



NASSCOM®

Building a Career in IT Services – Unraveling the Maze

Foreword

Dear Reader,

The IT industry in India has been growing at a tremendous pace and has been fuelling India's growth story. The industry has placed India on the world map with an image of a technological advanced and knowledge based economy.

The IT-ITeS industry is standing at a watershed moment in history. In FY 2012, the industry achieved a stellar landmark of crossing \$ 100 billion in revenues and contribution from IT Services stood at USD 52 billion, accounting for almost 50% of the total. The IT Services sub-sector directly employs around 1.8 million people in the country and as the Industry grows, this number is expected to grow.

The past decade has seen frequent changes in the movement of the economy and companies are becoming increasingly conscious that in the globally connected world, the "new normal" will be characterized by business volatility. Growth in the IT/ITes industry is based on your performance, skills and hard work. The benefits such as international assignments, flexible work arrangements, being part of the strong 'young' India make IT Services a sought after career option.

What attracts these million plus people to this industry? And why should you consider the IT/ITeS industry as a serious career option? This guide answers these and many other questions about a career in this industry.

Choosing a career is one of the most important decisions of your life, and this guide will help you make an informed choice. It tells you about the industry, the verticals it operates in, how to get a job in this industry and what you need to do to build a successful career.

Good luck and much success in whichever career you choose.

Som Mittal

President

This Career Guide answers the following key questions with respect to a career in the IT services industry...

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What is the overview of the IT – ITeS Industry?



The IT-ITeS industry has been 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 provide employment and a good standard of living to millions. It has placed India on the world map with an image of a technological advanced and knowledge based economy. Growth of the IT-ITeS industry has provided India with a wide range of economic and social benefits which includes 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 capitalist and has been credited with enabling the entrepreneurial ventures of many in the country. The IT-ITeS industry has almost doubled in terms of revenue and contribution to India's GDP over the last six years (2008-2013).

Structure of the IT-ITeS Industry

The organizations within the IT-ITeS Industry are categorized along the following parameters

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

A broad structure of the Industry based on the parameters identified in the Indian context is represented below¹:

Multi-national Companies (MNCs): MNCs organizations 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 (ISP): ISPs are organizations that have started with their operations in India. Most of these organizations would have their headquarters in India while having offices at many international locations

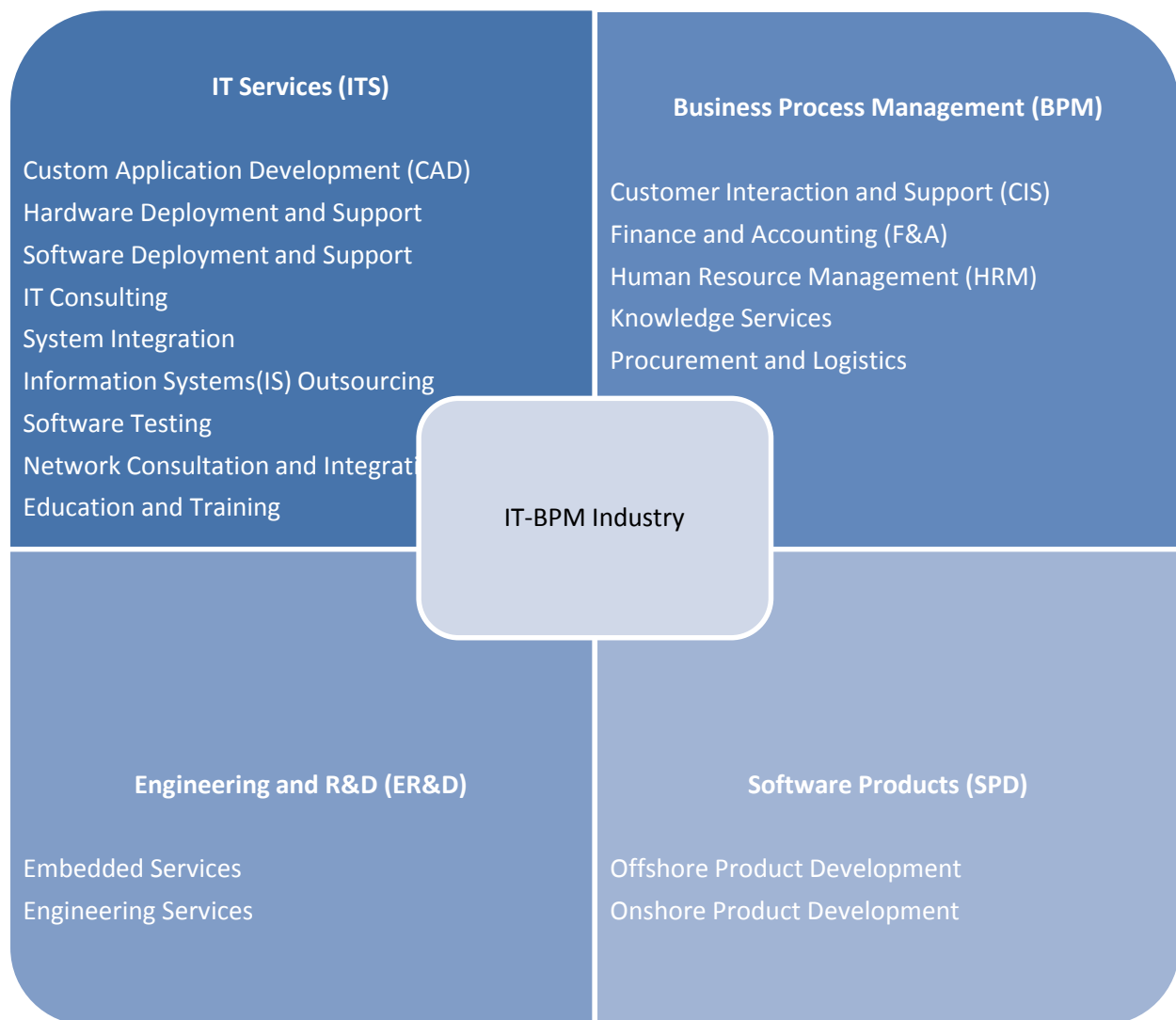
While most have a client base, which is global as well as domestic, there are some that have focused on serving only the Indian clients.

