



**Occupational Analysis**

**IT Services**



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**Occupational Analysis**

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# **IT Services**



Occupational Analysis of the IT-BPM Industry: ITS Sub-sector



## Foreword

2013 is an important year for the Indian IT-BPM Industry as global markets struggle to emerge from their economic instabilities and environmental challenges. The situation, though challenging, also presents new opportunities to tap for the Indian IT-BPM Industry. One of the key imperatives for the industry is to continuously seek and develop the 'right' talent to drive its growth.

As per the National Skills Mission, 500 million professionals would need to be skilled by 2022 to make them employable. The Indian IT-BPM Industry currently employs about 3 million people directly and about 9 million indirectly. As per the *NASSCOM Perspective 2020* report, the industry has a potential to contribute to, as much as, 30 million employment opportunities (direct and indirect) by 2020.

The need is to focus on developing ready-to-deploy talent by laying standards for skill requirements in the IT-BPM Industry. These requirements merit defining consistent standards of performance and quality and standardising recruitment procedures. With this in mind, NASSCOM has come up with the Occupational Analysis report for the IT-BPM Industry.

Occupational Analysis report identifies job roles across the IT-BPM industry at the Entry, Middle and Leadership levels. Career Paths for entry-level job roles have been identified for the benefit of the students and academia to facilitate the clear understanding of the career opportunities provided by the industry. Several case studies of successful people have been included to make careers in our industry more attractive.

This Occupational Analysis report is one of the ways in which NASSCOM aims to streamline job roles across the IT-BPM industry and is the first step in the development of Occupational Standards for the industry.

We reaffirm our commitment to facilitate the growth of the industry and trust you will find the report useful.

**Som Mittal**  
President





## Acknowledgements

We would like to thank the entire NASSCOM Leadership: Mr Som Mittal, President; Mr Lakshmi Narayanan, Chairman, IT-BPM Sector Skills Council NASSCOM and CEO Cognizant; Ms Sangeeta Gupta, Sr VP; KS Vishwanathan, VP and Head of Industry Relations; Ameet Nivsarkar, VP; Rajiv Vaishnav, VP; Rama Vedashree, VP, for their strategic leadership and support to this important project.

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We are grateful to the officers of Ministry of HRD (MHRD), Ministry of Communications and Information Technology, Ministry of Labor and Employment (MoLE), Prime Minister's Office (PMO), and National Skills Development Corporation (NSDC), for willingly providing us with relevant information and support required for this report.

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Occupational Analysis of the IT-BPM Industry: ITS Sub-sector



## Table of Contents

Foreword	3
Acknowledgements	5
Executive Summary	11
Summary of Key Occupations, Job Roles and Tracks within Each Sub-sector	14
Background	19
Sector Skill Councils	19
Occupational Standards	20
Occupational Mapping as Part of OS Development Process	21
Approach and Methodology	22
OS Development Framework	23
Structure of the IT-BPM Industry	27
Impact of the IT-BPM Industry in India	28
Sub-sectors within the IT-BPM Industry	32
Chapter 1 - Overview of the ITS Sub-sector	35
Introduction to the ITS Sub-sector	37
Evolution of the ITS Sub-sector	38
Profile of the ITS Sub-sector	39
Key Trends in the ITS Sub-sector	41
Chapter 2 - Talent in the ITS Sub-sector	43
Emerging Talent Trends	45
Qualifications, Knowledge and Understanding	48
Skills	49
Learning Opportunities	50
Chapter 3 - Entry-level Job Roles - ITS	51
Entry-level Job Roles	53
Entry-level Job Roles in the ITS Sub-sector	54
ITS Sub-sector - Occupations, Tracks, Verticals and Entry-level Job Roles	55
Chapter 4 - Middle-level Job Roles - ITS	57
Middle-level Job Roles	59
Middle-level Job Roles in the ITS Sub-sector	60
ITS Sub-sector - Occupations, Tracks, Verticals and Middle-level Job Roles	63
Chapter 5 - Leadership-level Job Roles - ITS	65
Leadership-level Job Roles	67
Leadership-level Job Roles in the ITS Sub-sector	68
ITS Sub-sector - Occupations, Tracks, Verticals and Leadership-level Job Roles	69



<b>Chapter 6 - Occupations and Roles in the ITS Sub-sector</b>	<b>71</b>
In Summary	73
Occupations within the ITS Sub-sector	74
Application Development	79
Application Development - Occupational Map	81
Application Development - Typical Career Paths	82
Application Deployment	83
Application Deployment - Occupational Map	84
Application Deployment - Typical Career Paths	85
Application Maintenance	86
Application Maintenance - Occupational Map	87
Application Maintenance - Typical Career Paths	88
Data Scientists	89
Data Scientists - Occupational Map	90
Data Scientists - Typical Career Paths	91
IT Consulting	92
IT Consulting - Occupational Map	93
IT Consulting - Typical Career Paths	94
IT Services Management	95
IT Services Management - Occupational Map	96
IT Services Management - Typical Career Paths	97
IT Support Services/IT Help Desk	98
IT Support Services/Help Desk - Occupational Map	99
IT Support Services/Help Desk - Typical Career Paths	100
Infrastructure Management Services (IMS)	101
Infrastructure Management Services (IMS) - Occupational Map	103
Infrastructure Management Services (IMS) - Typical Career Paths	104
Information Security	105
Information Security - Occupational Map	107
Information Security - Typical Career Paths	108
Project/Program Management	109
Project /Program Management - Occupational Map	110
Project / Program Management - Typical Career Paths	111
Sales and Pre-sales	112
Sales and Pre-sales - Occupational Map	113
Sales and Pre-sales - Typical Career Paths	114
Solution Architecting	115
Solution Architecting - Occupational Map	116
Solution Architecting - Typical Career Paths	117
Testing and QA	118
Testing and QA - Occupational Map	119
Testing and QA - Typical Career Paths	120
Movement to Other Occupations, Sub-sectors and Industries	121
<b>Annexures</b>	<b>123</b>
Annexure A: Glossary of Terms and Abbreviations	124
Annexure B: Case Studies of Career Paths	125



# EXECUTIVE SUMMARY

- Executive Summary
- Summary of Occupations Within Each Sub-sector

Occupational Analysis of the IT-BPM Industry: ITS Sub-sector



## Executive Summary

The IT-BPM industry has received global recognition as the growth engine for India and the sectors it services across the world. It has established itself as a pioneer with the range of services it offers, the global customer base it serves and the numerous employment opportunities it has provided to the workforce in India.

As per NASSCOM's **Strategic Review 2013**, the industry aggregated revenues exceeding USD 108 billion and employed more than 3 million people. The industry accounts for almost 25 percent of the total exports and 11 percent of the total service revenues. In order to drive the acquisition of right talent and to ensure the development of an employable workforce for the industry, IT-ITeS Sector Skills Council NASSCOM (SSC NASSCOM) has taken up an initiative to develop Occupational Standards (OS) for all Entry-level (unique) job roles in the IT-BPM Industry. These OS are being developed in close association with the key member companies in the IT-BPM Industry. In the long term, they will provide a foundation for the skill development training and certification programme.

There are four sub-sectors within the IT-BPM Industry. The sub-sectors are as follows:

- ❑ IT Services (ITS)
- ❑ Business Process Management (BPM)
- ❑ Engineering and R&D (ER&D)
- ❑ Software Products (SPD)

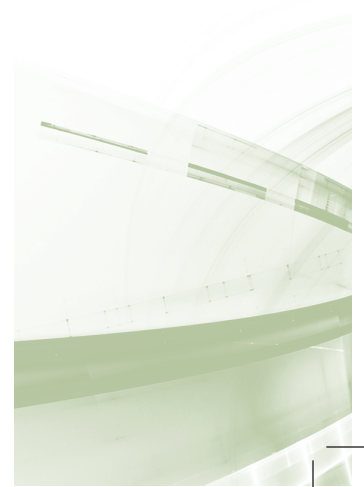
The current report shall focus on the ITS sub-sector within the IT-BPM industry.

**Occupational Analysis (OA)** is the first step in the development of the OS for any industry or sector. It entails an industry scan and a process of identifying different occupations in the various sub-sectors.

### Objective

The objective of this document is to describe the main features and characteristics of an occupation, within the IT-BPM industry, specifically the ITS sub-sector. It provides a high-level overview of an occupation in terms of the types of job roles that exist, workforce characteristics, key talent trends and a review of available education and training. OA, therefore, provides information on the opportunities that exist for progression through a career in a specific occupation.

The OA for IT-BPM industry contributes to the context and background for the development of the OS for the ITS sub-sector.





## Structure of the Occupational Analysis Report

This report consists of the following sections:

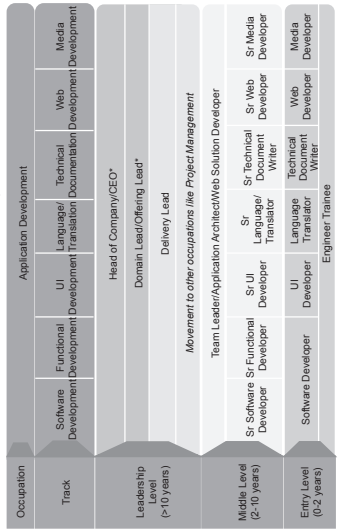
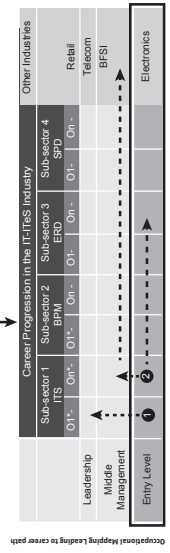
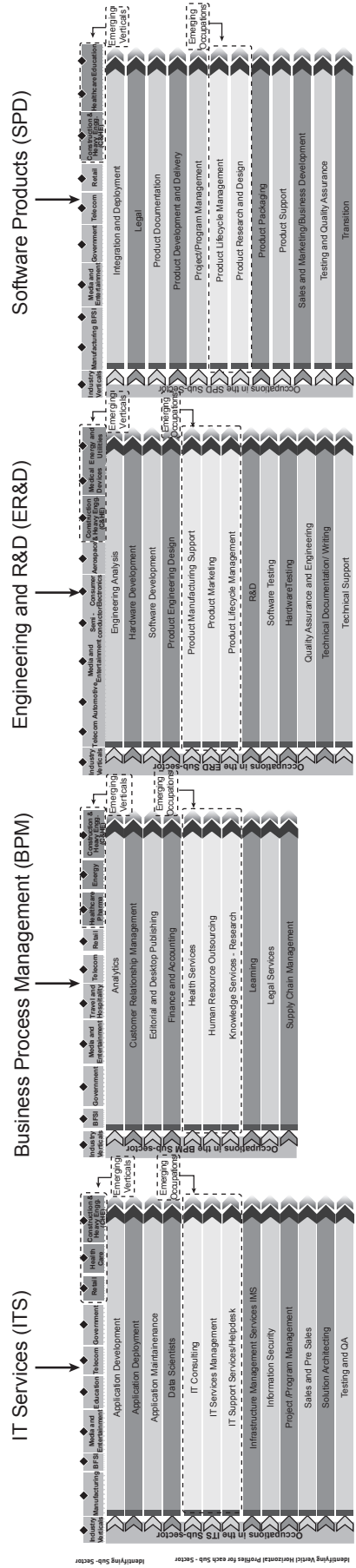
- **Background to the Project:** A brief description of the National Skills Mission, Sector Skills Councils and their objectives leading to the process of the development of the OS is given in this section
- **About the IT-BPM Industry:** This section covers the structure of the IT-BPM Industry in terms of the types of organisations within the ecosystem
- **Occupational Mapping and Career Paths for the ITS sub-sector**

The IT sub-sector is structured in the following chapters:

- **Chapter 1: About the sub-sector:** A brief description of the structure, evolution and profile of the sub-sector is given in this chapter. It covers information on the size of the sub-sector, the workforce employed therein, and so on
- **Chapter 2: Talent trends within the sub-sector:** This chapter provides an overview of the key drivers of change that have an influence on the workforce and talent within the sub-sector
- **Chapter 3: Entry-level roles – ITS:** This chapter provides an overview of the Entry-level roles within the sub-sector
- **Chapter 4: Middle-level roles – ITS:** This chapter provides an overview of the Middle-level roles within the sub-sector
- **Chapter 5: Leadership-level roles – ITS:** This chapter provides an overview of the Leadership-level roles within the sub-sector
- **Chapter 6: Occupations and job roles in the sub-sector:** Details of the types of occupational activity included in the scope of the sub-sector, associated occupations, job roles and typical career paths are addressed in this chapter

The steps undertaken to develop Occupation Mapping leading to 'Career Path' are summarised below

IT-BPM Industry



This figure does not depict any hierarchy

Occupational Analysis of the IT-BPM Industry: ITS Sub-sector

## Summary of Key Occupations, Job Roles and Tracks within Each Sub-sector

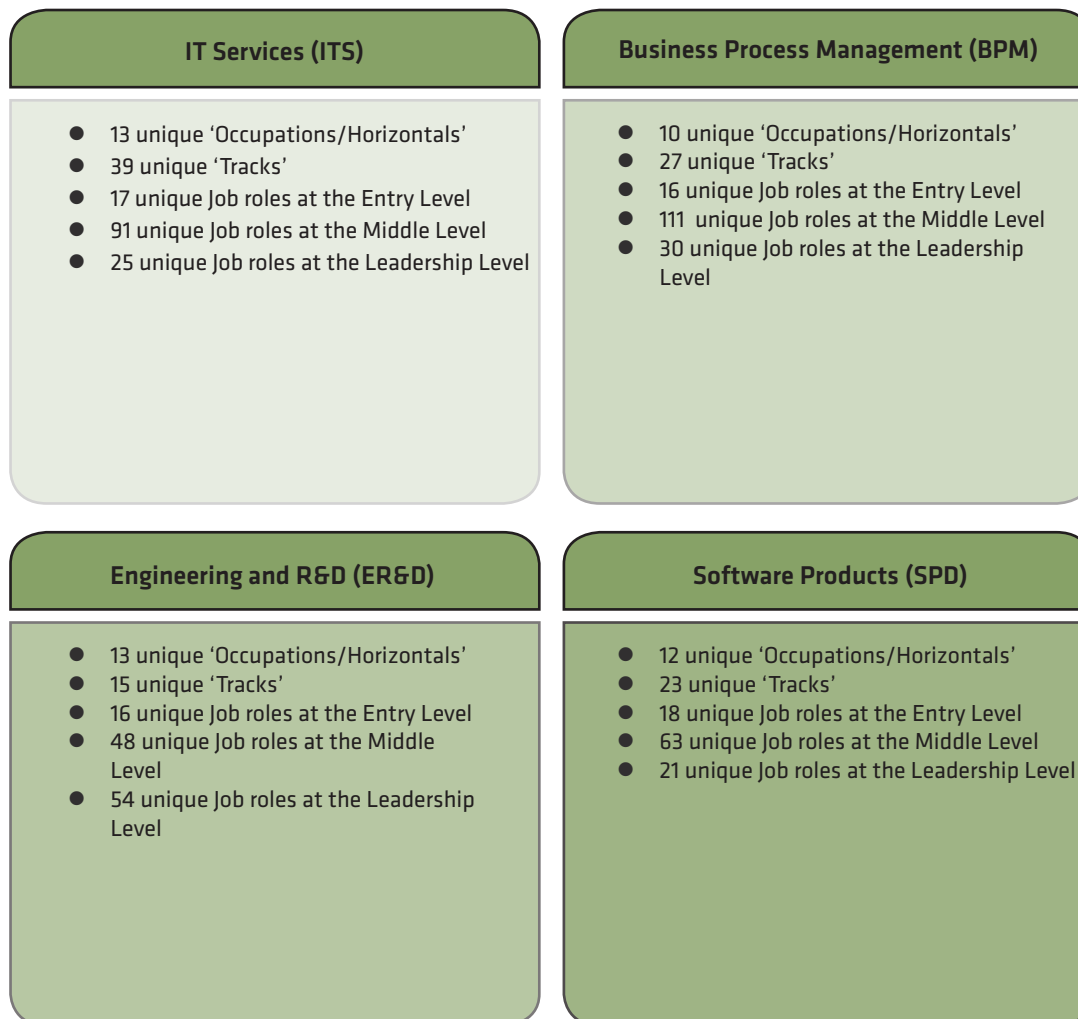
Figure 1 indicates the key occupations identified in each sub-sector. These occupations are differentiated on the basis of the unique skill-sets required for each occupation. Each occupation is further divided into tracks to highlight the specialisations that exist. Details of the tracks and the unique Entry-level job roles have been indicated further on in the document. These occupations, tracks and unique job roles exist in various organisations under different classifications and level of detail. The list tries to establish a balance between the level of detail and brevity while defining these basic 'distinct' skill-sets



**Figure 1:** Occupational Mapping Summary

In each of the four sub-sectors, unique occupations were identified as listed earlier in the section. In each of these occupations, based on the specificity of the skill requirements, skill-based demarcations or tracks have been identified. These tracks define the specific skills that are required to perform a job role within an occupation. In each of these occupations and tracks, Entry, Middle and Leadership level roles have been identified. These job roles identify the unique positions that exist in an organisation for fulfilling the functions defined under an occupation. These job roles differ from each other with respect to the competencies, knowledge, skill, attitude and performance criteria requirements for the fulfilment of a role.

Based on our research, we have identified 13 unique occupations in the ITS sub-sector, which are further segregated into 39 tracks with 17, 91 and 25 unique job roles at the Entry, Middle and Leadership levels, respectively. Similarly, we have identified 10 unique occupations in the BPM sub-sector, which are further segregated into 27 tracks with 16, 111 and 30 unique job roles at the Entry, Middle and Leadership levels, respectively. For the ER&D sub-sector, we have 13 unique occupations, which are further segregated into 15 tracks with 16, 48 and 54 unique job roles at the Entry, Middle and Leadership levels, respectively, while for SPD, we have 12 unique occupations, further segregated into 23 tracks with 18, 63 and 21 unique job roles at the Entry, Middle and Leadership levels, respectively.



**Figure 2:** Summary of Findings During Occupational Analysis



**EXECUTIVE SUMMARY**

Occupational Analysis of the IT-BPM Industry: ITS Sub-sector



# BACKGROUND

- Sector Skill Councils
- Occupational Standards
- Occupational Mapping as Part of OS Development
- OS Development Framework

## BACKGROUND

Occupational Analysis of the IT-BPM Industry: ITS Sub-sector



## Background

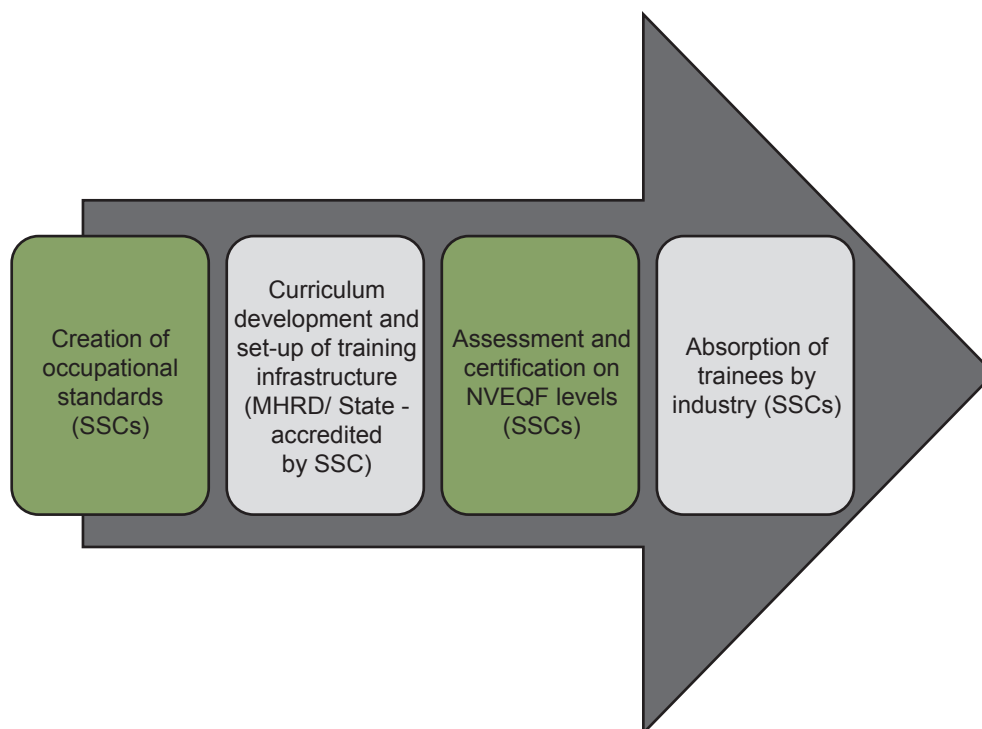
### Sector Skill Councils

The Sector Skill Councils (SSCs) have been established based on the mandate of the National Skill Development Policy (2009). The aim of the SSCs is to complement the existing vocational education system for the industry in meeting the entire value chain's requirements. This includes developing appropriately trained manpower in quantity and quality across all levels on a sustained and evolving basis.

It is important to note that the SSCs in India have been envisaged taking into account the ground realities in India as well as international best practices.

SSCs are national partnership organisations that bring together all the stakeholders - Industry, Labour, and the Academia - for the common purpose of workforce development of particular industry sectors.

The SSC is envisaged to develop the skill ecosystem in the country, as shown in Figure 3.



**Figure 3:** Skill Ecosystem and Stakeholders

Each SSC will create a repository of Occupational Standards (OS) for its respective sectors, which will be an input to develop the relevant content, training infrastructure and other related needs for imparting the training. The SSCs are also responsible for the assessment and certification at all the NVEQF levels as described in the next section. It is envisaged that the SSC for a particular sector would be the supreme certification body for that sector. The SSC as an industry/sector body can link the skilling ecosystem to the demands of the industry/sector, to ensure that the content, assessment, certification and so on are relevant to the industry. With people trained under this framework, it can be visualised that there would be industry absorption and retention.

## BACKGROUND



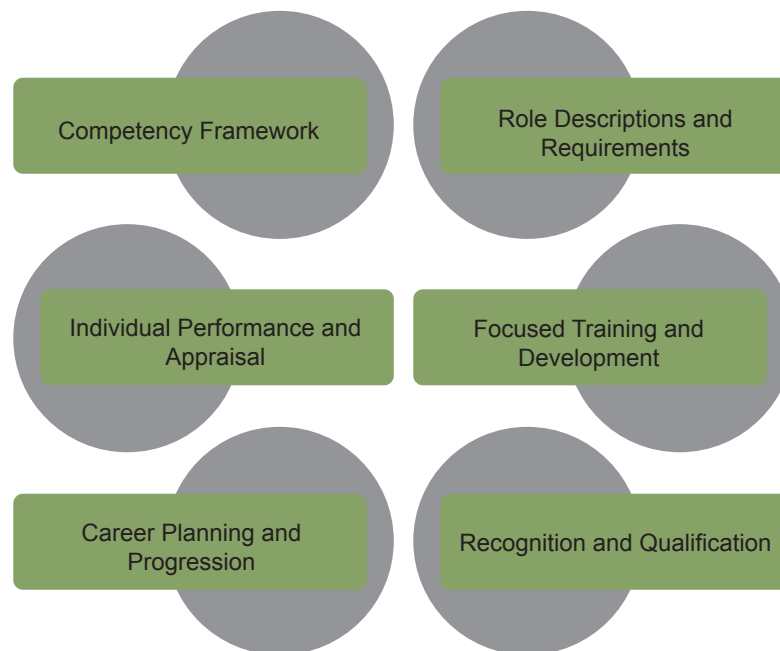
## BACKGROUND

### Occupational Standards

OS are the statements of the standards of performance individuals must achieve when carrying out functions in the workplace, along with the specifications of the underpinning knowledge and understanding required. OS describe what an individual needs to do, know and understand to carry out a particular job role or function. The OS serve a number of purposes as shown in Figure 4.

Once the OS are developed, it is easy to define a focused training and development ecosystem based on it. The OS will be also helpful in defining a job description for a job role, providing measurable performance outcomes for individual performance appraisals, devising appropriate recognition programmes, defining competency frameworks and providing support for career planning and progression.

OS  
Key Outcomes, Performance Criteria, Underpinning Knowledge

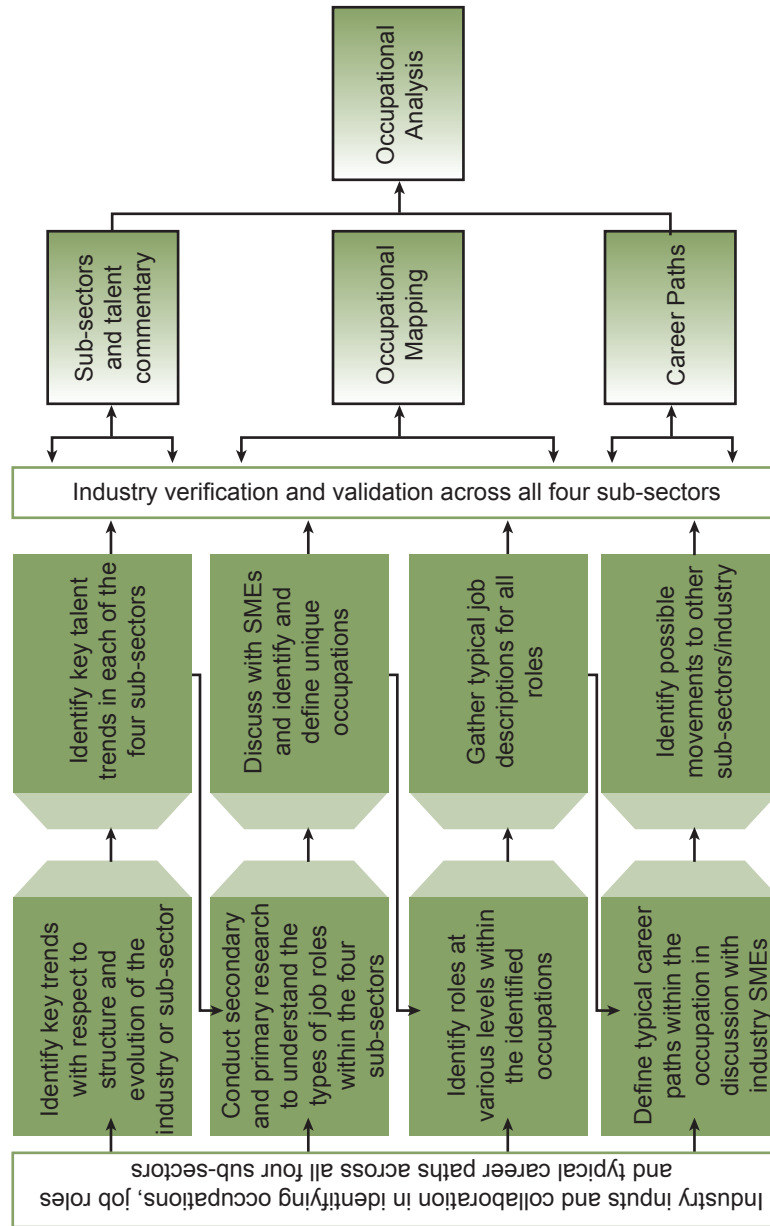


**Figure 4:** Uses of Occupational Standards



## Approach and Methodology

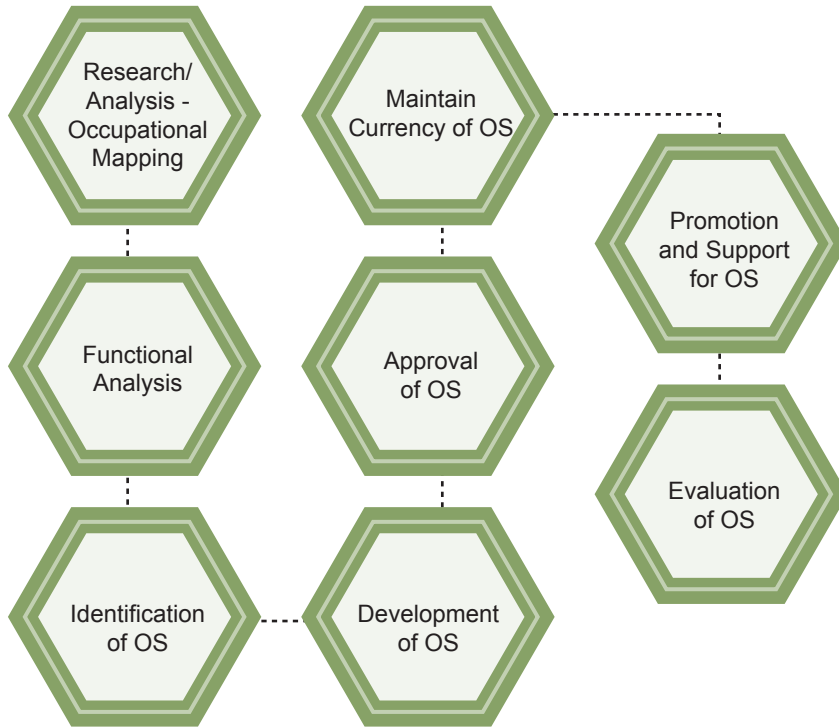
A step-by-step approach was followed to undertake the Occupational Analysis for the IT-BPM Industry, which is presented in Figure 6.



**Figure 6:** Occupational Analysis: Approach and Methodology

# OS Development Framework

The following framework<sup>1</sup> has been used for OS development.



**Figure 7:** OS Development Framework

As indicated in the OS Development Framework in Figure 7, the outcome of Occupational Mapping will feed into the next steps namely. Functional Analysis and OS Development.

<sup>1</sup>INSSO framework followed globally as a benchmark for OS development



## BACKGROUND

Occupational Analysis of the IT-BPM Industry: ITS Sub-sector





# ABOUT THE IT-BPM INDUSTRY

- Structure of the IT-BPM Industry
- Impact of the IT-BPM Industry in India
- Sub-sectors Within the IT-BPM Industry

Occupational Analysis of the IT-BPM Industry: ITS Sub-sector



**ABOUT THE  
IT- BPM INDUSTRY**

Occupational Analysis of the IT-BPM Industry: ITS Sub-sector



## Structure of the IT-BPM Industry

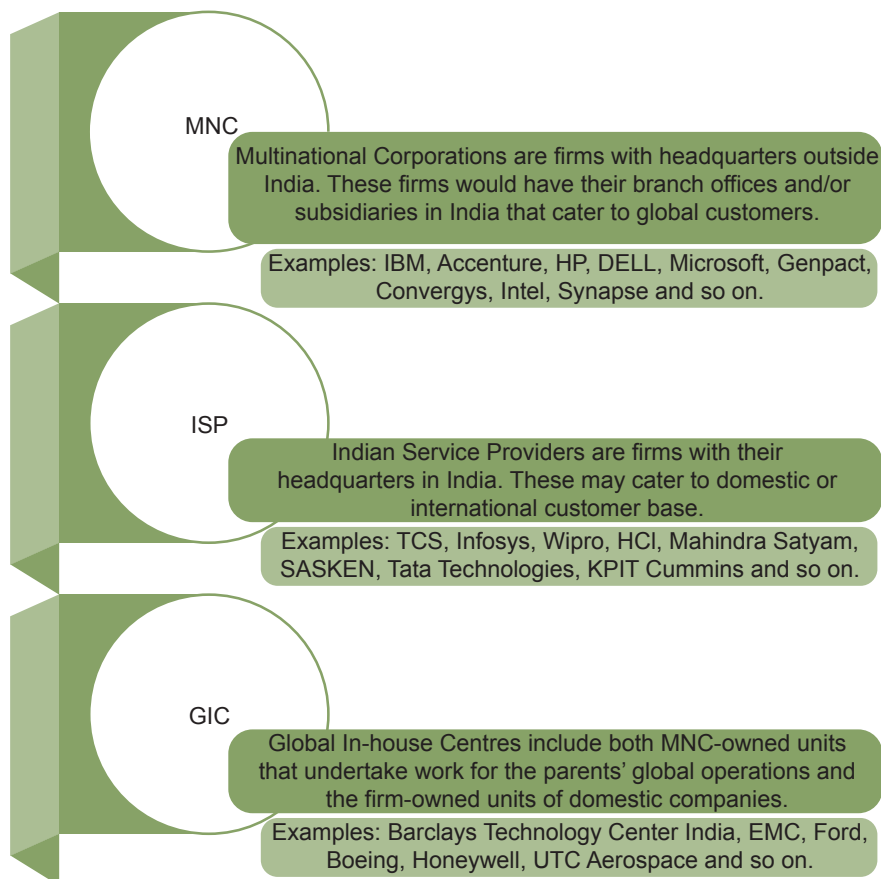
The organisations within the IT-BPM Industry are categorised along the following parameters.

- Sector the organisation is serving
- Type as well as the range of offering the organisation provides
- Geographic spread of operations
- Revenues and size of operations

A broad structure of the industry based on the parameters identified in the Indian context is represented in Figure 8<sup>2</sup>.

**Multinational Companies (MNCs):** MNC organisations have their headquarters outside India but operate in multiple locations worldwide, including those in India. They cater to external clients (both domestic and/or global).

**Indian Service Providers (ISPs):** ISPs are the organisations that have started with their operations in India. Most of these organisations would have their headquarters in India while having offices at many international locations.



**Figure 8:** IT-BPM Industry Structure

While most have a client base, which is global as well as domestic, there are some that have focused on serving only the Indian clients.

