash positions as well as overall liquidity of the fund.

High Impact

Consolidated Activities

	Today	Future
Financial Statements Preparation	Execution is manual. It involves the use of excel workbooks and can be prone to errors. Automation tools are adopted to streamline the statement production process and achieve cost efficiency.	Third-party solutions will continue to be leveraged to reduce risk of human error and manipulation, allowing the role to focus on value-added tasks e.g., validation, evaluation of new disclosure requirements, and vendor management etc. RPA supports automated distribution of financial statements and tax reports to external auditors.
Net Asset Value (NAV) Calculation	Execution is manual and error-prone. Asset management firms have moved away from the use of spreadsheet based solutions and have automated the NAV validation processes.	Blockchain solutions could offer significant efficiency improvements by performing daily NAV calculation processes in a few minutes.
Cash Positions Monitoring and Fund Liquidity	Execution requires validation and reconciliation, which can be supported by technology to reduce human error. RPA tools can enable cash and asset reconciliations against the records of the custodian.	API can enable the direct extraction of data (e.g., corporate actions, stock prices) from one system to another.

In the next

3-5 years ...

Many tasks performed by this role will continue to be outsourced to fund accounting software. Moving forward, this role will provide oversight, exception management and coordinate with third-party service providers.

Skills Differentiators:

- ▶ **Project Management:** This skill is essential for the job holder to deliver project objectives, key requirements and gain support from key stakeholders to implement actions that drive project success.
- ▶ **Advanced Digital Acumen/Literacy:** The job holder will possess strong understanding on how solutions can be further leveraged to support the business, and learn the technical features to better liaise with vendors
- ▶ **Complex Problem Solving:** The job holder will need to examine sophisticated cases that are escalated and leverage available resources to develop and execution solutions.
- ▶ **Business and Financial Acumen:** The job holder will possess commercial awareness to work effectively with business units and senior management in developing key requirements and addressing business needs.
- ▶ **Change Management:** The job holder will have the mindset and ability to drive effective change; ultimately improving the adoption of AI/digital solutions to support their day-to-day operations.





Subsector: Asset Management

Job Family: Performance Management

Impact Level

Today, this role is responsible for accurate calculation and reporting of portfolio returns, as well as ensuring performance analytics are incorporated and communicated into client presentations as appropriate.

High Impact

Consolidated Activities

	Today	Future
Portfolio Return Calculation	Execution is repetitive and typically rule based. Poor data quality may slow down performance calculations. Hence, asset management firms are driving initiatives to improve data and reduce onerous manual effort.	RPA technology will be leveraged to enable the extraction of data from multiple sources to reduce human errors, validate fund performance or portfolio data, and enable automated report generation and dissemination.
Performance Analytics	As volume increases, completion of attribution analysis can be time consuming.	Technology enabled with Advanced Analytics can enable the deconstruction of excess return to attribute it to the various investment decisions.
Stakeholder Reporting	Execution can be supported by digital platforms/technologies, with the increasing use of visual materials.	The rise of dashboards or digital apps could potentially deliver real-time reporting. Chatbots can also be used to interact with stakeholders and answer simple inquiries with regards to fund performance.
Factsheet Creation	Execution is fairly repetitive and mundane. Many asset management firms have adopted factsheet automation solutions.	Automated solutions will continue to be leveraged for factsheet creation, lightening up the workload and minimising human errors.

In the next

3-5 years ...

The experience and technical knowledge of this role will remain critical to steer/identify causes of excess returns. This role is also expected to provide technical support and guidance for new products and initiatives.

Skills Differentiators:

- ▶ **Automation Management:** The job holder will upskill to oversee automated systems, ensuring that operations requirements are met, and focusing on the continuous improvement of automated solutions.
- ▶ **Process Excellence:** With good understanding of the existing operations, the job holder can help to highlight the root cause of process inefficiencies and identify the right processes for automation.
- ▶ **Complex Problem Solving:** The job holder will need to examine complex cases that are escalated and leverage available resources to develop and execute solutions.
- ▶ **Data Storytelling:** The job holder will display the ability to disseminate key messages/findings in a clear and compelling manner to audiences with varying levels of subject matter understanding.
- ▶ **Influencing and Negotiation:** The job holder will possess the ability to display confidence in presenting and justifying the rationale for recommendations or solutions, and gain buy-in from relevant stakeholders.





Subsector: Asset Management

Job Family: Portfolio Management

Impact Level

Today, this role is responsible for providing fund management support, such as execution of investment strategies, portfolio construction based on client guidelines and cash management of team portfolios.

High Impact

Consolidated Activities

	Today	Future
Cash Management	Execution can be tedious and time consuming. Leveraging the technology available today, dashboards can help to display real-time cash positions, receivables, expected timeframe for receivables and payables to ensure timely decision making to achieve optimal efficiency.	Algorithms based on predetermined parameters are able to alert the role when there are excess cash balances.
Trade Order Monitoring	Execution is rule-based and can be repetitive. Business intelligence tools provide real-time dashboards enabling timely monitoring of trade orders, and ensure corrective action and updates are made in a timely manner.	APIs enable information transfer to and from enterprise systems e.g., trade order management systems to business intelligence programs. For reporting, RPA enables automated status reporting to internal stakeholders, Portfolio Managers, investment team and trading desk personnel, reducing the need for the role to be a liaison across all teams.
Portfolio Construction	N/A	Leverage predictive analytics (and analytics solutions) in constructing enhanced investment decisions. Alternative data sources will also further enhance analysis capabilities.

In the next

3-5 years ...

As technology is increasingly adopted, the job scope of the role is expected to shift. Advisory, human judgment and deep technical expertise will be the focus of this role as it evolves to become a Junior Fund Manager.

Skills Differentiators:

- ▶ **Advanced Digital Acumen:** The job holder will gain strong understanding on machine/deep learning powered solutions and how technology solutions and its features can be further leveraged/enhanced to support the business.
- ▶ **Influencing and Negotiation:** The job holder will have the ability to display confidence in presenting and justifying the rationale for the recommendations or solutions, and gain buy-in from relevant stakeholders.
- ▶ **Lateral Thinking:** The job holder will have the ability to look at the 'big picture' and find the linkage between various information, and ultimately using these information to evaluate investment recommendations/decisions.
- ▶ **Data Interpretation and Analysis:** The job holder will display the ability to interpret data and extract key insights for decisions, recommendations or actions.
- ▶ **Customer Mindset:** This enables the job holder to tailor recommendations that best meet the clients' needs.





Subsector: Asset Management

Job Family: Trade Management

Impact Level

Today, this role is responsible for clearing, settlements, margin and collateral management as well as follow-up with regulatory obligations and corporate actions.

High Impact

Consolidated Activities

	Today	Future
Trade Clearing and Settlement	Rule-based, high volume, document intensive activity which can be enabled by technology. RPA and workflow automation tools are leveraged to automatically update accounts and monitor adherence to payment agreements.	Blockchain could transform transaction documentation, resulting in the redundancy of reconciliation activities, and a reduction in settlement risk.
Collateral and Margin Management	Execution is tedious and involves manual collation of data from multiple sources (e.g., collateral management). Banks have started to leverage RPA tools to handle margin management.	RPA solutions combining machine learning skills will continue to be used in addressing margin calculation, margin calls and valuation and automatically populate terms into margin call management systems. Despite automation, human intervention would be required for complex exception cases.

In the next

3-5 years ...

This role will switch from delivering routine tasks, to exception management, driving initiatives that focus on automating trade support, and facilitating decisions in reducing counterparty credit risk. Human judgment and the ability to design creative solutions will be required.

Skills Differentiators:

- ▶ **Automation Management:** The job holder will upskill to oversee automated systems ensuring that operations requirements are met and focusing on the continuous improvement of machines.
- ▶ **Advanced Digital Acumen/Literacy:** On-going upskilling will be required to ensure the job holder is familiar with new electronic platforms, and capable of using advanced AI-tools.
- ▶ **Process Excellence:** With good understanding of the existing operations, the job holder can help to highlight the root cause of process inefficiencies and identify the right processes that require automation.
- ▶ **Complex Problem Solving:** The job holder will need to examine complex problems that are escalated and leverage available resources to develop and execute solutions.
- ▶ **Risk Awareness:** Deep understanding of risk and control remain crucial. By removing manual processes the job holder can refocus to support the management of counterparty credit risk.





Product Manager

Subsector: Asset Management

Job Family: Product Administration

Impact Level

Today, this role is responsible for product administration, conducting analysis and tracking product performance to inform the development and enhancement of new products.

High Impact

Consolidated Activities

	Today	Future
Product Due Diligence and Registration	Execution is fairly repetitive and document intensive. RPA is used to automate new product registration and documentation based on a set of rule-based conditions.	AI tools can help to validate that product requirements are compliant with market and company regulations, and are able to raise exceptions.
Consumer and Competitive Market Research	Execution is time consuming as they are high volume, but can be supported by technology when clear strategies are established.	Advanced Analytics provide real-time insights into consumer behavior and preferences, enabling targeted product development for specific client channels. Availability of alternative data sources will also enhances analyses.
Product Performance Tracking and Reporting	Asset management firms have started to leverage internal/external solutions to track and monitor product performance post-launch.	Digital technology and Advanced Analytics enable data navigation and real-time product health and performance monitoring/analysis. RPA can execute rule-based instructions to collate data from various applications for report assembly.

In the next

3-5 years ...

Many of the job holders tasks could be outsourced/offshored. Job holder will be required to manage exceptions, provide oversight, and coordinate with third-party service provider.

Skills Differentiators:

- ▶ **Project Management:** The job holder will possess skills to deliver project objectives, key requirements and gain support from key stakeholders to implement actions that drive project success.
- ▶ **Advanced Digital Acumen/Literacy:** The job holder will gain strong understanding on how solutions can be further leveraged to support the business, and learn the technical features to better liaise with vendors.
- ▶ **Data Interpretation and Analysis:** The job holder will need to be skillful in interpreting data to extract key insights for recommendations, decisions or actions.
- ▶ **Business and Financial Acumen:** The job holder will possess commercial awareness to work effectively with business units and senior management in developing key requirements and addressing business needs.
- ▶ **Change Management:** The job holder will have the mindset and ability to drive effective change; ultimately improving the adoption of AI/digital solutions to support their day-to-day operations.





Subsector: Asset Management

Job Family: Trade Management

Impact Level

Today, this role sits in the Middle Office, overseeing trade support and control of trading business. It is responsible for the processing of trades covering the validation, enrichment, and affirmation of trades, and ensuring that all controls are in place.

High Impact

Consolidated Activities

	Today	Future
Trade Booking	Job holders assist front office in ad-hoc booking requests and update middle office systems. Some banks are using RPA and workflow automation tools.	Execution could either be done effortlessly by Traders, or automated entirely.
Trade Enrichment	Execution is document-intensive. Some banks have already automated trade enrichment related tasks.	APIs can enable access to new data sources of additional trade-related information across relevant systems.
Trade Affirmation/ Confirmation	Execution involves issuance of trade confirmation, report trades to regulatory authorities, and issue settlement instructions. Often, STP is applied. For paper-based, technology OCR can enable a similar change.	RPA will continue to be used, enabling automated verification of trade details with counterparties for transactions involving electronic confirmation. Blockchain can also help to streamline the order-to-settlement process and significantly reduce the amount of work.
Pre- and Post-Trade Analytics	Advanced Analytics are applied to model capital, balance sheet and tax impacts pre-trade to better understand the actual trades executed, and gain insights into areas for profit generation.	Taken to the next level, analysis could be performed in real time – alerting the Trader who has not appeared to act appropriately in response to economic or sentiment analysis.
Governance and Control	Execution involves ensuring trades are booked timely on the trade date and anomalous trading activities are escalated and investigated.	The job holder will continue to oversee the control of trading and propose enhancements to improve processes.

In the next

3-5 years ...

Most of the tasks (except trading control) performed by this role will be automated. As exotic trades remain complicated for automation, this role will continue to contribute in complex transactions – e.g., structure and documentation of complex trades.

Skills Differentiators:

- ▶ **Automation Management:** As automation takes place, the job holder will upskill to oversee systems, ensuring that operations requirements are met before seeking continuous improvement opportunities.
- ▶ **Advanced Digital Acumen/Literacy:** On-going upskilling will be required to ensure the job holders are familiar with the new electronic platforms, and capable of using advanced AI-tools.
- ▶ **Process Excellence:** With good understanding of the existing operations, the job holder can help to highlight the root cause of their process inefficiencies and identify the right processes for automation.
- ▶ **Data Interpretation and Analysis:** The job holder will need to be skillful in interpreting data to extract key insights for recommendations, decisions or actions.
- ▶ **Complex Problem Solving:** The job holder will need to examine complex problems that are escalated and leverage available resources to develop and execute solutions.





Subsector: Asset Management

Job Family: Sales and Trading

Impact Level

Today, this role is responsible for executing buy and sell orders across all asset classes (equities, fixed income, money market, FX, commodities) on behalf on an investor.

High Impact

Consolidated Activities

	Today	Future
Order Execution	Automated trading and the development of algorithms are used to execute orders across different asset classes. The collaboration between human and machine is apparent throughout the trade cycle.	Human Traders and automation will continue to coexist to source liquidity and to ensure efficient execution. This role will work closely with Portfolio Managers to add value to the investment process, generate money-making ideas and reduce transaction costs.
Trading Strategy Development	Asset management firms are tapping on trading tools/software to obtain a clear view on the fragmented global information that affect the swings in different asset classes, and incorporate new trading data and analysis to optimise trading strategies.	This role will continue to leverage software and Advanced Analytics to generate new ideas for the portfolio team. It is also possible to take on more programming responsibilities to build their own custom tailored trading strategy using the templates available in software.
Partial Fill Allocation	Execution is rule-based and often repetitive. RPA helps to extract client/user data requirements (e.g., lot size allocation, long/short positions) to calculate partial fill allocations.	RPA solutions will continue to be leveraged.

In the next

3-5 years ...

Moving away from solely execution, buy-side Traders will add value to Portfolio Managers – e.g., demonstrate different trading methodologies and advise on the impact of regulations for best execution. The surge of data also requires them to distil information in the most effective way to asset managers.

Skills Differentiators:

- ▶ **Lateral Thinking:** The job holder will demonstrate the ability to think outside of the box when confronted with a new piece of information or research findings.
- ▶ **Risk Awareness:** The job holder will need to possess strong skills to understand how new regulations can affect execution and associated risks present in execution strategies.
- ▶ **Advisory:** The job holder will need to further develop this skill to apply the right advisory strategy to engage with the portfolio team in different situations.
- ▶ **Data Storytelling:** The job holder will need to be able to disseminate key messages and findings from research and analysis in a compelling, impactful, and easy-to-understand manner to audiences with varying levels of interest.
- ▶ **Advanced Digital Acumen:** The job holder will gain a strong understanding on AI-powered solutions and how technology solutions and its features can be further leveraged/enhanced to support the business.





Transaction Processing Officer

Subsector: Asset Management

Job Family: Operations

Impact Level

Today, this role is responsible for accurate processing of transactions for the products and services provided to the client.

High Impact

Consolidated Activities

	Today	Future
Document Verification	Execution is document intensive. Identity document verification technology can be used to authenticate and perform checks on different types of identity documents, including authenticity of the client's signature.	Blockchain could significantly shorten the document verification processes by providing a common shared platform that allows participating users to store, retrieve and remotely access documents.
Transaction Submissions and Processing	Execution is rule-based and repetitive. RPA has been leveraged to process transactions around the clock, achieving improved productivity.	RPA will continue to be leveraged, and AI will improve the approval rates of transactions by examining the transactions in an account to detect suspicious transactions.
Transaction Records Filing	Execution is document intensive. RPA can automate the scanning and indexing of transaction records. These records can be stored on the cloud to eliminate the need for off-site facilities and computer hard drives.	With the potential rise of blockchain, asset management firms could no longer need to spend time on documentation and filing.

In the next

3-5 years ...

Automation/advanced technology will remove a lot of laborious and repetitive tasks, freeing up time for this role. In short, this role will see a potential convergence of job roles with other back office functions.

Skills Differentiators:

- ▶ **Automation Management:** The job holder will upskill to oversee automated systems, ensuring that operations requirements are met and focusing on the continuous improvement of machines.
- ▶ **Advanced Digital Acumen/Literacy:** On-going upskilling will be required to ensure the job holder is familiar with new electronic platforms, and capable of using advanced AI-tools.
- ▶ **Process Excellence:** With good understanding of the existing operations, the job holder can help to highlight the root cause of process inefficiencies and identify the right processes that require automation.
- ▶ **Complex Problem Solving:** The job holder will need to examine complex problems that are escalated and leverage available resources to develop and execute solutions.
- ▶ **Technology Troubleshooting:** The job holder will need to display the ability to assist clients in resolving basic technical issues on different platforms to ensure seamless transaction processing.





Subsector: Asset Management

Job Family: Asset Servicing

Impact Level

Today, this role is responsible for maintaining records of shareholder accounts, calculating and disbursing dividends, preparing shareholder account statements, tax statements and other shareholder notices.

High Impact

Consolidated Activities

	Today	Future
Shareholder Record Keeping	Firms are looking for opportunities to streamline the record keeping system, allowing them to track the flow of shareholder financial/non-financial correspondences more effectively.	Blockchain could be able to record transactions while reducing risk. Digital technology will improve efficiency in account opening, documentation uploading and reporting.
Transaction and Dividend Processing	The process for dividend processing and information sharing can be onerous and manual. Many firms have already leveraged STP to streamline service delivery.	STP leveraging APIs and cloud technology to network data streams enables processing to be automated, assisting in identifying exceptions.
Account Services and Inquiry Resolution	Execution often involves the intervention of the call centre to be assisted by the respective agents. Asset servicing firms are gradually using solutions that enable real-time access to portals – allowing shareholders to view their account details and make transactions around the clock.	Chatbots are able to provide first-level answers to shareholder queries and requests for information such as account statements, account balances and transaction confirmations.
Process Subscriptions and Redemptions	RPA enables information to be extracted and validated from other enterprise systems and databases to process subscriptions or redemptions.	Blockchain could be able to process fund subscriptions and redemptions, without the intervention of an intermediary.

In the next

3-5 years ...

The role could be threatened with the rise of Blockchain (and the fall of legacy systems). The services offered must be reinvented to meet the new regulatory standards. Data analysis capacity must also be improved to provide Asset Managers with information on fund distribution/investor profiles.

Skills Differentiators:

- ▶ **Systems Thinking:** The job holder will possess strong understanding of how systems work over time and within the context of larger systems, ensuring successful implementation/integration of technology solutions.
- ▶ **Process Excellence:** With good understanding of the operations, the job holder can help to highlight the root cause of their process inefficiencies and identify the right processes that require automation.
- ▶ **Project Management:** This skill is vital for the job holder to implement improvements and new solutions in a timely manner, ensuring successful roll-outs.
- ▶ **Advanced Digital Acumen/Literacy:** The job holder will need to be upskilled to further enhance the solutions in order to better support the needs of asset management firms.
- ▶ **Data Storytelling:** The job holder will display the ability to disseminate key messages/findings in a clear and compelling manner to audiences with varying levels of subject matter understanding.