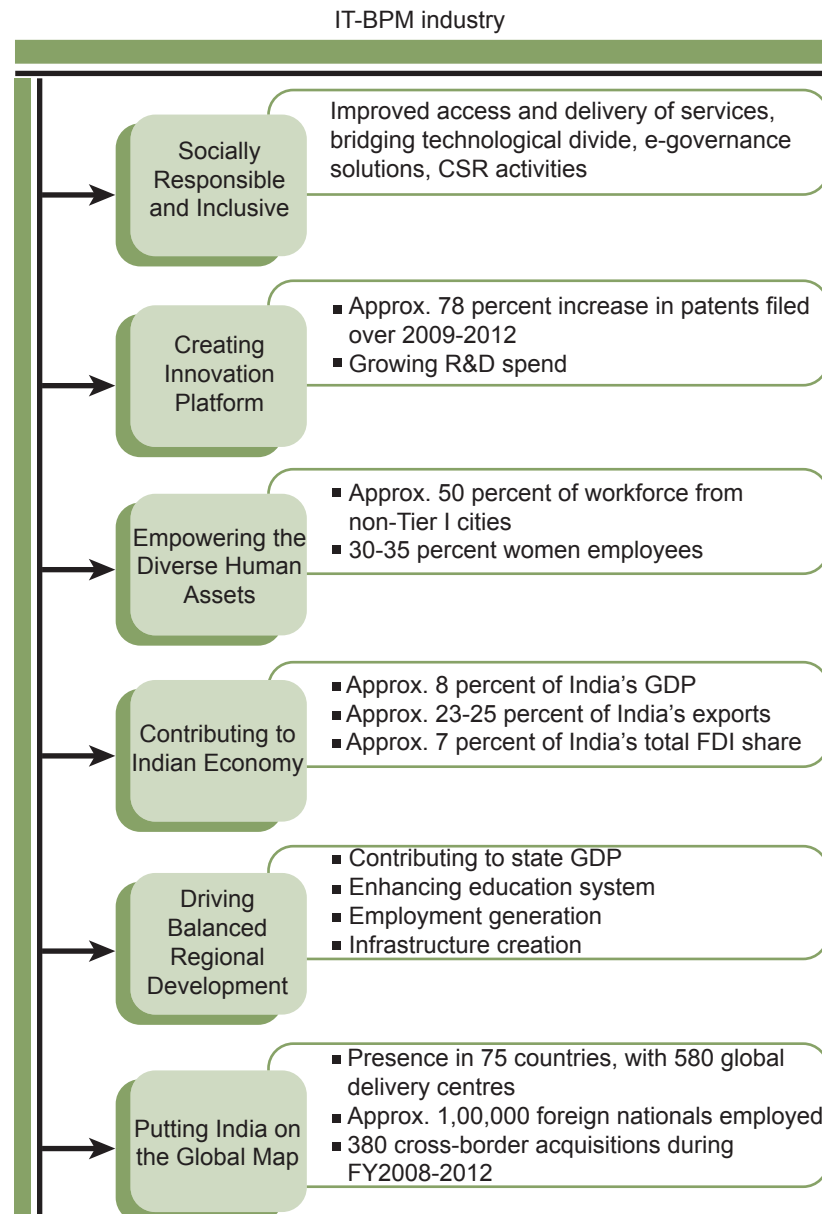
**Global In-house Centres (GICs):** GIC organisations cater to the needs of their parent company only and do not serve external clients. This model allows the organisation the option to keep IT operations in-house and at the same time take advantage of expanding their global footprint and offering opportunities for innovation in a cost-effective manner.

<sup>2</sup>NASSCOM Research

## Impact of the IT-BPM Industry in India

The IT-BPM industry has been significant in fuelling India's growth story. In addition to contributing to the country's gross domestic product (GDP) and exports, the industry has played a big role in influencing the socio-economic parameters across the country. The industry has helped in providing employment and a good standard of living to millions. It has placed India on the world map with an image of a technologically advanced by and knowledge-based economy<sup>3</sup>.

The following illustration summarises the contribution and impact of the sector to the Indian economy and employment.



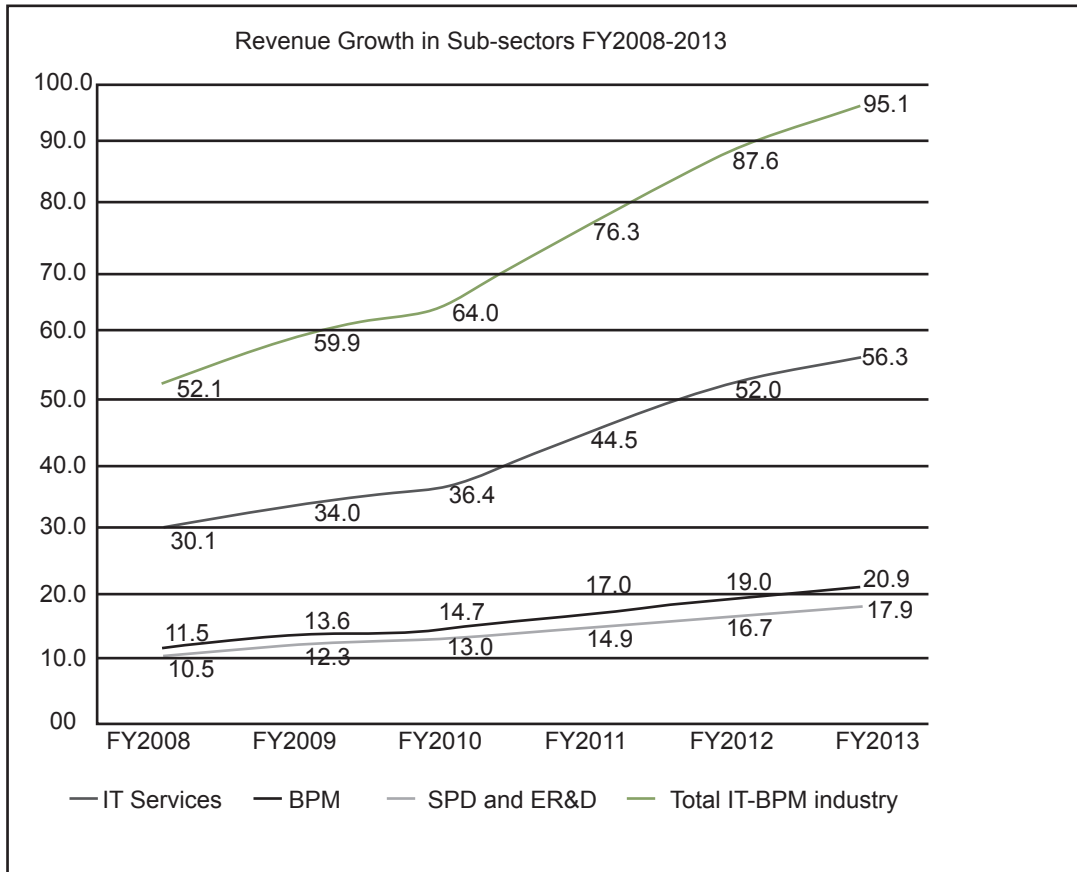
**Figure 9:** Impact of the IT-BPM Industry

Growth of the IT-BPM industry has provided India with a wide range of economic and social benefits, which include creating employment, raising income levels, promoting exports and significantly contributing to the GDP of the country. This sector attracts amongst the largest investments by venture capitalists and has been credited with enabling the entrepreneurial ventures of many in the country

<sup>3</sup>The IT-ITES sector in India Strategic Review 2012 by NASSCOM

## Revenue Growth

The IT-BPM industry has almost doubled in terms of revenue and contribution to India's GDP over the last six years (2008-2013). This growth has been presented in Figure 10<sup>4</sup>.

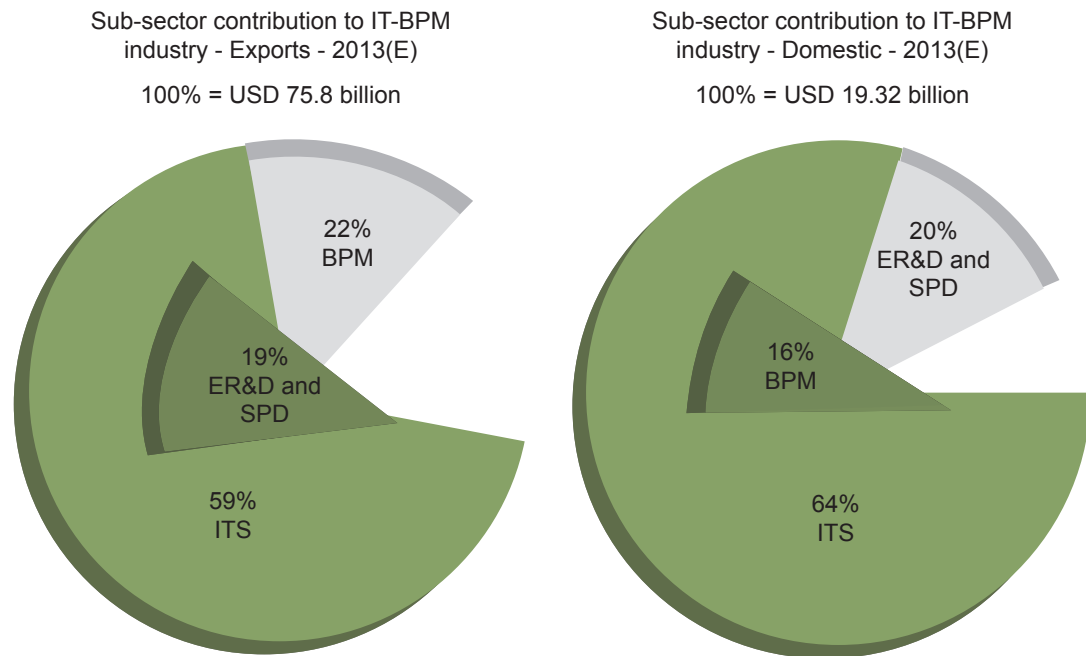


**Figure 10:** Revenue Growth across IT-BPM Industry, 2008-2013

<sup>4</sup>The IT-BPM sector in India Strategic Review 2013 by NASSCOM

## Contribution of Different Sub-sectors

The contribution of ITS sub-sector is close to 59 percent of the total revenue for the industry followed by BPM at 22 percent. The contribution of the various sub-sectors has been presented in Figure 11<sup>5</sup>.



**Figure 11:** Contribution of Sub-sectors to IT-BPM Industry

## Direct Employment Generated

The IT-BPM industry has contributed significantly towards the direct employment generation for the youth. The growth has been presented in Table 1.

## Indirect Employment

While, the IT-BPM industry employs about 3 million people directly, it also provides indirect employment opportunities to another 9 million in industries like construction, catering, security services, retail and transport. The increased earnings and employment further drive the spending in services like food, entertainment, telecommunication and healthcare apart from contributing to tax coffers of the country.

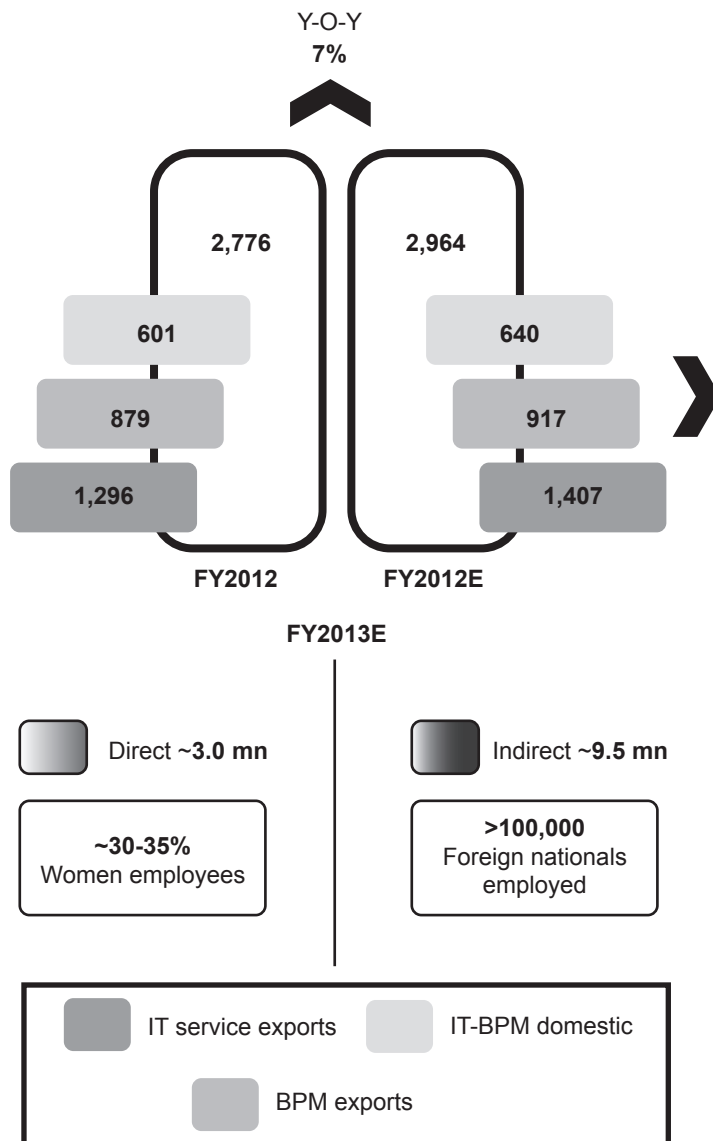
<sup>5</sup>The IT-BPM sector in India Strategic Review 2013 by NASSCOM

The indirect-direct employment ratio multiplier has reduced from 3.6 in 2010 to 3.2 in 2012<sup>6</sup>.

**Table 1:** Employment Generation in the IT-BPM Industry

Description	FY2010	FY2012	FY2013
Direct Employment	2.3	2.8	3.0
Indirect Employment	8.2	8.9	9.0
Ratio (Indirect: Direct)	3.6	3.2	3

**~3 million workforce contributing to industry growth**



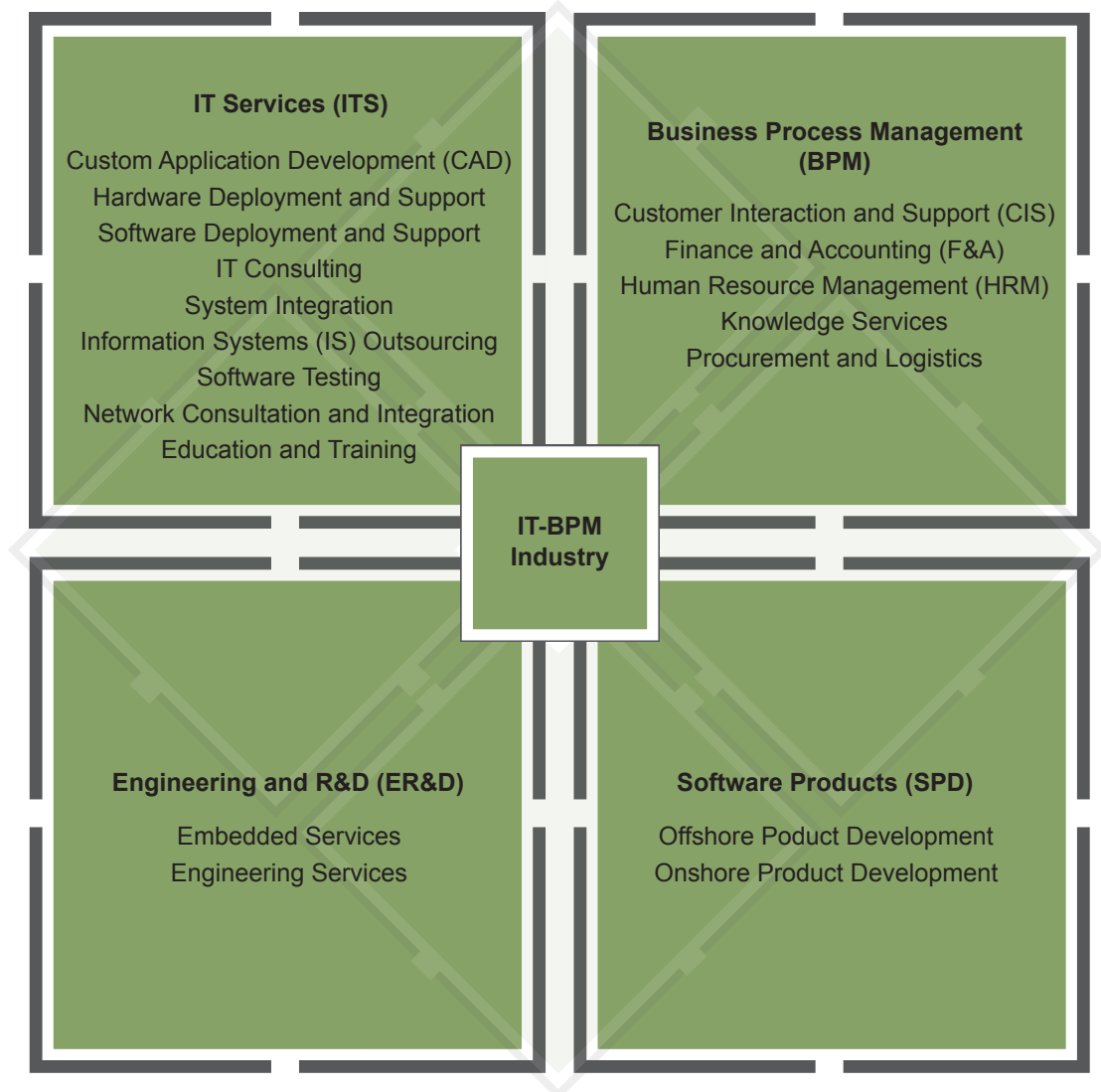
**Figure 12:** Employment Trends in IT-BPM Industry

<sup>6</sup>The IT-BPM sector in India Strategic Review 2013 by NASSCOM



## Sub-sectors within the IT-BPM Industry

The IT-BPM industry has four sub-sectors. The subsequent sections of the report describe Occupational Analysis conducted separately for the ITS sub-sector.



**Figure 13:** Sub-sectors within the IT-BPM Industry

Each of the four sub-sectors has been defined in detail subsequently. These terms/definitions have been used in discussion with NASSCOM and have been found to be consistent with the definitions used in the industry.

1. **IT Services (ITS):** ITS involves a range of engagement types that include consulting, systems integration, IT outsourcing/managed services/hosting services, training and support/maintenance.
  - a) **Custom Application Development (CAD):** CAD services focus on delivering customised (as per the client requirements) development of software applications and interface as well as enhancements to existing packaged applications or pre-engineered templates and support and provision of custom applications.
  - b) **Hardware Deployment and Support:** The Hardware Deployment and Support services pertain to the installation and support of a specific hardware device. The service is focused on the device and its components rather than on software that is running on the device. Installation activities can include hardware staging, configuration, testing and debugging, deployment site preparation and physical installation of the device.

- c) **Software Deployment and Support:** The Software Deployment and Support services are activities, expertise and systems providing the customer with proper installation and configuration of all packaged software products, custom applications as well as appropriate ongoing support, access to resources and distribution of software product releases, updates and upgrades.
  - d) **Information Systems (IS) Outsourcing:** IS Outsourcing services involve a long-term, contractual arrangement in which a service provider takes the ownership of and responsibility for managing all or part of a client's information systems operations or department, based on a service-level agreement. An IS Outsourcing contract usually includes data centre operations and may also include services such as desktop management, local and wide area network operations management, help desk support, application development and maintenance, disaster recovery services and related consulting and systems integration activities.
  - e) **Infrastructure Management Services (IMS):** IMS encompass all the services that relate to monitoring, managing and enhancing performance of a client's IT infrastructure. These include help desk services, server management, data centre management, network management, asset management, desktop support, IT security services, maintenance services and applications operations.
  - f) **IT Consulting:** IT Consulting includes IS Strategy, IT and network planning, architectural assessments, IS operational analysis, system and network designs, product-specific consulting, supplier assessment and maintenance planning.
2. **Business Process Management (BPM):** BPM is the management of one or more business processes by an external organisation that, in turn, owns and manages the selected processes based on defined and measurable performance metrics. The evolution of this sub-sector marks the shift in the delivery of business processes from high-cost destinations to low-cost ones. This shift is enabled by advancements in information and communication technologies.

BPM sub-sector includes the following types of organisations with different horizontal offerings (those that can be leveraged across specific industries):

- a) **Business Process Management (BPM):** Traditional BPM offerings can be categorised into major categories and vertical-specific offerings (those that demand specific Industry vertical process knowledge):
  - **Customer Interaction and Support (CIS):** CIS includes all forms of IT-enabled customer contact; inbound or outbound, voice or non-voice based support used to provide customer services, sales and marketing, technical support and help desk services.
  - **Finance and Accounting (F&A):** F&A includes activities such as general accounting, transaction management (account receivables and payables management), corporate finance (for example, treasury and risk management and tax management); compliance management and statutory reporting and so on.
  - **Human Resource Management (HRM):** HRM services include payroll and benefits administration, travel and expense processing, talent acquisition and talent management services, employee and manager self-service delivery services, employee communication design, and administration.
  - **Supply Chain Management (SCM):** SCM services include the transfer of the ownership of some or all procurement, sales and fulfilment processes or functions to providers, such as an outsourcing agency. These could include administrative, delivery or management-related processes or functions.
- b) **Knowledge Services:** Knowledge Services include services such as business research, market research, data management and analytics.
- c) **Legal Services:** Legal Services include legal and intellectual property services.

3. **Software Products (SPD):** SPD are programmes or code sets of any type, commercially available through sale, lease, rental or as a service. Packaged software revenues typically include fees for initial and continued right-to-use packaged software licenses.
  - a) **Offshore Product Development:** This involves offshore development of the customer's product, thereby taking up the responsibility of all aspects of the product lifecycle - R&D, prototyping, development, testing, maintenance and support and development of next generation of the products.
  
4. **Engineering and R&D (ER&D):** Engineering services are those that augment or manage processes. These processes are associated with the creation of a product or service, as well as those associated with maximising the life span and optimising the yield associated with a product or asset. This not only includes design elements of the product or service itself, but also encompasses the infrastructure, equipment and processes engaged in manufacturing/ delivering them.
  - a) **Research and Development (R&D) Services:** R&D services involve providing research and development for hardware and software technologies, as well as development of software running on embedded systems.



Chapter  
1

# OVERVIEW OF THE ITS SUB-SECTOR

- Introduction to the ITS Sub-sector
- Evolution of the ITS Sub-sector
- Profile of the ITS Sub-sector Skills
- Key Trends in the ITS Sub-sector

Occupational Analysis of the IT-BPM Industry: ITS Sub-sector

# OVERVIEW

**OVERVIEW OF THE  
ITS SUB-SECTOR**

Occupational Analysis of the IT-BPM Industry: ITS Sub-sector

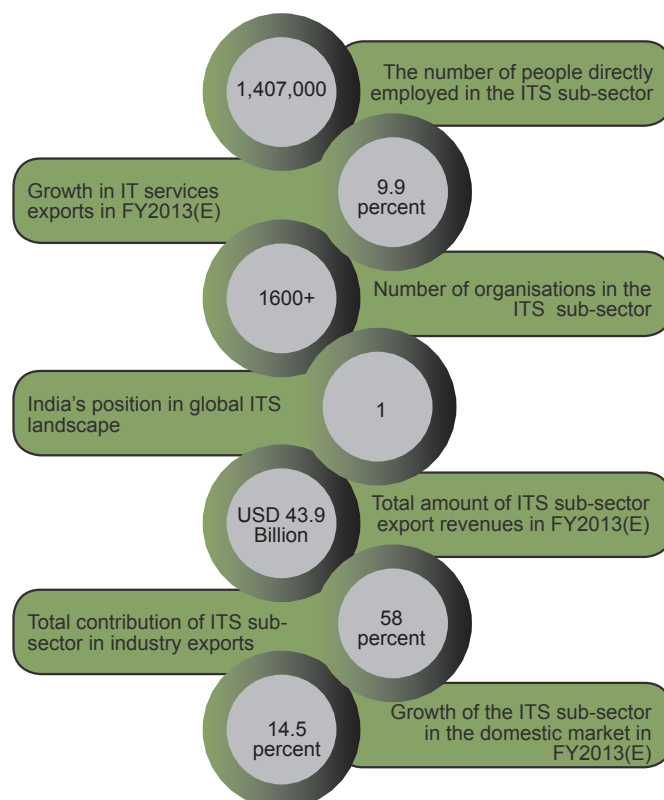


## Introduction to the ITS Sub-sector

IT-BPM market, a USD 108 billion market in India, is a leading contributor to the services industry in India with respect to employment and revenue. It accounts for 25 percent of the country's total exports and contributes to 11 percent of total service revenues<sup>1</sup>. The ITS sub-sector is a major contributor to the overall IT-BPM industry.

The ITS sub-sector offers services to create and manage information for business functions through host of activities that include consulting, systems integration, IT outsourcing/managed services/hosting services, training and support/ maintenance.

The sub-sector has evolved as a major contributor to India's GDP and plays a vital role in driving economic growth in terms of employment, export promotion and revenue generation.



**Figure 1:** ITS Sub-sector – Snapshot (Source: NASSCOM Strategic Review 2013)

The worldwide ITS market stood at USD 648 billion in 2012. The ITS exports form the largest and fastest growing segment of the IT services with a growth rate of 9.9 percent in FY2012. IT services export constituted over half of the entire export of the IT Industry. The sector is expected to see a growth of over 10 percent in the coming years as well. Even within the domestic market, IT services is the fastest growing segment in the Indian domestic market, growing by 14.5 percent to reach USD 12.5 billion, driven by IS outsourcing, cloud services and increasing adoption from all customer segments – government, enterprise, consumers and small and medium businesses. There are over 1600 companies providing IT services in the country with the top 5 comprising about 60 percent of the total revenue from the industry.

The sub-sector has established a record as a major contributor to the country's GDP as well as penetrated into many large sectors - established as well as upcoming like healthcare, media, education and retail. This has ensured that the sub-sector is a field in demand, both in the present and the future. With an increased focus on optimising efficiencies, companies in all the sectors see value in leveraging IT to manage their business better and are increasing their IT investments.

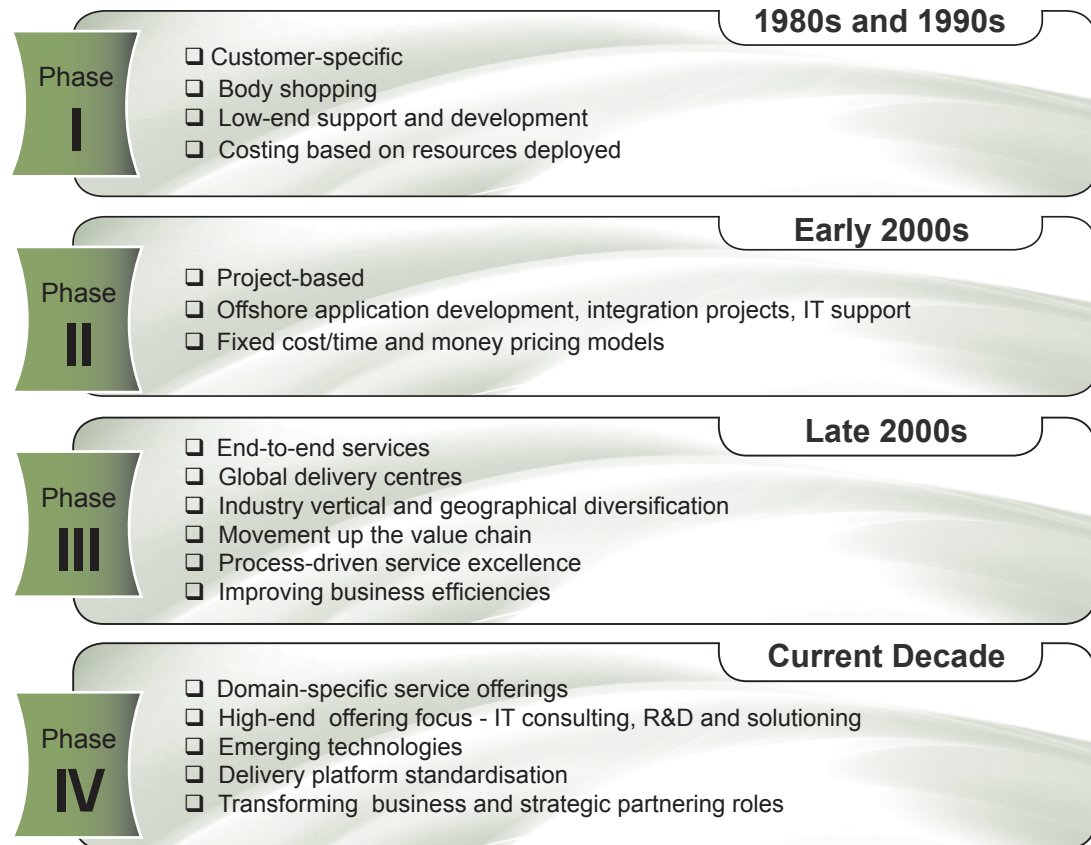
The wide scope of the services of this sub-sector creates a requirement for a large variety of skills. This reflects on the range of opportunities available for building a career in ITS to a varied group of people, and the industry continues to be amongst the most sought after for many young and aspiring individuals.

<sup>1</sup>THE IT-ITeS Sector In India, Strategic Review 2013, NASSCOM



## Evolution of the ITS Sub-sector

The IT Industry in India began in the mid-1970s with the government formulating the software export scheme. The ITS sub-sector witnessed a steady growth in the 1980s with the government introducing new reforms that helped bring focus on software as being distinct from hardware.



**Figure 2:** Evolution of the ITS Sub-sector

However, the emergence of this sub-sector really happened in the early 1990s after many companies started to offshore their operational work to India. The government also supported this growth and the general economic and political environment favoured a rapid development. Companies started to set up their captives in India. The Indian companies expanded locally and globally to address the growing demands of the sector. Development of infrastructure by the government and growing reputation of IT-BPM industry fuelled the growth. The later part of the decade saw increased spending on R&D within the ITS sub-sector. A general upward trend of the quality of offerings was clear with companies starting to offer more comprehensive and complex solutions. Various global phenomena like dot com crash and global recession created opportunities for the Indian industry owing to its sustainable cost and innovation advantages, thus putting India on the global map for IT services.

The first decade of the 21st century saw the presence of Indian MNCs grow significantly as the companies started to establish delivery centres worldwide and make global acquisitions. Services higher up in the value chain are becoming a significant part of the offerings and an increasing focus is on innovation and thought leadership. The industry has seen an average growth of about 30 percent in the last three decades with export driving the majority of the growth<sup>2</sup>.

The sub-sector started as a means of cost saving for the companies, by providing an extended workforce that could perform the job in a cost-efficient way. However, maturing clients and the changing economic environment have helped the industry evolve to provide more value-added services with an impact in the long term, thus giving it the role of a strategic partner to the business.

<sup>2</sup>NASSCOM Strategic Review 2013.



# Profile of the ITS Sub-sector

## Vertical Profile

BFSI is the largest driver in this space, claiming half of the entire IT services export. Other industry verticals like Healthcare, Retail and Media have started making big investments in IT services and are turning into key verticals for the ITS sub-sector. An illustrative view of the vertical and horizontal profiles is shown subsequently.

## Horizontal Profile

The ITS sub-sector started off in India with a focus on basic application development and maintenance. The sub-sector has now grown and includes significant footprints in traditional segments, which include custom application development, application management, IS outsourcing and software testing. With time, the sector has expanded to provide end-to-end IT solutions and includes consulting, testing services, infrastructure services and system integration in the offering<sup>3</sup>.

## Customer Profile

After starting off, the ITS sub-sector served mostly the North American market until the 1990s.

While North America continues to be a major importer of Indian IT services, the sub-sector has witnessed entry into other markets, in order to mitigate risk as well as to expand markets thus servicing clients in a greater number of geographical areas like Latin America, Asia-Pacific and Europe.

The client base in these markets is a healthy mix between BFSI, Manufacturing, Retail, Telecom and all key Industry verticals.

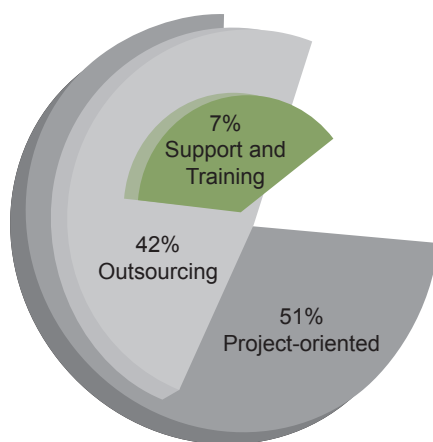


Figure 3: Contribution of Areas in the IT-BPM Industry



Figure 4: Customer Profile of ITS sub-sector

<sup>3</sup>The IT -BPM Sector in India – Strategic Review 2013, NASSCOM

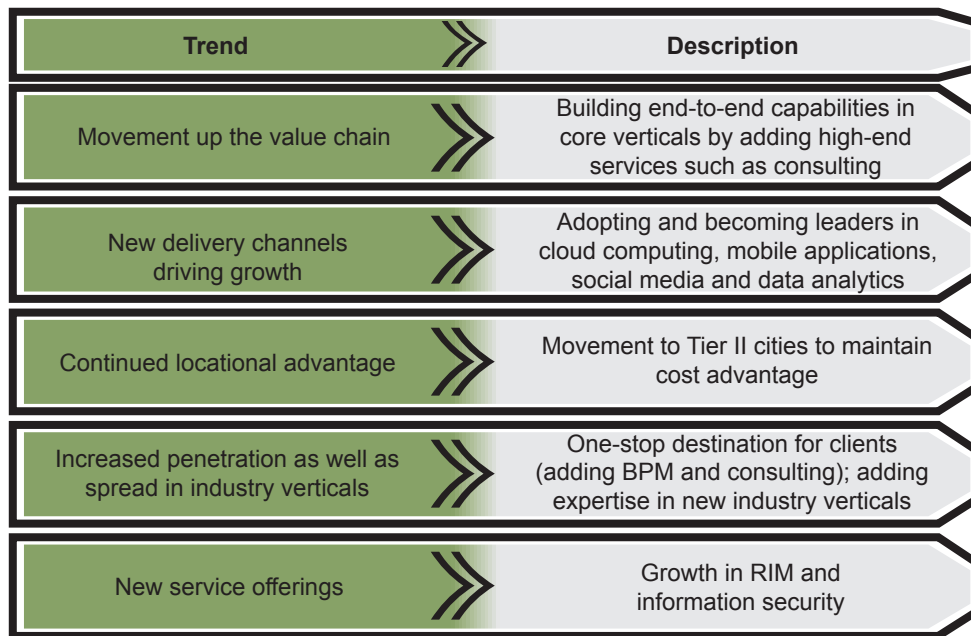
OVERVIEW OF THE ITS SUB-SECTOR

Occupational Analysis of the IT-BPM Industry: ITS Sub-sector

# Verticals and Occupations in the ITS sub-sector



The table does not depict any hierarchy.



**Figure 5:** Trends in the ITS Sub-sector

The IT-BPM industry is standing at a watershed moment in history. In FY2013, the industry achieved a stellar landmark of crossing USD 108 billion in revenues. However, with the industry slowly reaching a stage of maturity and with a business model closely aligned to exports, it faces the brunt of the economic shake-up like the one observed in 2008, which re-defined the economic order amongst nations.

While the recovery has gathered pace in the last few months, companies are becoming increasingly conscious that in the globally connected world, 'the new normal' will be characterised by business volatility. The ups and downs will be more frequent, and companies need to learn how best to manage this volatility.

Some of the key trends which are leading the growth in the sub-sector include the following.

#### **New Delivery Channels Driving Growth**

Growth of the different delivery channels like cloud computing, mobile applications, social media and data analytics has provided the industry with new opportunities and expanded the market, particularly for the small and medium-scale businesses.

#### **Continued Locational Advantage**

India leads the table as the most lucrative location for IT services, performing well on various parameters like financial attractiveness, skill availability and business environment.<sup>4</sup> While traditionally, 70 percent of the industry is located in Tier I cities, focus on controlling costs has created a gradual move to have centres in Tier II cities as well, thus widening the talent pool and spread.

<sup>4</sup>A. T. Kearney Global Services Location Index, 2011

### Increased Penetration as well as Spread in Industry Verticals

The BFSI sector has been the key business driver for the industry. Increasing penetration of new industry verticals like Healthcare, Utilities and Retail in addition to growing ones like Media, Government and Manufacturing is expected to happen, increasing the total market share. Indian IT service offerings have evolved from application development and maintenance, to emerge as full service players providing testing services, infrastructure services, consulting and system integration. Within that, IT outsourcing exhibited strong growth, in line with global trends, driven by increased spending in remote infrastructure management, application management, testing and SOA segments. Cloud computing and mobile computing gained credence this year as these offered clients access to best-in-class process management at reduced capital expenditure levels<sup>5</sup>.

### New Services


Growth in new areas of operations like Infrastructure Management Services (IMS)/Remote Infrastructure Management (RIM) and Information Security is being touted as the next growth driver for IT services. IMS professionals manage an enterprise's networks, servers, storage and so on. Advancements in technology have led to these services being increasingly offshored – a trend that is being welcomed by all major IT-BPM organisations in the industry.

In FY 2011, RIM observed a CAGR of 26 percent and it is being touted as the next growth engine for the ITS sub-sector<sup>6</sup>.

*With advancements in infrastructure technologies and increasing economies of scale, Remote Infrastructure Management Services will deliver the next wave of growth for the IT.*  
**Kothandaraman Karunakaran, Director Infrastructure Services - CSC**

<sup>5</sup>The IT-BPM Sector in India - Strategic Review 2013, NASSCOM

<sup>6</sup>NASSCOM Strategic Review 2011



Chapter  
**2**

# TALENT IN THE ITS SUB-SECTOR

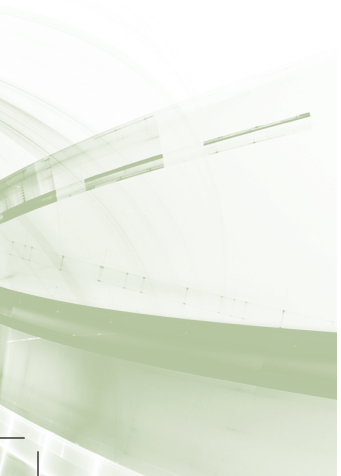
- Emerging Talent Trends
- Qualifications, Knowledge and Understanding Skills
- Learning Opportunities

Occupational Analysis of the IT-BPM Industry: ITS Sub-sector

# TALENT

**TALENT IN THE  
ITS SUB-SECTOR**

Occupational Analysis of the IT-BPM Industry: ITS Sub-sector



## Emerging Talent Trends



**Figure 6:** Key Talent Trends in the ITS Sub-sector

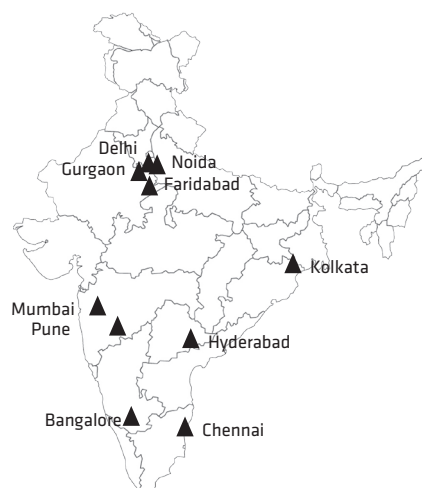
The ITS sub-sector directly employs around 1.8 million people in the country. Women comprise around 30-35 percent<sup>7</sup> of the workforce. While a major part of the workforce is hired locally, a small percent (6-8 percent) is also getting hired at other geographical locations for providing on-site support.

Leading ITS organisations are adopting certain initiatives in FY2012-13, which are reflective of the changing talent dynamics in the industry. In the heydays where HR focused predominantly on large-scale hiring, hefty salary increases, career progressions every couple of years, making the office environment a fun place to work in, the HR buzzwords in the current era are more around building competencies, improving performance, increasing productivity, enhancing accountability and so on.

Some of the key challenges with respect to talent up-skilling that lie ahead for organisations in the IT-BPM sub-sector include making the right investments to build deep domain skills and building the right organisational structure and people development processes to ensure that the domain skills can be scaled up to match increasing demand and getting the right talent. HR needs to ensure that employees not only have the right technical competency but also a penchant for being 'ahead of the curve'.

### 1. Extending the location and talent base

Majority of this workforce (~85 percent) is based out of seven key cities<sup>8</sup>. It is now becoming a challenge for organisations to sustain their strategic advantage because of the following reasons:



**Figure 7:** Leaders - Top 7 Leading Locations

<sup>7</sup> The IT-BPM Sector in India - Strategic Review 2013, NASSCOM

<sup>8</sup> At Keaeney NASSCOM Report - Sustaining IT-BPO Growth Location Readmap



## TALENT IN THE ITS SUB-SECTOR

- ❑ Rapidly rising real estate costs
- ❑ Presence of large number of IT services players resulting in high attrition and increased wages
- ❑ Rapid growth of other sectors in leading locations, resulting in greater competition for talent
- ❑ Saturation and deteriorating infrastructure

These have now made the larger organisations shift to a more diverse location base with several organisations looking to set up offices in Tier II and Tier III cities. Indian service providers are expanding their delivery centres across leading Tier II/III locations such as Chandigarh, Ahmedabad, Jaipur and so on to counter any potential threats from emerging sourcing locations such as the Philippines and China. India is thriving on the well-established Global Delivery Model (GDM) along with cheaper cost as the key value proposition among all global sourcing locations. This momentum will continue in 2013 as global customers continue to face weak or uncertain demand conditions in their domestic markets, thereby making them focus more on lowering their operational costs to improve or even maintain stable bottom lines.

### Jaipur

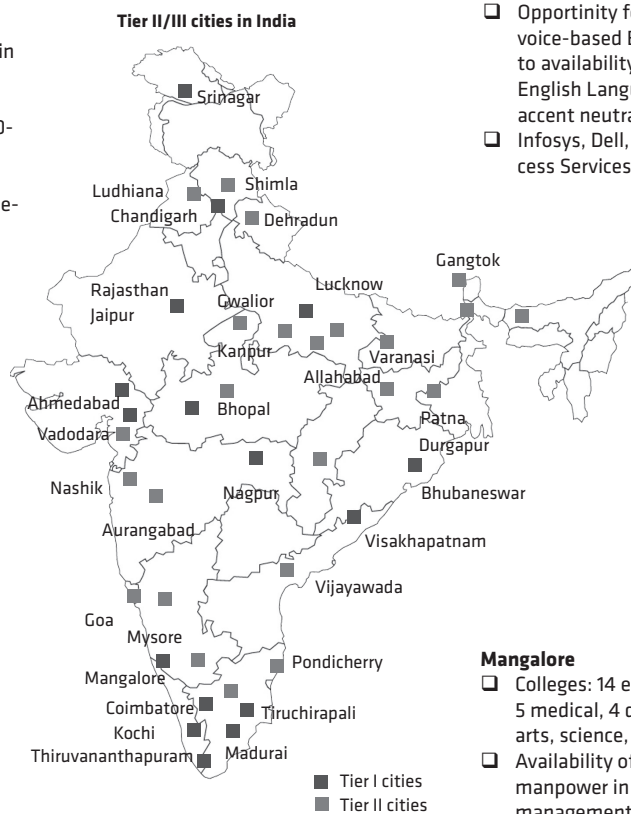
- ❑ ~5 SEZs/IT parks operational
- ❑ Mahindra World City, Jaipur, India's largest SEZ
- ❑ Over 64 engineering colleges in and around the city
- ❑ One of India's largest centres for CA training, contributes 10-12 percent of total number of CAs
- ❑ Good analytical skills available-an attractive destination for knowledge services
- ❑ Proximity to NCR region
- ❑ TCS, Infosys, Genpact, Wipro

### Ahmedabad

- ❑ >350 outsourcing firms
- ❑ Prominent services: IT services, CIS, F&A
- ❑ Caters to domestic market for voice processes especially for telecom
- ❑ Large pool of qualified F&As, CAs
- ❑ TCS, IGate, Mphasis, Aegis, Azure, Motif

### Chandigarh

- ❑ Opportunity for international voice-based BPM services due to availability of resources with English Language skills, low accent neutralisation needs
- ❑ Infosys, Dell, IBM Global Process Services



### Mangalore

- ❑ Colleges: 14 engineering, 5 medical, 4 dental, 25 law, arts, science, commerce
- ❑ Availability of trained manpower in engineering, management, basic sciences and arts
- ❑ Suitable for voice-based call centre and transactional services
- ❑ Robosoft, Infosys, Wipro, Mphasis, Global e-SoftSys

**Figure 8:** Tier II/III Cities in India

## 2. Leveraging the 'Demographics Dividend'

A large, growing and skilled talent pool provides a big thrust and is a key competitive advantage to the ITS sector in India.

More than three-fourth of this talent is between 18-30 years of age, a proportion only poised to increase in the coming years. A third of these are employed at the Entry Level, passing fresh out of colleges and universities.

Arming them with key skills is a challenge which is being addressed at a large scale. Collaborations with educational and training institutes are being undertaken by organisations individually as well as through industry bodies. Organisations in collaboration with educational institutions like DOEACC, CDAC, CMC and NIIT have undertaken several initiatives to up-skill the talent.

At the industry level, SSC NASSCOM also has undertaken several programmes like OS development and curricula development for programmes like GBFS to ensure that the industry leverages the true potential of India's demographic dividend.

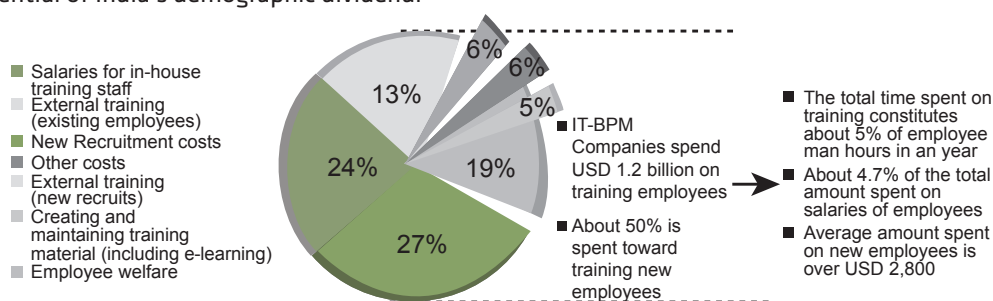


Figure 9: Capability Development/HCM costs

## 3. Organisational Capability Development

The changing business landscape, evolving industry as well as mature clients have made movement up the value chain a necessity for IT services organisations. Another trend that has emerged is the need to provide industry-specific solutions required by the clients. To address these concerns, it is important to have more domain experts. The talent needed for this has to have different levels of skill sets. Organisations are building this capability organically as well as collaboratively by devising a way to increase the pool in the market. The concept of 'borrowing' skills by hiring contingent workforce is also making headway with few organisations already experimenting with this. Organisations are spending more and more to ensure they have these right skills. Right skills are acquired through external hiring and/or elaborate internal and external training programmes. As per a study by NASSCOM and Evalueserve, ~INR 6450 crore were spent in 2009 towards up-skilling and capability development efforts.

## 4. Focus on Prime Talent

With many organisations working towards providing the complete solution, a varied workforce becomes imperative. However, having a one-approach-fit-all cannot work to sustain and manage such a diverse workforce. The organisation needs to use differentiated approach for various workforce segments with an increased focus on prime talent that would be critical to business and difficult to develop or acquire.

## 5. Target Talent Management Interventions

With IT services organisation focusing on improving efficiencies and productivity, it is important that the talent strategy be aligned to business yielding desired results. Talent management interventions should be designed so that identification of skills needed by the organisations, mapping of individuals to those identified skills and their development to have individuals perform at their optimum level when required, happen.

## 6. Talent Beyond Engineers

With the industry becoming more competitive and cost pressures increasing, trend will be towards hiring non-Engineers/Technology professionals. Several leading companies are evaluating the options of recruiting non-engineering graduates as well as Diploma holders for occupations like Testing, Infrastructure Services and IT Support Services. In some of the job roles, the trend is also to look for non-graduate students with relevant certifications.

## Qualifications, Knowledge and Understanding

Sourcing strategy may vary for different companies, but barring a few that provide niche/specialised services, majority hire both laterally and at Entry Level, with latter making up the bulk.

Nearly 70 percent of the total hiring happens at fresh graduate level, mostly from engineering colleges and universities.

Increasingly, a large number of companies are also hiring candidates with non-engineering degrees. For IT services, majority of the recruitment happens through technical graduates - Engineering institutes BCA/MCA and technical diploma holder candidates.

- ❑ Graduates with relevant certifications like CCNA, CCNP and MCSE are preferred for infrastructure-related occupations within the sub-sector
- ❑ There is usually an advanced requirement for occupations like IT Consulting, Sales and Pre-sales where candidates with a management degree are usually preferred
- ❑ Increasingly, the focus is shifting away from 'formal education' related qualifications to having the right skills to successfully deliver the job responsibilities

## Skills

The ITS sub-sector requires a wide range of skills that may vary with the organisation - value stream the organisation is servicing, and at the individual level - role and position. Both soft skills and functional skills are crucial in the industry and organisations put a lot of effort in building these capabilities. Major hiring at the Entry Level is done on the basis of the communication/soft skills and analytical aptitude.

### Key Generic skills

- Communication skills
- Analytical skills
- Problem solving
- Working with influence

### Key Functional skills

- Industry/domain skills
- SDLC concepts
- Programming skills
- Platform knowledge
- Automated testing
- ERP

*Gone are the days where force and hierarchy used to get work done in the organization. With a maturing workforce model and an increasing global footprint, individuals will need to be able to “work with influence” especially as they grow in their careers.*

**Kothandaraman Karunakaran, Director Infrastructure Services - CSC**

## Learning Opportunities

The ITS sub-sector is a knowledge-intensive industry and fresh graduates often have a steep learning curve, which they need to cover before becoming productive. The constant innovation of technology requires the employees to regularly update their knowledge for them to remain productive. Change in role or projects could also see the employee needing to learn new skills.

IT services thus encourages and provides learning opportunities through different sources like certifications, training materials (online/class room), focused learning programmes and on-the-job learning opportunities.

Increasing sector focus is leading to many IT services organisations looking to acquaint the employees with domain-specific (Retail, Manufacturing, Insurance and so on) knowledge. Similarly, tie-ups with institutes or external vendors is used to provide training to employees for specific technical or platform skills.


The industry spends significant amount of resources on providing learning opportunities. This not only provides for up-skilling of employees to meet business needs, but also helps to position the organisation as a preferred employer.

Learning opportunities are offered within and outside of the organisation. Some of these options include:

- ❑ Advanced technical degree courses like MCA, MTech, ME, MSc and so on.
- ❑ Advanced business courses like MBA/PGDBM
- ❑ Domain-related certifications in the areas of software languages, infrastructure management, information security and so on.
- ❑ Industry-related certifications in various verticals like BFSI, Telecom, and Retail and so on.

One of the key objectives of the IT-ITeS SSC NASSCOM is to develop avenues for learning and skill development in the IT-BPM Industry. In pursuit of this the SSC is planning to set up accreditation process for training providers and tailor courses on Occupational Standards that are currently being developed for the industry.

Certified training courses based on Occupational Standards will ensure standardised formal and non-formal learning opportunities that are accepted and endorsed by the industry.



Chapter  
**3**

# ENTRY-LEVEL JOB ROLES - ITS

- Entry-level Job Roles
- Entry-level Job Roles in the ITS Sub-sector
- ITS Sub-sector: Occupations, Tracks, Verticals and Entry-level Job Roles

Occupational Analysis of the IT-BPM Industry: ITS Sub-sector

# ENTRY

**ENTRY-LEVEL  
JOB ROLES - ITS**

Occupational Analysis of the IT-BPM Industry: ITS Sub-sector





## Entry-level Job Roles

Across the IT-BPM Industry, there are three levels of management that exist.

Entry Level

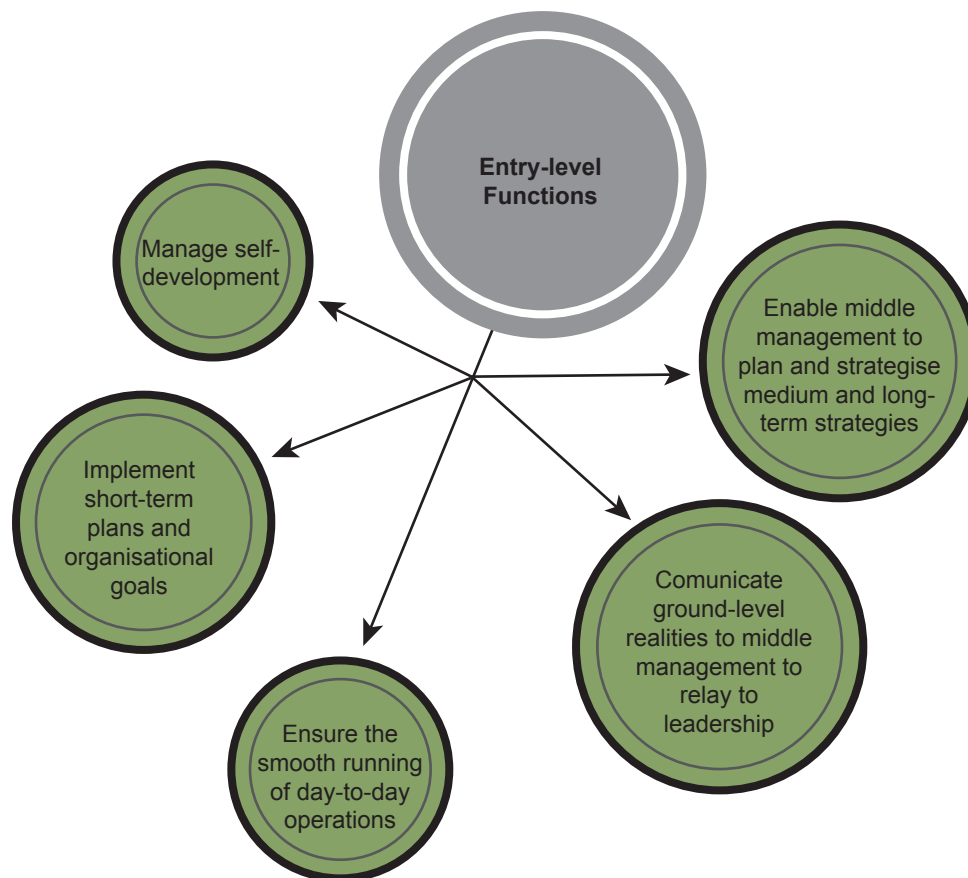
Middle Level

Leadership Level

An Entry-level job role is the first step to a career in the IT-BPM Industry. It is the first level of employment in an organization and typically employs candidates with about 0-2 years of experience. The purpose of an entry-level job role is to give the candidate an understanding of the occupation, an opportunity to learn and enhance his experience and to serve as a stepping stone to middle-level management.

With an increasing wave of domain and vertical specialisation across the IT-BPM Industry, many people are now focusing on acquiring experience through entry-level job roles in the industry.

Some of the functions of an entry-level job role are given in Figure 10.



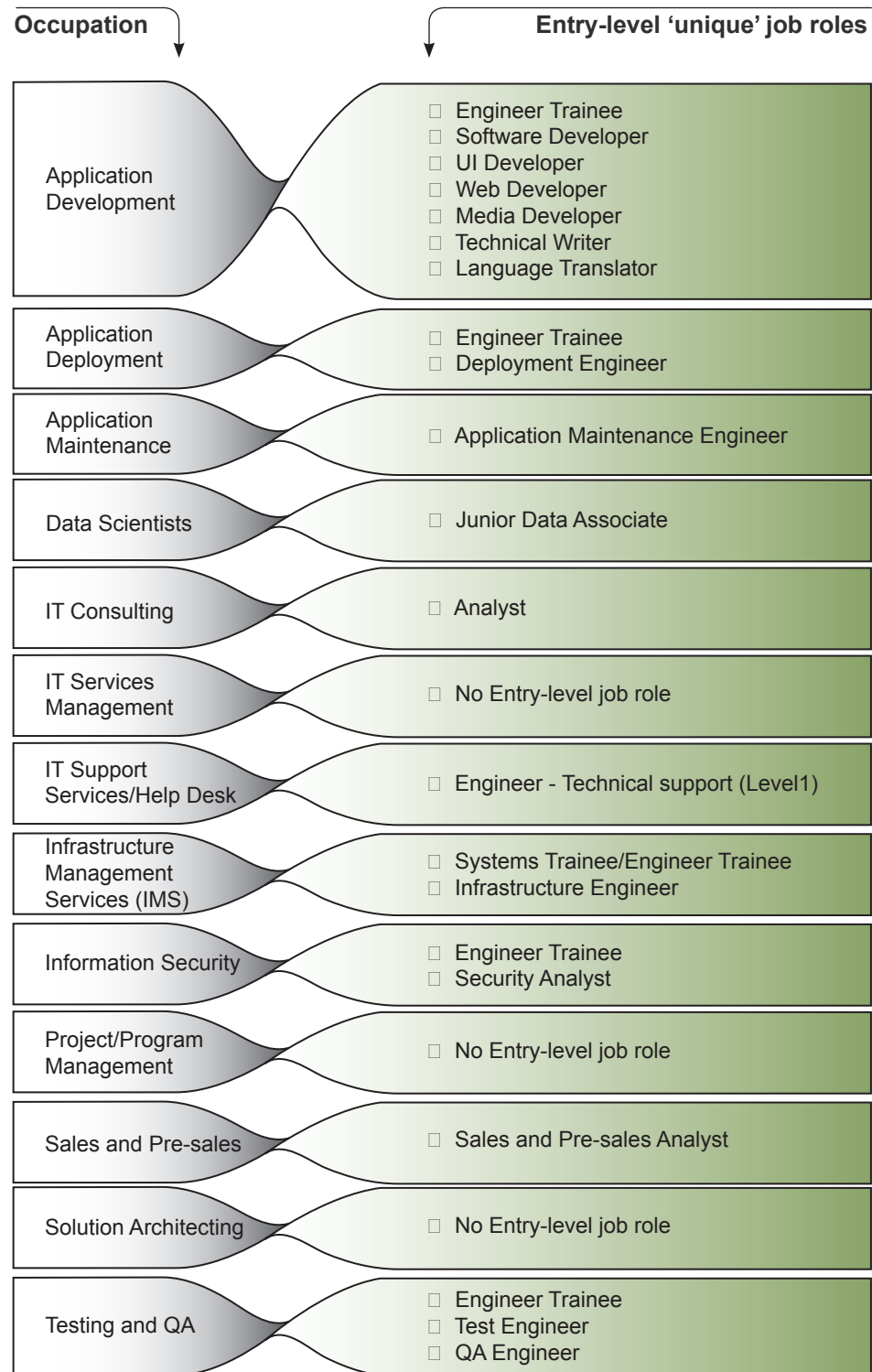
**Figure 10:** Functions of Entry-level Job Roles

## ENTRY-LEVEL JOB ROLES - ITS

## Entry-level Job Roles in the ITS Sub-sector

Entry-level job roles in the ITS sub-sector exist across almost all the occupations. For most of these job roles, the basic qualification remains graduate engineers in computer sciences and these graduates can be seen employed in almost all job roles, including software developer, application maintenance engineer, deployment engineer, technical support, test engineer and so on.

The following table gives a list of different entry-level job roles that exist across each occupation in the ITS sub-sector.



The table does not depict any hierarchy

## ITS Sub-sector - Occupations, Tracks, Verticals and Entry-level Job Roles

The IT-BPM Industry in India is one of the ever expanding industries in the country and offers myriad opportunities to fresh graduates for employment. According to NASSCOM estimates, the industry is estimated to aggregate revenues of USD 108 billion in FY2013. During this period, direct employment is expected to reach nearly three million, an addition of 1,88,300 employees, while indirect job creation is estimated at 9.5 million. About 95 percent of this hiring is of fresh graduates straight out of colleges.

Particularly, the ITS sub-sector which is the fastest growing sub-sector, in the industry, accounting for nearly 58 percent of total exports, is one of the most exciting and engaging fields to begin one's career in.

In total, there are about 17 unique job roles at the entry level across different occupations, tracks and verticals in the ITS sub-sector.

The subsequent table shows how each of these job roles is mapped to different tracks and occupations in this sub-sector

### Key Definitions

*Occupation is a set of job roles, which perform similar/related set of functions in an industry.*

*Tracks are a sub-set of occupations having similar set of functions under the larger gamut of the occupation they belong to.*

*Unique Job Roles defines a set of functions that together form a unique employment opportunity in an organisation.*

**Entry Level:** 0-2 years

**Middle Level:** 2-10 years

**Leadership Level:** >10 years

### ENTRY-LEVEL JOB ROLES - ITS

ENTR  
ROLES







Chapter  
4

# MIDDLE-LEVEL JOB ROLES - ITS

- Middle-level Job Roles
- Middle-level Job Roles in the ITS Sub-sector
- ITS Sub-sector: Occupations, Tracks, Verticals and Middle-level Job Roles

Occupational Analysis of the IT-BPM Industry: ITS Sub-sector

# MIDDLE

**MIDDLE-LEVEL  
JOB ROLES - ITS**

Occupational Analysis of the IT-BPM Industry: ITS Sub-sector



## Middle-level Job Roles

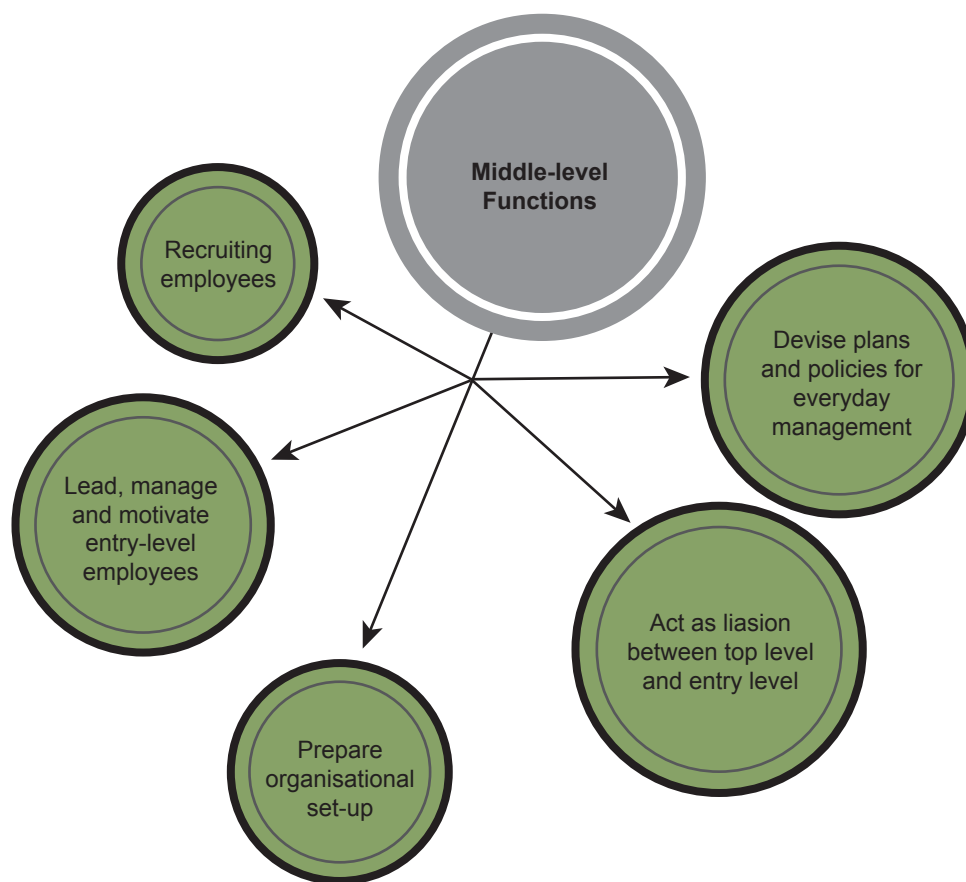
Across the IT-BPM Industry, there are three levels of management that exist.

Entry Level

Middle Level

Leadership Level

A Middle-level job role is the first step to a management career in the ITS Industry. It ranges from first-level supervisors to managers who manage supervisors and sometimes even managers of managers. They are responsible for carrying out and implementing the goals set out by top management. Often they assist and motivate the entry-level employees to achieve business objectives. Their role also includes acting as a liaison between the top level and the entry level by offering suggestions and feedback to both the groups.