Subsector: Asset Management

Job Family: Research

Impact Level

Today, this role is responsible for providing insightful advice based on the application of economic theory and knowledge particularly in the behaviour of the aggregate economy covering various phenomena.

Medium Impact

Consolidated Activities

	Today	Future
Secondary Research (e.g., economic reports, monetary policy shifts)	The nature of the task is rule based and document intensive. Traditionally, execution is time consuming.	APIs enable faster and in some cases, real-time access to information. AI (NLP) is able to decode voluminous sources of information, reducing the effort associated with manual research activities.
Economic Modelling and Analysis	Technical expertise/knowledge are required to conduct economic and sectoral analysis as well as forecast.	Applying machine learning in the development of complex economic models – e.g., economic growth prediction. Automated quantitative capabilities will help to answer questions more quickly that were previously very time consuming.
Economic Outlook Insights and Report Generation	Execution requires deep technical knowledge, and is advisory in nature – i.e., present economics views to clients, but it also has aspects that can undergo STP.	AI (NLG) has the potential to generate reports and commentary but there are limitations as these models are less likely to account for irrational and out of the 'norm' behaviours and trends.

In the next

3-5 years ...

As data mining and manual research tasks are being completed faster than before, this role would focus on incorporating subjective data to boost the robustness of data-driven models.

Skills Differentiators:

- ▶ **Data Storytelling:** The job holder will possess the skill to present results in an easily understood and persuasive manner to ensure that arguments/analysis outcomes are readily accepted.
- ▶ **Advisory:** Despite data analytics and automation, the job holder will need to apply the right advisory strategy to provide economic advice and recommendations.
- ▶ **Programming and Coding:** Coding proficiency allows the job holder to run/evaluate complex mathematical models and simulations. They are required to keep up with the new programming languages in the future.
- ▶ **Analytics and Computational Modelling:** Displaying solid quantitative/modeling skills is foundational for this role, and continue to be important despite advancements in automation. However, instead of utilising Excel, the job holder may leverage advanced statistical tools to build/maintain econometrics models. Hence, **advanced digital acumen/literacy** may be important in the future.





Subsector: Asset Management

Job Family: Investment Management

Impact Level

Today, this role is responsible for portfolio construction, asset allocation and managing client portfolios according to client investment goals and parameters.

Medium Impact

Consolidated Activities

	Today	Future
Client Management	Execution requires strong personal network and relationship building, but can be supported by technology.	Digital applications support job holders in conducting client investment needs assessments (e.g., investment goals, time and risk appetite).
Risk Analysis and Portfolio Construction	Execution requires technical expertise and knowledge, however, technology can help to augment it. Predictive analytics are gradually being used to forecast events and trends in the future based on historical data.	Algorithmic- and analytics solutions are used to streamline the decision-making process through "filtering" investment ideas against defined parameters. Alternative data sources will also further enhance analysis capabilities.
Trades Recommendation	While AI can be used to support the execution of this task, human judgment and deep technical expertise remain critical – i.e., decision to sell or buy – it is not possible for technology to replace it entirely.	The combination of AI and human judgment will continue to play a vital part in execution. Communication with Traders to execute the trades can be enabled through RPA.
Client Materials Development	RPA can enable the extraction of data from multiple data sources and assemble presentation materials and investment proposals into standardised templates. Human intervention will remain essential in personalising the materials for client's unique needs.	RPA combined with human judgment and technical expertise remain critical to offer personalised materials to clients.

In the next

3-5 years ...

Technology will continue to be adopted to support data gathering and improve recommendations. Moving forward, the key differentiator of the role is the technical expertise/judgment that can steer the basis/direction of analysis, ultimately translating into the quality of investment decisions.

Skills Differentiators:

- ▶ **Influencing and Negotiation:** The job holder will have the ability to display confidence in presenting and justifying the rationale for the recommendations, and gain buy-in from relevant stakeholders.
- ▶ **Lateral Thinking:** The job holder will have ability to look at the 'big picture' and find the linkage between information, ultimately, using these information to evaluate investment recommendations/decisions.
- ▶ **Advanced Digital Acumen:** The job holder will gain strong understanding on AI-powered solutions and how technology solutions and its features can be further leveraged/enhanced to support the business.
- ▶ **Customer Mindset:** This enables the job holder to tailor recommendations that best meet clients' needs.
- ▶ **Risk Awareness:** In-depth knowledge in this area is vital for the job holder to understand any associated risk present in products/recommendations, and be able to judge whether an investment suits the client.





Subsector: Asset Management

Job Family: Product Development

Impact Level

Today, this role is responsible for identifying market trends and opportunities in order to develop new products as well as enhance existing products according to client needs and requirements.

Medium Impact

Consolidated Activities

	Today	Future
Competitive Market Research	Execution requires deep technical knowledge and a high level of judgment to formulate research strategies and research parameters to be captured by algorithms.	Advanced Analytics tools can be used to speed up the data collation process, and extract key consumer insights in a shorter timeframe.
Products Design and Enhancement	Execution requires deep technical knowledge, an innovative mindset, and a high level of judgment to design and assess interventions for over- and under-performing products.	While product design requires innovative mindset, AI and Advanced Analytics can support "what-if" analysis and scenario testing to ensure effective product design.
Internal and External Client Engagement	Execution requires human interaction, personal networks and relationships.	Digital platforms may assist in enhancing client conversations, and enabling real-time information sharing.
Product Performance Monitoring	Asset management firms have started to leverage internal/external solutions to track and monitor product performance post-launch.	Digital technology can enable real-time product monitoring. Advanced Analytics can also be applied to better understand the root causes.
Product Design Implementation	Execution involves overseeing fund launches, repositioning, maintenance and closures, or other related product design/delivery tasks required by the business.	Technical expertise and human judgment will remain critical in delivering complex projects.

In the next

3-5 years ...

The nature of this role requires deep technical expertise, knowledge and judgment, hence, data and technology will be leveraged to augment the product design/refinement decisions.

Skills Differentiators:

- ▶ **Project Management:** The job holder will need to display ability to deliver project objectives, manage working groups, and ensure key activities are implemented to drive project success.
- ▶ **Influencing and Negotiation:** The job holder will display confidence in presenting and justifying the rationale for the design recommendations, and gain buy-in from relevant stakeholders.
- ▶ **Stakeholder Engagement:** The job holder will be highly skilled to liaise with internal and external stakeholders, effectively eliciting stakeholders' views and developing consensus.
- ▶ **Customer Mindset:** This enables the job holder to curate solutions that best meet their clients' requirements, as well as align with strategy defined by the firm.
- ▶ **Data Storytelling:** With more information gathered and analysed, the job holder will possess skills to effectively convey findings/messages to different audiences.





Subsector: Asset Management

Job Family: Research

Impact Level

Today, this role responsible for conducting research and providing investment recommendations to investment teams.

Medium Impact

Consolidated Activities

	Today	Future
Primary Research	Execution requires personal networks/relationships and involves soliciting information that is not publicly available.	In the longer-run, advanced AI technologies such as facial recognition may help support the process of and generation of differentiated/alternative interpretations.
Secondary Research	The nature of the task is rule based and document intensive. Traditionally, execution is time consuming.	Advanced Analytics engines can mine unstructured data from non-traditional sources and combine the results with structured data (e.g., earnings data, company reports). Powerful insights could also be drawn through analytics applied to IoT enabled systems.
Valuation and Analysis	Despite being enhanced by technology, technical expertise is required to inform the direction of the analyses.	Predictive analytics, machine learning algorithms and AI are able to automate analysis based on pre-set parameters more efficiently and accurately.
Investment Recommendation Compilation	Execution can be supported by RPA, enabling the extraction of data from multiple sources or databases for information assembly, on the condition that a standardised template is provided.	Despite the automation opportunity, technical expertise and human judgment remain critical to validate and tailor the content.

In the next

3-5 years ...

The efficiency in the data gathering will improve and strengthen analysis by incorporating alternative data sources. Moving forward, this role will leverage analytics coupled with human judgment, experience and foresight to steer the direction and basis of analysis.

Skills Differentiators:

- ▶ **Advisory:** The job holder will display the ability to deliver high quality and value added advices, based on objective interpretation of clients' contexts as well as their needs.
- ▶ **Data Storytelling:** The job holder will display the ability to disseminate key messages/findings in a clear and compelling manner to audiences with varying levels of subject matter understanding.
- ▶ **Lateral Thinking:** The job holder will be required to handle larger sets of data, hence, the ability to 'connect-the dots' and stay focused on the big picture.
- ▶ **Advanced Digital Acumen/Literacy:** As banks gradually move away from Excel-based tools, the job holders will be upskilled to be proficient in using advanced statistical analysis software or other tools.
- ▶ **Data Interpretation and Analysis:** The job holder will possess skills to analyse and interpret quantitative and qualitative data.





Subsector: Asset Management

Job Family: Investment Management

Impact Level

Today, this role is responsible for investing in alternative investments, managing the portfolio of investments and providing post-deal advisory to maximise returns.

Low Impact

Consolidated Activities

	Today	Future
New Investment Opportunities Identification	Execution requires deep technical knowledge, experience and a high level of judgment.	Human judgment and technical expertise will remain critical in executing the task.
Deal Closure Negotiation	Execution requires deep technical knowledge and a high level of judgment for bespoke and complex situations.	
Investments Management	Execution can be enabled by technology, particularly for real-time monitoring activities.	Digital technology and dashboards provide real-time status updates and performance tracking. Advanced Analytics (predictive analytics) can enable forecasting of potential events and trends that may impact company performance, supporting the decision-making process.
Post-Deal Advisory	Execution requires deep technical knowledge, experience and a high level of judgment.	Advanced Analytics (or predictive analytics) can potentially play a role in enabling “what-if” analysis to forecast potential outcomes, supporting the Alternatives Partner in providing advice to management.

In the next

3-5 years ...

Technology will have limited impact on the role – due to the high level of human judgment, deep technical knowledge, and bespoke/complex deals. There will be an increasing use of predictive analytics to support the investment decision-making process.

Skills Differentiators:

- ▶ **Lateral Thinking:** The job holder will have the ability to look at the ‘big picture’ and find the connections between various datasets, and ultimately use this information to evaluate investment opportunities.
- ▶ **Global Perspective:** A robust understanding of the global market/economy and the corporate landscape will remain a critical element.
- ▶ **Influencing and Negotiation:** The job holder will have the ability to display confidence in presenting and justifying the rationale for the solution, and gain buy-in from relevant stakeholders.
- ▶ **Data Interpretation and Analysis:** The job holder will display the ability to interpret data and extract key insights for decisions, recommendations or actions.
- ▶ **Data Storytelling:** The job holder will display the ability to disseminate key messages/findings in a clear and compelling manner to audiences with varying levels of subject matter understanding.





Distribution Manager

Subsector: Asset Management

Job Family: Distribution

Impact Level

Today, this role is responsible for acquiring and maintaining client relationships – institutions and intermediaries – while delivering the firm's service and product capabilities to clients.

Low Impact

Consolidated Activities

	Today	Future
Client Acquisition	Execution involves human interaction, long-term relationship building and may involve bespoke and complex products and services.	Predictive analytics and AI can anticipate client requirements through analytics-based selling.
Client Engagement	Execution requires human interaction, long-term relationship building and involves bespoke and complex products and services.	Digital technology augments this task by providing real-time dashboards and instant "what-if" scenario testing, enhancing client conversations. AI (NLP) and sentiment analysis enables the relationship management team to anticipate and respond to client queries in a targeted manner, enhancing the client experience.
Client Service Optimization	Execution requires handling bespoke and complex situations, requiring a high degree of human judgment.	Big data and Advanced Analytics enable targeted diagnosis of complex client service issues and complaints, identifying trends that lead to service deficiencies.

In the next

3-5 years ...

The nature of this role is highly strategic in nature. While technology can support the activities and tasks, it will not have a significant impact on the way day-to-day work is performed. With the rise of digital technologies, this role will need to be adept with multiple tools and platforms.

Skills Differentiators:

- ▶ **Data Storytelling:** The job holder will display the ability to disseminate key messages/findings in a clear and compelling manner to audiences with varying levels of subject matter understanding.
- ▶ **Data Interpretation/Analysis:** The job holder will display the ability to interpret data and extract key insights for decisions, recommendations or actions.
- ▶ **Influencing and Negotiation:** The job holder will have ability to display confidence in presenting and justifying the rationale for recommendations, and gain buy-in from relevant stakeholders.
- ▶ **Advisory:** The job holder will have the ability to apply the right advisory strategies to engage with clients in a variety of different situations.
- ▶ **Stakeholder Engagement:** The job holder will be highly skilled to liaise with internal and external stakeholders; effectively eliciting stakeholders' views and developing consensus.





Subsector: Insurance

Job Family: Claims Examiner

Impact Level

Today, this role is responsible for filing claims, analysing and investigating claims, facilitating settlement of claims and managing other customer relationship matters such as negotiation and complaints.

Retail: ██████████ High Impact
 Non-Retail: ██████████ Medium Impact

Consolidated Activities

	Today	Future
Claim Filing and General Claims Enquiries	Execution is tedious as it is high volume and document intensive in nature. There is typically not much human judgment or critical thinking required to perform these tasks.	First Notice of Loss (FNOL) and basic general enquiries can be addressed via digital channels enabled by Chatbots. AI can help process simple and basic claims. This would reduce the time required to perform these tasks, freeing up the job holder to attend to more complex claims.
Data Entry and Data Validation	Execution is time consuming and tedious as the volume of data involved is usually rather large.	RPA can be implemented to eliminate the need for manual data entry and allow the role to focus on more complex tasks.
Manual Claims Assessment	Execution is time consuming and administrative in nature. This task is repetitive, high in volume and largely rule-based. However, human judgment and evaluation is still required for more complex, larger claims.	Text mining tools can be used to identify payable and non-payable items on e-forms and uploaded documents. Automated fraud detection systems will help to identify claims that need attention, and escalate complex cases for claim examiners to handle.
Payment Approval and Calculation	Execution is largely administrative and simple in nature. However, this task is usually high in volume, which can be time consuming to finish processing.	Advanced Analytics and machine learning solutions can be used to assess the validity of claims and recommend an outcome/payment amount.
Complicated Case Review	Execution requires investigation and critical thinking skills to help evaluate the urgency and the authenticity of the claim. This task requires higher order thinking and each case is usually unique.	The job holder in this role will continue to rely on complex thinking and investigation skills to carry out task. In the future, however, the role will be able to incorporate data analytics and AI to gather real-time data and facts of the incident to help judge the authenticity of the claim.

In the next

3-5 years ...

This role will evolve to assist customers with more technical services related issues as customers continue to adopt digital applications. In addition, this role can shift to include more sales related activities due to improved customer data analytics.

Skills Differentiators:

- ▶ **Investigation:** With AI increasingly able to take over simpler settlements process, the job holder will require strong skill in conducting investigations of questionable claims and identifying root causes of complex claims.
- ▶ **Data Interpretation and Analysis:** The job holder must carefully consider and interpret various pieces of information to reach a decision. This skill will also become more important when insurers shift towards a preventive model.
- ▶ **Advanced Digital Acumen:** Strong digital acumen is needed to understand the features of digital tools and to utilise them to achieve seamless processing.
- ▶ **Research:** The skill will remain important as job holders need to remain well-informed around new medical procedures and the latest prescription drugs.
- ▶ **Complex Problem Solving:** The job holder will need to examine complex cases that are escalated and leverage available resources to develop and execution solutions.





Subsector: Insurance

Job Family: Customer Service

Impact Level

Today, the job holder is responsible for handling enquiries, issues, and customer service related requests.

High Impact

Consolidated Activities

	Today	Future
Enquiry Resolution	Execution is repetitive and simple in nature. However, communication and stakeholder engagement skills are still required.	Advanced Analytics and AI will support digital self-service platforms, possibly incorporating Chatbots (with natural language processing capabilities) which will respond to customers' needs in the same way that representatives currently do. Contact Centre Representatives can then focus on handling more complex enquiries, or even carry out sales related activities.
Data Entry and Issue Log Tracking	Execution is administrative in nature and demands much cognitive thinking or human judgment. It is also very rule-based and high in volume.	RPA will assist to consolidate information gathered from various digital sources to simplify the interpretation of data and trends, reducing time needed for manual completion.
Customer Issues/Inquiries Reporting (Specific to product/service)	Execution generally follows a standard operating escalation procedure.	Chatbots can assist to resolve simple enquiries which will allow the job holder to focus on more complex queries. IoT connected devices along with APIs could help to track pain points for more proactive approaches to deriving solutions rather than reacting to customer inquiries.
Cross-selling and Upselling	Execution requires an understanding of the customer profile to identify products to upsell. This task also calls for excellent communication and influencing skills that persuade and entice customers to purchase these products.	By leveraging Advanced Analytics, useful customer data can be obtained to provide Contact Centre Representatives with visibility of the customer's profile. They will be better positioned to recommend a bespoke range of products for cross-selling/upselling.

In the next

3-5 years ...

This role will evolve to assist customers with more technical services related issues as customers continue to adopt digital applications. In addition, this role can shift to include more sales related activities due to improved customer data analytics.

Skills Differentiators:

- ▶ **Data Interpretation and Analysis:** The job holder will display ability to make sense of data that is provided in various formats to create improved cross and up-selling opportunities.
- ▶ **Technology Troubleshooting:** The job holder will handle basic troubleshooting to assist customers with digital application support.
- ▶ **Automation Management:** The ability to help train chatbots and provide recommendations will help to improve capabilities in servicing customers.
- ▶ **Target Technical Sales:** Given enhanced customer profiles, the job holder will be able to have more targeted customer conversations, which can lead to potential for higher sales conversions.
- ▶ **User Experience Design:** The ability to advise customers and provide suggestions around design improvements will help the job holder to ensure that customer preferences are captured in the design of new features.





Subsector: Insurance

Job Family: Operations

Impact Level

Today, this role is responsible for managing workflow and improving the quality and time required for new business processes.

High Impact

Consolidated Activities

	Today	Future
Application Processing (Workflow Management System)	Execution is repetitive and document intensive. The process is usually time consuming due to the high volume of applications.	RPA will eliminate the need for manual document review, and improve both the speed and efficiency of data entry, thereby reducing processing time and potential for manual errors.
KYC Review	Execution is largely administrative in nature, and requires manual verification of paper based documents.	Advanced Analytics and AI can be used to screen for potential risk areas. This would greatly reduce manual processing time and allow individuals to focus on complex or abnormal cases.
Complex Sales Inquiries Resolution	Execution requires strong communication skills to advise contact centre representatives or other first-line customer service roles on how to resolve these enquiries.	Digital self-service channels will be aided by the incorporation of AI, which can be used to route customers to the correct qualified representative and provide the first-line of screening to filter out simpler inquiries, reducing the number of cases that require additional follow up and increasing the efficiency of the resolution process.