**Figure 11:** Functions of Middle-level Management

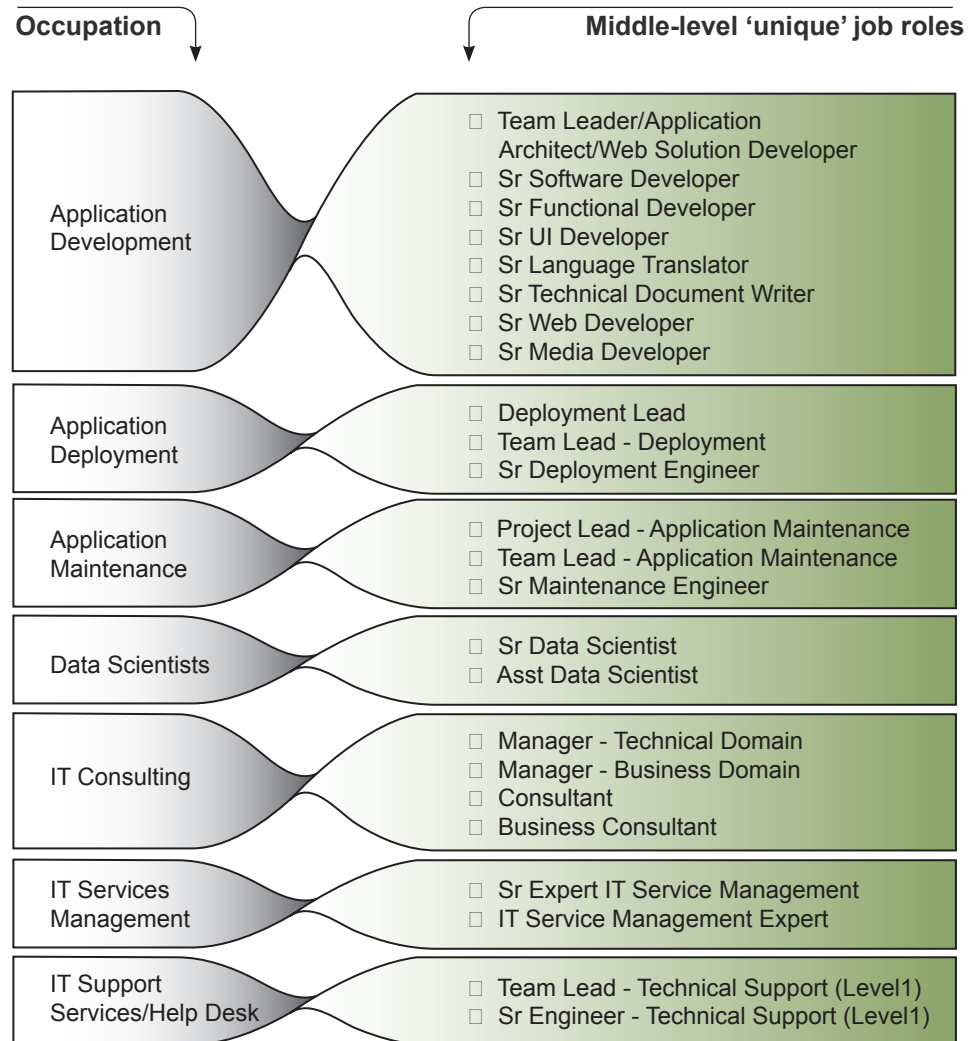


## MIDDLE-LEVEL JOB ROLES - ITS

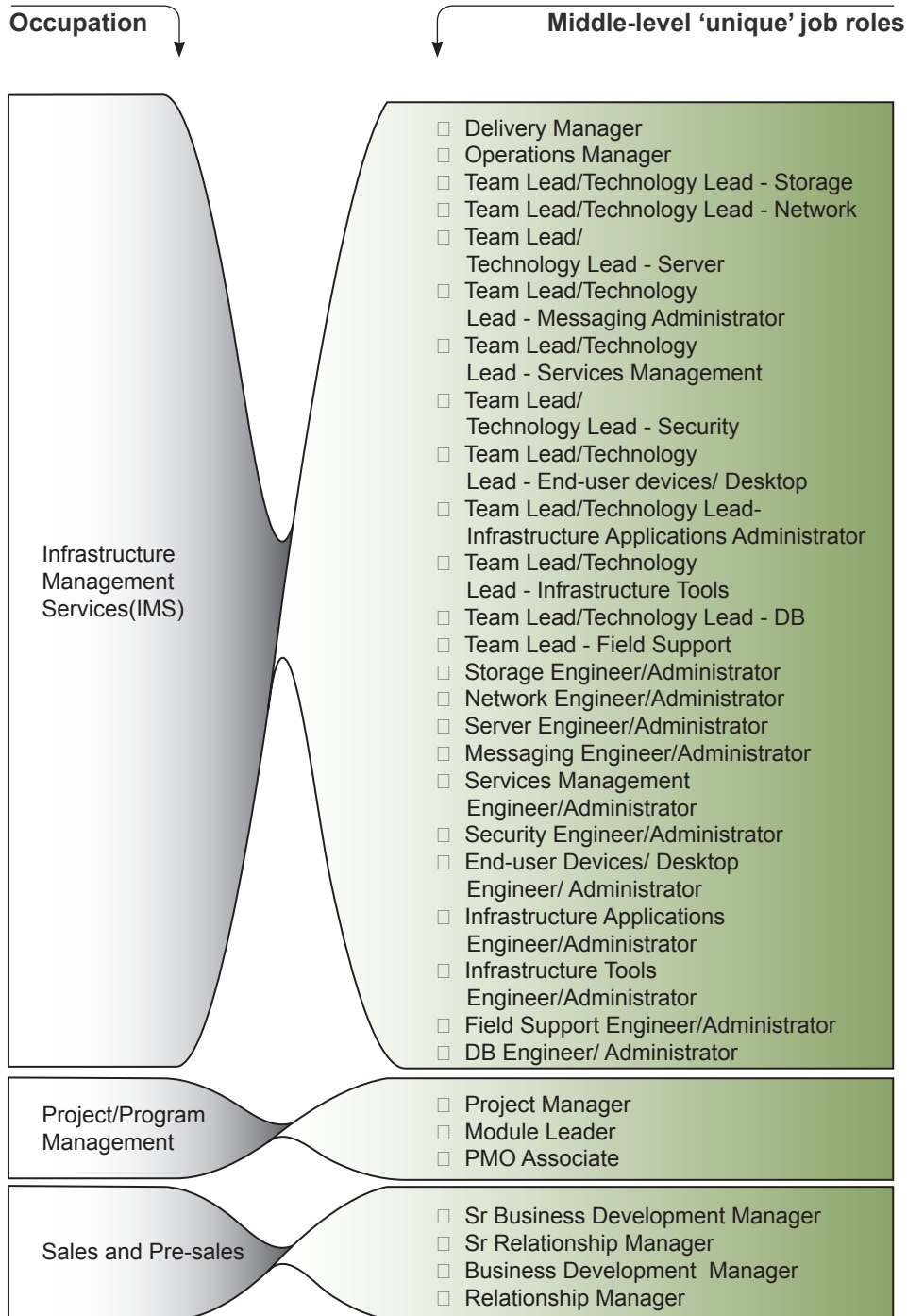
## Middle-level Job Roles in the ITS Sub-sector

Middle-level job roles in the ITS sub-sector include technical and specialist roles such as Sr Technical Document Writer, Sr UI developer, Sr Expert IT Service Management and so on as well as first-level supervisors such as Team Leaders, Manager – Business Domain and even Managers of Managers such as Deployment Lead, Project Lead Application Maintenance and so on.

The table below lists the unique middle-level job roles in the ITS sub-sector.

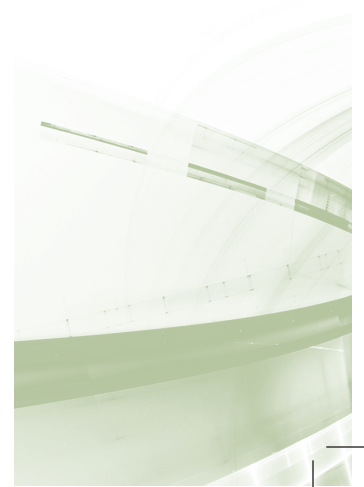


# Middle-level Job Roles in the ITS Sub-sector (Contd)

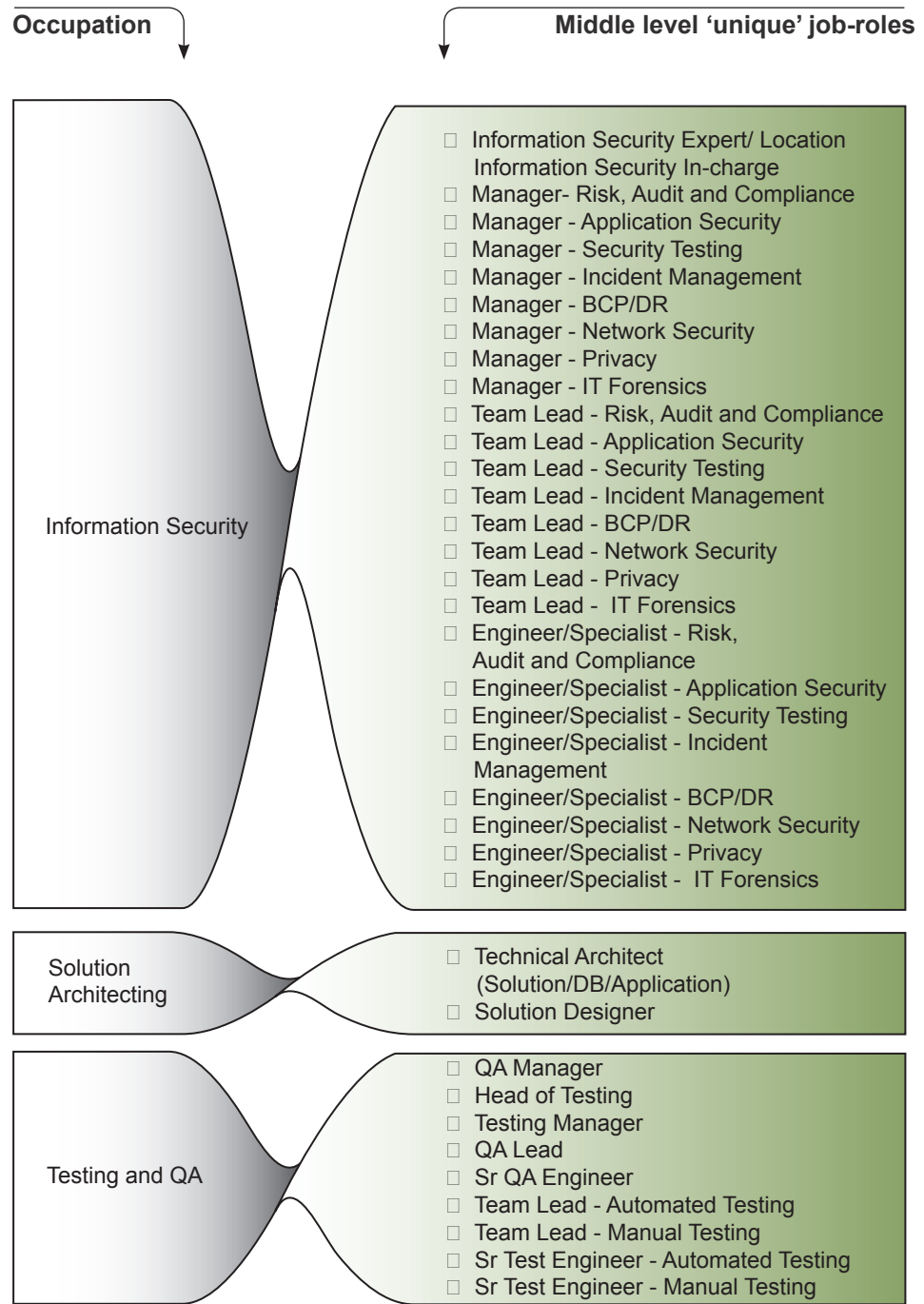


## MIDDLE-LEVEL JOB ROLES - ITS

Occupational Analysis of the IT-BPM Industry: ITS Sub-sector



## Middle-level unique Job Roles in the ITS Sub-sector (Contd)



The table does not depict any hierarchy

## ITS Sub-sector - Occupations, Tracks, Verticals and Middle-level Job Roles

The IT-BPM Industry in India offers unparalleled employment opportunities across the entire spectrum of its service offerings. Middle-level management has the maximum number of job roles as it encompasses people with 2-10 years of work experience. In smaller organizations, there may be only one layer of middle level of management but in larger enterprises, there may be multiple layers of middle-level management. This includes first-level supervisors, managers of supervisors and managers of managers as well.

In total, there are about 91 unique job roles at the middle level across different occupations, tracks and verticals in the ITS sub-sector.

The subsequent table shows how each of these job roles is mapped to different tracks and occupations in this sub-sector.

### **Key Definitions**

*Occupation is a set of job roles, which perform similar/related set of functions in an industry.*

*Tracks are a sub-set of occupations having similar set of functions under the larger gamut of the occupation they belong to.*

*Unique Job Roles defines a set of functions that together form a unique employment opportunity in an organisation.*


**Entry Level:** 0-2 years

**Middle Level:** 2-10 years

**Leadership Level:** >10 years

## MIDDLE-LEVEL JOB ROLES - ITS





Chapter  
**5**

# LEADERSHIP-LEVEL JOB ROLES - ITS

- Leadership-level Job Roles
- Leadership-level Job Roles in the ITS Sub-sector
- ITS Sub-sector: Occupations, Tracks, Verticals and Leadership-level Job Roles

Occupational Analysis of the IT-BPM Industry: ITS Sub-sector

# LEADERSHIP



**LEADERSHIP-LEVEL  
JOB ROLES - ITS**

Occupational Analysis of the IT-BPM Industry: ITS Sub-sector





## Leadership-level Job Roles

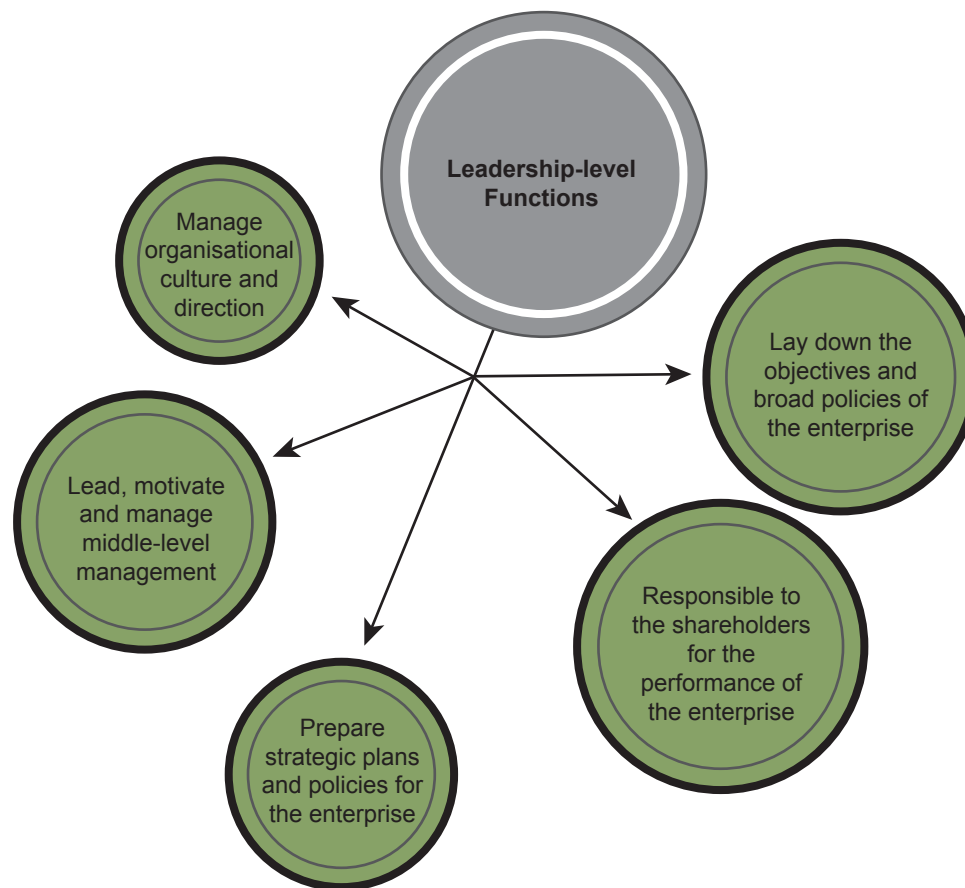
Across the IT-BPM Industry, there are three levels of management that exist.

Entry Level

Middle Level

Leadership Level

A leadership-level job role is one of the top level job roles in the ITS sub-sector. The top-level management generally consists of occupation leads as well as CXO level roles – including Chief Technology Officer (CTO), Chief Information Security Officer (CISO), Chief Information Officer (CIO) and so on. The top-level management determines the objectives, policies and plans of the organisation. They devise long term strategy, organisational objectives and goals and are also involved in mobilising resources. The top-level management has the final authority in the organisation. They are directly responsible to the shareholders, government and other stakeholders.



**Figure 12:** Functions of Leadership-level Management

## Leadership-Level Job Roles in the ITS Sub-sector

Leadership-level job roles in the ITS sub-sector include head of department roles such as Head of Application Deployment, Head of Application Maintenance, Infrastructure Lead, Chief Solution Architect and so on as well as CXO-level roles like Chief Information Officer (CIO), Chief Information Security Officer (CISO) and so on.

The table below lists the unique leadership-level job roles in the ITS sub-sector.

Occupation	Leadership-level 'unique' job roles
Application Development	<ul style="list-style-type: none"> <li>□ Delivery Lead</li> </ul>
Application Deployment	<ul style="list-style-type: none"> <li>□ Head of Application Deployment</li> </ul>
Application Maintenance	<ul style="list-style-type: none"> <li>□ Head of Application Maintenance</li> </ul>
Data Scientists	<ul style="list-style-type: none"> <li>□ Lead - Data Scientist</li> </ul>
IT Consulting	<ul style="list-style-type: none"> <li>□ Partner/ Sr Executive/ Managing Director</li> <li>□ Sr Manager/Director</li> </ul>
IT Services Management	<ul style="list-style-type: none"> <li>□ Infrastructure Services Head</li> <li>□ Lead IT Service Management</li> </ul>
IT Support Services/Help Desk	<ul style="list-style-type: none"> <li>□ IT Operations Manager</li> </ul>
Infrastructure Management Services (IMS)	<ul style="list-style-type: none"> <li>□ Infrastructure Lead</li> </ul>
Information Security	<ul style="list-style-type: none"> <li>□ CISO/ Head Information Services</li> </ul>
Project/Program Management	<ul style="list-style-type: none"> <li>□ Delivery Lead</li> <li>□ Client Account Lead</li> <li>□ Client Relationship Manager</li> <li>□ Program Manager</li> </ul>
Sales and Pre-sales	<ul style="list-style-type: none"> <li>□ Head Sales and Pre-Sales</li> <li>□ Zonal Head - Sales and Pre-sales</li> <li>□ Client Relationship Manager/ Chief Alliance Manager</li> </ul>
Solution Architecting	<ul style="list-style-type: none"> <li>□ Chief Solutions Architect</li> <li>□ Enterprise Architect</li> </ul>
Testing and QA	<ul style="list-style-type: none"> <li>□ Head of Quality Assurance</li> <li>□ Head of Testing</li> </ul>

The table does not depict any hierarchy

## ITS Sub-sector - Occupations, Tracks, Verticals and Leadership-level Job Roles

The IT-BPM Industry in India offers unparalleled employment opportunities across the entire spectrum of its service offerings. Leadership-level management has the maximum number of job roles as it encompasses people with 2-10 years of work experience. In smaller organisations, there may be only one layer of middle-level of management but in larger enterprises, there may be multiple layers of middle-level management. This includes first-level supervisors, managers of supervisors and managers of managers as well.

In total, there are about 91 unique job roles at the middle level across different occupations, tracks and verticals in the ITS sub-sector.

The subsequent table shows how each of these job roles is mapped to different tracks and occupations in this sub-sector.

### **Key Definitions**

*Occupation is a set of job roles, which perform similar/related set of functions in an industry.*

*Tracks are a sub-set of occupations having similar set of functions under the larger gamut of the occupation they belong to.*

*Unique Job Roles defines a set of functions that together form a unique employment opportunity in an organisation.*


**Entry Level:** 0-2 years

**Middle Level:** 2-10 years

**Leadership Level:** >10 years

### LEADERSHIP-LEVEL JOB ROLES - ITS





Chapter  
**6**

# OCCUPATIONS AND ROLES IN THE ITS SUB-SECTOR

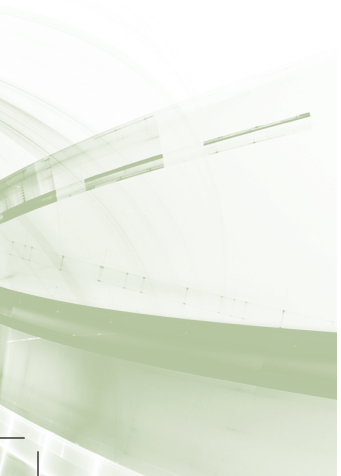
- In Summary
- Occupations within the ITS Sub-sector
- Description of Each Occupation
- Occupational Map for Each Occupation
- Typical Career Paths

Occupational Analysis of the IT-BPM Industry: ITS Sub-sector

# OCCUPATION

**OCCUPATIONS AND ROLES  
IN THE ITS SUB-SECTOR**

Occupational Analysis of the IT-BPM Industry: ITS Sub-sector



## In Summary

Based on the industry research as part of the Occupational Analysis, the occupations in the sub-sector have been classified and detailed as follow:

- 13 unique 'Occupations'
- 39 unique 'Tracks'
- 17 unique Job roles at the Entry Level
- 9 unique Job roles at the Middle Level
- 25 unique Job roles at the Leadership Level

### **Key Definitions**

**Occupation** is a set of job roles, which perform similar/related set of functions in an industry.

**Tracks** are a sub-set of occupations having similar set of functions under the larger gamut of the occupation they belong to.

**Unique Job Roles** defines a set of functions that together form a unique employment opportunity in an organisation.

**Entry Level:** 0-2 years

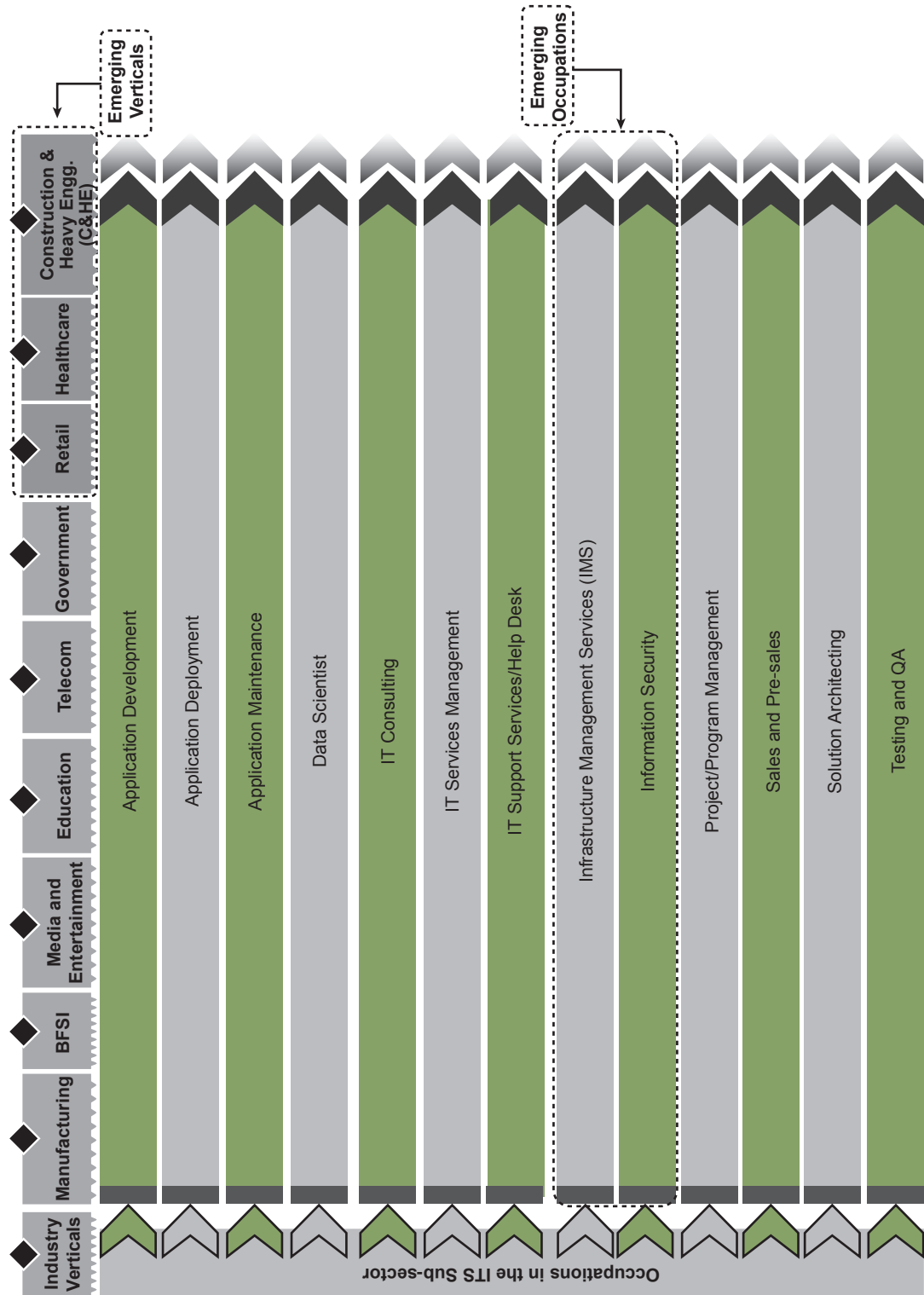
**Middle Level:** 2-10 years

**Leadership Level:** >10 years



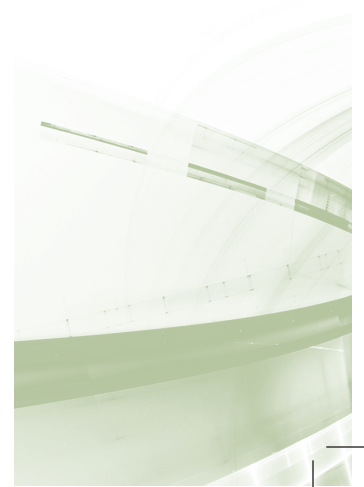
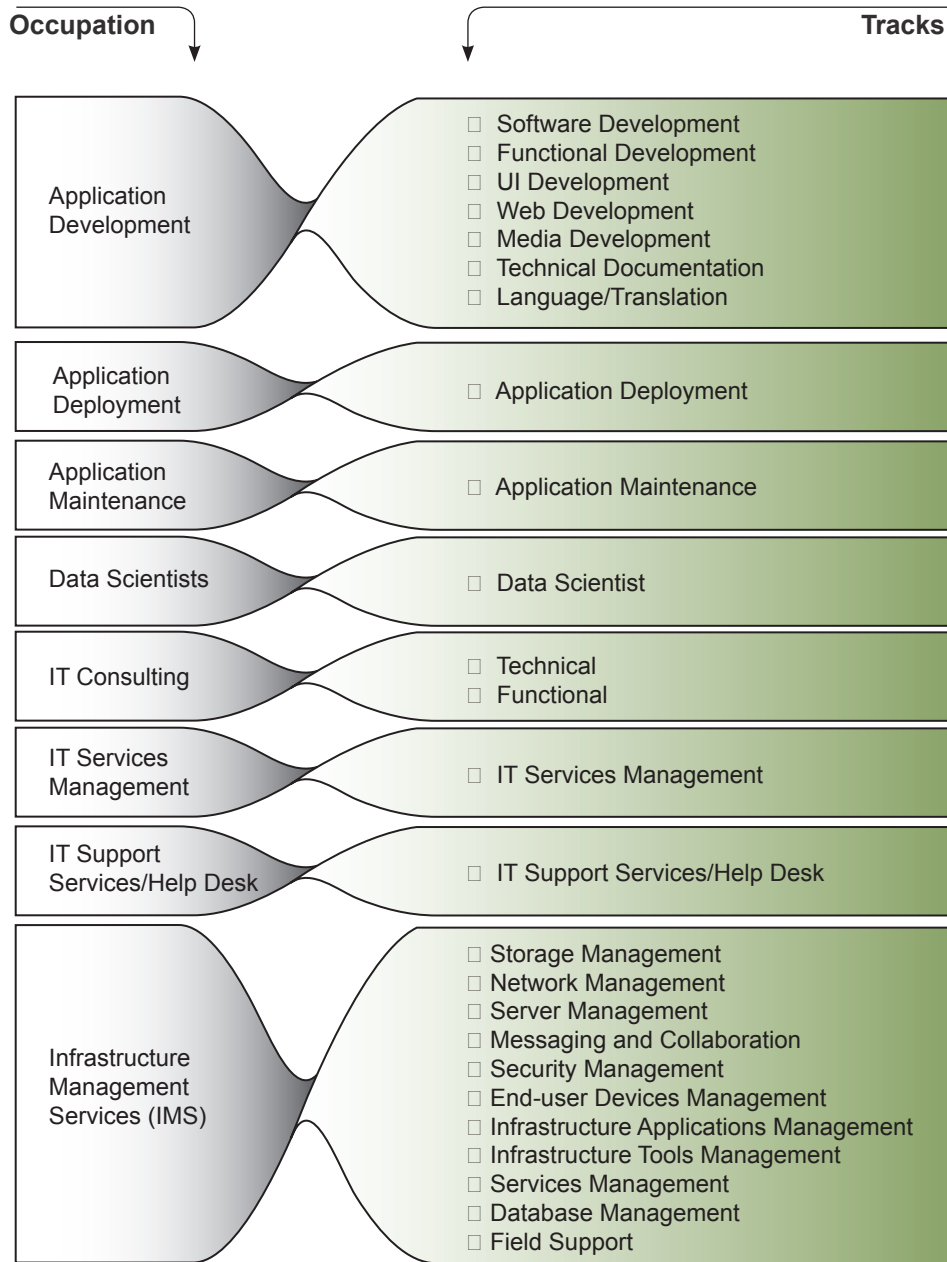
## Occupations within the ITS Sub-sector

Occupations identified have been classified further to indicate 'tracks'. These detailed tracks within each occupation have been represented in the table below. Some occupations like Solution Architecting, Application Deployment and so on, did not require a further split and hence they have a single track (same as the occupation name).

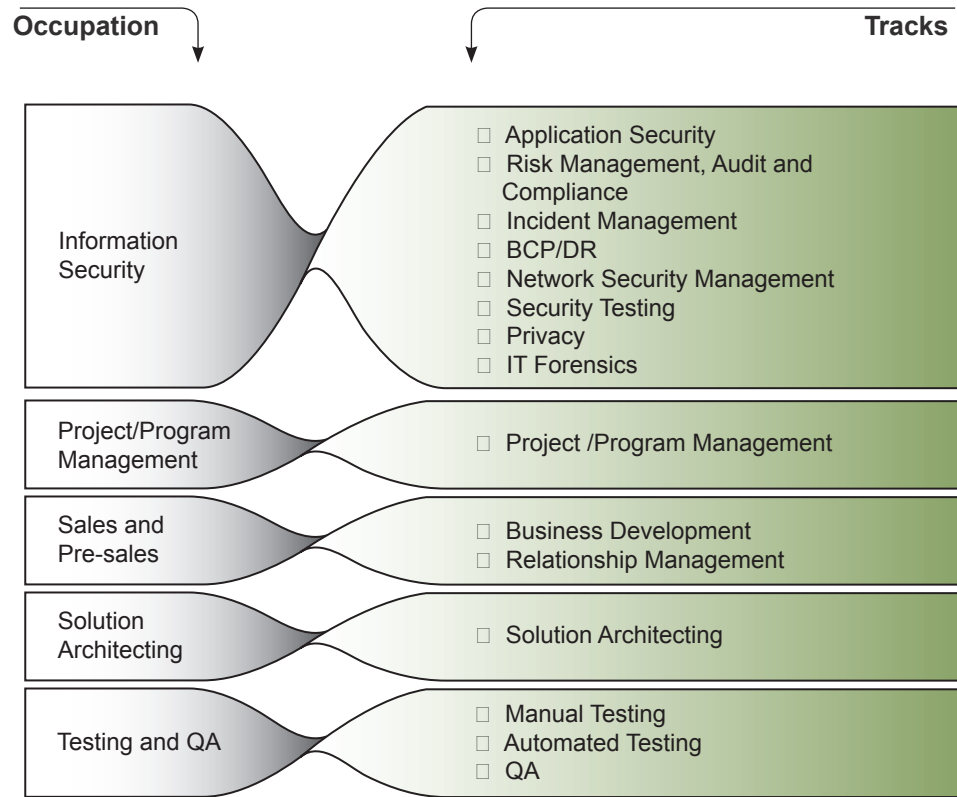


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# Occupations have been classified into 'Tracks' to capture further skill-based specialisations

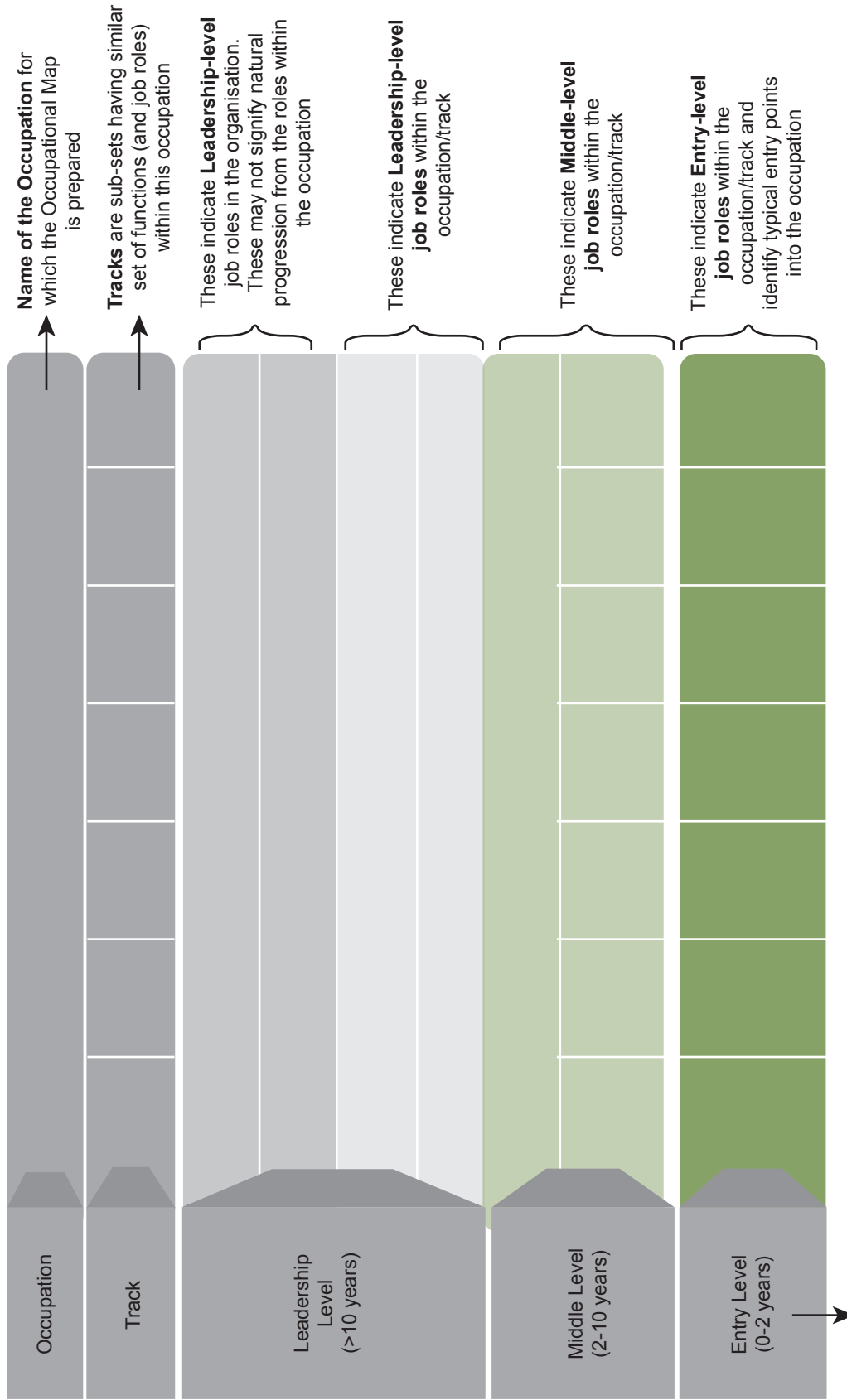


## Occupations have been classified into 'Tracks' to capture further skill-based specialisations (Contd)



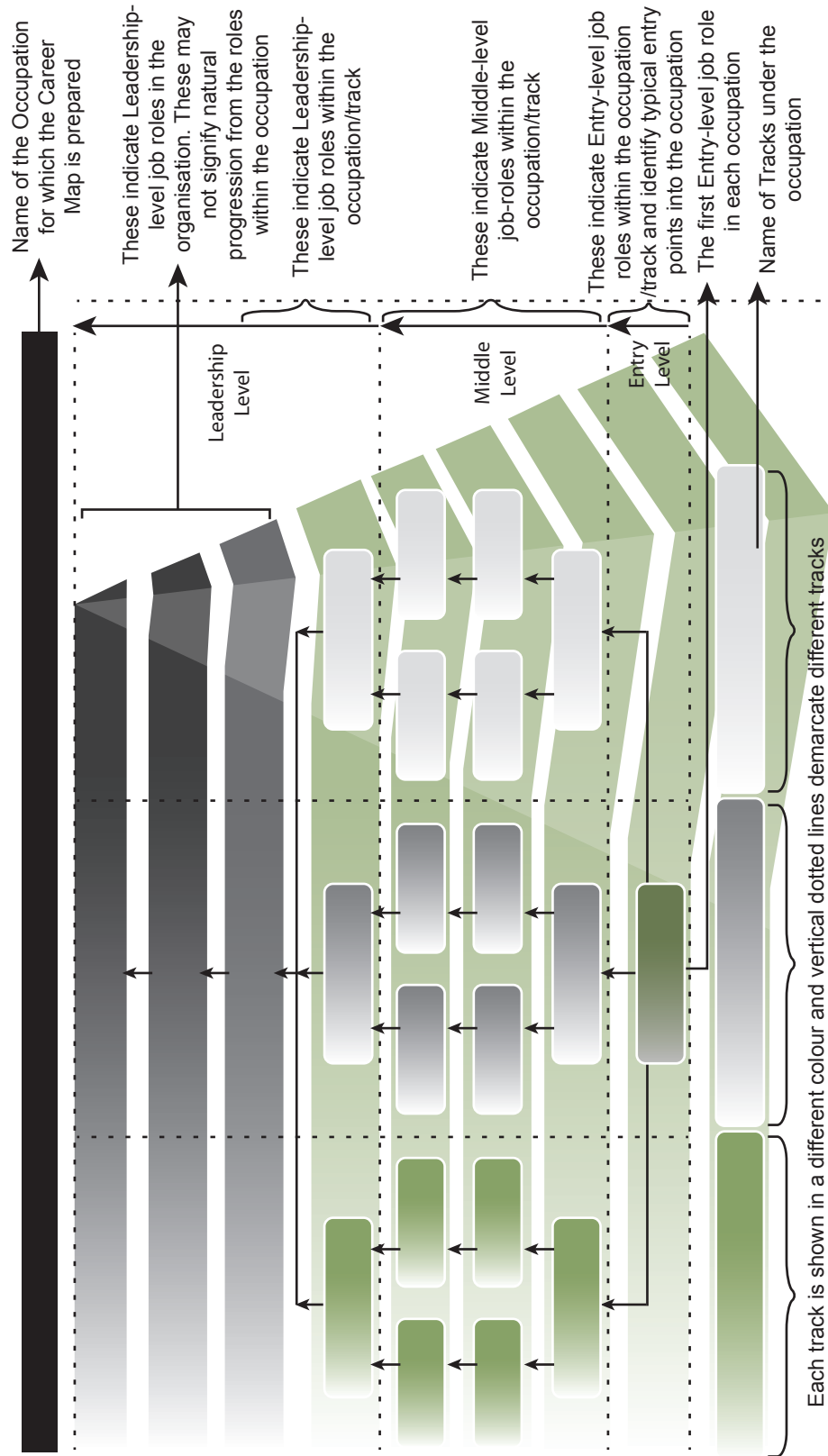
The table does not depict any hierarchy

# Occupational Map - Reading Guide



Please note that the number of years written here are only indicative and may vary from organisation to organisation

# Career Map - Reading Guide



## Application Development

Application Development involves the following.

- ❑ Developing and delivering customised software applications and interfaces
- ❑ Enhancing existing packaged applications or pre-engineered templates
- ❑ Support and provision of custom applications

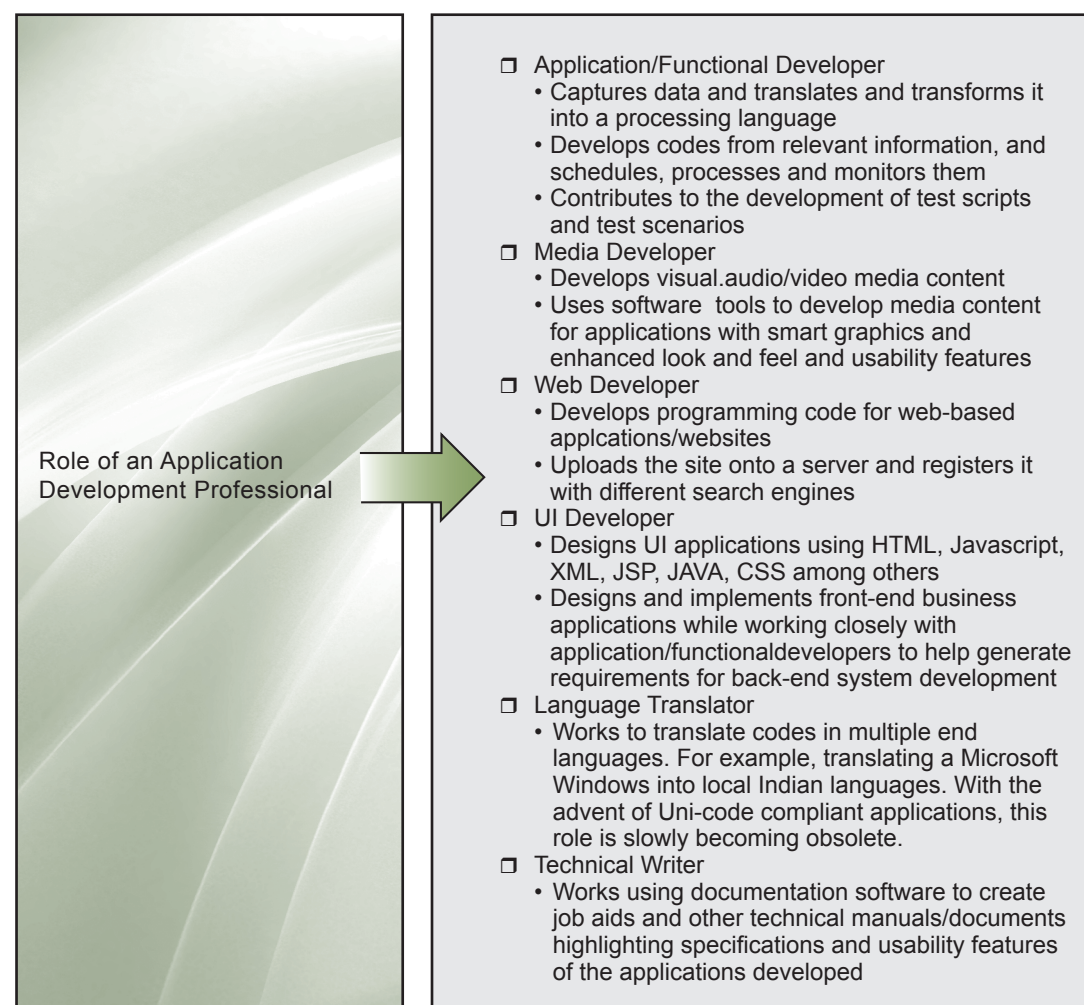
Application Developers develop software codes using a range of platforms (operating systems) and programming/scripting languages.

The application development professionals work closely with other software professionals like Testing and Support Services. The responsibilities vary widely with the years of experience and the type of application platform.

**Software Development:** Software Development roles are responsible for creating software applications by coding using programming/scripting languages like C, C++, Java, HTML, .Net, PHP, VB and so on.

**Functional Development:** Functional Development roles are responsible for providing function-specific inputs towards application development. These roles work closely with Application Developers and provide a domain perspective in the areas of CRM, Financial Management, ERP and so on.

**Media Development:** Media Development roles are responsible for designing and improving the look and feel, functionality and graphic appeal of the developed application. Media Development includes developing visual/audio and/or video content to the developed applications. These usually work along with application/functional developers to improve the aesthetics of the application being developed.



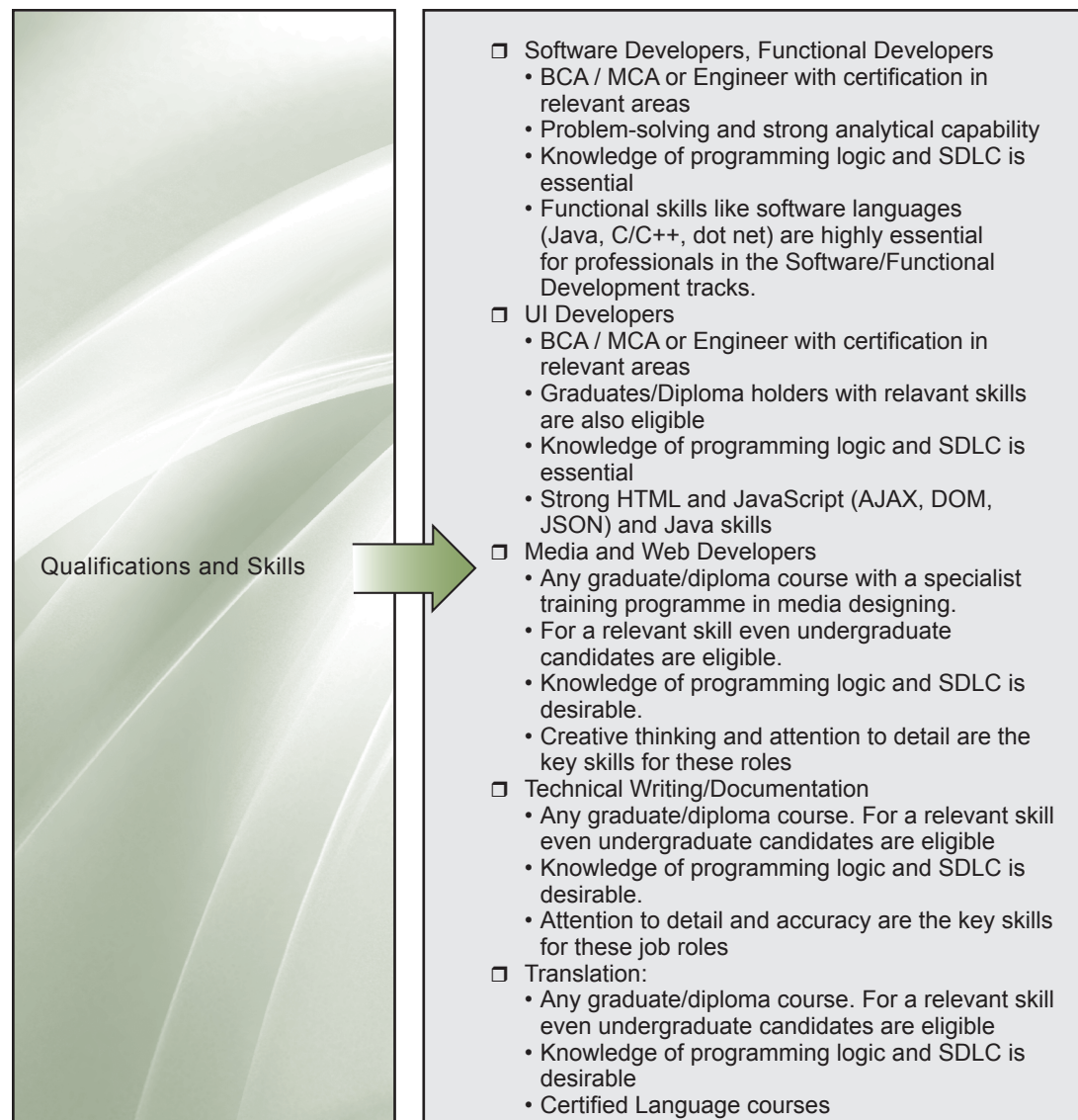


**Web Development:** Web Development roles are responsible for designing and maintaining web-based applications that include static and dynamic content. Web Designer/Developers are responsible for the design, layout and coding of a website. They are involved with the technical and graphical aspects of a website - how the site works and how it looks. They can also be involved with the maintenance and update of an existing site. These work along with application/functional developers as part of the overall solution that includes a web-based component.

**User Interface Development:** User Interface (UI) Development roles are responsible for designing rich UI for the developed application. UI Developers create complex user interfaces for a variety of applications, such as computer programs, databases and websites. UI Developers also maintain these interfaces. These work along with application/functional developers to include specific functionalities in the UI as part of the overall solution.

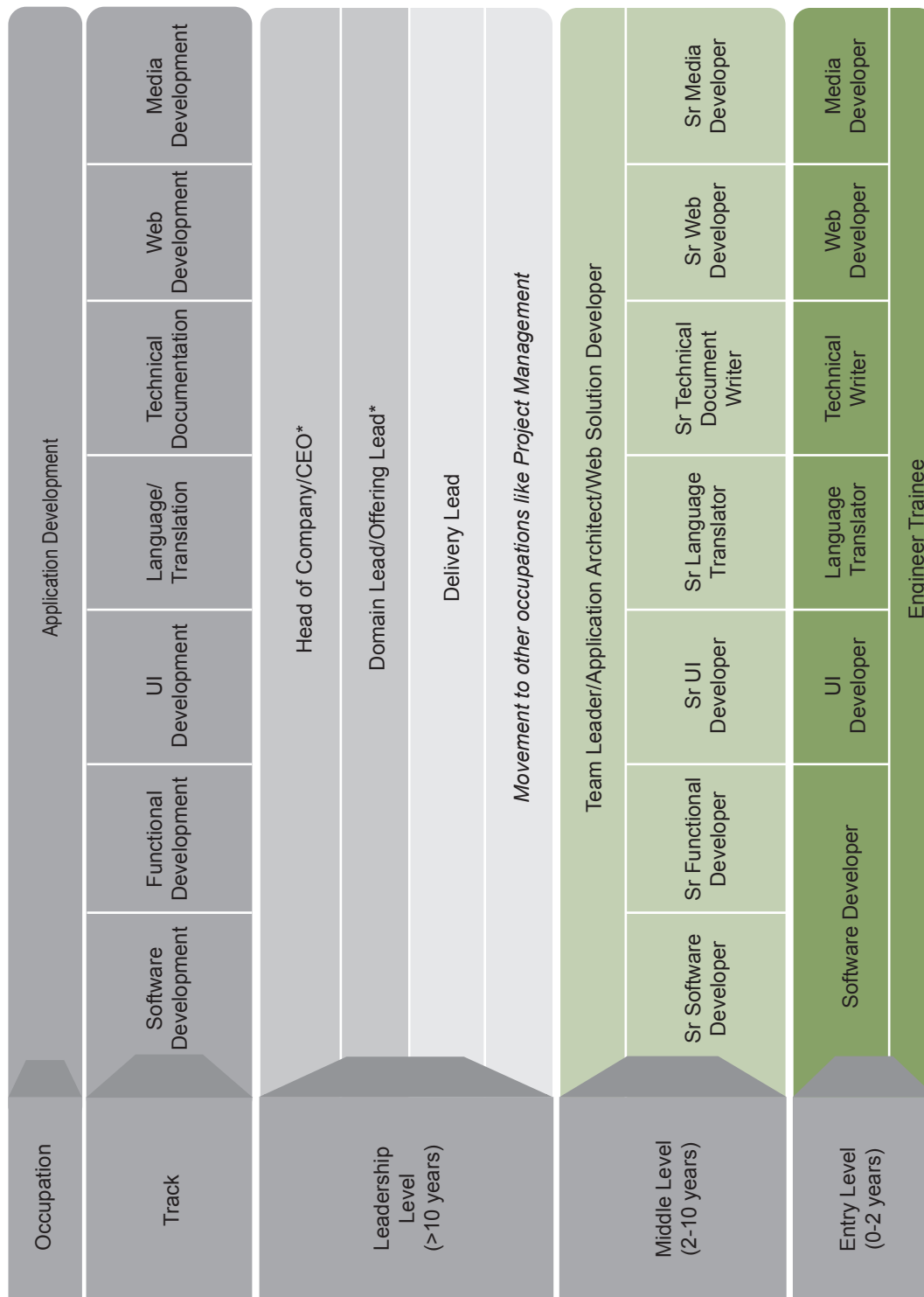
**Technical Documentation:** Technical Writing roles are responsible for creating technical documentation related to an application like job aids, help documents/manuals, and training materials. These documents serve the core purpose of transferring knowledge between the application development teams and the user teams. These documents can also be used as learning and troubleshooting aid by the users at a later stage.

**Language/Translation:** Translation roles are responsible for translating software into different languages that end-users may be well-versed with. These extend beyond regular language translator roles as they require understanding of the software languages and platforms.



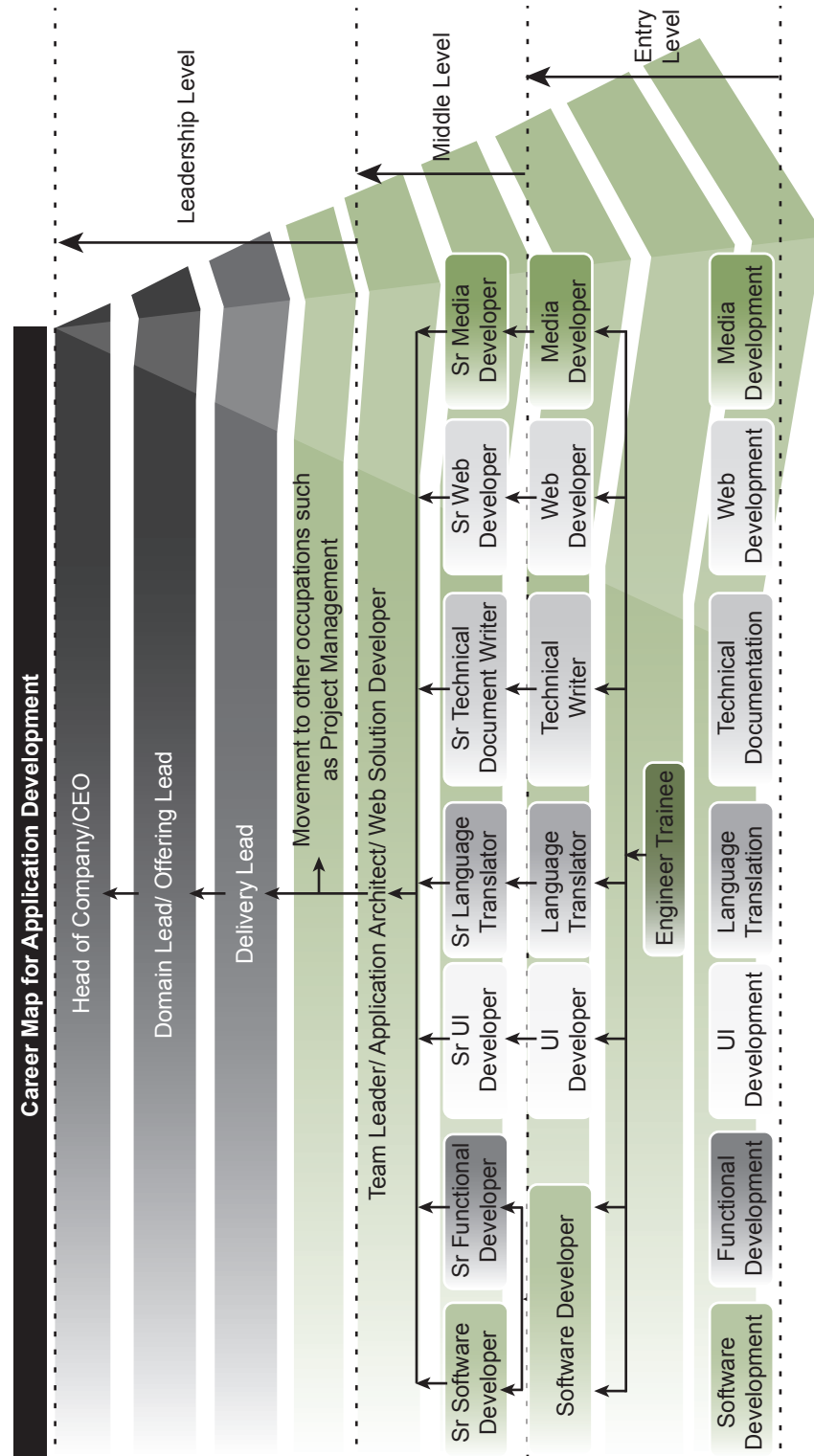


# Application Development - Occupational Map



\*Job roles such as 'Head of Company/CEO' and 'Domain Lead/Offering Lead' do not fall under this occupation, but can be a career progression for a person, provided he acquires business knowledge, skills and attributes required for that role through exposure to different occupations. The map does not depict any hierarchy.

# Application Development - Typical Career Paths

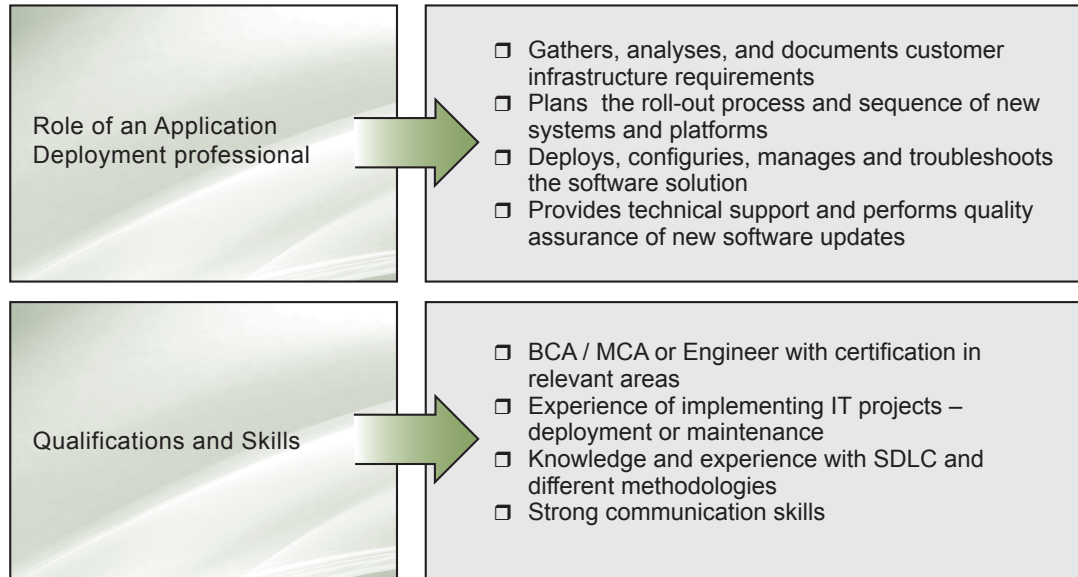


\*Note: Career growth across the Leadership Level is usually governed by cross-functional exposure to other occupations. While a possible movement has been indicated in the map, this is usually highly 'person specific' and should not be generalised. The map does not depict any hierarchy.

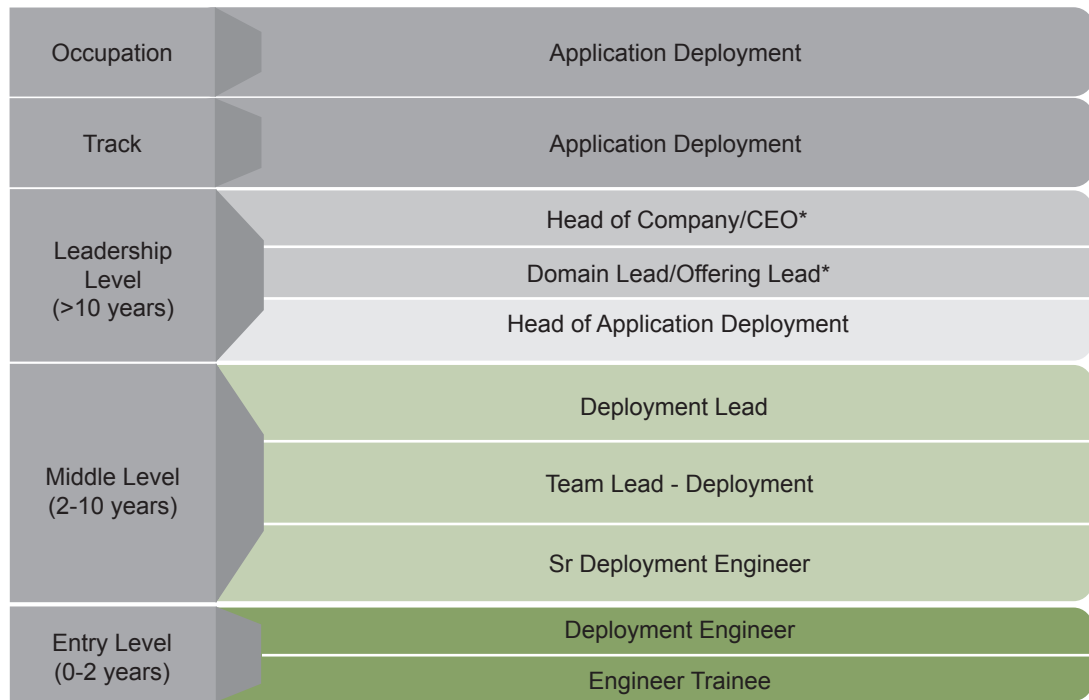
## Application Deployment

Application Deployment involves expertise and systems providing the customer with proper installation and configuration of all packaged and customised software products.

Application Deployment professionals are responsible for ensuring that software systems are fully deployed, implemented and functioning and are configured with hardware requirements.

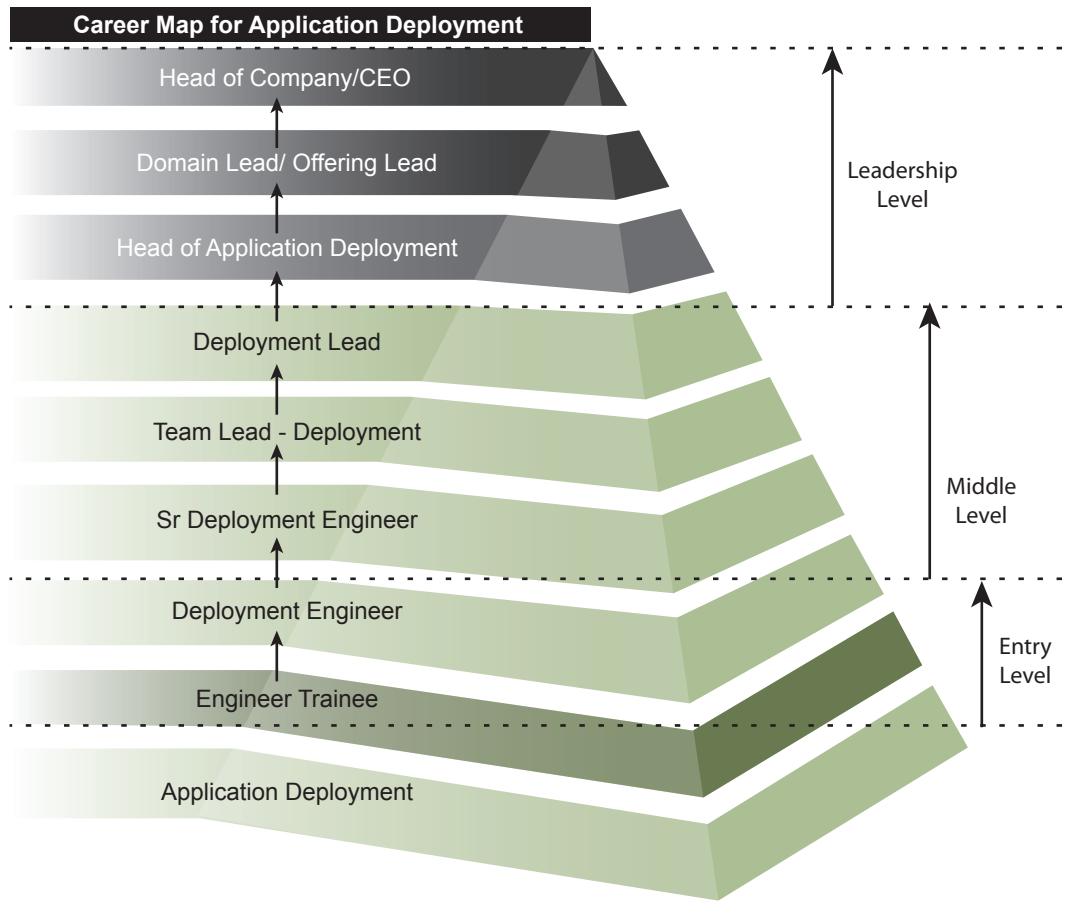


## Application Deployment - Occupational Map

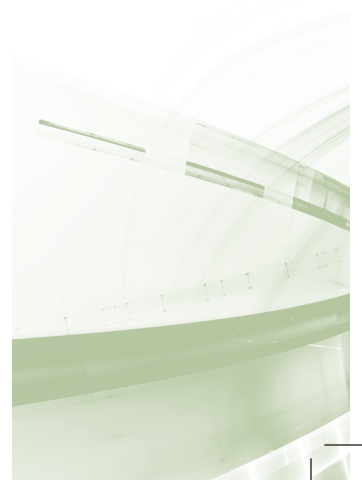


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# Application Deployment - Typical Career Paths



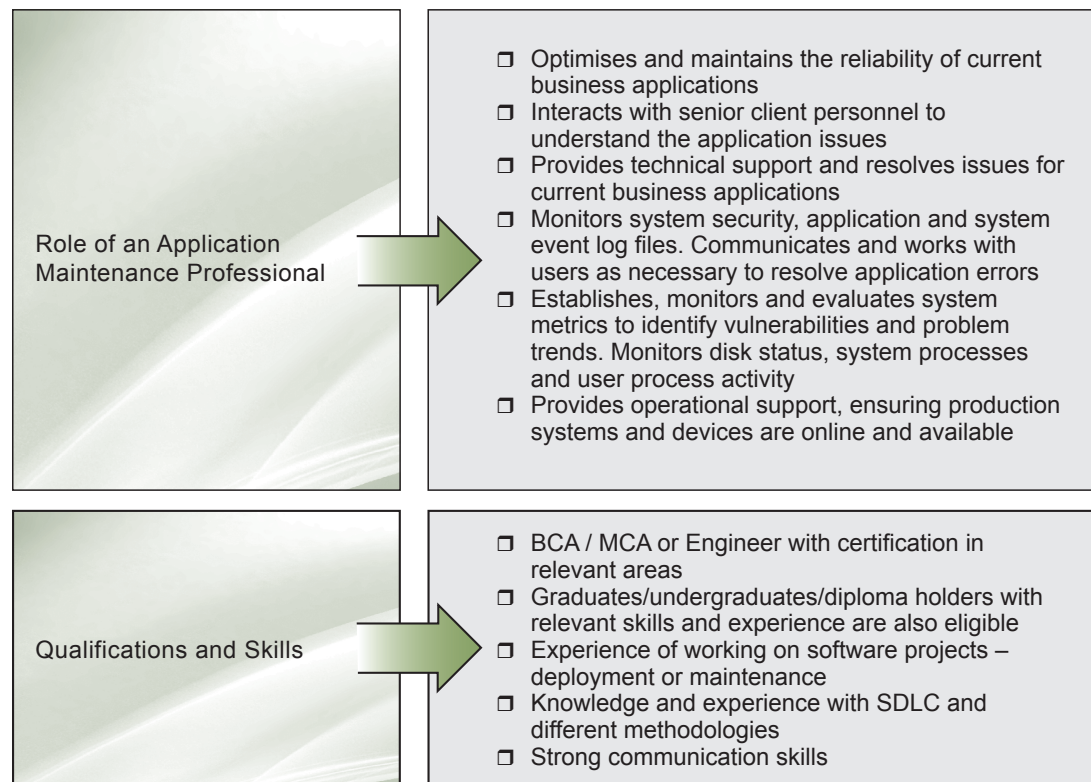
\*Note: Career growth across the Leadership Level is usually governed by cross-functional exposure to other occupations. While a possible movement has been indicated in the map, this is usually highly 'person specific and should not be generalised. The map does not depict any hierarchy.



## Application Maintenance

Application Maintenance covers a range of services that involve providing ongoing/ad-hoc support to software products or customised applications. These services are aimed towards the correction of faults/bugs or performance improvement. The primary responsibility of the Application Maintenance roles is to ensure the availability of an application or product for end-users.