In the next
3-5 years ...

Given that this role may be highly impacted, it is likely to see convergence with other client servicing type roles. In addition, the role will handle the most complex cases and continually need to remain updated about new offerings to ensure that information is accurately captured and processed.

Skills Differentiators:

- ▶ **Lead Virtual Teams:** Working collaboratively with teams that are dispersed across multiple locations will become more and more commonplace, leading to a need to adapt to working styles.
- ▶ **Advanced Digital Acumen/Literacy:** Understanding the variety of disruptive technologies available will help the job holder identify opportunities for process improvements.
- ▶ **Process Excellence:** Given the in-depth knowledge on application processing, the job holder can help to highlight the root cause of process inefficiencies and identify the right processes that require automation.
- ▶ **Automation Management:** As RPA solutions become more widely used to convert processes, the job holder will need to understand the underlying construct and continually look for opportunities for improvement.
- ▶ **Complex Problem Solving:** The job holder will need to examine complex cases that are escalated for review, and leverage available resources to develop and execution solutions.





Policy Servicing Officer

Subsector: Insurance

Job Family: Policy Management

Impact Level

Today, this role is responsible for policy administration, premium settlement and handling of policy-related enquiries and ensuring quality service delivery.

High Impact

Consolidated Activities

	Today	Future
Policy Documentation and Issuance	Execution is manual, repetitive in nature and rule-based with minimal need for human judgment.	RPA would allow tasks to be completed with little to no human intervention. This would greatly reduce processing and execution time, as well as increase accuracy rate.
Premiums and Adjustment Calculation	Execution is a manual process. Some human judgment and decision making is required for the adjustment of premiums.	Insurers can leverage Advanced Analytics to produce unique customer behaviour insights, allowing decisions on premium adjustments to be made in a more transparent and timely fashion.
Policy Enquiries	Execution is fairly repetitive and mundane. Simple enquiries can be resolved more quickly with automated processes.	Digital portals and mobile applications will provide a 'one stop' service centre for customers. Insurers can now filter out simple repetitive questions and focus on handling more complex enquiries.
In-force Portfolio and Liability Management	Execution requires strong financial acumen to manage risks and liabilities.	Analytical techniques can be adopted to uncover insights on the behaviour of policyholders, which will help to ensure portfolio profitability, and timely updating.

In the next

3-5 years ...

This role will shift to focus on more complex policy servicing needs. Advanced Analytics will allow for improved collection of customer information, allowing job holders to make more informed decisions and improve processes to drive improved customer experiences.

Skills Differentiators:

- ▶ **Data Interpretation and Analysis:** Being able to extract insights from data will help the job holder make more informed decisions. However, the job holder needs to be able to decipher when data is irrelevant or inaccurate to ensure it is not used.
- ▶ **Data Storytelling:** The job holder will need to incorporate data and insights when informing stakeholders on strategy or business decision with regards to policy retention.
- ▶ **Automation Management:** As more processes move to RPA and AI solutions, this role will provide oversight of these systems and work to continually train the tools to improve outputs.
- ▶ **Process Excellence:** With the use of RPA, an increased focus will be placed on improving existing processes to combine servicing needs with overall customer experience in a more efficient manner.
- ▶ **Complex Problem Solving:** There will be a shift in this role to focus on complex cases. The job holder will therefore need the ability to draw on business acumen to resolve cases that are unique and outside normal policy parameters.





Subsector: Insurance

Job Family: Underwriting

Impact Level

Today, this role is responsible for collection of data from insurance applicants, analysis of risk, determining policy terms, generating pricing and premiums as well as developing products and issuing policies.

Retail: High Impact
 Non-Retail: Low Impact

Consolidated Activities

	Today	Future
Insurance Application Review (Risk and Approval Assessment)	Execution is high in volume, repetitive and requires low decision latitude as it is administrative in nature.	Machine learning and automation will help to increase the volume of applications that can be analysed and approved. This will greatly facilitate the entire workflow and reduce the time taken to review and approve these applications.
Information Collection	Execution is simple and repetitive in nature.	RPA can potentially facilitate the collection of large amounts of data from a variety of sources which would speed up the entire process.
Quotation and Negotiation	Execution requires interpersonal skills such as negotiation and persuasion skills to help the organisation negotiate for the best deals with terms and a cost that meets the organisation's objective.	AI can leverage on insights from data analytics to help suggest optimal quotations for certain products or plans, which will also require less manual revision or time taken to manually determine an optimal quote.
Coverage Limits and Premiums Setting	Execution requires close collaboration with other roles and departments who are able to adjust the coverage and premiums to an appropriate level.	Advanced Analytics could increase efficiency by helping Underwriters to price premiums by providing deeper customer and market insights at an optimal level, whilst ensuring profit and cover potential risks.
Policy Terms and Condition Setting	Execution requires in-depth product and customer knowledge to ascertain the appropriate and suitable terms and conditions for the policy.	Advanced Analytics and AI will help to predict risks and losses, leading to the potential for more favourable terms for customers.

In the next
3-5 years ...

This role will shift to support more complex underwriting, and look for new ways to improve the overall process with the infusion of Advanced Analytics. In addition this role will need to remain adaptable and updated to new developments in the industry to prepare for changes in underwriting needs.

Skills Differentiators:

- ▶ **Advanced Digital Acumen/Literacy:** The job holder will need to understand new robust data analytics software/tools, which will help to allow the role to use that information in meaningful ways.
- ▶ **Stakeholder Engagement:** The job holder will need to be able to develop a strong network of internally and externally, as well as balance interests of complex stakeholders.
- ▶ **Lateral Thinking:** The job holder will possess skills to leverage diverse information, and be able to connect-the-dots', in improving the pricing and risk mitigation strategy.
- ▶ **Data Interpretation and Analysis:** Data analytics can be collected in a more efficient way, and so the job holder will need to possess skills to derive meaning from the data.
- ▶ **Analytics and Computational Modelling:** As more complex underwriting gets passed on to this role the complexity of the premium, limits and policy term models will also increase. Therefore, the job holder needs to be prepared to determine which computational methods will achieve the desired results.





Subsector: Insurance

Job Family: Sales and Distribution

Impact Level

Today, this role is responsible for setting sales targets and developing agency strategies to deliver growth targets, focusing on improving the business profitability through product mix and maintaining business quality.

Medium Impact

Consolidated Activities

	Today	Future
Goal Setting and Business Planning	Execution requires strong business and financial acumen to set strategic goals and plans for the agency. This task requires close collaboration with various stakeholders to collect input and decide the direction of the agency.	Advanced Analytics can be used to generate deeper insights (e.g., past performance, sales trends and data around customer behavior) to facilitate evidence-based decision making.
Training Program Design and Facilitation	Execution requires strong communication skills as well as a passion for developing others.	E-learning portals and digital applications can be put in place to support personalised training and experience sharing, regardless of time or location.
New Agents' Recruitment and Onboarding	Execution is time intensive and document heavy, with strong communication skills being critical as recruiters are the initial point of contact between new agents and the insurer.	AI can be used to conduct quicker background screenings. Digital applications with self-service capabilities will allow agents to have easier access to information without having to liaise extensively with the job holder in this role. RPA can also help to speed up documentation processes during onboarding of new staff.
Regulatory Changes and New Products Communication	Execution requires strong communication skills to effectively communicate updates across the entire agency.	Digital applications will be able to inform agents about new product launches and communicates updates of regulatory policy changes in a quick and efficient manner.

In the next

3-5 years ...

Self service channels will help to improve communication and transfer of information between parties. Digital tools and Advanced Analytics will help to support this role in serving agents, which in turn will better support customers.

Skills Differentiators:

- ▶ **Advanced Digital Acumen/Literacy:** Staying updated with evolutions and being well versed in the latest digital trends will allow for the job holder to effectively use digital tools and advise the organisation on how best to communicate with agents.
- ▶ **Leading Virtual Teams:** Working with agents via digital channels will need the job holder to adapt to new communication and management technique to achieve the same results as face-to-face interactions.
- ▶ **Data Interpretation and Analysis:** The job holder will possess the ability to draw further insights from the information provided to create actionable plans.
- ▶ **Stakeholder Engagement:** The job holder will need to be able to develop a strong network of internal and external contacts, as well as balance the interests of complex stakeholders.
- ▶ **Technology Troubleshooting:** The job holder will display ability to handle agent inquiries about digital channels and provide basic technical support to ensure a positive user experience.





Subsector: Insurance

Job Family: Sales and Distribution

Impact Level

Today, this role is responsible for identifying clients and providing advice about products, policies, potential risks and opportunities for budget optimisation.

Medium Impact

Consolidated Activities

	Today	Future
Lead Generation	Execution is time consuming and requires ongoing search and follow-up with potential clients. Human judgment is required to effectively identify needs and propose ways to address them.	Advanced Analytics can be used to monitor and analyse how prospects are engaged, identify needs and propose follow-up actions for the job holder to act on.
Relationship Management (with insurers and clients)	Execution relies heavily on 'people' skills to manage different stakeholders.	Sustaining relationships still requires hi-touch skills to develop trust and engage in relevant negotiations with insurers on behalf of clients.
Product Recommendation and Advisory	Execution is focused on distilling various options for clients, and utilising human judgment to provide recommendations best fit for specific needs.	Chatbots can act as "internal advisors", helping Brokers to seek clarifications on products and processes of various insurers. Advanced Analytics can be used for loss-scenario testing to help clients understand policy differences.
Claims Settlement Assistance	Execution can be time and document-intensive helping clients to gather and review documentation, and filing.	RPA can continue to support administrative aspects of tasks. Advanced Analytics can assist the job-holder to play a risk advisory role to advise clients how to maximise claims process.

In the next
3-5
years ...

This role will continue to require human insight and people skills to manage relationships, negotiate and provide guidance. With augmentation of technology, job holders will spend less time on administrative and repetitive actions, and be better equipped to act in an advisory capacity.

Skills Differentiators:

- ▶ **Advanced Digital Acumen/Literacy:** The job holder will need to stay abreast of latest technologies to manage and use tools to increase effectiveness.
- ▶ **Data Interpretation and Analysis:** The job holder will need to effectively extract and make sense of information to generate insights relevant to clients and partner insurers.
- ▶ **Influencing & Negotiation:** The job holder must be able to handle various situations and stakeholders and use persuasive techniques to supplement data-driven insights to align audience's perspectives with the over-arching objective.
- ▶ **Targeted Technical Sales:** Leveraging insights from advanced analytics, the job holder will be able to identify the unique needs and preferences of potential partners and prepare to meet their needs and build stronger rapport with prospective companies.
- ▶ **Advisory:** Having access to advanced analytics will sharpen the job holder's ability to make more relevant and targeted recommendations.





Subsector: Insurance

Job Family: Sales and Distribution

Impact Level

Today, this role is responsible for developing and implementing financial plans to help customers meet their objectives and manage customer relationships.

Medium Impact

Consolidated Activities

	Today	Future
Customer Base Development	Execution requires relationship building skills to retain and grow the existing customer base. The role would require strong networking skills and initiative to source new customers and develop new sales channels.	AI can leverage on Advanced Analytics to generate insights that allow agents to better understand potential sales and distribution networks. Networking and relationship building, however, will still remain key to the success of this task.
Insurance Sales	Execution is sales and profit driven. Excellent negotiation and influencing skills remain critical for the success of this task.	Advanced Analytics will help agents to better understand the profile of customers to recommend a bespoke variety of products for customers to select from. Agents will be expected to take on a more advisory role in guiding customers with selecting the right product that fits their specific needs. Improved digital applications will help to support post-sales activity to create a more seamless experience for both parties.
Policy Explanation	Execution is repetitive and requires low decisional latitude.	Mobile/digital channels enabled with self-service portals and/or chatbots can assist with providing information to customers without human intervention. This allows agents to focus on complex or escalated cases that require human intervention.
Administrative Record-keeping and Policy Renewals	Execution is administrative and high in volume, resulting in a time consuming activity.	Digital applications will allow customers to have access to basic self-service tasks. RPA can help to automatically detect policies that are approaching renewal dates and send out reminders.

In the next
3-5 years ...

In the future, this role will shift to encompass a variety of financial planning products. Given changing customer preferences for digital channels, the job holder will need to adapt their approach to customer service. Advanced Analytics will help to make this possible with enhanced customer profiling.

Skills Differentiators:

- ▶ **Advisory:** Given shifting customer preferences, the job holder will be required to provide more holistic recommendations considering differing factors.
- ▶ **Advanced Digital Acumen/Literacy:** As digital applications/channels become more common for customers, the job holder will need to be prepared to shift the way they communicate with customers, as well as have a deeper understanding of the tools available to help them.
- ▶ **Data Interpretation and Analysis:** The job holder will possess the ability to make sense of analysis results to enhance sales recommendations.
- ▶ **Targeted Technical Sales:** The job holder will leverage analytics to more effectively profile customers, which will drive customised recommendations and likely lead to more sales conversions.
- ▶ **Global Perspective:** In an effort to provide more holistic services, the job holder will need to understand market trends and developments to offer the most appealing products.





Subsector: Insurance

Job Family: Investment Management

Impact Level

Today, this role is responsible for developing and managing tactical execution of investment strategies to achieve earnings and growth targets set forth by the business.

Medium Impact

Consolidated Activities

	Today	Future
Investment Guidelines and Strategy Development	Execution requires expertise on current investment regulations, financial product awareness and strategy planning to help formulate guidelines that align with the strategic development of the organisation.	Advanced Analytics can be leveraged on to help provide insights on financial markets and consumer behaviours for more granular analysis to improve strategic decisions together and minimise potential for losses.
Internal and External Investment Coordination	Execution still requires a high level of human judgment, tapping on communication and management skills, such as the ability to coordinate and collaborate effectively between various tasks and teams to ensure the smooth running and planning of internal and external investments.	This role is likely to still rely on collaborative partnerships between internal and external investment departments to ensure that investment strategies are aligned with the overall direction of the firm. Interpersonal relationship and communication skills will still be key for this role.
Portfolio Management and Analysis	Execution requires strong financial acumen and product knowledge, as well as deep analytical and decision making skills to evaluate and draw insights from the current investment portfolio.	Advanced Analytics and algorithm automation will help to monitor portfolio performance, and provide analysis for current investment performance and structuring potential portfolios.
Investment Strategy Research	Execution requires strong research and investigation skills to conduct insightful research.	Machine learning will help to run “what-if” scenarios on investment strategies, reducing potentially risky decisions. Human judgment will still be required to evaluate whether these risks are significant and/or likely to be detrimental to the firm.

In the next

3-5 years ...

This role will use Advanced Analytics to help with investment decisions. However, human judgment will still be required to align with strategic investment decisions. Opportunities for automation of portfolio management could facilitate reaching desired targets.

Skills Differentiators:

- ▶ **Risk Awareness:** Given the infusion of data analytics and automation in decision making processes, the job holder will need to have the ability to evaluate risk and return decisions.
- ▶ **Lateral Thinking:** The job holder needs to possess skills to connect business insights to enhance quality of research findings.
- ▶ **Advanced Digital Acumen/Literacy:** The ability to use and understand available tools will ensure most efficient utilisation to achieve desired outcomes.
- ▶ **Influencing and Negotiation:** Job holders will be required to show ability to persuade stakeholders to rely on information provided by Advanced Analytics.
- ▶ **Complex Problem Solving:** Increasingly complex investment strategies will give rise to new issues that the job holder may not have prior experience dealing with, requiring them to adapt new approaches.



RPA



Advanced Analytics



AI



Subsector: Insurance

Job Family: Claims Management

Impact Level

Today, this role is responsible for assessing potential hazards and loss exposures to help make recommendations to reduce potential for loss and minimize risks.

Medium Impact

Consolidated Activities

	Today	Future
Data Gathering	Execution is administrative in nature, high in volume and fairly time consuming.	AI can facilitate the data gathering process by extracting data from various sources and processing. This reduces the time and energy spent, freeing the job holder's capacity for more complex tasks.
Data Analysis/ Risk Identification	Execution requires familiarity in conducting analysis and interpretation of data. Human judgment is also required to gather evidence from various sources of data to identify the various risks involved.	AI can identify and evaluate the various sources of data, and generate potential areas of risk based on findings. Human expertise would still be needed to determine whether these risks are unprecedented or calculated.
Formulation of Loss Prevention Strategy	Execution requires technical understanding of products and data. The job holder will also need to be able to think laterally to gain insights from various quantitative and qualitative sources to formulate loss prevention strategies. Close collaboration with other business units is required to ensure that the strategy developed is aligned with the organisation's overall strategy.	AI can leverage on data analytics to formulate a cost-effective strategy for risk mitigation. However, human expertise will be needed to communicate these strategies to clients in a manner that facilitates accurate and stringent compliance.

In the next
3-5 years ...

Access to Advanced Analytics and AI will enable the job holder to provide more relevant risk insights to determine how to mitigate risks, which will lead to a less reactive and more proactive approach to loss prevention.

Skills Differentiators:

- ▶ **Advanced Digital Acumen/Literacy:** The ability to use advanced tools and software to collate and process information will be critical. Given the potential for IoT devices to become more common, the job holder will need to understand how that technology can aid the role.
- ▶ **Consulting/Advisory:** Given the access that this role has to Advanced Analytics, the expectation is that the job holder will be able to impart that information in an advisory capacity to others.
- ▶ **Data Storytelling:** The job holder will need to be able to share Advanced Analytics insights in a way that is relevant and useful to other parts of the organisation in order to help gain their buy-in.
- ▶ **Stakeholder Engagement:** The job holder will be required to work more collaboratively with other business units to implement loss prevention across the organisation, which will make it more effective in the future.
- ▶ **Data Interpretation and Analysis:** The ability to understand data from a variety of sources will help the job holder create more holistic loss prevention recommendations to the business.





Subsector: Insurance

Job Family: Actuary and Pricing

Impact Level

Today, this role is responsible for the development of product pricing, drive innovative approaches and estimating profitability associated with potential future risk.

Medium Impact

Consolidated Activities

	Today	Future
Model Development, including Risk and Profit Evaluation	Execution requires expertise in computational modelling to help develop and improve pricing models. The tasks require human judgment to evaluate risks and potential profits.	Advanced Analytics and AI can be used to create more robust and complex pricing models.
Pricing Procedure Analysis	Execution is rule-based and repetitive which allows room for human error. Errors can be minimised using automation.	RPA can assist to support pricing and rate monitoring, which will reduce time necessary for the manual collection and analysis of the information - thereby allowing the procedure to be conducted more efficiently.
Financial Earnings Interpretation	Execution requires critical thinking, as well as an understanding of the organisation's objectives.	The use of human judgment remains critical, however RPA can enable the quick processing and summarising of important data to help uncover deeper insights from reports.
New Product Development	Execution requires knowledge of customer demographics and needs, which are derived from in-depth market research. The job holder would need to collaborate with other teams to develop suitable products with suitable prices to entice customers.	Advanced Analytics will help to determine customer preferences for more targeted product development. Products will become easier to customize, and more accurate pricing will help to drive profitability.