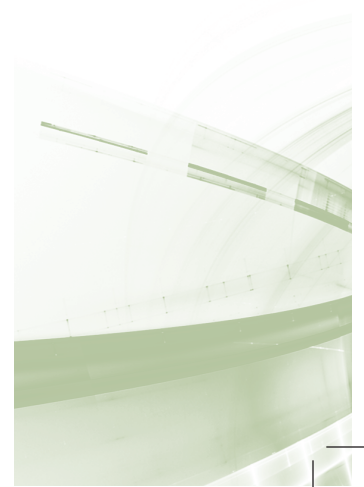
Application Maintenance professionals are all-rounder experts who understand the aspects of application development, maintenance, support and deployment



# Application Maintenance - Occupational Map

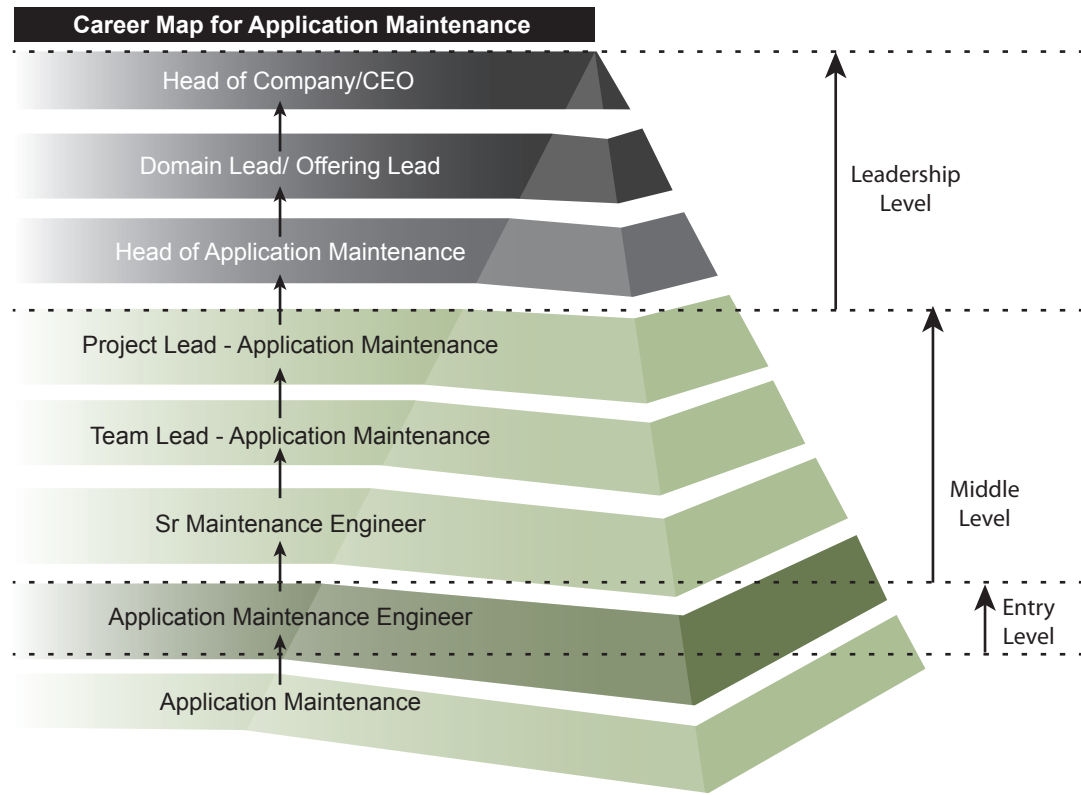
Occupation	Application Maintenance
Track	Application Maintenance
Leadership Level (>10 years)	Head of Company/CEO*
	Domain Lead/Offering Lead*
	Head of Application Maintenance
Middle Level (2-10 years)	Project Lead - Application Maintenance
	Team Lead - Application Maintenance
	Sr Maintenance Engineer
Entry Level (0-2 years)	Application Maintenance Engineer

\*Job roles such as 'Head of Company/CEO' and 'Domain Lead/Offering Lead' do not fall under this occupation, but can be a career progression for a person, provided he acquires business knowledge, skills and attributes required for that role through exposure to different occupations. The map does not depict any hierarchy.





## Application Maintenance - Typical Career Paths

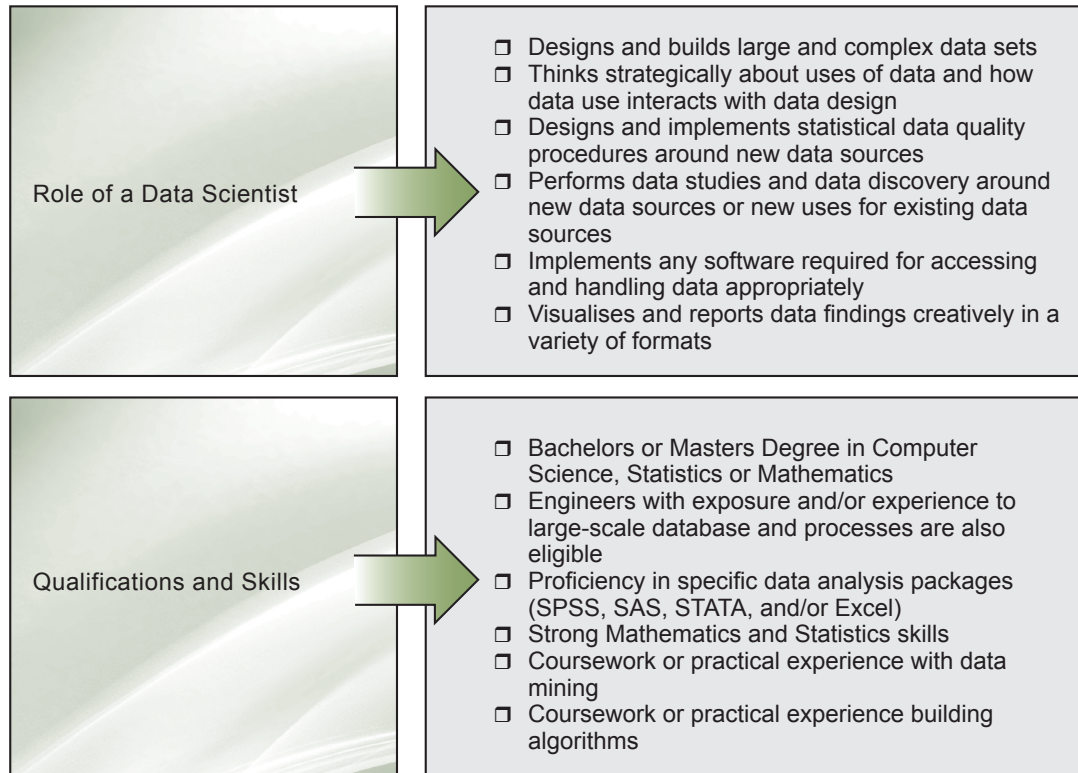


\*Note: Career growth across the Leadership Level is usually governed by cross-functional exposure to other occupations. While a possible movement has been indicated in the map, this is usually highly 'person specific' and should not be generalised. The map does not depict any hierarchy.

## Data Scientists

Data Scientists are responsible for designing and implementing processes and layouts for complex, large-scale data sets used for modelling, data mining and research purposes.

Data Scientists evaluate strategic uses of data and how data use interacts with data design. Responsibilities also include designing and implementing statistical data quality procedures around new data sources

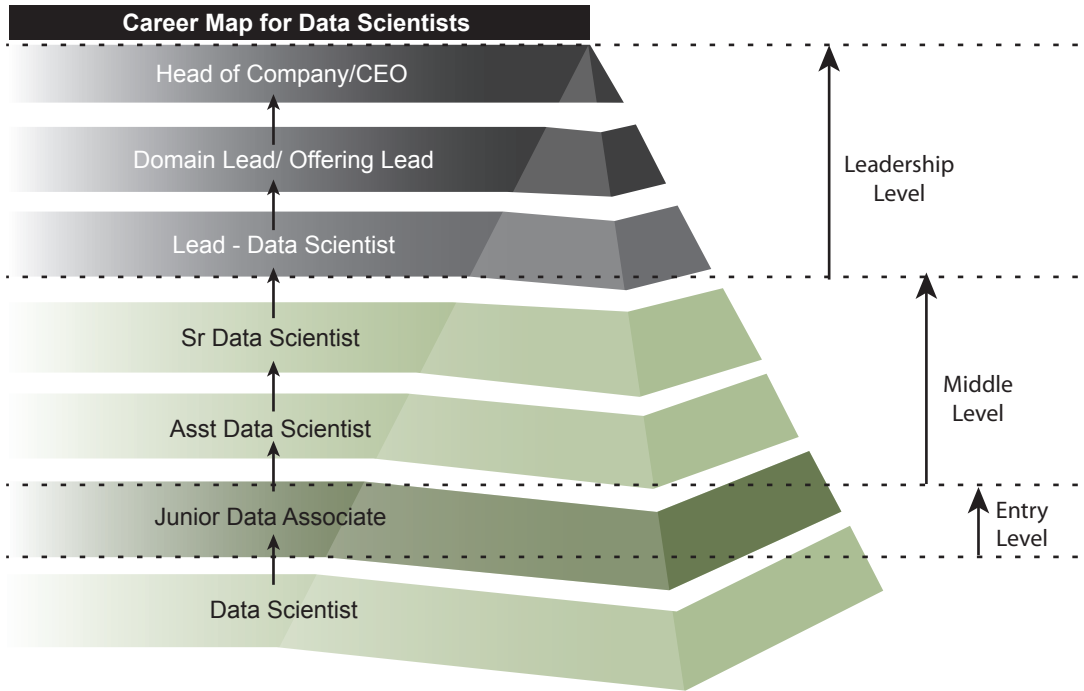


## Data Scientists - Occupational Map

Occupation	Data Scientists
Tracks	Data Scientist
Leadership Level (>10 years)	Head of Company/CEO*
	Domain Lead/Offering Lead*
	Lead - Data Scientist
Middle Level (2-10 years)	Sr Data Scientist
	Asst Data Scientist
Entry Level (0-2 years)	Junior Data Associate

\*Job roles such as 'Head of Company/CEO' and 'Domain Lead/Offering Lead' do not fall under this occupation, but can be a career progression for a person, provided he acquires business knowledge, skills and attributes required for that role through exposure to different occupations. The map does not depict any hierarchy.

# Data Scientists - Typical Career Paths



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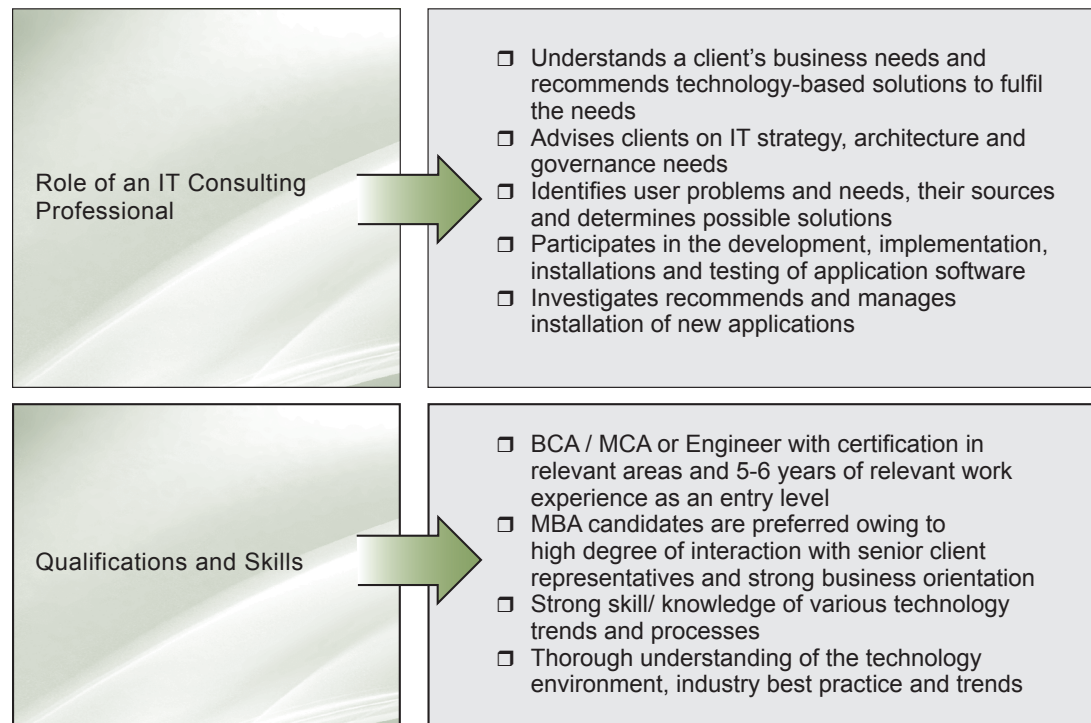
## IT Consulting

IT Consulting includes IS strategy, IT and network planning, architectural assessments, IS operational analysis, technical system and network designs, product-specific consulting, supplier assessment and maintenance planning

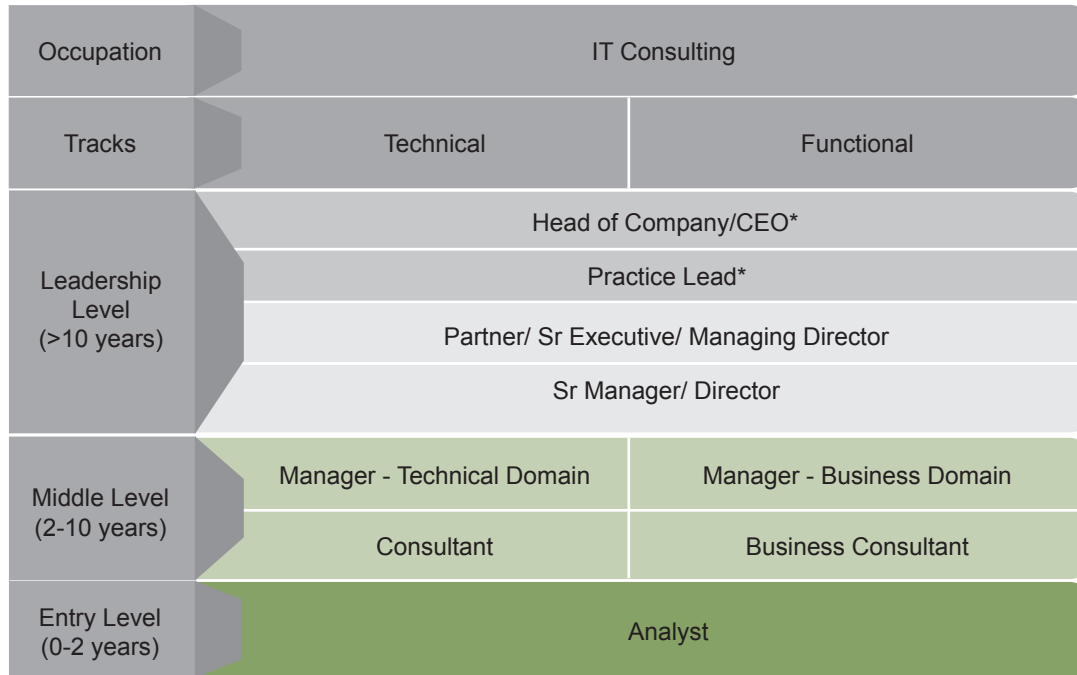
IT Consulting professionals identify and analyse user requirements and recommend appropriate applications or modifications for an organisation, which is typically the client. It is their responsibility to develop, install, maintain and modify system application programmes and business application programmes.

**Technology Consulting:** Technology Consulting roles provide technology solution to the clients based on functional/business requirements gathered by the Business Analysts. These include designing various solutions, such as ERP, Web and IT Strategy and so on, which are then delivered by Application Developers.

**Functional/Business Consulting:** Functional/Business Consulting involves understanding the clients' business requirements and translating them into technology requirements. These professionals work closely with the business teams and have a basic understanding of the tenets of technology consulting.



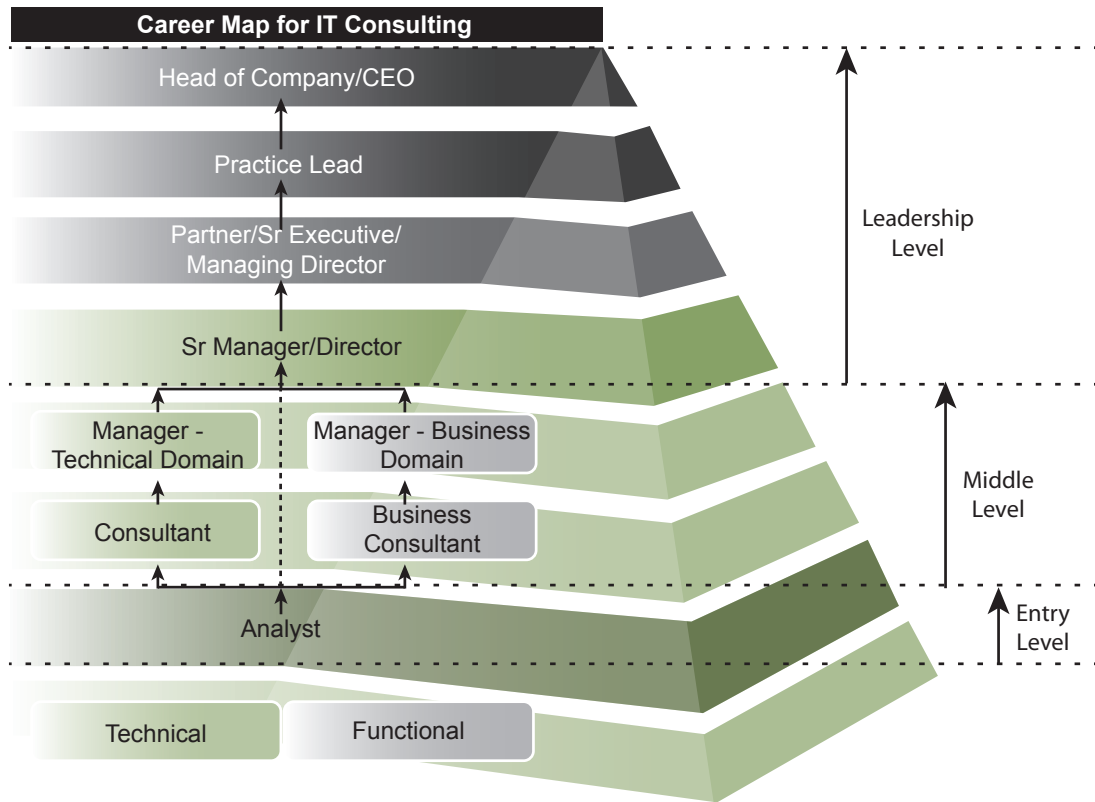
# IT Consulting - Occupational Map



\*Job roles such as 'Head of Company/CEO' and 'Domain Lead/Offering Lead' do not fall under this occupation, but can be a career progression for a person, provided he acquires business knowledge, skills and attributes required for that role through exposure to different occupations. The map does not depict any hierarchy.



## IT Consulting - Typical Career Paths



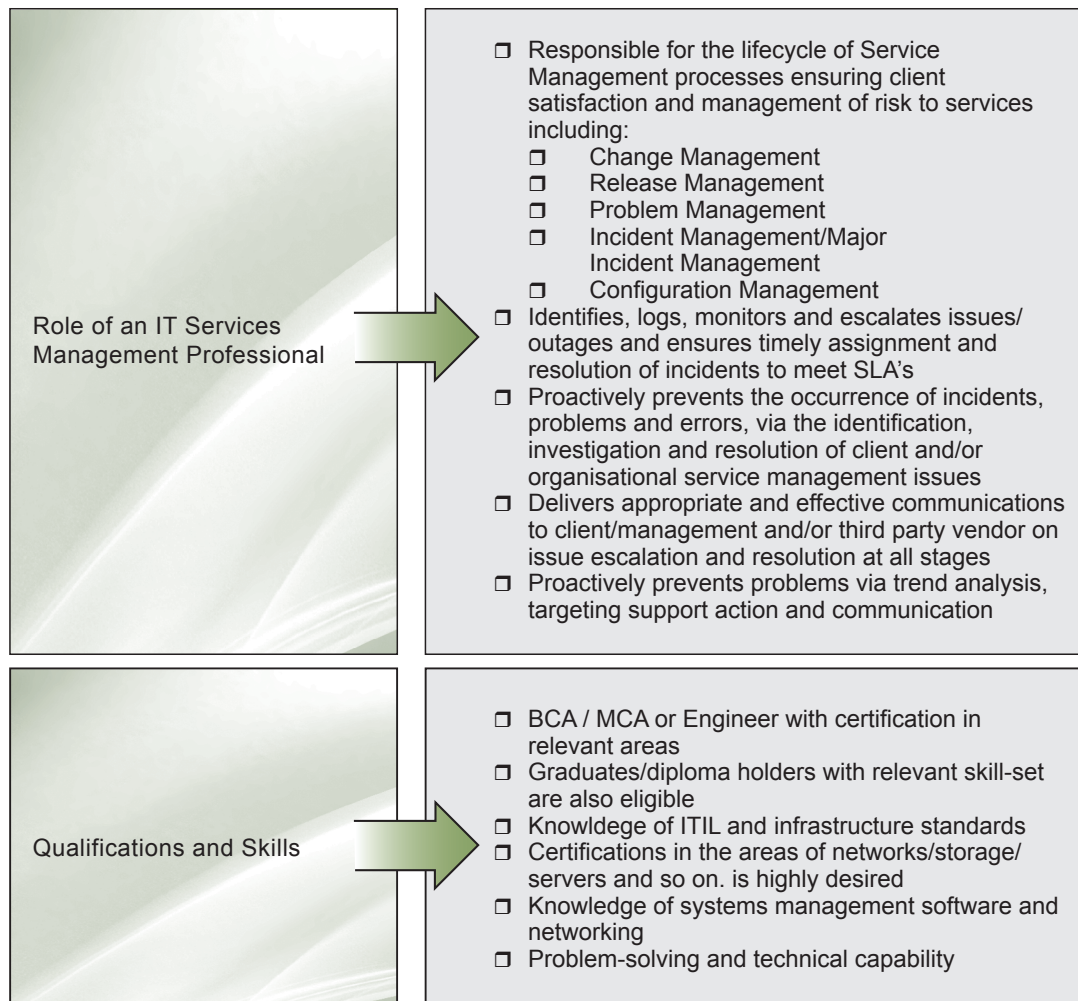
\*Note: Career growth across the Leadership Level is usually governed by cross-functional exposure to other occupations. While a possible movement has been indicated in the map, this is usually highly 'person specific' and should not be generalised. The map does not depict any hierarchy.



## IT Services Management

IT Services Management involves the delivery of ITIL service operations processes of Problem, Change, Configuration, Incident and Release Management. These roles provide cross-functional IT Services Management and work closely with multiple domains on the development, maintenance and reporting of service catalogues, processes/procedures and new technology/tools.

IT Services Management professionals require a proactive approach towards managing events such as an incident or a change and support a continuous improvement strategy in providing accurate recording of information and the related analysis of the events.

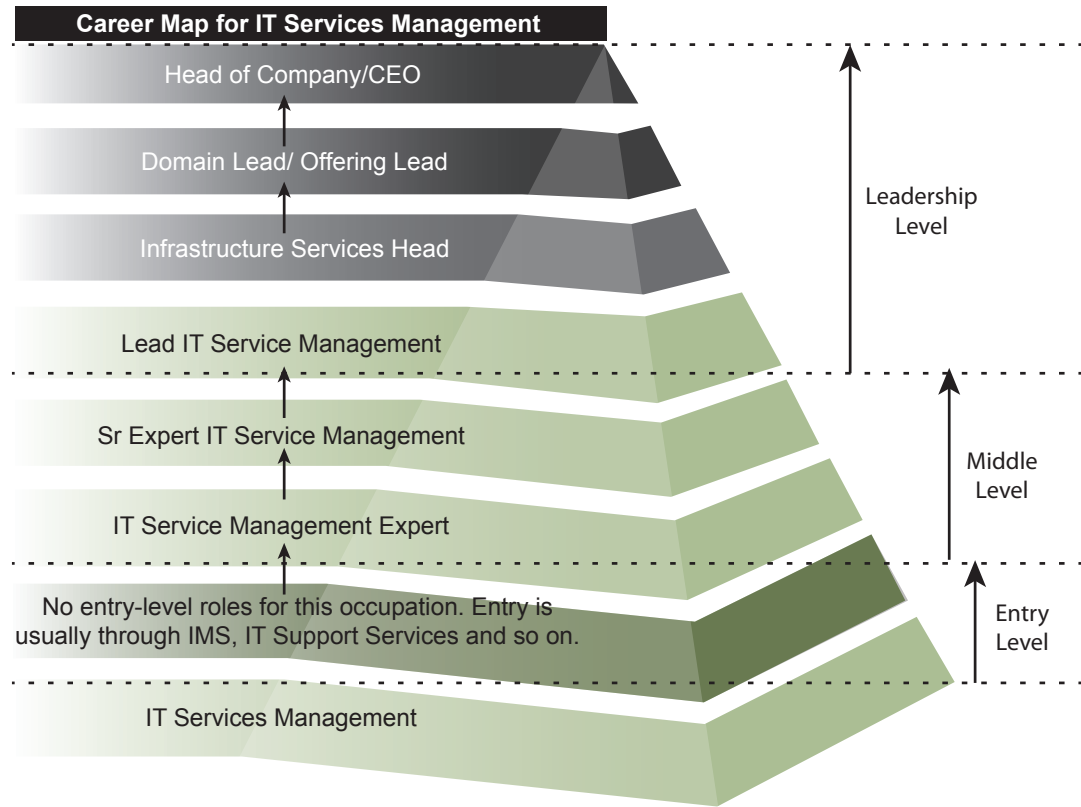


## IT Services Management- Occupational Map

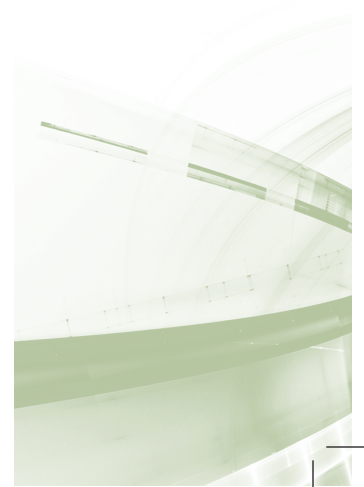
Occupation	IT Services Management
Tracks	IT Services Management
Leadership Level (>10 years)	Head of Company/CEO*
	Domain Lead/Offering Lead*
	Infrastructure Services Head
	Lead IT Service Management
Middle Level (2-10 years)	Sr Expert IT Service Management
	IT Service Management Expert
Entry Level (0-2 years)	No Entry-level roles for this occupation Entry is usually through IMS, IT Support Services and so on

\*Job roles such as 'Head of Company/CEO' and 'Domain Lead/Offering Lead' do not fall under this occupation, but can be a career progression for a person, provided he acquires business knowledge, skills and attributes required for that role through exposure to different occupations. The map does not depict any hierarchy.

# IT Services Management - Typical Career Paths



\*Note: Career growth across the Leadership Level is usually governed by cross functional exposure to other occupations. While a possible movement has been indicated in the map, this is usually highly 'person specific and should not be generalised. The map does not depict any hierarchy.



## IT Support Services/IT Help Desk

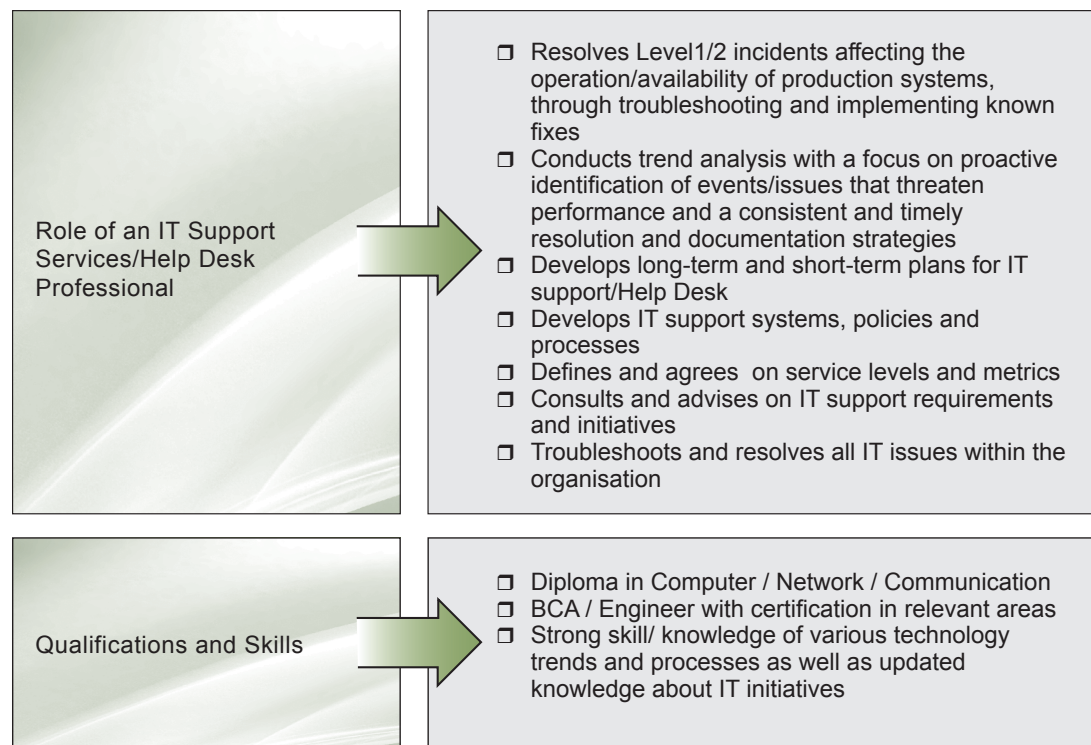
IT Support Services/Help Desk encompasses services that relate to monitoring, managing and enhancing performance of a client's IT infrastructure backbone.

These include level 1 Help Desk services offering simpler solutions to clients - internal or external to the organisation.

Primary purposes of an IT Support Services/service desk include the following.

- ❑ **Incident control:** Lifecycle management of all service requests
- ❑ **Communication:** Keeping a customer informed of progress and advising on workarounds

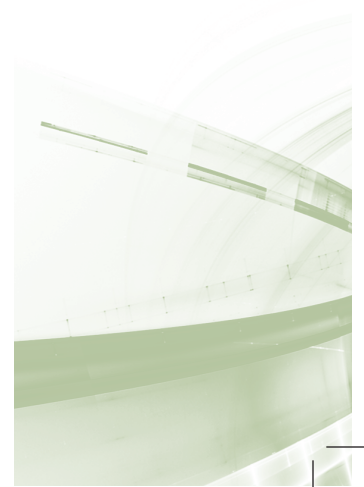
Key responsibilities of IT Support Services professionals are to manage, coordinate and resolve incidents as quickly as possible at primary support level.



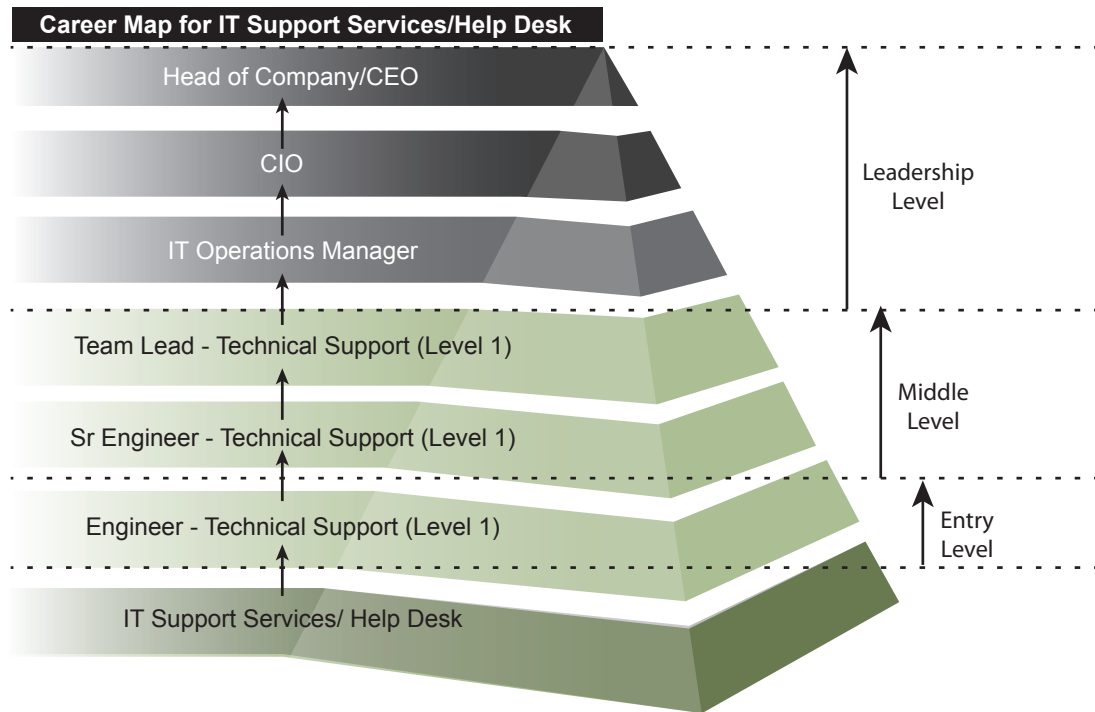
# IT Support Services/Help Desk - Occupational Map

Occupation	IT Support Services/Help Desk
Track	IT Support Services/Help Desk
Leadership Level (>10 years)	Head of Company/CEO*
	CIO*
	IT Operations Manager
Middle Level (2-10 years)	Team Lead - Technical Support (Level1)
	Sr Engineer - Technical Support (Level1)
Entry Level (0-2 years)	Engineer - Technical Support (Level1)

\*Job roles such as 'Head of Company/CEO' and 'Domain Lead/Offering Lead' do not fall under this occupation, but can be a career progression for a person, provided he acquires business knowledge, skills and attributes required for that role through exposure to different occupations. The map does not depict any hierarchy.



## IT Support Services/Help Desk - Typical Career Paths



\*Note: Career growth across the Leadership Level is usually governed by cross-functional exposure to other occupations. While a possible movement has been indicated in the map, this is usually highly 'person specific' and should not be generalised. The map does not depict any hierarchy.



## Infrastructure Management Services (IMS)

Infrastructure Management Services (IMS) includes designing and maintaining infrastructure required to support hardware and software for own/client organisation. This also includes both remote management and onsite management of application infrastructure like servers, storage, data and networks.

IMS professionals provide services that include technical assistance in the installation, configuration, administration, support and maintenance of systems, storage or back-up services of databases, traffic diversion, network support and maintenance and so on.

IMS covers two broad areas:

- ❑ **Infrastructure Operations/Maintenance** - Refers to maintenance roles that ensure 'business as usual' (BAU) state for all infrastructure devices - software and hardware. Infrastructure Operations is a highly critical stream as the downside of a system breakdown can be catastrophic for an organisation. Typical roles are Administrators/Team Leads.
- ❑ **Infrastructure Engineering/Transformation** - Refers to engineering roles responsible for installation/improvement/upgradation of Infrastructure devices for own/client's organisation. Typical roles are Engineers/Technology Leads.