In the next

3-5 years ...

The job holder will use more complex models to arrive at more accurate pricing for products. These models will be aided by Advanced Analytics and AI, leaving increased capacity for analysis, assumption review and product innovation.

Skills Differentiators:

- ▶ **Lateral Thinking:** The job holder will need to identify new opportunities for collaboration, as well as draw insights from more complex models - which will lead to improved pricing.
- ▶ **Data Storytelling:** The ability to take insights from complex models and use them in communicating findings to other business units for potential improvements will be important, along with the ability to help achieve stakeholder buy-in.
- ▶ **Business and Financial Acumen:** The job holder will require commercial acumen and perspective to determine ways to work with product development teams will be useful for both teams.
- ▶ **Stakeholder Engagement:** The job holder will need to be able to present findings to relevant stakeholders in a meaningful and impactful way which leads to action.
- ▶ **Programming and Coding:** It will be useful for the job holder to be able to write and develop programs that facilitate the interpretation of larger data sets.





Subsector: Insurance

Job Family: Product Management

Impact Level

Today, this role is responsible for performing market analysis, building strategies to drive product demand and developing product positioning. This role often coordinates with actuaries to determine pricing.

Medium Impact

Consolidated Activities

	Today	Future
New Product Creation/Product Enhancement	Execution requires collaboration and coordination between various teams. Awareness of current market needs is necessary in developing successful products.	Job holders can leverage Advanced Analytics to uncover deeper customer insights for customisation of products that better suit customers' needs.
Product Support/ Advisory (to sales and distribution channels)	Execution leverages on advisory skills. Communication and engagement with various teams in the sales and distribution channels is key to providing support to these outlets.	Digital and mobile applications with Chatbots will be able to provide real time, around the clock support with limited human intervention using various channels. Complex issues will be escalated towards this role.
Product Performance Reporting	Execution is time consuming as the job holder must gather data and conduct relevant calculations. Execution can be tedious, depending on how extensive the product range is, and may take a long time for the information to be processed.	AI will help to track and collect performance metrics, carry out calculations, and generate reports - greatly reducing the processing time and manual effort involved. Advanced Analytics and machine learning can help facilitate additional stress testing to minimize unforeseen errors.
Inforce Product Analysis	Execution requires product awareness and lateral thinking skills to gather information from various sources.	Advanced Analytics will provide deeper insight into performance and sales of products, allowing for more focused scope and context for analysis.

In the next

3-5 years ...

This role will be increasing data driven to identify and cater to customer needs, which will allow increased customisation by targeting smaller customer segments.

Skills Differentiators:

- ▶ **Customer Mindset:** Access to Advanced Analytics will provide customer preference information to the job holder which will result in improved product development focused on targeting customer needs.
- ▶ **Data Interpretation and Analysis:** The ability to make sense of Advanced Analytics will give the job holder an edge. Additionally, being able to identify when information is irrelevant or incorrect will ensure that decisions are made based on valid information.
- ▶ **Lead Virtual Teams:** Given that product creation will become more collaborative, the job holder will need to work with various teams and stakeholders who are often spread across geographies.
- ▶ **Global Perspective:** Understanding various markets and competitor offerings will allow the job holder to cater to a wider audience and deliver more in-demand products.
- ▶ **Project Management:** With increasing product complexity and customisation, the job holder will need to learn new ways of managing projects to increase speed and efficiency of project delivery.





Subsector: Insurance

Job Family: Reinsurance Management

Impact Level

Today, this role is responsible for management of reinsurance business between insurance companies and reinsurance companies.

Medium Impact

Consolidated Activities

	Today	Future
Contract Administration and Filing, Statement or Accounts Booking and Settlement Reporting (incl. Bordereau maintenance)	Execution of task is manual and administrative in nature. Task is repetitive.	RPA could help to consolidate information for analysis and interpretation. APIs will help to transfer information between relevant parties.
Premium Calculations Review, Reporting and Adjusting	Execution of task can be repetitive and time consuming. However, some parts of the task may require human judgment and analysis skills to decide whether premiums should be maintained or adjusted.	Advanced Analytics can provide insights on pricing or market situations to allow for more granular primary and secondary analysis on premiums for review. AI supported models could help with large complex calculations of premiums and generate digestible and easy to read reports for review.

In the next

3-5 years ...

This role will help to maintain the relationship between insurers and re-insurers with augmented insights they will be able to provide more value-adding services rather than just purely maintenance.

Skills Differentiators:

- ▶ **Process Excellence:** RPA will enable processes that allow the job holder to focus on identifying and implementing potential improvements to reinsurance management in an effort to make the process more seamless and efficient.
- ▶ **Data Interpretation and Analysis:** The job holder will need to be able to validate data analysis findings and ensure they are accurate and relevant.
- ▶ **Complex Problem Solving:** As insurance products become more complicated, the relationship with reinsurance providers will also have more intricacies that the job holder will need to be prepared to handle.
- ▶ **Advisory:** The job holder will have the ability to apply the right advisory strategy to provide guidance and value adding insights to stakeholders.
- ▶ **Lateral Thinking:** The ability to look for mutually beneficial opportunities between the two parties will help to drive adoption of process improvements.





Subsector: Insurance

Job Family: Actuary and Pricing

Impact Level

Today, this role is responsible for forecasting cash flow projections and earnings analysis of future liabilities associated with inforce policies issues, and ensure compliance with valuation and solvency requirements.

Medium Impact

Consolidated Activities

	Today	Future
Valuation Process Development/Improvement	Execution requires business acumen and foresight to develop and/or improve the valuation process in alignment with the overall strategy of the organisation.	Advanced Analytics can be leveraged to produce insights around potential areas of improvement in the valuation process.
Actuarial Model Development	Execution requires technical expertise in advanced computational modelling, and knowledge of the business to contextualise and develop relevant actuarial models.	Advanced Analytics can help provide insights that will facilitate the creation of more complex models. Digital visualisation tools will allow for quicker and clearer analysis of data.
Reserve Modelling and Capital Requirement Reporting (incl. monthly financial review)	Execution is repetitive. Analysis of monthly financial reports is relatively rule-based and provides opportunity for automation.	APIs can provide more seamless integration between accounting and financial systems for easier review. In addition, RPA could be used to increase the speed of data consolidation - allowing more time for trend analysis.
Management Report (EEV, IFRS and SII/Ecap) and Regulatory Compliance	Execution requires human judgment and decision making. In addition, technical knowledge on regulatory compliance is essential to perform in this role.	Human judgment will remain critical to communicate and determine the impact of latest regulations.

In the next

3-5 years ...

Access to an increased amount data analytics will lead to improved reporting and collaboration on assumption building with other business units. Being able to communicate increasingly complex models, findings and insights to non-actuarial stakeholders will be critical.

Skills Differentiators:

- ▶ **Business and Financial Acumen:** These skills will be necessary for the job holder to evaluate new regulations and make strategic decisions about implementation with upcoming regulations, such as IFRS17.
- ▶ **Analytics and Computational Modelling:** The job holder will need to possess strong quantitative skills to help with using increasingly complex models to support decision making.
- ▶ **Programming and Coding:** The job holder will need to be able to write and develop programs that lead to more robust models which would ultimately improve model results for enhanced reporting.
- ▶ **Data Storytelling:** Being able to create a meaningful business case based off Advanced Analytics findings will help the job holder work more efficiently within the organisation.
- ▶ **Stakeholder Engagement:** The job holder will need to have strong communication skills and the ability to achieve strategic alignment with stakeholders.





Partnership and Affinity Management

Subsector: Insurance

Job Family: Sales and Distribution

Impact Level

Today, this role is responsible for managing partnerships with various companies (FIs) and other industry segments to deliver product offerings and services to a larger group of customers.

Low Impact

Consolidated Activities

	Today	Future
Account/ Relationship Management	Execution involves building interpersonal relationships and customer networks, requires strong communication and networking skills.	Advanced Analytics can produce insights and information tidbits to provide the foundation for relevant conversations between the various parties. Development and management of a relationship however, requires meaningful cultivation as well as "human touch".
New Partnership Identification/ Evaluation	Execution relies on relationship building and communication skills. However, prior research will need to be done in advance to identify potential partners.	Advanced Analytics will help to generate stronger profiles of potential partners, which will allow the individual to have more informed conversations and be better prepared with insights specific to their potential needs.
Business Development Plan Preparation	Execution requires in-depth business knowledge, both in understanding the objectives of business units as well as how to achieve results that is aligned with the strategic position of the organisation.	Advanced Analytics will provide deeper insights to enable more customized business solutions to be produced. This provides extra value to the insurer's partners and strengthens the network between the insurer and partner.
Sales Analysis and Support for Bank/ Affinity Partners	Execution requires close collaboration with partners to share sales reports for analysis.	Advanced Analytics can be better integrated with the use of APIs to enable improved tracking of sales metrics and potential identification of sales or consumer behavior patterns.

In the next

3-5 years ...

This role will harness data analytics capabilities to leverage on information which will empower the job holder to more effectively approach current and potential partners. Remaining updated on the latest industry trends and technology will ensure that they can cater to a wide range of companies.

Skills Differentiators:

- ▶ **Advanced Digital Acumen/Literacy:** The job holder will need to stay abreast of latest technologies to seek new opportunities with companies.
- ▶ **Change Management:** Adapting to companies with various levels of technology adoption will require constant adapting of resources and techniques, requiring the job holder to be comfortable in managing changes
- ▶ **Influencing and Negotiation:** The job holder must be able to handle various situations and stakeholders and use persuasive techniques to align audience's perspectives with the overarching objective and to maintain good stakeholder relationships.
- ▶ **Targeted Technical Sales:** Leveraging insights from Advanced Analytics, the job holder will be able to identify the unique needs/preferences of potential partners and prepare to meet their needs and build stronger rapport with prospective companies.
- ▶ **Advisory:** Having access to Advanced Analytics will sharpen the job holder's ability to make more relevant and targeted recommendations.



RPA



Advanced Analytics



AI



Subsector: Enterprise

Job Family: Compliance (Operational)

Impact Level

Today, this role is responsible for ongoing review of transactions flagged by monitoring systems, ensuring significant issues identified are fully investigated and promptly escalated where necessary, and analyse data to enhance monitoring effectiveness.

High Impact

Consolidated Activities

	Today	Future
Data Collection and Investigation	Execution is rule based. Though transaction monitoring systems are leveraged today, the rate of false positives is high. Hence, extensive time and human effort is required to access diverse systems/data sources to extract and review results.	Using API, machines will be used to collect data (pulling from diverse sources including client information system, transactions history, open sourced searches and watch-list screening), reducing the human effort and time spent in the process.
Suspicious Transaction Reports (STRs) Drafting	Execution is tedious and prone to human errors. Automated solutions are available to put together information needed to complete a STR report.	With the use of advanced natural language generation (NLG), draft STR can be autogenerated – wherein the most important and relevant details from the highlighted transactions are captured in the narrative for review and edit by the analyst.
STR Validation	Tasks require human judgment. Human intervention is needed to review and validate content in STR before submission to the authorities.	Human intervention will continue to be critical in the process of reviewing and validating the STR content prior to submission.

In the next

3-5 years ...

Automated systems will shift the day-to-day focus from execution of manual and time consuming activities to value-adding report validation, and challenging the inputs to ensure narratives are robust and accurate.

Skills Differentiators:

- ▶ **Data Interpretation and Analysis:** The job holder will need to be skillful in interpreting data to extract key insights for recommendations, decisions or actions.
- ▶ **Advanced Digital Acumen/Literacy:** The job holder will need to be constantly upskilled to operate using new or refined AI-enabled machines.
- ▶ **Data Storytelling:** The job holder will need to be able to disseminate key messages and findings from investigation in a compelling, clear, and easy-to-understand manner for relevant stakeholders to take action.
- ▶ **Complex Problem Solving:** The job holder will need to examine complex problems that are escalated for review, and leverage available resources to develop and execute solutions.
- ▶ **Investigation:** The job holder will display ability to gather and ascertain evidence to uncover suspicious behaviours and evaluate the appropriate corrective actions.





Subsector: Enterprise

Job Family: Compliance (Operational)

Impact Level

Today, this role is responsible for testing the effectiveness of compliance risk controls in accordance with compliance monitoring procedures, communicating results to management and promoting best practices to strengthen internal controls.

High Impact

Consolidated Activities

	Today	Future
Compliance Monitoring Plans Development	Execution involves manual compilation of required inputs to determine the scope, scale and complexity of monitoring plans.	With the support of aggregated enterprise-wide data, a robust risk-based testing and monitoring strategy, plan and approach can be better developed.
Testing Execution and Reporting	Execution is time consuming. FIs are leveraging RPA to broaden the sample size (or scope of coverage), and gradually shifting towards full-population testing without the need to expand the workforce.	Execution will be deployed off-shore (testing-as-a-service), with experts who are dedicated to perform large scale testing activities and offer real time test results through dashboard.

In the next

3-5 years ...

This role will evolve as RPA takes over the manual and/or repetitive testing process, allowing them to refocus on higher value areas - e.g., validate results, build mitigation strategies to close the gap of existing control and contribute to the development of robust internal controls.

Skills Differentiators:

- ▶ **Data Interpretation and Analysis:** The job holder will need to be skillful in interpreting data to extract key insights for recommendations, decisions or actions.
- ▶ **Advanced Digital Acumen/Literacy:** The job holder will need to be constantly upskilled to operate new or refined AI-enabled machines.
- ▶ **Data Storytelling:** The job holder will need to be able to disseminate key messages/findings from investigation in a compelling, clear, and easy-to-understand manner for relevant stakeholders to take action.
- ▶ **Complex Problem Solving:** The job holder will need to examine complex problems that are escalated for review and leverage available resources to develop and execute solutions.
- ▶ **Process Excellence:** Equipped with findings of operational effectiveness testing, the job holder needs to possess the skills to identify process improvement opportunities and drive continuous improvement.





Subsector: Enterprise

Job Family: Compliance (Operational)

Impact Level

Today, this role is responsible for second line monitoring of front office trading activities, examining trade related data to detect potential market abuse, and escalating breaches for appropriate actions to be executed.

High Impact

Consolidated Activities

	Today	Future
Trade/Order Patterns Analysis	Trade surveillance solutions are available to monitor Traders' communication, and cross reference information against the trading activities. Due to the high volume of data, execution is resource intensive and time consuming.	Unstructured data from electronic communications will increasingly be incorporated in the analysis, with the help of cognitive computing. RPA and analytics will also be used for Trader profiling, using unsupervised learning techniques to cluster Traders based on their trading patterns, and outliers can then be used as a gauge to identify potentially illicit trading activities.
Suspicious Alerts Investigation	Automated systems powered by machine learning are used to alert officers in early stages by identifying suspicious situations based on a series of pre-defined scenarios, such as naked short-selling, high volume trades, phantom orders, and then classify based on level of risk. Due to the high volume of alerts, execution is resource intensive and time consuming.	With the help of automated systems, the team could focus their investigations on the highest priority issues. There is also a possibility that a common utility service will be developed to share the surveillance capability across participating FIs.

In the next

3-5 years ...

This role will move away from reactive processes which focus on past patterns of activities and invest greater time and effort in predictive capabilities to prevent adverse events. In addition, this role is likely to converge with other surveillance roles.

Skills Differentiators:

- ▶ **Data Interpretation and Analysis:** The job holder will need to be skillful in interpreting data to extract key insights for recommendations, decisions or actions.
- ▶ **Advanced Digital Acumen/Literacy:** The job holder will need to be constantly upskilled to operate using new or refined AI-enabled machines.
- ▶ **Data Storytelling:** The job holder will need to be able to disseminate key messages and findings from investigation in a compelling, clear, and easy-to-understand manner for relevant stakeholders to take actions.
- ▶ **Complex Problem Solving:** The job holder will need to examine complex problems that are escalated for review and leverage available resources to develop and execute solutions.
- ▶ **Investigation:** The job holder will display the ability to gather and ascertain evidence to uncover suspicious behaviours and evaluate the appropriate corrective actions.





Compliance Regulatory Reporting Officer

Subsector: Enterprise

Job Family: Compliance (Operational)

Impact Level

Today, this role is responsible for liaising with internal stakeholders on regulatory reporting matters, and overseeing the delivery of regulatory submissions.

Medium Impact

Consolidated Activities

	Today	Future
Local Regulatory Reporting	Execution involves extraction of information for regulatory bodies, head office, and other government authorities. The manual extraction from different systems can be time consuming.	With clearly defined rules and standardisation on data format, location and file name, machines can be programmed to extract, cleanse, and validate data within minutes.
Aggregation and Variance Analysis	Execution involves complex computations and can be prone to human errors. However, the task is rule-based. Hence, FIs are exploring automation opportunities.	With the processes and requirements well defined, AI-powered technologies can be built to perform complex calculations in a shorter timeframe and with minimal errors. Human judgment remains critical in validating and challenging outputs.
Queries Resolution	Execution requires human intervention. Technical expertise is vital in investigating and performing logical checks on the information conveyed to regulators and management.	Human judgment and technical expertise will remain critical in handling and effectively closing queries raised by the regulators and management.

In the next

3-5 years ...

With the support of automated technologies, this role will focus on managing the expectations of stakeholders, and validating the information conveyed to regulators and senior management.

Skills Differentiators:

- ▶ **Process Excellence:** With good understanding of existing operations, the job holder will help to highlight the root cause of process inefficiencies, and identify the right processes that require automation.
- ▶ **Data Interpretation and Analysis:** The job holder will need to be skillful in interpreting data to extract key insights for recommendations, decisions or actions.
- ▶ **Stakeholder Engagement:** The job holder will need to proactively engage key stakeholders to address ad-hoc queries and effectively manage the balance of interests of various stakeholders.
- ▶ **Risk Awareness:** The job holder needs to possess strong risk management skill to identify hidden risks or non-conformity issues.
- ▶ **Advanced Digital Acumen/Literacy:** The job holder will need to be constantly upskilled to operate new or refined AI-enabled machines.





Subsector: Enterprise

Job Family: Risk Management

Impact Level

Today, this role is responsible for identifying and balancing credit risk and returns of the credit portfolio through credit modeling techniques.

Medium Impact

Consolidated Activities

	Today	Future
Credit Risk Appetite and Limit Definition	Execution involves collaboration with business and key stakeholders to determine appropriate thresholds. Human judgment is needed to ensure alignment between various parties.	Role may leverage on Advanced Analytics to predict customer's spending patterns and behavior to help decide on appropriate credit limit.
Credit Risk Policy Development	Execution requires deep technical expertise and field experience to understand how best to safeguard interests of the organisation and minimise risk.	Advanced Analytics will enable modelling to create more robust frameworks that can be customised for different business line needs, while reviewing aggregated data will help to reveal trends and causal relationships.
Counterparty Risk Review and Rating	Execution requires human judgment and analytical thinking skills to manually evaluate and determine risk levels.	APIs will be used to aggregate financial information on existing and prospective counterparties, obtaining a holistic understanding of credit risk exposure. Advanced Analytics allows for robust risk evaluation. Human judgment will still be required to validate and challenge machine-generated outputs.
Model Implementation	Execution involves technical expertise and knowledge of computational modelling to conduct stress testing, setting limits and provisioning.	Advanced Analytics and machine learning will generate more complex and robust models, but human judgment is needed to ensure that stress testing outputs are complete, consistent and comply with business and regulatory requirements.
Credit Risk Portfolio Monitoring and Reporting	Execution requires deep analytical skills and technical understanding of credit risk. However, task can be high in volume and tedious as manual monitoring and generating of reports are required.	AI will monitor credit data in real-time to produce more accurate reports and allow for earlier warning triggers.

In the next

3-5 years ...

This role will dedicate more time on strategic and policy implementation decisions due to the augmentation of the role by data analytics and automation. This role will need to be able to work with more complex models to continue to improve stress testing and reporting.

Skills Differentiators:

- ▶ **Data Storytelling:** The job holder will demonstrate ability to disseminate key findings in a compelling, impactful, and easy-to-understand manner to audiences with varying level of interests and appetite.
- ▶ **Data Engineering:** The job holder will possess strong understanding of the data pipeline and how to improve the collection of information prior to analysis.
- ▶ **Systems Thinking:** The job holder will possess strong understanding of how systems work within the context of larger systems to ensure successful implementation/integration of technology solutions.
- ▶ **Automation Management:** The job holder will oversee systems to ensure that requirements are met.
- ▶ **Analytics and Computational Modelling:** Despite automation, the job holder will continue to demonstrate strong capability in creating and delivering sophisticated models.





Data Analyst

Subsector: Enterprise

Job Family: Information Technology

Impact Level

Today, this role is responsible for collecting, organising, and interpreting statistical information to help companies make better business decisions.

Medium Impact

Consolidated Activities

	Today	Future
Data Collection	Data collation and integration of structured datasets that are high volume and time consuming in nature. RPA and AI are gradually being leveraged to consolidate data from primary and secondary sources.	AI-tools can be leveraged to address and adjust data issues – such as errors and irregularities. The process of converting raw information into data that can be easily understood – remains human centric.
Data Analysis	Execution can be supported by technology but it still requires technical oversight to ensure that analysis is carried out properly.	AI and Advanced Analytics could be used to analyse and identify trends in data sets to derive insights from unstructured and structured data sets.
Insights and Findings Presentation	Task requires human judgment and understanding of organisation needs and objectives to help provide relevant information to the business.	Data visualisation tools will continue to be leveraged to present findings to management in an easy-to-understand manner and to work with various business units to incorporate the insights into business decisions.

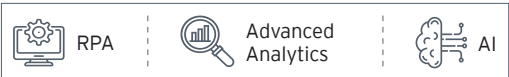
In the next

3-5 years ...

It will become increasingly necessary to make sense of Advanced Analytics to communicate insights across the organisation. This role will be augmented by technology, and given automation opportunities for the data gathering and collection processes to allow for greater allowing higher order thinking and analysis improving recommendations.

Skills Differentiators:

- ▶ **Business and Financial Acumen:** The job holder will possess commercial awareness to work effectively with business units, gain understanding of business needs, and leverage data to help them to build targeted solutions.
- ▶ **Lateral Thinking:** The job holder will be required to handle larger sets of data today, hence, the ability to 'connect-the-dots' and stay focused on big picture will remain important.
- ▶ **Investigation:** The job holder will demonstrate ability to gather and ascertain information to gain a deeper understanding of the problems, and ultimately, developing unique solutions to resolve outstanding issues.
- ▶ **Data Storytelling:** With more information gathered and analysed, the job holder will possess skills to effectively convey findings/messages to different audiences – ensuring that critical messages are communicated accordingly.
- ▶ **Process Excellence:** As systems and tools become available to improve the data collection aspects of the role, the job holder can highlight the root cause of their process inefficiencies and identify the right processes that require automation.





Subsector: Enterprise

Job Family: Information Technology

Impact Level

Today, this role is responsible for designing and constructing new processes for data modeling and production using prototypes, algorithms, predictive models, and custom analysis.

Medium Impact

Consolidated Activities

	Today	Future
Data Collection	Data collation and integration of structured datasets that are high volume and time consuming in nature. RPA and AI are gradually being leveraged to consolidate data from primary and secondary sources.	While AI-tools can be leveraged to address and adjust data issues – such as errors and irregularities – the process of converting raw information into data that can be easily understood remains human centric.
Model Development and Project Management	Task requires in depth technical knowledge and expertise to create models that aid the job holder in achieving business objectives.	Advanced Analytics and AI could help to organise complex structured and unstructured data sets. The creation of models will continue to require human intervention – mainly to translate business needs into algorithms, and to interpret analysis outcomes for further actions.
Insights and Findings Presentation	Task requires human judgment and understanding of organisation needs and objectives to help provide relevant information to the business.	Data visualisation tools will continue to be leveraged to present findings in an easy-to-understand manner and to work with various business units to incorporate the insights into business decisions.

In the next

3-5 years ...

This role will evolve to combine increased business knowledge with technical and machine learning capabilities, leading to enhanced data visualization capabilities. As organisations have access to more data analytics, this role will collaborate more with various business units to derive models and solutions for the organisation.

Skills Differentiators:

- ▶ **Data Engineering:** The job holder will possess strong understanding of the full data pipeline and be able to identify opportunities for optimisation and enhanced analysis.
- ▶ **Business and Financial Acumen:** The job holder will possess commercial awareness to work effectively with business units, gain understanding of business needs, and leverage data to help them build targeted solutions.
- ▶ **Advisory:** The job holder will display the ability to apply the right advisory strategy to engage with stakeholders in different situations and provide advice that leverages on deeper business acumen infused with quantitative and technical insights to the business.
- ▶ **Stakeholder Engagement:** The job holder will be highly skilled to liaise with various stakeholders across the organisation, effectively eliciting stakeholders' views on areas of priorities and developing alignment across.
- ▶ **Data Storytelling:** With more information gathered and analysed, the job holder will possess skills to effectively convey messages and findings to different audiences – ensuring that critical messages are communicated accordingly.





Subsector: Enterprise

Job Family: Finance

Impact Level

Today, this role is responsible for financial reporting, management reporting, organisational budgeting, expenditure and other finance and tax management related activities.

Medium Impact

Consolidated Activities

	Today	Future
Tax Assessment and Filing	Execution is administrative and document intensive. Processing high volumes of paperwork can be time consuming, while current regulations limit the use of technology.	RPA will be leveraged to process such high volume administrative tasks due to the higher complexity of the information being processed and evaluated.
Financial and Management Reporting	Execution is administrative, typically high volume and requires low decision latitude.	RPA will be able to automatically generate financial and management reports by translating data into reports.
Operational Accounting	Execution is rule-based and processing the high volume of work can be time consuming.	RPA will automate various operational accounting functions (e.g., management of account receivables), and assist to convert hardcopy documents into a digital format.
Organisational Planning, Budgeting and Forecasting	Execution involves detailed analysis to forecast the firm's fiscal spending. FIs have moved away from using spreadsheet software (e.g., Microsoft Excel).	Predictive analytics and AI capabilities will be used to analyse large data sets and perform sophisticated modelling to churn more accurate forecasting. Human intervention will remain vital to drive budgeting and planning decisions.
General accounting	Execution is rule based, time consuming, and prone to human error. RPA is increasingly adopted to automate general accounting functions.	Machine Learning will be leveraged in general ledger applications to analyse historical and pending transactions, thus improving cash flow predictions.

In the next
3-5 years ...

As administrative accounting duties (e.g., statement closing, reconciliation) are replaced by technology, this role will oversee the processing of financial and tax documents using machines. Job holders can analyse larger sets of data in a meaningful way with the support of advanced solutions, and to facilitate decision making in a unbiased, fact driven way.

Skills Differentiators:

- ▶ **Business and Financial Acumen:** The job holder will possess commercial awareness to work effectively with business units in developing strategies to improve organisation's financial position.
- ▶ **Data Interpretation and Analysis:** The job holder will display ability to verify data integrity/relevance, interpret data and extract key insights for decisions, recommendations or actions.
- ▶ **Process Excellence:** With good understanding of the existing operations, the job holder can help to highlight the root cause of their process inefficiencies and identify the right processes for automation.
- ▶ **Lateral Thinking:** The ability to drawing insights from disperse data and incorporate information collated from different sources into their advice or solutions will be vital.
- ▶ **Advisory:** Incorporating the insights acquired, the job holder will display ability to apply the right advisory strategy to facilitate the development of robust budgeting and related strategy.





Subsector: Enterprise

Job Family: Compliance (Advisory)

Impact Level

Today, this role is responsible for undertaking investigation into AML/CFT related matters, working closely with management to address significant reputation risks arising from investigations findings and acting as a subject matter on financial crime investigation.

Medium Impact

Consolidated Activities

	Today	Future
AML/CFT Thematic Analysis and Investigation	Execution is time-consuming and resource-intensive. FIs are gradually introducing analytics and automation at every step of the financial crime detection and investigation process.	The increasing use of RPA and machine learning-powered tools will aid in data collection and turning raw data into actionable intelligence. However, human judgment remains critical in leveraging interpretation of data points to draw conclusions.
Media Sweeps/ Financial Crime Typologies Updates	Execution is time-consuming and resource-intensive.	In conjunction with client transactional data, external data sources (including news feeds and social media) and AI technology will be leveraged to increase accuracy in AML.

In the next

3-5 years ...

Advanced technologies (powered by AI) have been tapped on to make investigations more efficient. This role will gradually evolve, shifting from the manual effort to acquire data to bespoke investigation strategies and methods to uncover the root cause of financial crime.

Skills Differentiators:

- ▶ **Investigation:** The job holder will display ability to gather and ascertain evidence to uncover suspicious behaviours and evaluate the appropriate corrective actions.
- ▶ **Data Storytelling:** The job holder will need to be able to disseminate key messages/findings from investigation in a compelling, clear, and easy-to-understand manner for relevant stakeholders to take action.
- ▶ **Data Interpretation and Analysis:** The job holder will need to be skillful in interpreting data to extract key insights for recommendations, decisions or actions.
- ▶ **Conflict Management:** The job holder will need to apply appropriate conflict resolution strategies to manage complex situations – especially under circumstances where clear solutions are lacking.
- ▶ **Advanced Digital Acumen/Literacy:** The job holder will need to be constantly upskilled to operate new or refined AI-enabled machines.





Financial Crime Data Analytics

Subsector: Enterprise

Job Family: Compliance (Advisory)

Impact Level

Today, this role is responsible for developing financial crime models in the areas of anti-money laundering, sanctions screening, and external and internal fraud - with the objective to automate financial crime reports and dashboards.

Medium Impact

Consolidated Activities

	Today	Future
Data Collection	Tasks are manual and time-consuming. Manual data retrieval process is reduced by using RPA. Big data technology is also increasingly being used.	Big data technology will be widely adopted, providing a single point of access and an all-inclusive view across the FI, supporting the development of a wide range of analytics and scenarios that are applicable for compliance and wider business needs.
Machine Learning Models Development	Execution is analysis-intensive. Machine learning is used to analyse client transaction patterns, identify outliers and anomalies in behaviours and profiles, and to supplement the analysis of emerging trends and the assessment of potential risks.	Financial crime analytics utility platforms will be developed to help financial institutions collaborate towards protecting their customers and other stakeholders while creating a more robust control environment.
Stakeholder Liaison and Results Presentation	Execution requires human interactions and technical expertise to explain findings to key stakeholders and facilitate discussions with business to improve future modelling.	Technical expertise and knowledge will remain critical in delivering and explaining the results to stakeholders. In addition, in-depth regulatory and compliance knowledge will be developed to assist in solutioning.

In the next

3-5 years ...

This role will continue to explore advanced technologies that provide them with the ability to investigate large and random data sets more quickly and efficiently.

Skills Differentiators:

- ▶ **Change Management:** Apart from coping with changes happening with data and technology ecosystem, the job holder will need to be equipped with the capability and emotional resilience to drive change based on analytical and predictive outputs.
- ▶ **Process Excellence:** Equipped with data-driven insights, the job holder will need to possess skills to address process inefficiencies and prioritise areas of improvement for creating more robust control environments.
- ▶ **Data Storytelling:** The job holder will need to be able to disseminate key messages and findings from investigations in a compelling and easy-to-understand manner for relevant stakeholders to take action.
- ▶ **Automation Management:** The job holder will need to upskill to oversee systems, ensuring that operations requirements are met before seeking continuous improvement opportunities.
- ▶ **Analytics and Computational Modelling:** Solid quantitative and modeling skills are the foundational skills required for this role, and they will continue to be important despite advancement in automation.



RPA



Advanced Analytics



AI



Subsector: Enterprise

Job Family: Human Resources

Impact Level

Today, this role is responsible for leading Human Resources (HR) practices that will provide an employee-oriented, high performance culture – including managing recruitment and ongoing development of the workforce.

Medium Impact

Consolidated Activities

	Today	Future
Talent Acquisition	Tasks such as filing of paperwork and arranging of interviews are administrative, and the outcomes often rely on human decision making which is susceptible to bias and inconsistencies in judgment.	AI (cognitive) solutions will facilitate candidate profiling while eliminating human bias from the process. Virtual recruiters will handle scheduling, feedback collation, and address basic questions in real time.
Employee Onboarding	Execution is often rule-based and document intensive. Activities can ideally be completed on digital platforms, eliminating need for paperwork and excessive downtime.	AI will be used to customise onboarding programmes for new hires or even to ease integration into the company by providing a virtual buddy/digital assistant to answer questions or provide basic technical support.
Employee Retention and Performance Analysis	Execution involves collection of inputs and data to assess a staff member's performance, and is typically time consuming. Outcomes are often subject to bias and inconsistencies in judgment.	AI will yield real-time insights on employee feedback, allowing HR to more proactively reach out to employees, as well as provide a continuous flow of data to enable better feedback and promotion decisions.
Employee Training	Execution involves close collaboration with business to acknowledge training needs, which can be supported by technology. Many banks have adopted on-the-go learning with the increasing use of mobile platforms.	AI will collect and analyse employee data to generate customised training programs, and virtual reality (e.g., gamification) will be used to make training scenarios more engaging and realistic.

In the next

3-5 years ...

This role will continue to play a critical role in working closely with business to prepare their workforce for the future. They will incorporate advanced data analytics and AI solutions to improve various HR processes and delivery, as well as enhance employees' experience.

Skills Differentiators:

- ▶ **Advanced Digital Acumen/Literacy:** Access to more software and digital tools will help to augment this role's responsibilities but it will be necessary to understand the underlying technology to take full advantage of it.
- ▶ **Data Interpretation and Analysis:** Using Advanced Analytics to provide more meaningful insights for the organisation will require being able to make sense of data to draw conclusions.
- ▶ **Change Management:** Being adaptable to changing workforce needs will be important, in addition to changing underlying processes and how tasks are carried out in terms of acquisition and on-boarding. Adapting to these changes will require a willingness to work alongside technology.
- ▶ **Advisory:** Using access to Advanced Analytics, the role will be able to draw more meaningful insights from data to provide enhanced recommendations to the business.
- ▶ **Business and Finance Acumen:** Understanding the evolving business environment and the impact of data analytics and automation will be necessary to help this role acquire talent that is suited for rapidly changing roles, skill sets and business needs.





Internal Audit

Subsector: Enterprise

Job Family: Internal Audit

Impact Level

Today, this role is responsible for the on-going maintenance and assessment of an institution's internal controls, risk management and governance systems and processes.

Medium Impact

Consolidated Activities

	Today	Future
Independent Assurance Services	Execution requires business and technical expertise to provide advisory and oversight services to the organisation.	RPA and AI tools will be used to automate the audit process, and enable the auditing of future scenarios within a controlled environment or allow for live simulation with test subjects/bots. This role will review results and provide exception management.
Governance Risks and Controls Advisory	Execution requires strong communication and advisory skills, as well as strong expertise on current regulations.	Cloud computing and digital platforms will enable the use of interactive web based tools that are accessible anywhere. AI will generate real-time updates on current changes in regulations to equip the role job holder with enhanced information for prior to sharing across the organisation.

In the next

3-5 years ...

This role will continue to provide advisory and assurance services to the organisation. However, tasks execution can be augmented by easing manual processes along with using technology to increase the speed in which audit reports can be consolidated for further analysis and review.

Skills Differentiators:

- ▶ **Complex Problem Solving:** Given the infusion of data analytics into many of the services that will be reviewed by the job holder, the complexity of audit services will increase – requiring the job-holder to understand how to resolve more complex problems.
- ▶ **Lateral Thinking:** The job holder will display the ability to find linkages between various information and piece them together in a complete form to develop the best recommendation for the business.
- ▶ **Advisory:** The job holder will the display ability to apply the right advisory strategy to act as a consultant for identifying and suggesting improvements in organisation practices.
- ▶ **Data Interpretation and Analysis:** The job holder will be able to draw insights from data and incorporate them into the development of recommendations.
- ▶ **Process Excellence:** The job holder will demonstrate capability in evaluating and improving the effectiveness of governance, risk management and control processes.





IT Applications and Software

Subsector: Enterprise

Job Family: Information Technology

Impact Level
 Today, this role is responsible for translating the needs of business units into technical specifications and overseeing the deployment and management of systems and solutions, which are developed internally and/or built and sourced externally.

Medium Impact

Consolidated Activities

	Today	Future
Applications/ Software Implementation	Execution of development activities are seeing augmentation from a DevOps perspective – in the way that they adopt and implement technology methodologies such as Agile and Waterfall. These are impacting the speed of delivery for new applications and software.	Given the rapid need for development, this role will need to continue to remain updated on new and enhanced technology and methodologies available. As the number of connected devices grows and users become more sophisticated, software development will also become more specialised.

In the next **3-5** years ...

While the responsibility for application and software development/implementation remains stable as technology advances, the technical knowledge of the individual must evolve with it to remain relevant including working more collaboratively with various business units.

Skills Differentiators:

- ▶ **Business and Financial Acumen:** The job holder will possess commercial awareness to work effectively with business units in developing requirements that will guide the design and implementation of applications and software.
- ▶ **Project Management:** The job holder will possess skills to deliver assignment objectives, key requirements and gain support from key stakeholders to implement actions within agreed deadlines.
- ▶ **Stakeholder Engagement:** The job holder will need to be able to coordinate and maintain productive working relationships with stakeholders, to ensure successful roll out of initiatives and projects.
- ▶ **Risk Awareness:** The job holder will possess knowledge of risk – including strong understanding on new and emerging risks such as cybersecurity – to be able to proactively guard against threats.
- ▶ **User Experience Design:** The job holder will display ability to design and solve user experience issues for various types of users.