While the responsibilities and the skill-sets may vary with the area of operation, both Infrastructure Operations and Infrastructure Engineering can be categorised into the following tracks.

### Storage Management

Storage management roles are responsible for managing storage equipment deployed in an organisation. This includes a range of activities from installation, records management, log keeping, evaluation, constant supervision and improvement of storage systems like EMC Symmetrix VMAX, Flash, cloud and so on.

### Network Management

Network Management roles are responsible for the deployment, configuration, maintenance and monitoring of active network equipment such as switches, routers, firewalls and so on. The scope also includes network design and security, particularly troubleshooting and/or debugging network-related problems. This is most relevant for offshore clients (RIM).

### Server Management

Server Management roles are responsible for maintaining client server applications and hardware deployed in an organisation. This includes the range of activities involved in installation, administration, maintenance and improvement of company and/or client/server like UNIX, Windows, Citrix and so on.

### Messaging and Collaboration

Messaging and Collaboration roles are responsible for maintaining messaging applications for end-user systems and servers in an organisation. This includes the range of activities from cryptic messages to instant messaging (IM), server messages and so on within the same/across multiple organisations.

### Security Management

Security Management roles are responsible for maintaining security of application and network equipment within an organisation. This includes the range of activities from devising security policy, managing firewalls, granting access rights and ensuring end-to-end security of all IT equipment and applications for the organisation/client.

### End-user Devices Management

End-user Devices Management roles are responsible maintaining end-user devices like desktops/laptops/mobile devices within an organisation. This includes the range of activities from providing first-level troubleshooting, maintaining software and hardware upgrades, MS Office applications and the necessary security and safety features necessary as per the security policy



### Services/Facility Management

Services/facility management roles are responsible for maintaining facilities and services that support the infrastructure services for an organisation. This includes the range of activities from ensuring continuous power to servers, storage and other infrastructure-related IT equipment to maintaining the physical space for storage of this critical equipment.

### Infrastructure Applications Management

Infrastructure Application Management roles are responsible for the administration, support, maintenance, lifecycle planning and optimisation of infrastructure applications including: mobile device management, unified communications and IT management software. This includes undertaking necessary activities to resolve hardware and software with respect to infrastructure applications in a timely and accurate fashion.

### Infrastructure Tools Management

Infrastructure Tools Management roles are a specialised set of roles responsible for the management of infrastructure tools in an organisation. The main objectives of the roles are to increase operational efficiency, reduce cost and support fluctuations in service levels to ensure service delivery for all IT applications supported by infrastructure. These tools plug into the operating system, hardware controllers and critical applications to ensure effective and efficient IT operations.

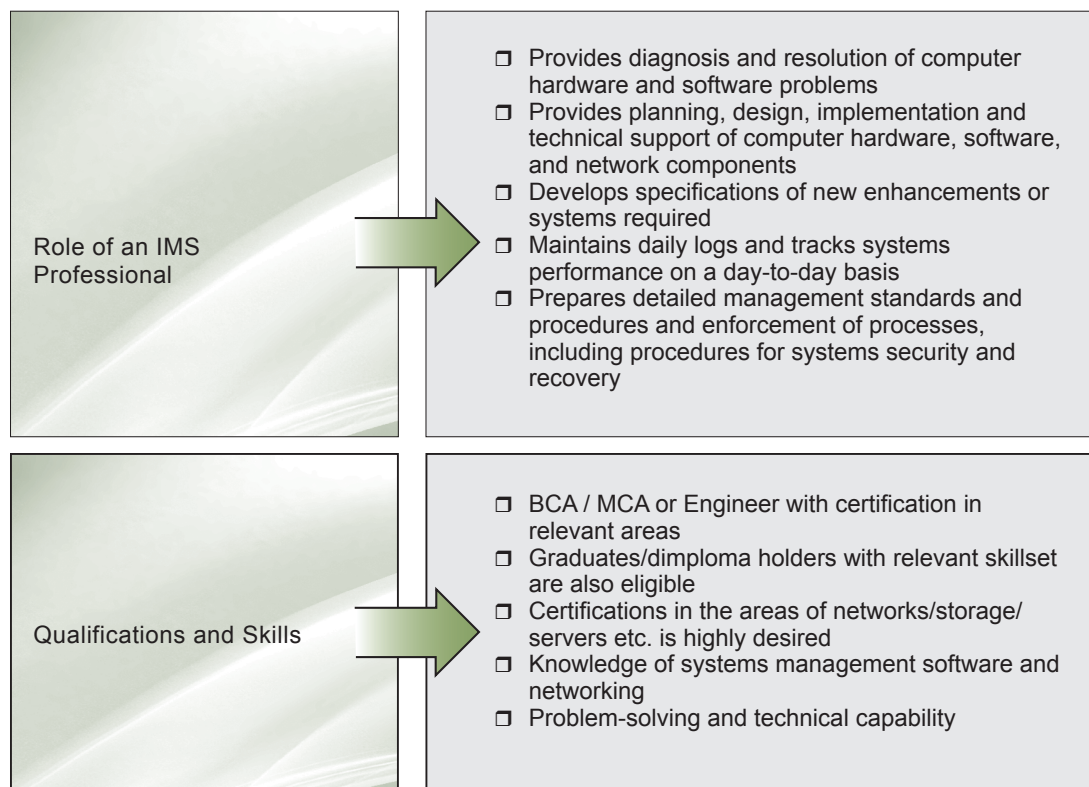
### Database Management

Database Management roles are responsible for the installation, testing, configuration and maintenance of database systems. The scope extends to monitoring, optimising, analysing systems performance and set user privileges within the database environment. In most cases, this group of job roles also includes database design.

### Field Support

Field support includes the installation and support of hardware devices for own/client's organisations. The service is focused essentially on the device and its components and in a minor way, on software that is running on the device.

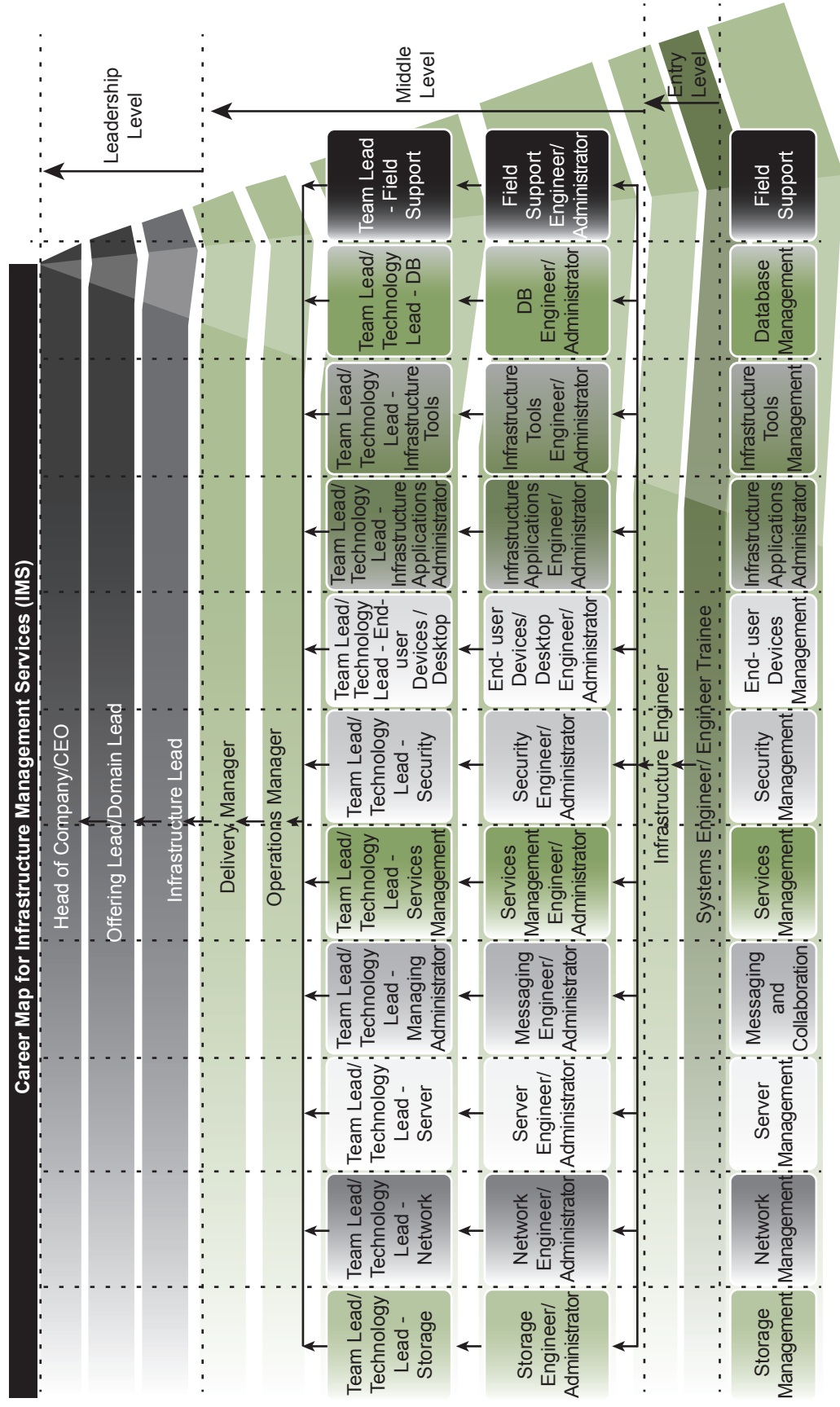
Field support activities include hardware staging and configuration, testing and debugging, site preparation and physical installation of the device.



# Infrastructure Management Services (IMS) - Occupational Map

Occupation	Infrastructure Management Services (IMS)										
Track	Storage Management	Network Management	Server Management	Messaging and Collaboration	Services Management	Security Management	End-user Devices Management	Infrastructure Applications Management	Infrastructure Tools Management	Database Management	Field Support
Leadership Level (>10 years)	Head of Company/CEO*										
	Domain Lead/Offering Lead										
	Infrastructure Lead										
Middle Level (2-10 years)	Delivery Manager										
	Operations Manager										
	Team Lead/Technology Lead-Storage	Team Lead/Technology Lead-Network	Team Lead/Technology Lead-Server	Team Lead/Technology Lead-Messaging Administrator	Team Lead/Technology Lead-Services Management	Team Lead/Technology Lead-Security	Team Lead/Technology Lead-End-user Devices/Desktop	Team Lead/Technology Lead-Infrastructure Applications Administrator	Team Lead/Technology Lead-Infrastructure Tools	Team Lead/Technology Lead-DB	Team Lead-Field Support
	Storage Engineer/Administrator	Network Engineer/Administrator	Server Engineer/Administrator	Messaging Engineer/Administrator	Services Management Engineer/Administrator	Security Engineer/Administrator	End-user Devices/Desktop Engineer/Administrator	Infrastructure Applications Engineer/Administrator	Infrastructure Tools Engineer/Administrator	DB Engineer/Administrator	Field Support Engineer/Administrator
	Infrastructure Engineer										
	Systems Trainee/Engineer Trainee										
	Entry Level (0-2 years)										

# Infrastructure Management Services (IMS) - Typical Career Paths



\*Note: Career growth across the Leadership Level is usually governed by cross-functional exposure to other occupations. While a possible movement has been indicated in the map, this is usually highly 'person specific' and should not be generalised. The map does not depict any hierarchy.

## Information Security

Information Security includes the activities relating to protecting information and information systems from unauthorised access, use, disclosure, disruption, modification, perusal, inspection, recording, or destruction. The core function of this occupation is to ensure the confidentiality, integrity and availability of data to the 'right' users within/outside of the organisation.

### Application Security

Application Security roles are responsible for ensuring stable and secure functioning of the applications.

Application Security professionals perform the following functions in an organisation:

- Knowing threats
- Securing the network, host and application
- Incorporating security into the software development process

### Risk, Audit and Compliance

Risk Management roles are responsible for assessing, measuring, and managing the security risks to information security of an organisation. These conduct assessments for security threats and vulnerabilities, determine deviations from acceptable pre-defined configurations, enterprise or local policy, assess the level of risk and develop and/or recommend appropriate mitigation countermeasures in operational and non-operational situations.

Key responsibilities also include measuring the maturity of an organisation to ensure that proper security controls are incorporated when developing and running Information-security systems. These also perform scheduled/un-scheduled audits on the organisation's security systems and processes and ensure compliance.

### Security Testing

Security Testing involves devising testing standards and cases of confidentiality, integrity, authentication, availability, authorisation and non-repudiation of information. Security Testing professionals perform scheduled and ad-hoc tests to assess vulnerability and/or safety of an organisation's information systems

### Incident Management

Incident Management roles work towards restoring normal service operations in an organisation to minimise the adverse effect on business operations, thus ensuring that the best possible level of service quality and availability is maintained.

Incident Management professionals 'manage and protect computer assets, networks and information systems to answer the key question what to do, when things go wrong.'

### Business Continuity Management/Disaster Recovery (BCP/DR)

BCP/DR roles are responsible for improving system availability and integration of IT operational risk management strategies for an organisation. These roles provide organisational capability to build resilience in business processes and IT infrastructure. BCP/DR professionals perform the following functions in an organisation (own/client organisation):

- Development, implementation, testing and maintenance of the business continuity management plan.
- Recommendation and proof of concept for recovery options.
- Assessments and audits for BCP/DR.

### Network Security

Network Security roles are responsible for defining and implementing overall network security that includes baseline configuration, change control, security standards and process implementation.

### Privacy

Privacy roles are responsible for defining and managing data/information/IP policies for an organisation. These roles require knowledge of information security norms and data privacy norms and regulations.

Privacy professionals help define and implement privacy standards and build privacy awareness to protect an organisation's information assets

### IT Forensics

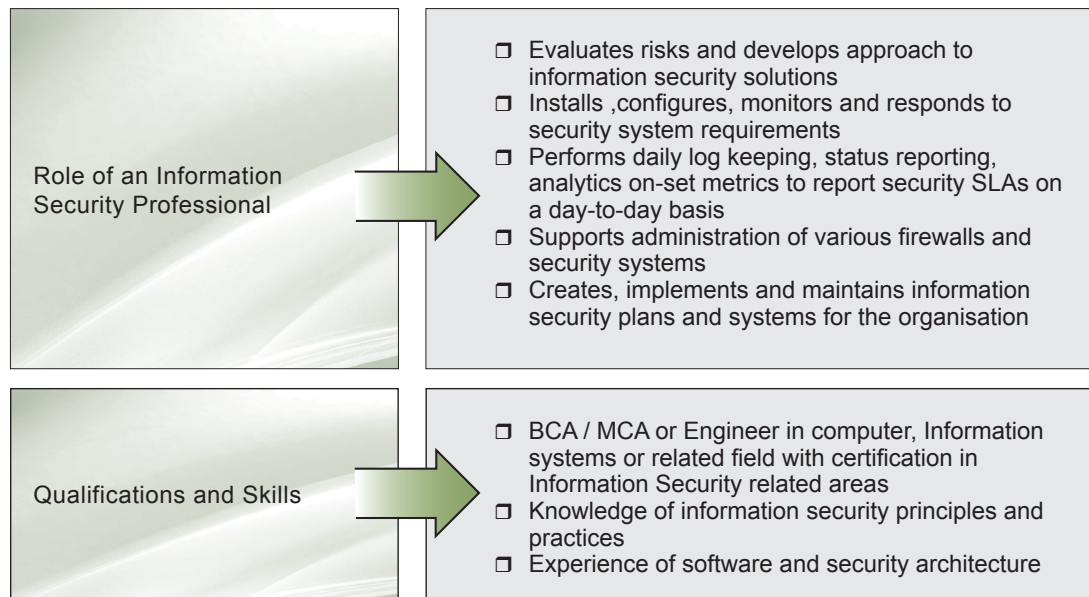
IT Forensics roles collect, process, preserve, analyse and present computer-related evidence in support of network vulnerability mitigation, and/or criminal, fraud, counterintelligence or law enforcement investigations.

### Note on Information Security occupation

Information Security related job roles may be performed in any of the following set-ups:

- Consulting
- Managed services
- Internal function within the organisation

In each of these set-ups, the essential functions and the highlighted tracks remain the same, however, the delivery style and hence skills vary slightly depending upon the set-up.



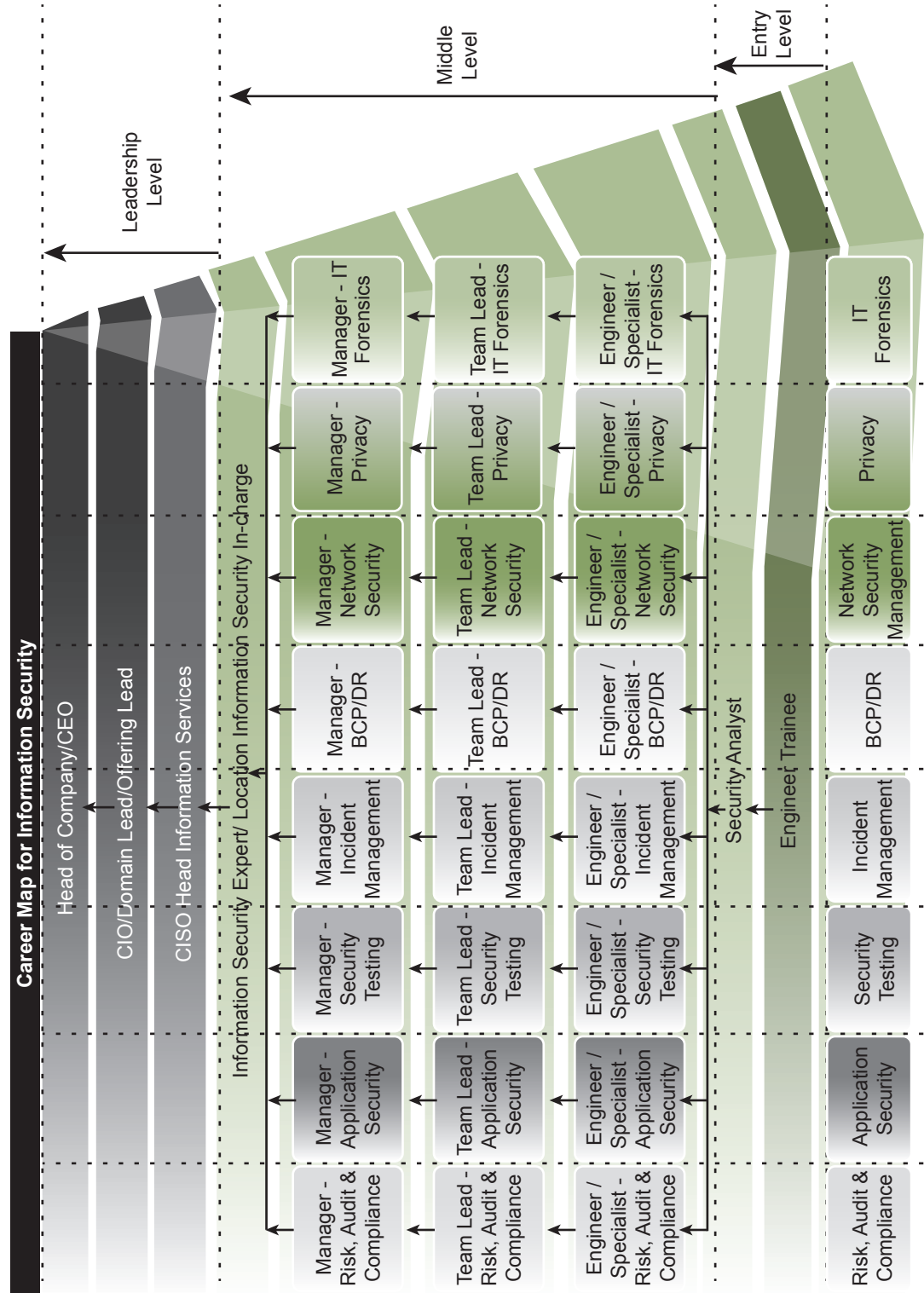


# Information Security - Occupational Map

Occupation	Information Security							
Track	Risk, Audit and Compliance	Application Security	Security Testing	Incident Management	BCP/DR	Network Security Management	Privacy	IT Forensics
Leadership Level (>10 years)	Head of Company/CEO*							
	CIO/Domain Lead/Offering Lead*							
	CISO/Head Information Services							
Middle Level (2-10 years)	Information Security Expert/ Location Information Security In-charge							
	Manager - Risk, Audit and Compliance	Manager - Application Security	Manager - Security Testing	Manager - Incident Management	Manager - BCP/DR	Manager - Network Security	Manager - Privacy	Manager - IT Forensics
	Team Lead - Risk, Audit and Compliance	Team Lead - Application Security	Team Lead - Security Testing	Team Lead - Incident Management	Team Lead - BCP/DR	Team Lead - Network Security	Team Lead - Privacy	Team Lead - IT Forensics
	Engineer /Specialist - Risk, Audit and Compliance	Engineer /Specialist - Application Security	Engineer /Specialist - Security Testing	Engineer /Specialist - Incident Management	Engineer /Specialist - BCP/DR	Engineer /Specialist - Network Security	Engineer /Specialist - Privacy	Engineer /Specialist - IT Forensics
Entry Level (0-2 years)	Security Analyst							
	Engineer Trainee							

\*Job roles such as 'Head of Company/CEO' and 'Domain Lead/Offering Lead' do not fall under this occupation, but can be a career progression for a person, provided he acquires business knowledge, skills and attributes required for that role through exposure to different occupations. The map does not depict any hierarchy.

# Information Security - Typical Career Paths



\*Note: Career growth across the Leadership Level is usually governed by cross-functional exposure to other occupations. While a possible movement has been indicated in the map, this is usually highly 'person specific' and should not be generalised. The map does not depict any hierarchy.



## Project/Program Management

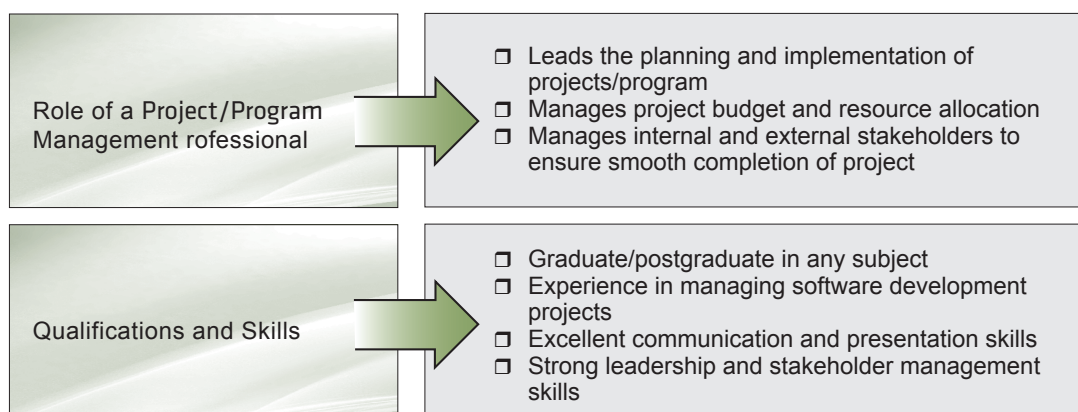
Project/Program Management includes the set of activities to plan, implement, monitor and control projects. It includes managing project financials, overseeing delivery, reporting and stakeholder management.

Project/Program Management will have subtle differences depending upon the scope of the project. The variances will vary depending on whether the project is:

- A pure play application development project;
- An infrastructure/architecture project;
- An IT consulting project; or an integrated project that includes some or all of the above

Professionals usually enter in the Project/Program Management occupation after developing key expertise in a delivery focused occupations like Application Development, Testing, Application Deployment, or Outsourcing.

Project/Program Management professionals can also grow from other key occupations like Infrastructure Management Services (IMS) and Information Security.

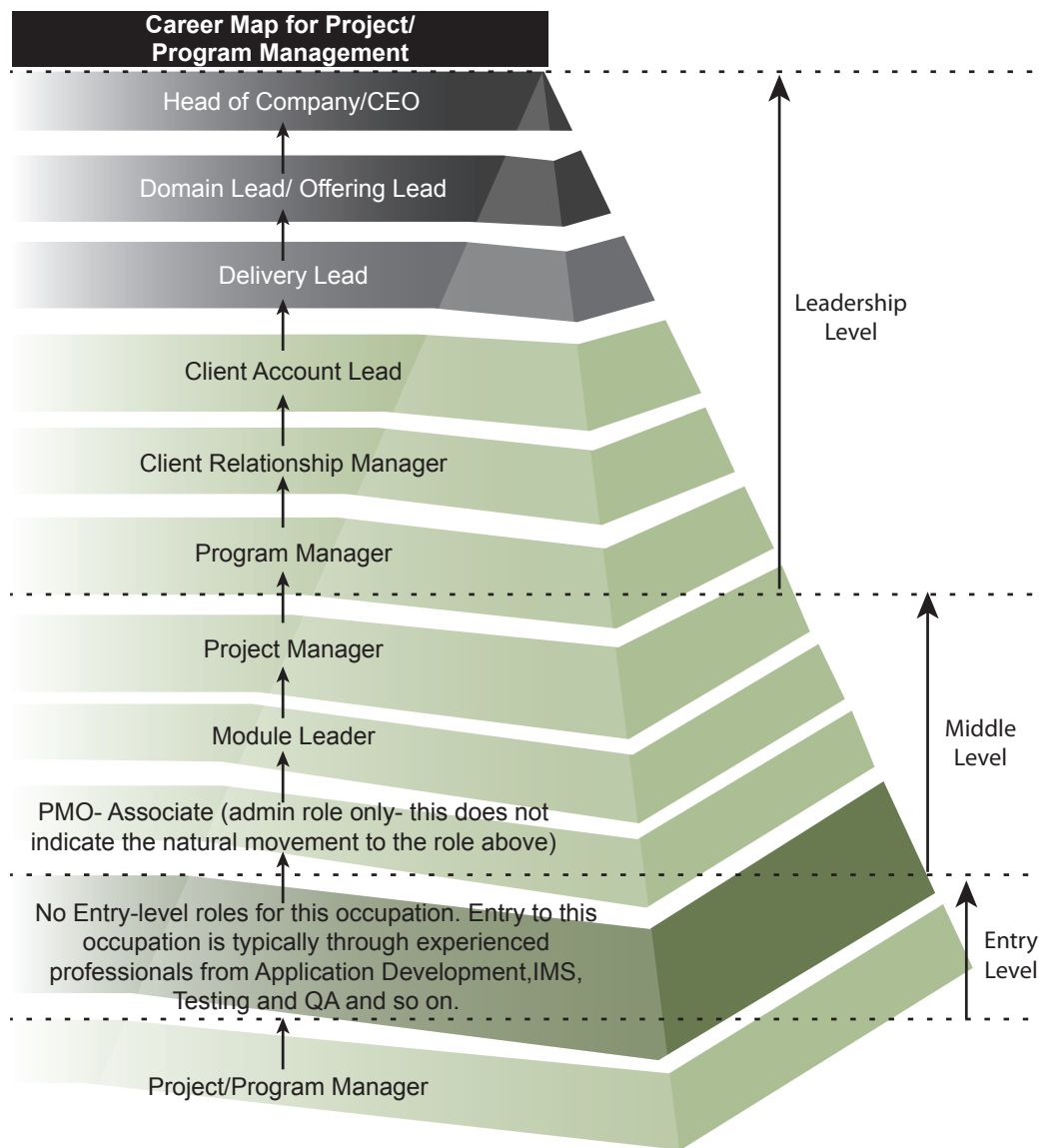


## Project/Program Management - Occupational Map

Occupation	Project/ Program Management
Track	Project/ Program Management
Leadership Level (>10 years)	Head of Company/CEO*
	Domain Lead/Offering Lead*
	Delivery Lead
	Client Account Lead
	Client Relationship Manager
	Program Manager
Middle Level (2-10 years)	Project Manager
	Module Leader
	PMO Associate (Admin role only - this does not indicate a natural movement to the role above)
Entry Level (0-2 years)	No Entry-level roles for this occupation. Entry to this occupation is typically through experienced professionals from Application Development, IMS, Testing and QA and so on.

\*Job roles such as 'Head of Company/CEO' and 'Domain Lead/Offering Lead' do not fall under this occupation, but can be a career progression for a person, provided he acquires business knowledge, skills and attributes required for that role through exposure to different occupations. The map does not depict any hierarchy.

# Project/Program Management - Typical Career Paths



\*Note: Career growth across the Leadership Level is usually governed by cross-functional exposure to other occupations. While a possible movement has been indicated in the map, this is usually highly 'person specific and should not be generalised. The map does not depict any hierarchy.



## Sales and Pre-sales

Sales and Pre-sales generate and develop business for the organisation. This involves developing business relationships, marketing, managing brand and driving sales for the organisation.

These professionals develop a go-to market strategy with entity Leadership and OU/industry leads for assigned territories and the strategic accounts within it. This could include build-outs for inside sales, field marketing and alliance activities.

### Relationship Management/Alliance Management

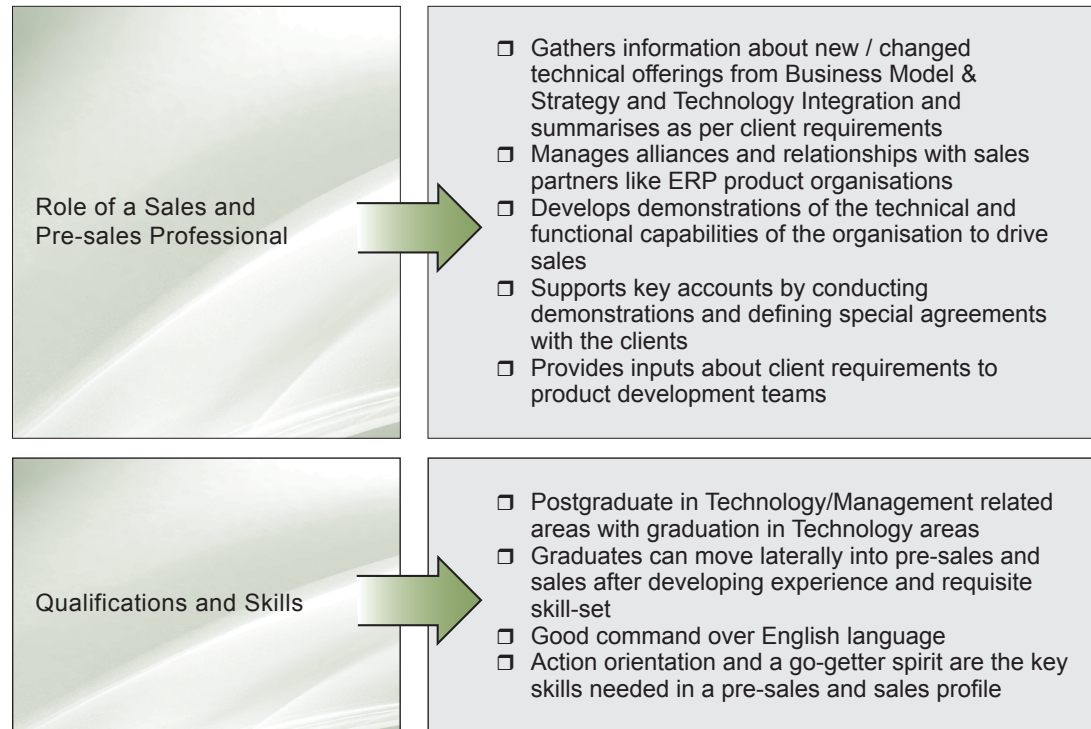
Relationship management involves developing and maintaining relationships with key clients to ensure development and implementation of plans, resources and processes to ensure the effective delivery of services. Relationship Management extends across entire Pre-sales including working closely with Solution Architecting teams to ensure completion of bids and proposals.

Relationship Management also covers change management, contract management and customer loyalty in a pursuit to maximise business opportunities. The Alliance Management part covers managing these relationships with key alliance partners like ERP vendors and product organisations to co-develop sales relationships.

### Business Development

Business Development involves a closer association with driving sales numbers for an organisation. Professionals in this area are accountable to drive sales within a territory/region/state or country/global regions.

Specifically in IT Services, senior roles are given responsibilities to lead sales efforts in global zones like APAC, Euro-zone, Africa, and the Americas.

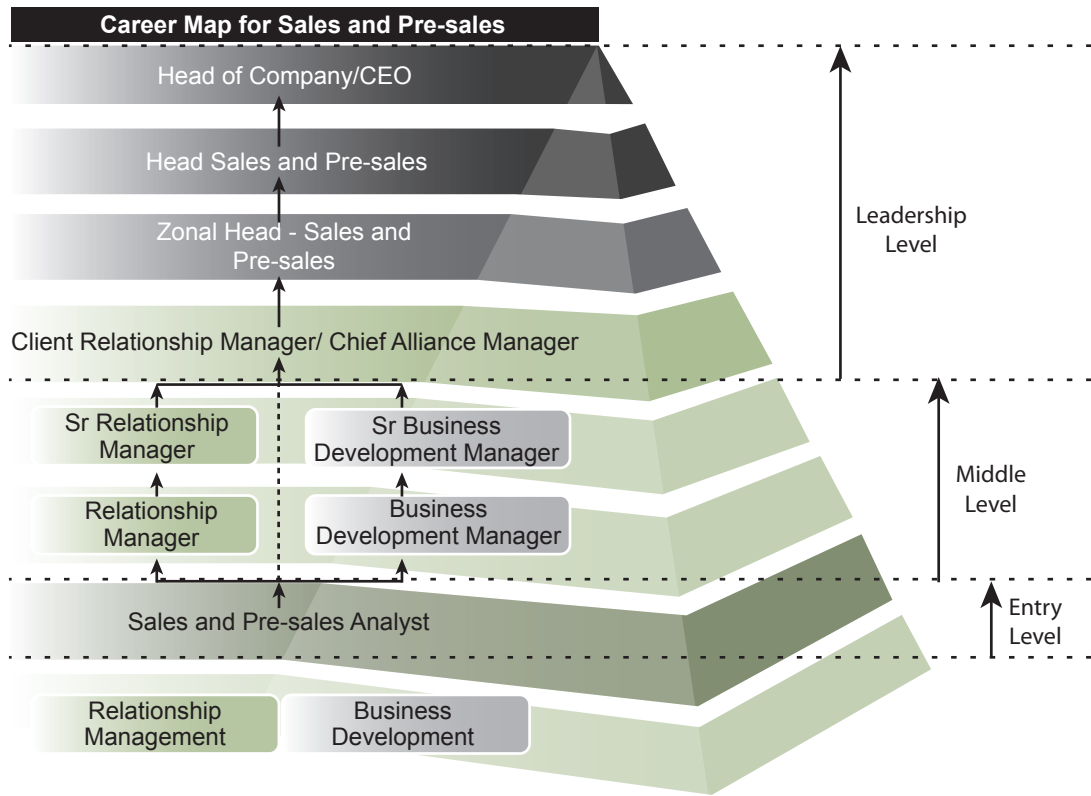


## Sales and Pre-sales - Occupational Map

Occupation	Sales and Pre-sales	
Track	Relationship Management	Business Development
Leadership Level (>10 years)	Head of the Company/CEO*	
	Head - Sales and Pre-sales	
	Zonal Head - Sales and Pre-sales	
	Client Relationship Manager/ Chief Alliance Manager	
Middle Level (2-10 years)	Sr Relationship Manager	Sr Business Development Manager
	Relationship Manager	Business Development Manager
Entry Level (0-2 years)	Sales and Pre-sales Analyst	

\*Job roles such as 'Head of Company/CEO' and 'Domain Lead/Offering Lead' do not fall under this occupation, but can be a career progression for a person, provided he acquires business knowledge, skills and attributes required for that role through exposure to different occupations. The map does not depict any hierarchy.

## Sales and Pre-sales – Typical Career Paths



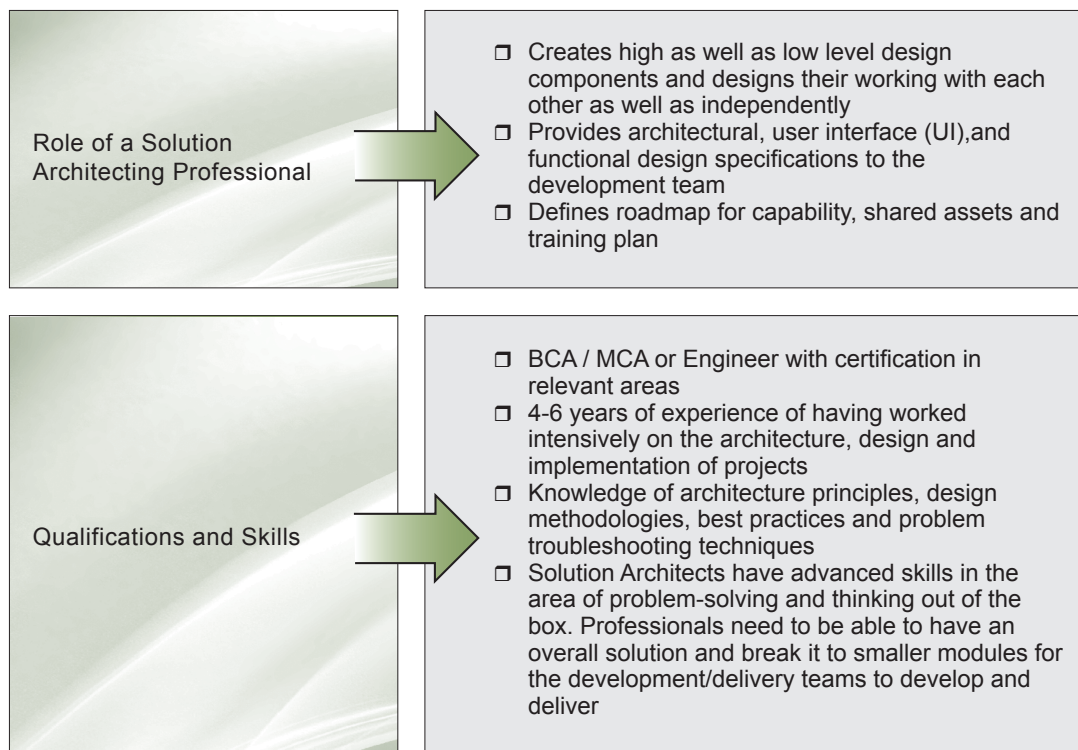
\*Note: Career growth across the Leadership Level is usually governed by cross-functional exposure to other occupations. While a possible movement has been indicated in the map, this is usually highly 'person specific' and should not be generalised. The map does not depict any hierarchy.

## Solution Architecting

Solution Architecting involves defining and detailing the technology solutions for a business/technology problem. Solution Architects work closely with Sales/Pre-sales and delivery teams to develop the solution.

A Solution Architect is expected to provide expertise in technology, methodology, business, application and product in terms of technical and solution architecture.

These roles generally require more experience and a strong technology background.



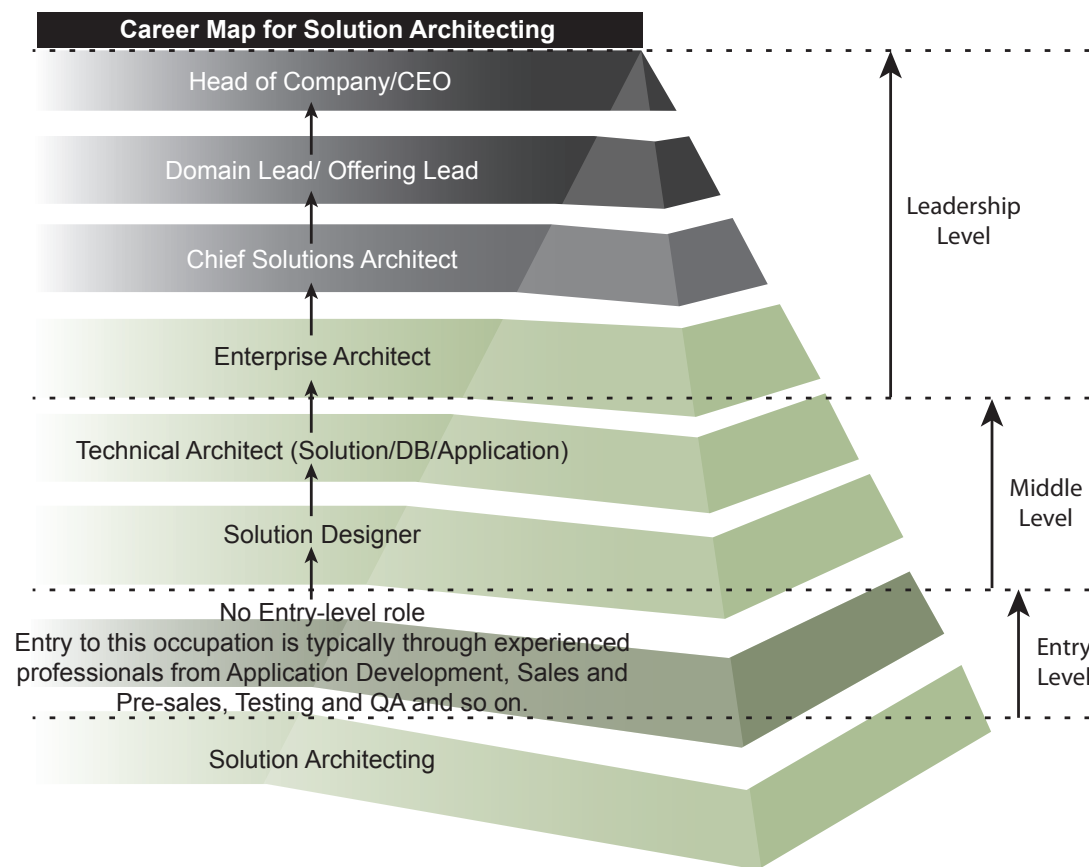


## Solution Architecting - Occupational Map

Occupation	Solution Architecting
Track	Solution Architecting
Leadership Level (>10 years)	Head of Company/CEO*
	Domain Lead/Offering Lead*
	Chief Solutions Architect
	Enterprise Architect
Middle Level (2-10 years)	Technical Architect (Solution/DB/Application)
	Solution Designer
Entry Level (0-2 years)	No Entry-level role Entry to this occupation is typically through experienced professionals from Application Development, Sales and Pre-sales, Testing and QA and so on.

\*Job roles such as 'Head of Company/CEO' and 'Domain Lead/Offering Lead' do not fall under this occupation, but can be a career progression for a person, provided he acquires business knowledge, skills and attributes required for that role through exposure to different occupations. The map does not depict any hierarchy.

# Solution Architecting – Typical Career Paths



\*Note: Career growth across the Leadership Level is usually governed by cross-functional exposure to other occupations. While a possible movement has been indicated in the map, this is usually highly 'person specific and should not be generalised. The map does not depict any hierarchy.

OCCUPATIONS AND ROLES IN THE ITS SUB-SECTOR

Occupational Analysis of the IT-BPM Industry: ITS Sub-sector



## Testing and QA

Testing and QA includes conducting scheduled and unscheduled tests in the areas of integration, performance, application and so on. Testing and QA professionals act as the final check between the solution developed by the Application Developers and go-live.

Depending upon the structure of the organisation, QA professionals may be responsible only for laying out quality assurance processes and programmes like TQM, ISO and so on. QA teams conduct periodic audits and drive compliance to the defined quality norms and processes.

### Manual Testing

Manual Testing roles are responsible for running planned/ad-hoc tests on the developed application and reporting results and variances. Manual Testing usually involves executing test scenarios manually without the use of automated software and analyse the test results. These roles may not require understanding of the code/language but only an understanding of the test plan, common bugs and the 'success' and 'failure' scenarios for the application.

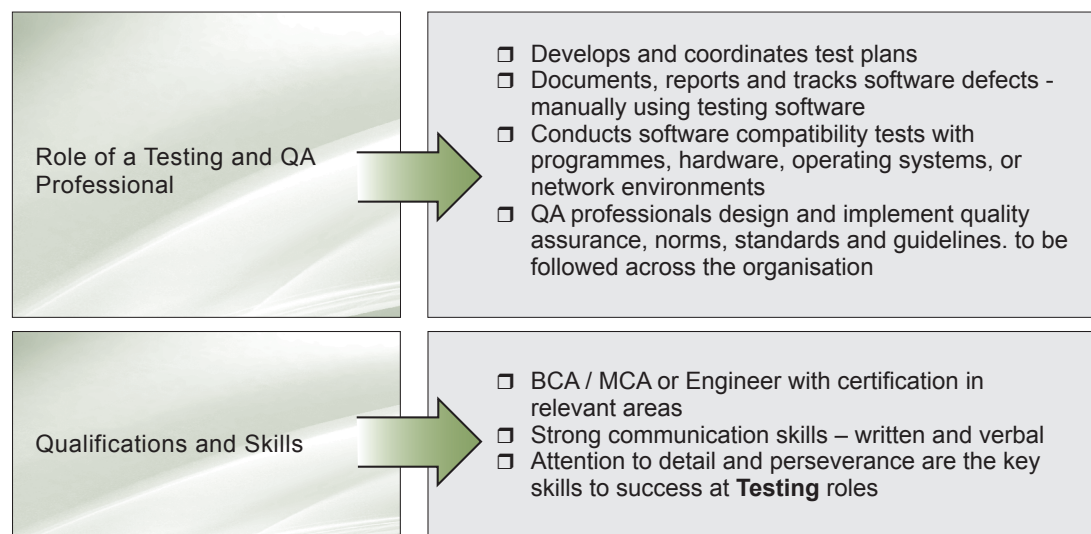
### Automated Testing

Automated Testing roles are responsible for creating and running test scripts for the developed application. Automated Testing is undertaken over testing software like Microsoft Visual Studio, Time Partition Testing (TPT) and HP QuickTest Professional (QTP) to execute test scenarios by controlling the environment variables as desired.

These roles require extensive knowledge of coding/programming language as automated testing often requires the testers to undertake first hand debugging for minor bugs/defects.

### Quality Assurance

Quality Assurance roles are responsible for setting quality standards for products, systems and processes within the organisation. These roles implement quality norms that are based on industry accepted standards, such as Total Quality Management (TQM) and International Standards Organization (ISO) and conduct audits and compliance-related activities. Depending upon the organisation they may be responsible for conducting a final quality check on every application that is delivered to the client.

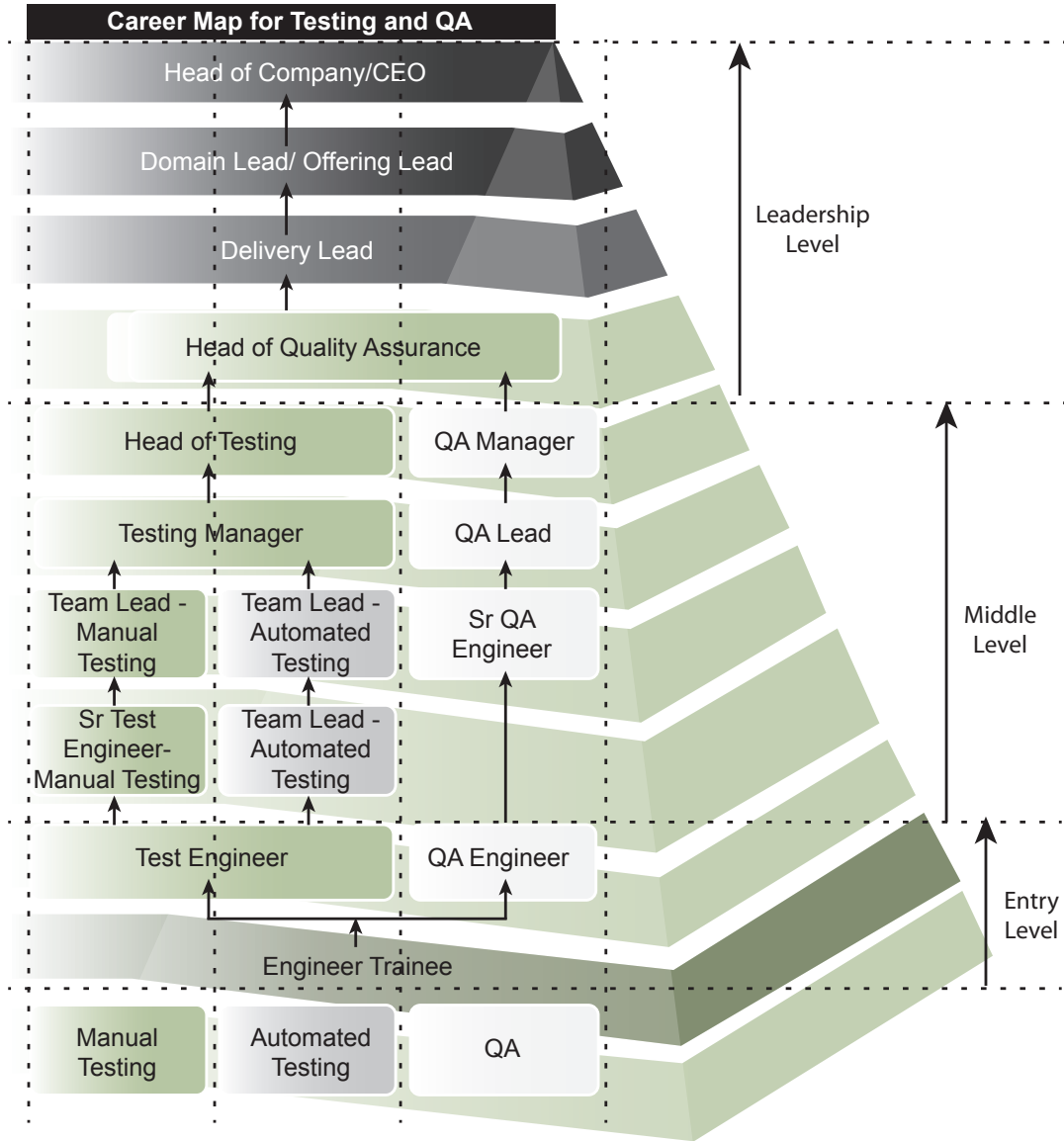


## Testing and QA - Occupational Map

Occupation	Testing and QA		
Track	Manual Testing	Automated Testing	QA
Leadership Level (>10 years)	Head of Company/ CEO*		
	Domain Lead/Offering Lead*		
	Delivery Lead		
	Head of Quality Assurance		
Middle Level (2-10 years)	Head of Testing		QA Manager
	Testing Manager		QA Lead
	Team Lead- Manual Testing	Team Lead - Automated Testing	Sr QA Engineer
	Sr Test Engineer- Manual Testing	Sr Test Engineer- Automated Testing	
Entry Level (0-2 years)	Test Engineer		QA Engineer
	Engineer Trainee		

\*Job roles such as 'Head of Company/CEO' and 'Domain Lead/Offering Lead' do not fall under this occupation, but can be a career progression for a person, provided he acquires business knowledge, skills and attributes required for that role through exposure to different occupations. The map does not depict any hierarchy.

## Testing and QA - Typical Career Paths



\*Note: Career growth across the Leadership Level is usually governed by cross-functional exposure to other occupations. While a possible movement has been indicated in the map, this is usually highly 'person specific' and should not be generalised. The map does not depict any hierarchy.

## Movement to Other Occupations, Sub-sectors and Industries

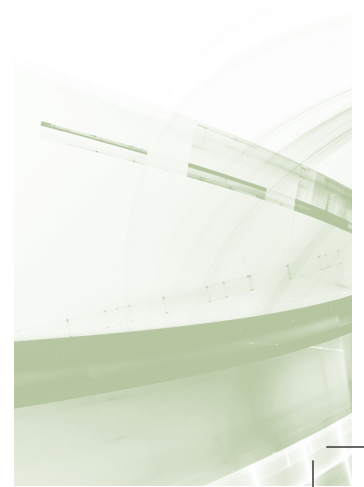
ITS and the occupations within provide ample opportunities for the individuals for movement outside their core occupation.

Individuals can move freely in 'related' occupations within the sub-sector at a similar level by displaying the relevant skills. The level of joining varies highly with the organisation. While some organisations ensure parity in terms of providing similar vertical-level role others have defined Entry- level criteria for specific occupations.

For example, an individual from a Team Lead - Application Development willing to move to IT Consulting may join at Analyst or Consultant level, depending upon the organisation's norms and policies.

The horizontal career movements from one occupation to another occupation within the sub-sector, to another sub-sector or to another industry occurs typically at Middle or Leadership levels after a professional has acquired expertise in one particular occupation or more than one related occupations at Entry Level.

The possible career movements to related occupations, sub-sectors and industries have been highlighted in the subsequent table.



## Movement to Other Occupations, Sub-sectors and Industries

Occupation	Horizontal Movements		
	To Other Occupations	To Other Sub-sectors	To Other industries
Application Development	IT Consulting, Project/Program Management, Sales and Pre-sales, Testing and QA, Application Maintenance, Application Deployment, IMS, Information Security	SPD, BPM, ER&D	IT-specific roles in any industry
Application Deployment	Project/Program Management, Sales and Pre-sales, Testing and QA, Application Outsourcing	SPD, BPM, ER&D	IT-specific roles in any industry
Application Maintenance	Project/Program Management, Sales and Pre-sales, Testing and QA, Application Development, Application Deployment	SPD, BPM, ER&D	IT-specific roles in any industry
Data Scientists	N/A	BPM	Statistics/MIS/Analytics specific roles in any industry
IT Consulting	Sales and Pre-sales, Project/Program Management, Application Development	SPD	N/A
IT Services Management	Project/Program Management, IMS, IT Support Services/Help Desk, Solution Architecting	SPD	IT support roles in any industry
IT Support Services/Help Desk	IT Consulting, Application Deployment, Application Outsourcing, Hardware Deployment, IMS	BPM	IT support roles in any industry
Infrastructure Management Services (IMS)	IT Consulting, Project/Program Management, Sales and Pre-sales, Testing and QA, Application Outsourcing, IT Services Management, Application Deployment, IT Support Services/Help Desk, Information Security	SPD, BPM, ER&D	Infrastructure department in all industry, esp. Media, Telecom, BFSI etc.
Information Security	IT Consulting, Project/Program Management, Sales and Pre-sales, Application Development, Testing and QA, IMS, IT Support Services/Help Desk	SPD, BPM	Information Security roles in any industry, esp. BFSI, Media, Telecom etc.
Project / Program Management	IT Consulting, Sales and Pre-sales, Project/Program Management	SPD, BPM, ER&D	All Services Industries
Sales and Pre-sales	IT Consulting, Project/Program Management, Application Development	SPD, BPM	All industries
Solution Architecting	IT Consulting, Sales and Pre-sales, Project/Program Management	SPD, BPM	N/A
Testing and QA	Project/Program Management, Application Development, Sales and Pre-sales, Application Outsourcing, Application Deployment	SPD, BPM, ER&D	IT-specific roles in any industry





# ANNEXURES

- Annexure A: Glossary of Terms and Abbreviations
- Annexure B : Case Studies of Career Paths

# ANNEXURE

**ANNEXURE****Annexure A: Glossary of Terms and Abbreviations**

<b>Keywords /Terms</b>	<b>Description</b>
IT-ITeS	Information Technology - Information Technology enabled Services
BPM	Business Process Management
BPO	Business Process Outsourcing
KPO	Knowledge Process Outsourcing
LPO	Legal Process Outsourcing
IPO	Information Process Outsourcing
BCA	Bachelor of Computer Applications
B.Sc.	Bachelor of Science
OS	Occupational Standard(s)
NOS	National Occupational Standard(s)
QP	Qualifications Pack
UGC	University Grants Commission
MHRD	Ministry of Human Resource Development
MoLE	Ministry of Labor and Employment
NVEQF	National Vocational Education Qualifications Framework
NVQF	National Vocational Qualifications Framework
BFSI	Banking Financial Services and Insurance
ITS	IT Services
NASSCOM	National Association of Software Services Companies
SSC	Sector Skills Council
BPM	Business Process Management
ER&D	Engineering and Research and Development
SPD	Software Products
CRM	Customer Relationship Management
IMS	Infrastructure Management Services
RIM	Remote Infrastructure Management
SCM	Supply Chain Management
HRO	Human Resources Outsourcing
IP	Intellectual Property
QA	Quality Assurance
F&A	Finance and Accounts
PLM	Products Lifecycle Management
B.A.	Bachelors in Arts
B. Com.	Bachelors in Commerce
B. Tech.	Bachelors in Technology
L.L.B	Bachelors in Law
M. Tech.	Masters in Technology
L. L.M	Masters in Law
UI	User Interface
CEO	Chief Executive Officer
VP	Vice President
AVP	Associate Vice President
SVP	Senior Vice President
GM	General Manager
TL	Team Leader

## Annexure B: Case Studies of Career Paths

### CONRAD COLACO

Manager  
Accenture

#### Entry to IT-BPM Industry

How did you start your professional journey? Which organization and at which designation?

I joined Cordys R&D India Pvt. Ltd. as a software programmer in 2002. My role was of a developer in web technologies. I spent 32 months with this company

#### Certifications/Trainings Undertaken

Did you add to your knowledge base by undertaking any certifications?

AMDA

#### Career Movement and Growth

How have you moved through your chosen career over the years?

I started as a software programmer in 2002. In 2005, I decided pursue further studies & did my full time MBA from T.A. Pai Management Institute (TAPMI). In 2007, on completion of my MBA, I joined Accenture as a Team Lead in CIO. In 2009, I was promoted to Associate Manager. In 2012, I was promoted to a Manager. In the last 5+ years in CIO, I have working to different projects in roles around business analysis and project management.

#### Learnings for people looking forward to enter the IT-BPM Industry

What were the key things that you learnt along the way?

- Stakeholder management – Team/Client/Senior Leadership/Sponsor
- Team and resource management
- Project Management tools and techniques

## Annexure B: Case Studies of Career Paths

### CHINMAY PATNAIK

Technical Test Lead  
Infosys technologies

#### Entry to IT-BPM Industry

How did you start your professional journey? Which organization and at which designation?  
On 16th August 2005 I joined Mahindra Satyam in Hyderabad as Software Engineer. The training in Satyam was very professional and methodic with periodic tests and assessments to access and strengthen the skills. This training gave me a perfect launch pad for bright future years in this industry.

#### Certifications/Trainings Undertaken

Did you add to your knowledge base by undertaking any certifications?

Although I did not do any certifications I undertook training in various testing related topics. I have completed White Badge in Six Sigma as part of quality improvement. I was also involved in imparting various technical and behavioral trainings in Satyam Learning Center.

#### Career Movement and Growth

How have you moved through your chosen career over the years?

Joining Mahindra Satyam was followed by a training tenure where in addition to knowledge enhancements we also got our first taste of corporate world. My first assignment was preparing a RFID application for IISc. Bangalore as a POC (Proof of Concept). Then I got a chance to work in Motorola India Pvt. Ltd, a client of Satyam then as an automation test engineer. The role was to automate test suites designed for functionality and regression testing of Motorola mobile devices.

My interest in higher studies led me to quit the project in Motorola after two and half years and return back to Satyam for finding some time to prepare for the competitive exams. This led to my association with Satyam Learning Center as a Program Manager Credit Cards.

#### Learnings for people looking forward to enter the IT-BPM Industry

What were the key things that you learnt along the way?

In my experience it is imperative for a person to be confident of her/his abilities and be ever ready to take up new and difficult challenges. I also learned that it is important to have a balance between work and life otherwise we run the risk of burning ourselves out too quick. And it is very important to feel passionately about the work we do.

## Annexure B: Case Studies of Career Paths

### **ANOOP NAIR**

Manager  
Accenture

#### **Entry to IT-BPM Industry**

How did you start your professional journey? Which organization and at which designation?  
I joined SYNTEL (I) Ltd as a programmer analyst in 2001. My role was of a developer in Unix and MF Cobol. Within a short span I got engaged in client facing roles, operations/production support & testing roles.

#### **Certifications/Trainings Undertaken**

Did you add to your knowledge base by undertaking any certifications?

- ITIL, AMDA (Internal certification)
- Pursuing PPSM & CBAP currently

#### **Career Movement and Growth**

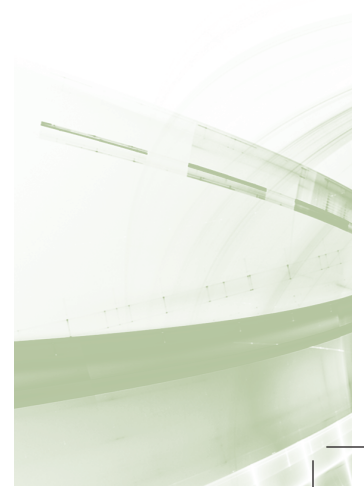
How have you moved through your chosen career over the years?

I started off as a developer and then played the role of a tester. Post this I played a client facing role and was a lead for testing and production support. After a brief onsite stint in US (Nashville), I decided pursue further studies & did my full time core MBA from NMIMS. Post which I joined Accenture as a Team Lead (Systems Analyst) in a Business Intelligence project for Accenture's internal IT organization (CIO). I grew to an Associate manager in 2 yrs. post and played a senior B.A. role. Post 3 yrs. I play the role of a manager and a functional lead.

#### **Learnings for people looking forward to enter the IT-BPM Industry**

What were the key things that you learnt along the way?

- Stakeholder management - Team/Client/Senior Leadership
- Expectations management - Customer & Team
- Communications management
- How to add Client value
- Brainstorming skills



## Annexure B: Case Studies of Career Paths

### **PANKAJ CHAUDHURY**

Project Manager  
Computer Sciences Corporation (CSC)

#### **Entry to IT-BPM Industry**

How did you start your professional journey? Which organization and at which designation?  
In 2000 I joined Birlasoft Ltd. as a Software Engineer. I joined CSC in 2004 as an Engineer. Presently I hold the position of Project Manager at CSC responsible for Product Development of RISKMASTER from our Noida delivery center along with a team of 40+ software professionals.

#### **Certifications/Trainings Undertaken**

Did you add to your knowledge base by undertaking any certifications?

- NS 21: Property and Liability Insurance Principles
- INS 22: Personal Insurance
- Certified Software Quality Analyst (CSQA)
- Post Graduate Diploma in Management from IIM Lucknow

#### **Career Movement and Growth**

How have you moved through your chosen career over the years -?

I worked with the Ministry of Tourism, Govt. of India as project trainee and worked to develop an information system for the travel agents & tour operators. In 2000, I started my career as a Software Engineer with Birlasoft Ltd.

Based on the platform/experience developed at Birlasoft, I got an offer to join CSC in 2004 for a project which was re-engineering of a legacy project into a new platform- RISKMASTER. Computer Sciences Corporation (CSC) is an MNC that provides information technology and professional services to global services.

#### **Learnings for people looking forward to enter the IT-BPM Industry**

What were the key things that you learnt along the way?

It is very important that you are equipped with all the tools needed to succeed in the industry. Some of the important tools are- academic education, professional courses, technical & domain certification and of course good communication skill.

With the maturity in the industry it is important that you differentiate yourself from the crowd so that, there is always a high USP for yourself. This can be done by being different, quick decision making, innovation, hard work and consistent performance.

## Annexure B: Case Studies of Career Paths

### **KRISHNANAND**

Senior Project Manager  
HCL Technologies

#### **Entry to IT-BPM Industry**

How did you start your professional journey? Which organization and at which designation?

I started my professional career in 1991 as a part time lecturer for 6 months for PUC computer science students. Worked with a private company dealing with computer sales & support for 6 months. Joined Andhra Pradesh State Road Transport Corporation (APSRTC) as a graduate trainee during Feb 1992. With this background, I got an opportunity to join the software industry. I joined as a Software Engineer in Deutsche Software Ltd. during Aug 2000.

#### **Certifications/Trainings Undertaken**

Did you add to your knowledge base by undertaking any certifications?

Training in Unix System Administration & Mainframes Training at ER&DC. After joining Deutsche Software, Attended mandatory internal trainings.

#### **Career Movement and Growth**

How have you moved through your chosen career over the years?

It took me a long time to move to the chosen career due to my educational background. Due to a perfect match of requirements with my knowledge & experience, got an opportunity to join Deutsche Software Ltd., during Aug, 2000. Took up various onsite and offshore roles in application development, support and IT Product Management. In 10 years, I have been promoted as a Senior Project Manager.

#### **Learnings for people looking forward to enter the IT-BPM Industry**

What were the key things that you learnt along the way?

To grow in career, one has to enhance knowledge on a continuous basis. Show the responsibility & ownership at every level.



## Annexure B: Case Studies of Career Paths

**M W Khan**  
Senior Manager  
Accenture

### Entry to IT-BPM Industry

How did you start your professional journey? Which organization and at which designation?  
I started in 1996 with ITW Signode as a Sales Engineer for Engineering Solutions for various kinds of industries.

After my MBA, I started my journey in IT industry in 1999 with Wipro's Hardware business where I started my career as a Senior Engineer and was responsible for doing Process Improvements for their Manufacturing and Warehousing operations

### Certifications/Trainings Undertaken

Did you add to your knowledge base by undertaking any certifications?

- Black Belt Certification
- Attended multiple trainings on Client Management and Sales
- Technology Orientation Programs

### Career Movement and Growth

How have you moved through your chosen career over the years?

Wipro: Manager- Business Process Re-Engineering;  
May 1999 to April 2002

Analyzing and Transforming Business Processes for Wipro by e-enabling the Business Processes utilizing ERP (Symix and SAP), CRM and the Web and by using the Six Sigma Methodology, for Manufacturing and Warehousing Operations of Wipro.

Accenture: Program Management Office Lead

Jan 2008 to Jan 2009

Was responsible for Leading PMO for a global engagement with about 1000+ resources, responsibility included:

Financial Planning and Management  
Contract Administration  
SQA/Quality Management

### Learnings for people looking forward to enter the IT-BPM Industry

What were the key things that you learnt along the way?

- Understand Business Impact of the IT solutions- have the big picture in mind
- Understand Technology Trends
- Hone People Management Skills

## Annexure B: Case Studies of Career Paths

### SWAMINATHAN

Deputy General Manager  
HCL technologies

#### Entry to IT-BPM Industry

How did you start your professional journey? Which organization and at which designation?

I started my professional journey in Dec 1996 with Deutsche Software Ltd as Software Engineer in Sep 2001 the company was taken over by HCL and ever since I have been part of HCL.

#### Certifications/Trainings Undertaken

Did you add to your knowledge base by undertaking any certifications?

- PGDBA, Finance, Symbiosis University, Pune, India
- ITIL Foundation V3, EXIN, Netherland. 2008
- IIBF, Basics of Banking, India. 2008
- Certified Lotus Notes Specialist, 1998

Trainings on: Leadership, process, domain and Behavioral skills within and outside the Organization.

#### Career Movement and Growth

How have you moved through your chosen career over the years?

I started as Lotus Notes Developer who was involved developing and maintaining workflow applications. Next took up Designing and then to Server Administration. During this period got multiple opportunities to work at client locations.

Moved on to become a Project Manager in 2004 for a development project on J2EE platform, next was a program manager role for a Sales and Research unit for the Bank, next was a delivery manager role for providing services in testing, development, maintenance and support of software applications. Currently I am Delivery Unit Head responsible for delivering software services for our client.

In between, I had taken up a functional role of PMO for a short duration.

#### Learnings for people looking forward to enter the IT-BPM Industry

What were the key things that you learnt along the way?

Stay relevant always in an ever changing environment by being on the path of continuous learning, taking new projects, working with different teams and service lines. Reaching to seniors for guidance in times of difficulty always helps. Tough projects teach you more; failures are part and parcel of professional life.