IT Operations Management

Subsector: Enterprise

Job Family: Information Technology

Impact Level

Today, this role is responsible for delivering efficient and reliable infrastructure through performance monitoring and maintenance and overseeing the routine installations of hardware (e.g., network components and multi-functional devices).

Medium Impact

Consolidated Activities

	Today	Future
Governance for Infrastructure Architecture	Execution requires human judgment and technical expertise for design and development of policies.	Human judgment and technical expertise remain critical in setting-up infrastructure architecture and overall governance framework.
Business Requirements Definition	Execution requires human judgment and technical expertise to translate requirements.	Human judgment and technical expertise will remain critical to liaise with stakeholders to understand the business needs, technical requirements, as well as to negotiate expectations.
Infrastructure Maintenance and Optimisation	Execution requires human oversight. It is becoming increasingly common for job holders to work alongside data analytics and automation systems and tools to solve problems.	Machine learning could collect system performance data for capacity planning. Machine learning will be used as a way to optimise systems rather than independently handle potential problems.
Infrastructure Incidents Resolution	Digital tools are available that will help to self-recover in case of an incident. However, human judgment and technical expertise are required to resolve more complex problems.	AI will help to optimise system performance using tools that are available. Job holders will continue to work closely with senior management to establish disaster recovery plans for the organisation.

In the next

3-5 years ...

This role will continue to facilitate the overarching operations to ensure smooth operations and governance for the IT infrastructure. This role will leverage AI to optimise systems leading to enhanced recommendations. In addition, the rise of cloud computing will require that this role will move away from managing on-premise.

Skills Differentiators:

- ▶ **Change Management:** The job holder will possess the mindset and ability to adapt to and drive effective change that are aligned to the organisation's direction, ultimately improving the adoption of new infrastructure across organisation.
- ▶ **Process Excellence:** The job holder will possess skills to highlight the root causes of process inefficiencies and identify improvement opportunities across organisation.
- ▶ **Stakeholder Engagement:** The job holder will need to be able to coordinate and maintain productive working relationships with stakeholders to deliver initiatives and projects that are aligned to desired objectives for the organisation.
- ▶ **Project Management:** The job holder will be able to apply the appropriate principles for the planning and managing of a wide variety of projects to ensure the objectives are achieved within agreed timeframe.
- ▶ **Business and Financial Acumen:** The job holder will possess commercial awareness to work effectively with business units in implementing IT infrastructure and strategies that are aligned to business or organisational needs.





Subsector: Enterprise

Job Family: Information Technology

Impact Level

Today, this role is responsible for planning and delivering IT projects across the organisation, and provisioning IT services (e.g., development, negotiation and review of licensing contracts).

Medium Impact

Consolidated Activities

	Today	Future
Resource Management and Project Plan Development	Execution requires human judgment to plan and identify necessary resources for projects.	Organisations will continue to move towards adoption of agile/scrum methodologies. This role will continue to require being tech-savvy and adapting to the new technology methodologies, rather than just being functional project managers.
Stakeholder Management	Dashboards are already being adopted and being used to provide real-time updates to stakeholders.	Data analytics will facilitate the collection of feedback from various sources to spot trends and draw attention to oversights that affect other teams before they become barriers to project success.
Change Management	Task requires understanding the complexities of undertaking change initiatives and how they will effect the organisation.	This role will need to stay abreast of new methodologies and best potential for adoption within their organisation. This will also include deciding on which tools are useful and take advantage of their benefits to improve efficiency.

In the next

3-5 years ...

This role adopts new methodologies in the facilitation and delivery of IT related projects, and will continue to rely on stakeholder engagement, project management skills, as well as hone their technological expertise to continue delivering top quality IT projects to the organisation.

Skills Differentiators:

- ▶ **Change Management:** The job holder will possess a change mindset and ability to incorporate latest methodologies into project delivery.
- ▶ **Influencing and Negotiation:** The job holder will display confidence in presenting and justifying the rationale for new strategies, as well as guide the organisation throughout the transition and/or project delivery.
- ▶ **Stakeholder Engagement:** The job holder will be highly skilled to liaise with internal and external stakeholders (e.g., vendors), effectively eliciting stakeholders' views on areas of priorities and developing alignment across.
- ▶ **Risk Awareness:** The job holder will possess knowledge of risk and be able to identify potential areas of risk for new methodologies and project delivery to proactively address any concerns prior to escalation.
- ▶ **Business and Financial Acumen:** The job holder will possess commercial awareness to work effectively with business units in implementing IT projects that address the different needs.





Subsector: Enterprise

Job Family: Information Technology

Impact Level

Today, this role is responsible for overseeing the programs, protocols and escalation processes for security incidents, and working towards enhancing security operations as well as cybersecurity solutions.

Medium Impact

Consolidated Activities

	Today	Future
Security Strategy and Standards Setting	Execution involves human judgment and technical expertise in aligning enterprise security vision and underlying initiatives with business strategy.	Human interaction and technical expertise will remain key in advising top management on information technology security matters.
Cyber Risk Mitigation and Network Disaster Recovery Plan Development	Execution requires deep technical expertise and can be time consuming due to the need for independent reviews of information and formulation of recommendations.	Machine learning will be used to identify potential cyber-security incidents and potential network abnormalities. Working through raw data and leveraging unsupervised machine learning algorithms, abnormal information security activities can easily be detected. However, human judgment will remain critical in formulating corrective actions and appropriate controls to mitigate technical risks.
Penetration Testing and Results Reporting	Automated penetration testing software for real time information is already being adopted today. Dashboards that are able to visualise the testing and results are also common to help determine issues and quickly counter threats.	Automation of the security testing allows the human tester to focus their time and expertise on actually simulating realistic threats.

In the next

3-5 years ...

Methods of security breaches would be increasingly complex and difficult to prevent, hence, this role will leverage AI tools to predict anomalies and take a preventive approach to manage cyber threats with varying levels of complexity and determine the optimal course of action.

Skills Differentiators:

- ▶ **Cybersecurity:** The job holder will continuously upskill to be able to handle and address increasingly advanced data/online threats.
- ▶ **Systems Thinking:** The job holder will possess strong understanding of how systems work within the context of larger systems, ensuring successful implementation/integration of security solutions.
- ▶ **Stakeholder Engagement:** The job holder will need to be able to coordinate/maintain productive working relationships with stakeholders and achieve buy-in to ensure successful roll out of new security measures.
- ▶ **Risk Awareness:** The job holder will possess in-depth knowledge of risk – including strong understanding of emerging risks, inherent process and system risks – to develop comprehensive cyber-attack prevention plan.
- ▶ **Business and Financial Acumen:** The job holder will possess commercial awareness to work effectively with business units in developing security measures and strategies to combat security vulnerabilities – in a way that is aligned across the organisation.





IT Service Support

Subsector: Enterprise

Job Family: Information Technology

Impact Level

Today, this role is responsible for day-to-day IT support and oversight of the maintenance and upgrading of support systems, as well as restoring services with minimal impact to users.

Medium Impact

Consolidated Activities

	Today	Future
System Maintenance, Installation and Configuration	Automated deployment is ongoing today which allows for automatic pushing of updates to users, continuing to reduce manual human intervention needed for these activities.	This role will need to monitor ongoing system utilisation and work with third-party vendors for implementation of monitoring tools. This role will need to be able to evaluate pre-packaged solutions for selection of best fit for the organisation.
Incident Resolution and Helpdesk	Execution is heavily depended on using IT personnel to address events and alerts from the IT infrastructure, as well as incidents reported by customers. Many organisations have developed self-service platforms with live chat software and portals to solve users' problems.	Chatbots will be used to handle first level of helpdesk cases, as they are largely repetitive. Chatbots will be trained to improve capabilities to resolve an incident or service request. For complex cases, chatbots will perform pre-processing, and route tickets to the right personnel for further action.

In the next

3-5 years ...

This role will change to handle more complex cases that are escalated by automated systems. Human intervention will be required to resolve complex system issues, and to recommend preventive solutions for issues that arise frequently.

Skills Differentiators:

- ▶ **Data Interpretation and Analysis:** The job holder will possess skills to interpret data to extract key insights for recommendations, decisions or actions.
- ▶ **Process Excellence:** With good understanding of existing operations, the job holder can help to highlight the root causes of their process inefficiencies and identify the right processes for automation.
- ▶ **Complex Problem Solving:** The job holder will need to examine escalated complex problems, and leverage available resources to develop and execute solutions.
- ▶ **Advanced Digital Acumen/Literacy:** On-going upskilling will be required to ensure the job holder is familiar with new electronic platforms, and capable of providing support to minimise disruptions
- ▶ **User Experience Design:** With the increasing introduction of self-service options, the job holder will possess capability to make recommendations for future improvements to enhance user experience.





Subsector: Enterprise

Job Family: Information Technology

Impact Level

Today, this role is responsible for translating business needs into technical system solutions. They develop architectural approaches, conduct business reviews, and offer recommendations to address system integration problems as well as compatibility.

Medium Impact

Consolidated Activities

	Today	Future
Enterprise and Information Architecture Strategy Implementation	Execution requires human judgment and collaboration with other business units.	Close collaboration with business units will remain critical to anticipate future needs and requirements of the organisation, driving alignment of enterprise architecture strategy and design with the overall business strategy.
Business Needs Identification	Execution requires human judgment, complex analytical and critical thinking skills to identify business needs from data and research.	Advanced Analytics will be increasingly leveraged to identify pain points within processes, and uncover the gaps between business objectives, processes and systems.
Enterprise and Information Architecture Design	Execution requires technical knowledge and collaboration with other business units.	The role need to stay abreast with new technologies as technical expertise is critical in the development of future state models and plans to deliver an architecture that supports the most efficient and secure IT environment that is in line with regulations.
Stakeholder Management and Partnership	Execution requires technical knowledge and effective communication skills with stakeholders. Technology may assist in the execution.	Human judgment and technical expertise will remain vital to garner buy-in and influence business stakeholders to shift priorities, resources, and budgets to align with enterprise and information architecture roadmaps. Close collaboration with IT stakeholders will be necessary to create ownership within the organisation.

In the next

3-5 years ...

Human judgment remains critical and this role will incorporate data analytics to obtain unique business insights for the design of IT architecture.

Skills Differentiators:

- ▶ **Cybersecurity:** Given the rise of cybersecurity vulnerabilities, this role will need to continually focus on, and remain updated with the latest information to help create strategies to protect the organisation.
- ▶ **Global Perspectives:** The job holder will look beyond the needs of the organisation, gain understanding on market best practice, and incorporate new learnings into the design of IT architecture for the firm.
- ▶ **Risk Awareness:** The job holder will possess in-depth knowledge of risk to ensure IT strategy is robust to support the organisation needs.
- ▶ **Strategic Planning:** The job holder will demonstrate ability to incorporate insights into the development of strategic initiatives cater to the organisation and business needs.
- ▶ **Business and Financial Acumen:** The job holder will possess commercial awareness to work effectively with business units in identifying opportunities to leverage on new technologies to help achieve desired business outcomes.





Subsector: Enterprise

Job Family: Information Technology

Impact Level

Today, this role is responsible for Information Technology (IT) quality assurance through manual and automated testing – this includes finding and reporting bugs and glitches.

Medium Impact

Consolidated Activities

	Today	Future
IT Testing and Audit Plan Development	Execution requires manual documentation to describe testing scope and activities. However, some FIs have started to use RPA to map test plans to tracking tools.	IT testing plan development will continue to be improved with RPA tools that are able to run tests more quickly and accurately. This role will still be involved with analysing the results from automation systems.
Quality Assurance Testing and Monitoring	Execution can be time consuming and does not scale well.	RPA will be able to help with regression testing and test automation. Testing tools will reduce manual testing efforts, making the role more efficient.

In the next

3-5 years ...

This role will change to handle more complex cases that are escalated by automated systems. Human intervention will be required to resolve complex system issues, and to recommend preventive solutions for issues that arise frequently.

Skills Differentiators:

- ▶ **Automation Management:** Being able to use automated systems and identify opportunities to derive additional value from RPA will be critical to maximise its benefits.
- ▶ **Data Interpretation and Analysis:** Given more complex systems testing outputs, the job holder will be upskilled to analyse and interpret larger and more complex datasets in a meaningful way.
- ▶ **Investigation:** The job holder will display ability to examine logs and error reports to gather relevant information and uncover root causes.
- ▶ **Risk Awareness:** The job holder will possess strong knowledge of risk to assess system errors or problem severity across different scenarios.
- ▶ **Process Excellence:** With the incorporation of RPA, the job holder will need to continuously seek for opportunities to improve and streamline processes.





Marketing and Communications Officer

Subsector: Enterprise

Job Family: Marketing

Impact Level

Today, this role is responsible for the realisation of business strategies by driving marketing and branding programmes, communication plans, and generating data-driven commercial insights.

Medium Impact

Consolidated Activities

	Today	Future
Marketing Strategy Development	Execution requires human judgment and strategic planning. In addition, deep product knowledge and business acumen is important in helping job holders devise marketing plans that will attract customers, and are in line with the firm's branding.	Advanced Analytics can yield better customer insights leading to improved marketing strategies. Human judgment will still be needed to decide what data is actionable and how to best align strategies with the firm's ultimate objectives.
Campaign Development and Execution	Tasks are administrative in nature. Execution involves close partnership with multiple business stakeholders.	Advanced Analytics, coupled with usage of digital tools, will help to track the performance of campaigns and provide metrics to determine if any actions are needed to improve campaign performance.
Internal and External Communications	Execution requires excellent "people" skills – such as stakeholder engagement and conflict management to ensure smooth coordination of communications.	Digital platforms will facilitate the dissemination of communication. Human intervention will remain critical in managing an effective working relationships with different stakeholders.

In the next

3-5 years ...

This role will continue to be responsible for the ideation, creation and execution of strategic marketing campaigns. Advanced Analytics will be incorporated to improve marketing campaigns approaches. With the rise of digital platforms, this role will likely transform to be more similar to a Digital Marketer.

Skills Differentiators:

- ▶ **Data Interpretation and Analysis:** The job holder will use data driven insights to supplement generation of new ideas and create captivating content.
- ▶ **Targeted Technical Sales:** Due to increased efficiency, improved understanding of customer preferences, and speed of campaign development, more marketing communications can be circulated to support the product and sales value-chain and the function will be more closely linked to sales roles.
- ▶ **Product Awareness:** The job holder will possess in-depth understanding of the product portfolio in order to develop a robust marketing campaigns.
- ▶ **Customer Mindset:** The job holder will possess in-depth understanding of client's needs and incorporate valuable insights into marketing related activities.
- ▶ **Advanced Digital Acumen/Literacy:** The job holder will upskill to be proficient in using advanced digital tools and gain a strong understanding on how different solutions and its features can be leveraged to support marketing efforts.





Subsector: Enterprise

Job Family: Risk Management

Impact Level

Today, this role is responsible for the implementation of process improvement initiatives to enhance operational efficiency, service delivery, and to create a continuous improvement culture in the organisation.

Medium Impact

Consolidated Activities

	Today	Future
Performance and Quality Monitoring	Execution is manual, and involves developing required performance management and quality scorecards for various functions.	Supported by AI, tracking will begin at the operational level, triggering alerts when service level agreements (SLAs) are not met. Organisations will also assess key performance indicators (KPIs) in a historical context and leverage data to predict operational "pain points", ultimately to improve performance
Continuous Process Improvement	Execution requires liaising with various business units to gather inputs and identify which areas in the operations workflow can be improved.	Advanced Analytics will provide more granular information to detect potential pain points. New methodologies will continue to be adopted to realise business products and process improvement opportunities.
Foster Culture of Continuous Improvement	Execution is advisory in nature and requires human judgment and expertise to collaborate across the organisation to create a work environment that engages employees at all levels to help drive out non-value adding work and simplify processes to achieve cost reduction.	Execution will continue to be human centric - relying on soft skills to encourage others to increase awareness, adopt and maintain a culture that encourages operational efficiency.

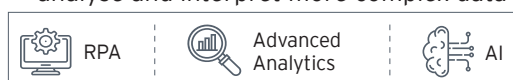
In the next

3-5 years ...

Moving away from the reactive break-and-fix approach, this role will leverage data to predict potential pain points across operations and strategically deploy resources to address anomalies as well as prioritise processes for automation.

Skills Differentiators:

- ▶ **Change Management:** The job holder will have the mindset and ability to drive effective change to ensure employees across the organisation adopt the continuous improvement culture, and showcase willingness to drive improvement in processes.
- ▶ **Project Management:** The job holder will be able to apply the appropriate principles for the planning and managing of a wide variety of process improvement projects to ensure stakeholder expectations and the objectives are achieved within agreed timeframe.
- ▶ **Business and Financial Acumen:** The job holder will possess commercial awareness to obtain a deeper understanding of the business needs and expectations, and ensure all processes and practices are able to drive and deliver business results.
- ▶ **Influencing and Negotiation:** The job holder needs to have the ability to display confidence in presenting and justifying the rationale for new processes as well as aligning the stakeholder's way of thinking and gaining buy-in from them.
- ▶ **Data Interpretation and Analysis:** Given the availability of large datasets, the job holder will be upskilled to analyse and interpret more complex data in a meaningful way.





Subsector: Enterprise

Job Family: Legal

Impact Level

Today, this role is responsible for supporting the running of legal department operations and legal administrative activities.

Medium Impact

Consolidated Activities

	Today	Future
Legal Research and Analysis	Execution involves extraction of information for regulatory bodies, head office, and other government authorities. The manual extraction from different systems can be time consuming.	AI-enable software will be used to filter and analyse legal databases to look for relevant information, allowing more sources to be processed in less time. Job holders will spend more time with analysis and identifying insights.
Filing and Documentation	Execution is repetitive and document intensive making it tedious and prone to human error.	RPA can be used to draft standard legal documents and automate routine filing of documents. Some human judgment is required for oversight and managing quality of output.
Vendor and Stakeholder Management	Execution can be time and document intensive, with large amounts of correspondence going between parties. However, partnership and 'people' skills are needed to effectively engage and communicate effectively.	Digital tools will facilitate dissemination of correspondence and communication. Human intervention will remain critical to manage effective working relationships and manage exceptions.

In the next

3-5 years ...

This role will continue to support the legal department operations and administration, but using technology to speed up efficiency of completing tasks. The job holder would be required to oversee and manage the use of digital tools, and focus more on project management and vendor management activities.

Skills Differentiators:

- ▶ **Advanced Digital Acumen/Literacy:** The job holder will need to stay abreast of latest technologies to effectively incorporate, manage and use digital tools to support legal activities.
- ▶ **Cybersecurity:** The job holder will possess awareness and knowledge of cybersecurity risks and work to proactively mitigate them through controls and safeguards
- ▶ **Risk Awareness:** The job holder will be aware and proactively identify risks that need to be addressed by the business from a legal capacity
- ▶ **Lateral Thinking:** The job holder will demonstrate the ability to connect the dots across different types of information as part of legal research to draw insights to support plans for addressing legal matters
- ▶ **Process Excellence:** The job holder will identify business processes which can be improved and seek opportunities to achieve efficiency in operations and legal administration.





Regulatory Change Management Officer

Subsector: Enterprise

Job Family: Regulatory Liaison

Impact Level

Today, this role is responsible for liaising with regulatory bodies and industry associations, and assessing the impact of new or refined regulations on business.

Medium Impact

Consolidated Activities

	Today	Future
Regulatory Bodies and Industry Association Liaison	Execution requires human interaction and involves ongoing networking. Human judgment, interaction and expertise are required to participate in official communications, industry roundtables and other related events to keep abreast with local regulatory matters.	This role will continue to act as the liaison with regulators, external counsels and consultations in respect to local regulatory requirements. Hence, human intervention remains critical.
Impact Assessment and New Requirements Interpretations	Execution is highly technical, and manual tracking and maintaining the library of regulations could be time consuming. FIs are exploring automation opportunities to automate the tracking of regulatory information – where new updates and insights are collated from external sources and integrated into a common repository.	AI-driven automated systems will be used to create a centralised regulatory library with consistent taxonomy. It will track regulatory updates from multiple sources, notify affected business units, and automatically run impact assessments. Human judgment remains critical in advising top management and risk function on changes and implications. In addition, technical expertise is vital in validating the outcomes of impact assessments and segmenting new regulations for various functions to take action.

In the next

3-5 years ...

This role will apply their expertise and technical knowledge in verifying and challenging the impact assessment results from different perspectives, and providing advice on the alignment between organisation strategy and new and/or refined regulations.

Skills Differentiators:

- ▶ **Influencing and Negotiation:** The job holder will need to display confidence in presenting and justifying the rationale for new policy implementation, and gaining buy-in from all stakeholders.
- ▶ **Stakeholder Engagement:** The job holder will need to proactively engage key stakeholders to address the business impact of regulatory changes and effectively manage the balance of interests of stakeholders.
- ▶ **Project Management:** This skill is important for the job holder to drive the implementation process, ensuring that regulatory changes are properly assigned and actions that drive project success are rolled out in a timely manner.
- ▶ **Data Interpretation and Analysis:** The job holder will need to be skillful in interpreting data to extract key insights for recommendations, decisions or actions.
- ▶ **Change Management:** Change management expertise is vital for job holders to help the business with successful transitions to revised or new regulations.





Subsector: Enterprise

Job Family: Compliance (Advisory)

Impact Level

Today, this role is responsible for maintaining/ developing AML guidelines and procedures, recognising the potential implications of regulatory changes, and providing prompt, constructive advice on AML/CFT legislation application to business.

Low Impact

Consolidated Activities

	Today	Future
AML/CFT Regulation Updates Notification	Execution requires human interpretation, hence leaving little room for application of technology.	Digital platforms will be used to alert officers on global emerging trends (e.g., in AML, sanctions, etc.), but technical knowledge and judgment are needed in the development of AML policies and procedures that are in line with the local regulatory requirements.
AML Policies and Procedures Drafting	Execution requires in-depth understanding of local and global regulatory requirements, and high level of human judgment to operationalise regulatory requirements with consideration to business practices.	Regulatory intelligence and analytical capabilities will contribute to the analysis and understanding of the impact of regulatory change. However, an effective system of internal control requires more than rigorous adherence to legislation. It requires the use of judgment in the application of the requirement to the business.
Stakeholder Management	Execution involves human interactions and advisory. There is limited to no automation opportunity.	Frequent stakeholder communications are needed to steer drafted policies and standards through various approval processes, discuss refinements and additional inputs, as well as track policy adoption and understand the challenges of adoption.

In the next
3-5 years ...

The nature of this role is unlikely to change in the near future. There is limited automation opportunity, but as financial crime evolves and regulations become more stringent, Advanced Analytics may potentially be used to support the advisor in policy formulation.

Skills Differentiators:

- ▶ **Product Awareness:** The job holder will need to possess good product knowledge in order to provide oversight from an AML/CFT perspective.
- ▶ **Complex Problem Solving:** The job holder will need to oversee emerging AML/CFT concerns and leverage available resources internally and externally to address complicated cases.
- ▶ **Advisory:** The job holder will display ability to apply the right advisory strategy to guide stakeholders on emerging AML/CFT regulations and to enable the prevention of crimes.
- ▶ **Lateral Thinking:** The job holder will display ability to incorporate information collated from different sources into their advice or solutions.
- ▶ **Stakeholder Engagement:** Job holder will need to proactively engage stakeholders to address AML/CFT issues with practical solutions, and effectively manage the balance of interests of different stakeholders.





Subsector: Enterprise

Job Family: Compliance (Advisory)

Impact Level

Today, this role is responsible for implementing ABC programmes across business divisions, reviewing risk assessment framework and providing advice to manage risks associated with transactions, client relationships, joint ventures, business development etc.

Low Impact

Consolidated Activities

	Today	Future
ABC Framework/ Program Design	Execution requires strong technical expertise. The evolving behaviours – specific to bribery, insider trading and corruption can be detected using Advanced Analytics and AI.	With the increasing use of Advanced Analytics, outcomes will be leveraged to inform the refinement of existing programmes. Human intervention and judgment will remain essential in fostering collaboration, facilitating discussion, redesigning internal policies and to ensure refined controls are fit for purpose.
ABC Policies Implementation	Execution is advisory-driven. Human intervention is key in building strong relationships with stakeholders within all business divisions, providing support relative to the management of ABC – related risk and addressing new legislative or regulatory requirements.	Human intervention remains critical in the execution, with limited to no opportunities for technology to be integrated.
Risk Management/ Mitigation Advisory	Execution is advisory-driven. In-depth knowledge and strong understanding of the business, risks, and regulations are critical in putting forth mitigation strategies.	Expertise and strong understanding of business is key to providing guidance and appropriate risk consultation to stakeholders (such as donations, sponsorships, joint venture, third parties management) and assist in the development of mitigation strategies.

In the next
3-5 years ...

This role will continue to play a strategic role, leveraging analytics for the development of robust intervention plans – in an effort to protect financial institutions against breaches.

Skills Differentiators:

- ▶ **Product Awareness:** The job holder will need to possess strong product knowledge, as well as commercial awareness to guide and ensure that the business is adhering strictly to anti-corruption legislation.
- ▶ **Complex Problem Solving:** The job holder will need to address a variety of compliance violations and leverage available resources to develop and implement corrective action plans.
- ▶ **Advisory:** The job holder will need to apply appropriate advisory strategies to guide stakeholders on emerging regulations and to enable the prevention of breaches.
- ▶ **Lateral Thinking:** The job holder will display the ability to incorporate information collated from different sources into advice or solutions.
- ▶ **Stakeholder Engagement:** The job holder will need to proactively engage stakeholders to address ABC issues with practical solutions, and effectively manage the balance of interests of various stakeholders.





Subsector: Enterprise

Job Family: Compliance (Advisory)

Impact Level

Today, this role is responsible for advising the business on the implementation of new changes in regulations in various areas, and act as a subject matter expert to recommend refinements for compliance policies.

Low Impact

Consolidated Activities

	Today	Future
New Regulations Implementation Advisory	Execution is advisory-driven, with human judgment and expertise required to advise the business on the appropriate applications as well as implementing the suitable mitigation strategy to resolve compliance and operational risks.	With in-depth knowledge and understanding of the business and regulatory environment, this role will continue to act as a trusted advisor to the business.
Compliance Requirements Interpretations	While this task can be supported by technology (e.g., tracking of new regulations), interpretation requires human judgment.	Machine learning and analytics will be able to perform real-time tracking of current and upcoming regulations, and AI-powered applications or technology used to centralise regulatory library with consistent taxonomy. However, expertise remains critical in interpreting and keeping abreast with new legislations.
Compliance Policy Drafting and Revision	Human judgment and expertise are critical to fully understand the impact of new regulations on various functions, and develop robust internal controls to ensure that the organisation, its clients and employees are protected.	Human judgment and expertise will remain critical in establishing robust internal controls.

In the next

3-5 years ...

This role will continue to play a strategic, and important part in partnering with the business, to provide guidance on the interpretation of regulatory requirements and delivery of operations aligned with the organisation's appetite.

Skills Differentiators:

- ▶ **Product Awareness:** The job holder will need to possess strong product knowledge as well as commercial awareness to guide and ensure that the business is adhering to rules and regulations.
- ▶ **Complex Problem Solving:** The job holder will need to examine complex problems that are escalated for review, and leverage available resources to develop and execute solutions.
- ▶ **Advisory:** The job holder will need to apply appropriate advisory strategies to guide stakeholders on emerging regulations and to enable the prevention of breaches.
- ▶ **Lateral Thinking:** The job holder will display ability to incorporate information collated from different sources into advice or solutions.
- ▶ **Stakeholder Engagement:** The job holder will need to proactively engage key stakeholders to address compliance issues with practical solutions, and effectively manage the balance of interests of various stakeholders.





Subsector: Enterprise

Job Family: Information Technology

Impact Level

Today, this role is responsible for developing and implementing strategies aimed at improving customer relationships and satisfaction with the business, product and services, including incorporating feedback for continuous improvement.

Low Impact

Consolidated Activities

	Today	Future
Customer Experience Strategy Design	Task is advisory in nature and requires in-depth business knowledge. Predictive analytics are increasingly used to determine customer preferences and help shape the unique experience for various customer segments.	AI tools with Advanced Analytics capabilities will provide in-depth information about customers and their preferences, ultimately informing a robust strategy for customer experience.
Feedback and Customer Insights Evaluation	Execution requires human judgment. Collating and analysing information across multiple touchpoints can be time intensive, hence many organisations are leveraging technology for execution.	Digital applications may be developed to facilitate the voice of customer to help improve the customer journey. Human judgment will remain necessary to interpret the results.
Continuous Improvements On Customer Service	Task requires networks and relationships across the business to be able to identify and prioritise areas for change.	Data analytics will be used to identify common issues and root causes pertaining to quality of service across various platforms, creating robust insights and recommendations. Human judgment will remain vital in execution.
Customer Engagement Programs Development	Task is advisory in nature, and execution requires understanding business needs.	The role will leverage active and passive data to gauge customer sentiments, preferences, and to create the optimal schemes and incentives for customer engagement.
Usability Testing and User Experience Optimisation	Task requires understanding end-to-end solutions and providing advice on potential areas for improvements.	Data analytics will help to analyse user feedback on interface performance with the intention of enhancing the customer experience.

In the next

3-5 years ...

Recognising that enhanced customer experiences will serve as a differentiator amongst competitors, this role will need to be able to leverage data analytics to help address ever-changing customers' expectations and preferences.

Skills Differentiators:

- ▶ **Complex Problem Solving:** The job holder will be able to incorporate data insights into tackling complex solutions and seek for continuous improvement opportunities that are unique to the organisation.
- ▶ **Influencing and Negotiation:** The job holder will have the ability to display confidence in presenting and justifying rationale for the recommendations or solutions, and gain buy-in from relevant stakeholders to help achieve desired outcomes.
- ▶ **Data Storytelling:** The job holder will possess skills to effectively convey messages and findings to different audiences to ensure that critical messages are communicated accordingly.
- ▶ **Advisory:** The job holder will display the ability to apply the right advisory strategy to engage with stakeholders in different situations and provide advice that leverages on deeper business acumen infused with quantitative and technical insights to inform better customer experience.
- ▶ **Lateral Thinking:** The job holder will be required to handle larger sets of data today, hence the ability to 'connect-the-dots' and stay focused on big picture to develop creative solutions will remain important.





Subsector: Enterprise

Job Family: Marketing

Impact Level

Today, this role is responsible for the realisation of the organisation's business strategies by driving its digital marketing programmes and implementing marketing content across all digital channels.

Low Impact

Consolidated Activities

	Today	Future
Marketing Campaigns Development	Execution requires an innovative mindset coupled with deep product knowledge and business acumen to devise effective marketing plans that are aligned to the organisation's branding. The job holder possesses knowledge in of how digital channels function to understand how best to structure online campaigns.	Advanced Analytics will be used to develop more segmented and targeted marketing campaigns. The job-holder will have enhanced ability to track conversions and adapt more quickly if campaigns are not performing up to determined standards.
Digital Marketing Strategy Definition and Implementation	Execution requires human judgment to design the parameters of the marketing strategy and enforce it across the team and the organisation.	Third-party software incorporated with machine learning and predictive analytics capabilities will be leveraged to identify factors that affect campaign effectiveness. Human intervention remains critical in utilising the insights to determine the best strategies and develop the most suitable marketing campaigns for various products.
Campaign Effectiveness Tracking	Execution involves regular trend analysis of online campaigns (e.g., paid search, social media etc.) to obtain insightful and actionable data. Organisations are leveraging software tools to gather real-time data to measure campaign impact and effectiveness.	

In the next

3-5 years ...

This role will continue to drive the online marketing efforts of the organisation. Solutions with Advanced Analytics and AI capabilities will help to enhance the strategic planning and design of marketing campaigns. This role will likely oversee both online and offline marketing events, offering an integrated strategy to drive effectiveness.

Skills Differentiators:

- ▶ **Data Interpretation and Analysis:** The job holder will display the ability to deliver actionable recommendations through data analysis to influence business decisions and strategies.
- ▶ **Advanced Digital Acumen/Literacy:** The job holder will continue to upskill to be proficient in using advanced digital tools and gain a strong understanding on how different solutions and its features can be leveraged to support marketing efforts.
- ▶ **Technology Troubleshooting:** The job holder will possess skills to resolve basic technical issues of different digital solutions or platforms to ensure seamless execution.
- ▶ **Product Awareness:** The job holder will possess in-depth understanding of the product portfolio in order to develop robust marketing campaigns.
- ▶ **Customer Mindset:** The job holder will possess in-depth understanding of client's needs and incorporate valuable insights into marketing related activities.





Subsector: Enterprise

Job Family: Information Technology

Impact Level

Today, this role is responsible for creating and implementing an organisation's digital agenda, in addition to innovation of product and services for continued digital advancement.

Low Impact

Consolidated Activities

	Today	Future
Opportunities Identification for Digital Solutions	Execution requires in-depth understanding of technical needs as well as business objectives.	Many of the solutions will require creation of bespoke or complex product and service solutions. Advanced Analytics and AI will help to provide more information for consideration during new solution development.
Digital Strategy and Roadmap Development	Execution requires in depth business knowledge.	Understanding the existing state of the business and infrastructure will help to more accurately determine the best plan for adoption of digital solutions.
Relationship Management (or Stakeholder Alignment)	Execution requires personal networks and relationships, but can be supported by technology.	Evaluation of potential partners will require deep understanding of technologies available and potential use-cases for business.
Digital Best Practices and Process Development	Execution requires human judgment and staying abreast of latest trends and developments.	Given new and emerging technologies, it is important to understand implications that come along with implementation. Task is advisory in nature and requires the ability to communicate with various business units.

In the next

3-5 years ...

This role will be assisted by Advanced Analytics, however, human judgment remain critical to understand the needs and requirements of the customer and business. In the longer term, this role could become more ingrained within other parts of the organisation.

Skills Differentiators:

- ▶ **Stakeholder Engagement:** The job holder will be highly skilled to liaise with various stakeholders across the organisation, effectively eliciting stakeholders' views on areas of priorities and developing alignment across.
- ▶ **Advanced Digital Acumen/Literacy:** The job holder will possess strong understanding on how solutions can be further leveraged, and learn the technical features to support the business.
- ▶ **Change Management:** The job holder will have the mindset and ability to adapt to and drive effective change to ensure the client can successfully adopt digital solutions to support their day-to-day operations.
- ▶ **Customer Mindset:** The job holder will need to be closer to the customer to better understand their expectations, and put together digital solutions to drive business growth.
- ▶ **Influencing and Negotiation:** The job holder will display confidence in presenting and justifying the rationale for proposed digital strategies, and gain buy-in from relevant stakeholders.





Subsector: Enterprise

Job Family: Risk Management

Impact Level

Today, this role is responsible for identifying, and monitoring all major risk classes (such as strategic, financial, reputational etc.) in financial institutions, in addition to establishing risk aggregation and risk governance frameworks.

Low Impact

Consolidated Activities

	Today	Future
Enterprise Risk Management (ERM) Capabilities and Program Development	Execution requires in depth business knowledge. Human expertise is needed to generate the insights that lead to effective risk mitigation strategies. Human collaboration is critical in working with senior management to address potential risks.	Tasks will continue to leverage on human expertise, but performance will be enhanced by incorporating AI technology. AI can enable the analysis data on enterprise risks and generate insights to allow for more meticulous planning of ERM programmes.
Cross-risk Exposures Evaluation and Cross-risk Type Aggregations	Execution requires in-depth technical knowledge and sound decision making to evaluate the various risk exposures. Analytical and critical thinking skills would be critical for the success of this task.	AI will be able to process various situations and scenarios to estimate cross-risk exposures and provide insights and recommendations for this role to evaluate further.
Development of Business Continuity Management (BCM) governance framework	Execution requires in-depth business knowledge and stakeholder management skills. Tasks requires knowledge of the organisation's operations such that the role is able to ensure business continuity efficiently. Enterprise risk managers are required to collaborate with the BCM team – by exchanging insights on identified interruption risks – to support BCM exercise scenarios.	Advanced Analytics will be used to develop better forecasting models, while digital data visualisation tools can be used to better communicate results and findings. AI can contribute by running multiple “what-if” scenarios to understand the various impacts and implications during different emergencies. These would be invaluable insights that can contribute to the development of the BCM framework. However, human decision making and judgment would still be key for the success of this task.

In the next
3-5 years ...

This role will continue to be responsible for identifying and preventing enterprise risk within the organisation. However, technology can help provide additional insights to expand the foresight of the role and help them better prepare for such risks more proactively.

Skills Differentiators:

- ▶ **Data Engineering:** Given the increase in data analytics, data pipeline management will be critical to ensure that data meets the standards and requirements necessary.
- ▶ **Data Storytelling:** The job holder will demonstrate ability to disseminate key findings in a compelling, impactful, and easy-to-understand manner to audiences with varying level of interests and appetite.
- ▶ **Analytics and Computational Modelling:** Despite automation, the job holder will continue to demonstrate strong capability in creating and delivering sophisticated models.
- ▶ **Complex Problem Solving:** The job holder will need to examine sophisticated cases that are escalated and leverage available resources to develop and execution solutions.
- ▶ **Stakeholder Engagement:** The job holder will be highly skilled in liaising with internal and external stakeholders; effectively eliciting stakeholders' views and developing alignment across.





Subsector: Enterprise

Job Family: Legal

Impact Level

Today, this role is responsible for handling and mitigating any legal issues that could arise. They play a critical role in reviewing and drafting contracts, employee policies, and handling court cases.

Low Impact

Consolidated Activities

	Today	Future
Due Diligence and Contract Review	Execution is document-intensive, can be tedious, and is prone to human error.	AI-enabled software will be able to help in the due diligence/contract review process by extracting relevant information from contracts for analysis.
Documentation and Reporting	Execution is repetitive and often high in volume. Task is also time and document intensive and detail-heavy, making the process inefficient.	NLP will automate the drafting of legal agreements. RPA can help draft legal documents that are standard and low in complexity. However, due to the important nature of such documents, some human judgment is still required for oversight.
Legal Research and Analysis	Execution requires human judgment and analytical skills to search through various sources and extract insights. Research can be time and document intensive, resulting in only a limited number of sources being examined due to time constraints.	AI will be able to filter through and analyse large legal databases to look for relevant information AI may tap on natural language processing to identify desired keywords to filter databases for insights. This allows more documents to be processed within the given time, expanding the scope of research.

In the next

3-5 years ...

This role will continue to be responsible for overseeing the legal processes and ensuring legal compliance of the organisation. However, with augmentation, many traditionally administrative tasks can be processed at much greater speeds, increasing the job holders' efficiency.

Skills Differentiators:

- ▶ **Change Management:** The job holder will have the mindset and ability to adopt and drive effective change to ensure advanced solutions and new ways of working are embraced.
- ▶ **Risk Awareness:** The job holder will possess in-depth risk knowledge to help business evaluate and address risks pre-emptively.
- ▶ **Cybersecurity:** The job holder will possess in-depth knowledge of cybersecurity risks to work closely with relevant stakeholders to provide guidance on managing cybersecurity risk and addressing cybersecurity incidents.
- ▶ **Advanced Digital Acumen/Literacy:** The job holder will possess strong understanding on how digital solutions and technical features can be incorporated and leveraged to support operations.
- ▶ **Lateral Thinking:** The job holder will demonstrate the ability to connect the dots using all available information, and create robust arguments or action plans to address legal issues.





Subsector: Enterprise

Job Family: Risk Management

Impact Level

Today, this role is responsible for identifying, quantifying, and managing the liquidity risk (cash flow and asset illiquidity), taking into account potential vulnerabilities and prepare regulatory liquidity standards.

Low Impact

Consolidated Activities

	Today	Future
Scenario Analysis and Stress Testing	Execution can be time consuming and repetitive. However, this task still requires analytical and critical thinking, as well as human judgment to conduct stress testing with multiple scenarios.	Advanced Analytics can yield probabilities of order flow scenarios or generate regulatory-required buffers and liquidity stress testing metrics. Machine learning could also be used to project balance sheet/income statements.
Liquidity Forecasting and Reporting	Execution is administrative and manual in nature. However, some human judgment and decision making is required to conduct forecasting of the liquidity risk.	Automated infrastructure will improve lead time and reporting consistency. Machine learning tools can potentially cluster and predict asset classes by evaluating relevant factors influencing liquidity.
Liquidity Impact Modelling	Execution requires deep technical expertise in liquidity risk and computational modelling to help design liquidity impact models.	AI can help with complex modelling. However, human judgment is needed to assess if assumptions are appropriate.
Risk Appetite/ Control Thresholds Setting	Execution requires strong business acumen and strategic planning to ensure that risk appetite is carefully calculated as the implications of insufficient risk controls would be severe for the organisation.	Machine learning will be used in systemic risk identification, but defining risk thresholds, proposing appropriate appetite and establishing contingency funding plans that align with business strategies requires human judgment and business expertise.
Liquidity Policy, Governance Framework and Contingency Funding Planning (CFP)	Execution requires deep technical knowledge and awareness of the business goals. Close collaboration with other business partners are key to ensure that policies planned are in line with the organisation's position and values.	Supported by stress testing data, human judgment and expertise will be key in creating a robust liquidity governance framework and the drawing up CFPs to address the financial institution's liquidity under stress.

In the next

3-5 years ...

This role will benefit from the inclusion of Advanced Analytics and AI into many of the tasks that are part of current processes. New sources of information will help with more proactive risk management and improved analysis and reporting.

Skills Differentiators:

- ▶ **Data Engineering:** Given the increase in data analytics, data pipeline management will be critical to ensure that data meets the standards and requirements necessary.
- ▶ **Data Storytelling:** The job holder will demonstrate ability to disseminate key findings in a compelling, impactful, and easy-to-understand manner to audiences with varying level of interests and appetite.
- ▶ **Analytics and Computational Modelling:** Despite automation, the job holder will continue to demonstrate strong capability in creating and delivering sophisticated models.
- ▶ **Programming and Coding:** The job holder will continue to enhance their programming capabilities as models are becoming more complex.
- ▶ **Stakeholder Engagement:** The job holder will be highly skilled in liaising with internal and external stakeholders; effectively eliciting stakeholders' views and developing alignment across.





Subsector: Enterprise

Job Family: Risk Management

Impact Level

Today, this role is responsible for the periodic review of market risk limits to ensure that risk measures and thresholds are commensurate with the markets, business strategy and risk/return profile.

Low Impact

Consolidated Activities

	Today	Future
Market Risk Reporting	Tasks are administrative and execution is time consuming as a lot of time is spent looking for information and monitoring the market on and ongoing basis.	Real-time calculation engines could conduct interest rate risk estimation/sensitivity to better model risks. Human expertise will remain vital in validating risk reporting to ensure compliance with ever changing regulatory reporting requirements.
Stress and Scenario Testing On Trading Portfolios	Execution is time intensive and is quite rule-based. However, some human judgment and expertise is still required to run these tests and review results.	Real-time calculation engines can be used to run 'what-if' scenario analyses along with DV01/PV01, but human expertise will remain vital in addressing exceptions and governing the accuracy of model outputs.
Market Risk Threshold and Triggers Review/Advice	Execution requires deep technical expertise to provide consulting/advisory on market risk thresholds and triggers. Human expertise is critical in defining market risk limits, and ensuring that exceptions to limits are escalated and addressed when necessary.	AI is able to process various situations and scenarios to estimate the threshold for market risk, and provide insights and recommendations for this role to process. The job holder should be able to leverage on these insights to provide recommendations to business units.
Trading Or Balance Sheet Strategies Advisory	Execution requires deep technical expertise and good communication skills to provide consulting/advisory services. Cross collaboration with trading and other risk functions is essential, and human expertise is important in advising on the right strategy.	

In the next

3-5 years ...

This role will continue to be responsible for analysing and preventing market risks within an organisation. However, technology can in processing more administrative and repetitive tasks, allowing the roles focus to shift to be more about proactive risk management and reviewing of information provided by AI-enabled systems.

Skills Differentiators:

- ▶ **Data Engineering:** Given the increase in data analytics, data pipeline management will be critical to ensure that the data meets the standards and requirements necessary.
- ▶ **Data Storytelling:** The job holder will demonstrate ability to disseminate key findings in a compelling, impactful, and easy-to-understand manner to audiences with varying level of interests and appetite.
- ▶ **Analytics and Computational Modelling:** Despite automation, the job holder will continue to demonstrate strong capability in creating and delivering sophisticated models.
- ▶ **Programming and Coding:** The job holder will continue to enhance on programming capabilities as models are becoming more complex.
- ▶ **Stakeholder Engagement:** The job holder will be highly skilled in liaising with internal and external stakeholders; effectively eliciting stakeholders' views and developing alignment across.





Subsector: Enterprise

Job Family: Risk Management

Impact Level

Today, this role is responsible for development, implementation and monitoring of the operational risk framework in line with best practices and legal requirements.

Low Impact

Consolidated Activities

	Today	Future
Operational Risk Management Framework Development	Execution requires close collaboration with other business units to understand and evaluate potential risks.	AI will be used to mine and sift through data to identify risk indicators. Cloud computing will enable a more collaborative data management system to oversee the entire organisation's framework.
Control Testing and Review	Execution is repetitive and time consuming. Testing can have limited success as only certain situations can be evaluated due to time constraints.	AI will help to look at processes more quickly and determine risk levels due to the ability to review multiple scenarios - this will be necessary given the increased complexity of models used for analysis.
Risk Profile Monitoring and Reporting	Execution requires technical expertise in risk reporting and the ability to analyse large volumes of risk reports. Task is document intensive and is time consuming as the role needs to constantly monitor these profiles.	AI will allow for a more proactive approach to addressing risks/losses by identifying most risky behavior and automatically providing an investigative context while eliminating manual efforts.

In the next

3-5 years ...

This role will continue to be in-charge of overseeing the operational risk control of the organisation, and will be partially augmented by AI – allowing the job holders to better identify and prevent risk prone situations and behaviours.

Skills Differentiators:

- ▶ **Process Excellence:** The job holder will help to highlight root cause of process inefficiencies and identify the right processes that require automation.
- ▶ **Data Storytelling:** The job holder will demonstrate ability to disseminate key findings in a compelling, impactful, and easy-to-understand manner to audiences with varying level of interests and appetite.
- ▶ **Change Management:** The job holder will have the mindset and ability to adapt to and drive effective change to ensure advanced solutions and new ways of working are embraced.
- ▶ **Advanced Digital Acumen/Literacy:** The job holder will possess strong understanding on how digital solutions and technical features can be further leveraged to support analysis.
- ▶ **Data Interpretation and Analysis:** The job holder will enhance their capability in evaluating model results and interpreting data to extract key insights for recommendations, decisions or actions.



7.2 Industry Participants

Organisation

1	ABN Amro Bank N.V	41	Insurance and Financial Practitioners Association of Singapore
2	AIA Singapore	42	Investment Management Association of Singapore
3	AIG Singapore	43	Julius Baer Trust Company (S'pore) Ltd
4	AL Wealth Partners Pte Ltd	44	LGT Bank Singapore Ltd
5	Allianz SE, Singapore Branch	45	Life Insurance Association Singapore
6	Allied World Assurance Company Ltd	46	Lion Global Investors Limited
7	Ant Financial	47	Manulife (Singapore) Pte Ltd
8	Aprikot Pte Ltd	48	Maybank Singapore
9	Association of Financial Advisers (Singapore)	49	Maybank Kim Eng Singapore
10	Aviva Singapore	50	MSIG Insurance
11	AXA Singapore	51	Nanyang Polytechnic
12	Bank Julius Baer (Singapore) Ltd	52	Ngee Ann Polytechnic
13	Bank of America Merrill Lynch	53	Nikko Asset Management
14	Bank of Singapore	54	Nomura Singapore Limited
15	Bank Pictet & Cie (Asia) Ltd	55	NTUC Income Insurance Co-operative Limited
16	Barclays PLC	56	NTUC's Financial and Professional Services Cluster
17	Blackrock Advisors LLC	57	Oversea-Chinese Banking Corporation Limited
18	BNP Paribas	58	Prime Partners Group
19	CGS-CIMB Securities (Singapore) Pte Ltd	59	Prudential Assurance Co. Singapore (Pte) Ltd.
20	China Life Insurance Company Limited	60	QBE Insurance Group
21	Citibank N.A.	61	Schroder Investment Management Limited
22	Citibank Singapore	62	Scotiabank
23	Citicorp Investment Bank (Singapore) Limited	63	Singapore College of Insurance
24	Credit Suisse Group AG	64	Singapore Corporate Counsel Association
25	Crowe Horwath Capital Pte Ltd	65	Singapore Exchange Limited
26	DBS Bank	66	Singapore Trust Company Pte Ltd
27	Dentons Rodyk & Davidson LLP	67	Singapore Trustees Association
28	Deutsche Bank	68	Sompo Insurance Singapore Pte Ltd
29	Deutsche Asset Management	69	Standard Chartered Bank
30	Dymon Asia Capital	70	Temasek Polytechnic
31	EFG Bank AG	71	The Bank of Tokyo-Mitsubishi UFJ, Ltd
32	Financial Planning Association of Singapore	72	The Hongkong and Shanghai Banking Corporation
33	First State Investments	73	Tokio Marine Life Insurance Singapore Ltd.
34	Fullerton Fund Management Company Ltd	74	TrustCapital Advisors Investment Management
35	General Insurance Association of Singapore	75	UBS AG
36	General Reinsurance AG, Singapore Branch	76	UBS Trustees Singapore Ltd
37	Great Eastern Financial Advisers	77	UniCredit Bank AG
38	Great Eastern Life Assurance Company Limited	78	United Overseas Bank
39	ING Bank	79	UOB Kay Hian Pte Ltd
40	Institute of Technical Education	80	Zurich Insurance

7.3 Skills Taxonomy

Foundational Skills	
Adaptability	Ability to change strategies and actions to conform to diverse situations while maintaining effectiveness
Basic Communications	Ability to convey information to others verbally and in writing as well as ask questions and pay attention to what others are saying to gain additional information
Basic Digital Literacy	Use ICT tools, equipment and software to create, evaluate and share information digitally with others
Basic Mathematical and Statistical Analysis	Ability to understand the language of math and reason with statistics as well as data
Collaboration	Working cooperatively with others, virtually and physically, to build consensus and to take collective action to achieve common objectives
Critical Thinking	Apply reasoning to evaluate statements, separating truth from falsehoods, and assess the strengths and weakness of different options of solution, conclusion and approach
Decision Making	Assemble information to form a well-rounded understanding of complex situations
Empathy	Establish and sustain relationships by identifying and valuing feelings of others, accurately interpreting others' emotions and working style without judgment, leveraging insights to effectively manage own responses so that one can mindfully interact with others to achieve intended results

Interpersonal Skills	
Conflict Management	Rationally handling conflict and attempting to mitigate fallout including determining key takeaways for future learnings
Develop Others/Coaching	Help others to learn and develop capabilities to enhance performance and achieve both personal and professional goals
Global Perspective	Display openness to and awareness of diversity across global culture and market trends
Influencing and Negotiation	Ability to convince others to take appropriate actions or being able to reach a mutually satisfactory agreement
Lead Virtual Teams	Use appropriate technologies, methods and interpersonal styles to form, develop, guide, and motivate remote, teams to attain successful outcomes and business objectives
Stakeholder Engagement	Manage stakeholder expectations and relationships through effective communication, networking and strategic alignment

Business Skills

Advisory	Apply a long-range view on problem or situation and use in-depth knowledge to advise on potential actions
Business and Financial Acumen	Gain clarity on business goals, market situation and develop expertise in financial matters, evaluate the financial performance and position of the organisation over time
Business Report Writing	Analyse, select and organise ideas to write a clear, concise, correct and complete business report
Change Management	Manage various resources using available tools and techniques to assist organisation in making successful transitions, resulting in adoption and realisation of changes
Complex Problem Solving	Incorporate related information and past experience into the evaluation of options and development of solutions
Customer Mindset	Build cohesive end-to-end customer journey and experience to engage a population of customers with changing profiles, demands and buying patterns
Investigation	Gather and ascertain evidence and information, use logic and reasoning to uncover potential missing information and/or identify suspicious behaviors to determine root cause
Lateral Thinking	Identify opportunities by interpreting information and connect insights from various sources, incorporate a creative approach to develop actions
Process Excellence	Identify critical business processes and seek opportunities to achieve efficiency
Product Awareness	Establish strong understanding of various products and services offered in an organisation, peer groups, as well as regional/global market
Project Management	Plan and manage all aspects of a project including the allocation of resources (people, budget, time), close engagement with stakeholders and resolution of project concerns
Research	Interpret information to obtain deep understanding of specific field or area, integrate the findings into recommendation
Risk Awareness	Identify, assess and prioritise risks and apply resources to mitigate risks and impact of incidents. Understand impact of latest global regulatory development on business strategies
Strategy Planning	Identify and prioritise organisational objectives to support the business vision, including evaluating decisions to assess the resources necessary to achieve desired results. This also considers global/macro changes and its impact on local markets
Systems Thinking	Apply a holistic approach to analysis that focuses on the way that a system's constituent parts interrelate and how systems work over time and within the context of larger systems
Targeted Technical Sales	Customise product and service proposals to address unique customer needs, demonstrating in depth technical product knowledge to target customer preferences

7.3 Skills Taxonomy

Data and Digital Skills	
Advanced Digital Acumen/Literacy	Sophisticated understanding of technology and software features used to analyse and manipulate data and use ICT to organise and share information clearly
Analytics and Computational Modelling	Develop, select and/or apply algorithms and advanced computational methods to enable systems or software agents to learn, improve, adapt and produce desired outcomes or tasks, also include application of data modelling techniques to explore and address a specific requirement
Automation Management	Oversee automation systems to ensure operation requirements are met as well as propose strategies for the automation systems performance improvement
Cybersecurity	Understand cyber security threats and potential weaknesses for prioritisation of managing security risks
Data Engineering	Develop efficient and stable processes to collect, store, extract, transform, load and integrate data at various stages in the data pipeline ensuring that it is ready for use and analysis according to business requirements
Data Interpretation and Analysis	Extract, analyse and make sense of information to form a holistic perspective and generate insights
Data Storytelling	Blend the world of hard data and human communication. Use a combination of visualisation(s) and narrative(s) in a format that suits a particular need, and augment the full comprehension of new information.
Programming and Coding	Technical capability required to write programs to be processed by computers
Technology Design	Create solutions and strategies to implement technology incorporating emerging technology trends to meet current and future business needs
Technology Troubleshooting	Ability to problem solve basic technical issues and identify root cause of problems, including determining when to escalate issues
Threat Intelligence and Detection	Monitor intelligence-gathering and anticipate potential threats to an ICT system proactively, this involves the pre-emptive analysis of potential perpetrators, anomalous activities and evidence-based knowledge and inferences on perpetrators' motivations and tactics
User Experience Design	Understand prototyping and able to contribute in wireframing website features that appear logical and usable on any device - with the objectives to improve customer loyalty and satisfaction through ease of use and utility provided in the interaction with an end-product



8. Contacts



Liew Nam Soon
Managing Partner,
ASEAN Markets
nam-soon.liew@sg.ey.com



Brian Thung
Managing Partner,
ASEAN Financial Services
brian.thung@sg.ey.com



Joanne Abbott
Partner,
People Advisory Services
joanne.abbott@sg.ey.com

About EY

EY is a global leader in assurance, tax, transaction and advisory services. The insights and quality services we deliver help build trust and confidence in the capital markets and in economies the world over. We develop outstanding leaders who team to deliver on our promises to all of our stakeholders. In so doing, we play a critical role in building a better working world for our people, for our clients and for our communities.

EY refers to the global organization, and may refer to one or more, of the member firms of Ernst & Young Global Limited, each of which is a separate legal entity. Ernst & Young Global Limited, a UK company limited by guarantee, does not provide services to clients. Information about how EY collects and uses personal data and a description of the rights individuals have under data protection legislation are available via ey.com/privacy. For more information about our organization, please visit ey.com.

© 2019 EYGM Limited.
All Rights Reserved.

ED None

This material has been prepared for general informational purposes only and is not intended to be relied upon as accounting, tax or other professional advice. Please refer to your advisors for specific advice.

ey.com