¹ Source: NASSCOM Research

Global In-house Centers (GIC): GIC organizations cater to the needs of their parent company only and do not serve external clients. This model allows the organization 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.

Sub-sectors within the IT-BPM Industry

The IT-BPM industry has four sub-sectors. The subsequent sections provide information and insights for a career in the IT Services sub-sector.



What is the IT Services sub-sector?



Introduction to the IT Services Sub-sector

IT-BPM market, a \$ 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% of the country's total exports and contributes to 11% of total service revenues². The IT Services sub-sector is a major contributor to the overall IT-ITeS Industry

IT Services (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.

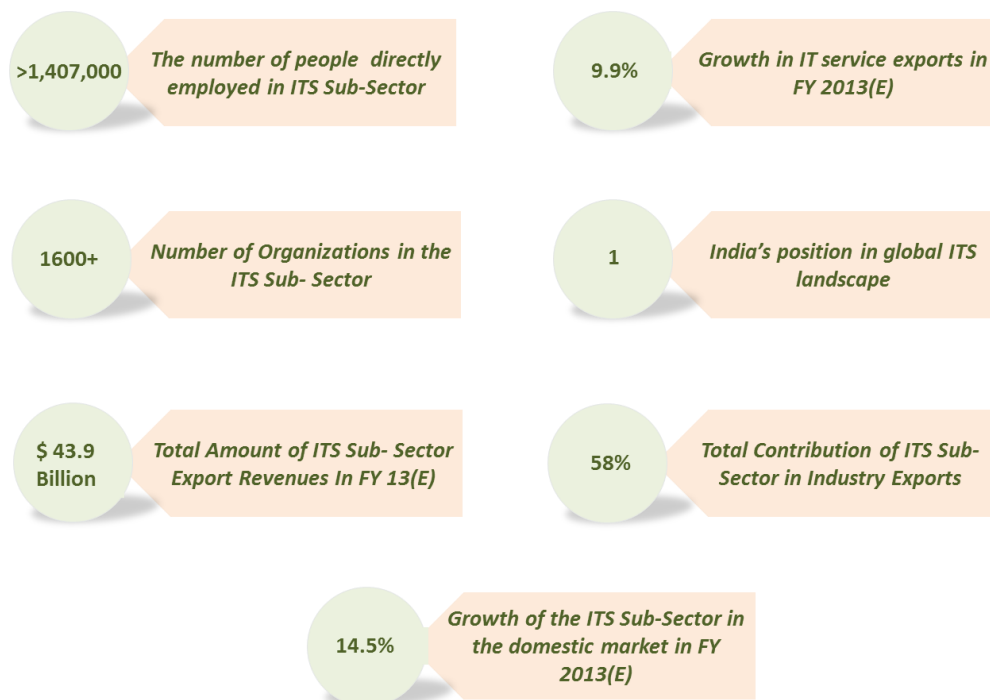


Figure 15: IT Services sub-sector – Snapshot (Source: NASSCOM Strategic review 2013)

² The IT-BPM sector in India Strategic Review 2013, NASSCOM

The worldwide IT Services market stood at \$ 648 Billion in 2012. The IT Services exports form the largest and fastest growing segment of the IT services with a growth rate of 9.9% in FY 2012. IT Services export constituted over half of the entire export of the IT Industry. The sector is expected to see growth of over 10% 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% to reach \$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 around 60% 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 optimizing 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 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 IT Services to a varied group of people and the industry continues to be amongst the most sought after for many young and aspiring individuals.

Profile of the IT Services 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 IT Services sub-sector. An illustrative view of the vertical and horizontal profiles is shown below.

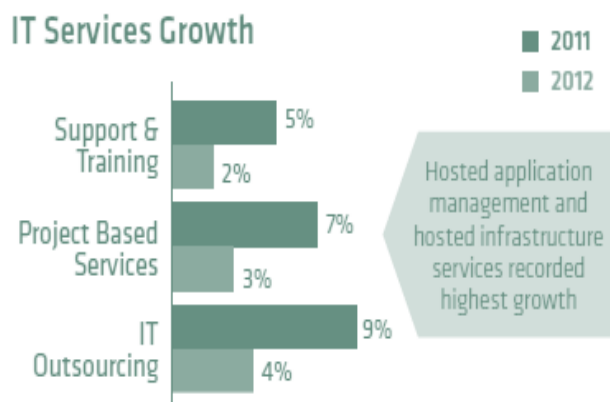


Figure 1: Growth of sub-sectors in IT-ITeS Industry

Horizontal Profile: The IT Services 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.³

Customer Profile: After starting off the IT Services sub-sector, served mostly the North American market until the

90s.

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 18: Customer Profile of IT Services sub-sector

³ The IT –BPM Sector in India – Strategic Review 2013, NASSCOM

Key Trends in the IT Services Sub-sector

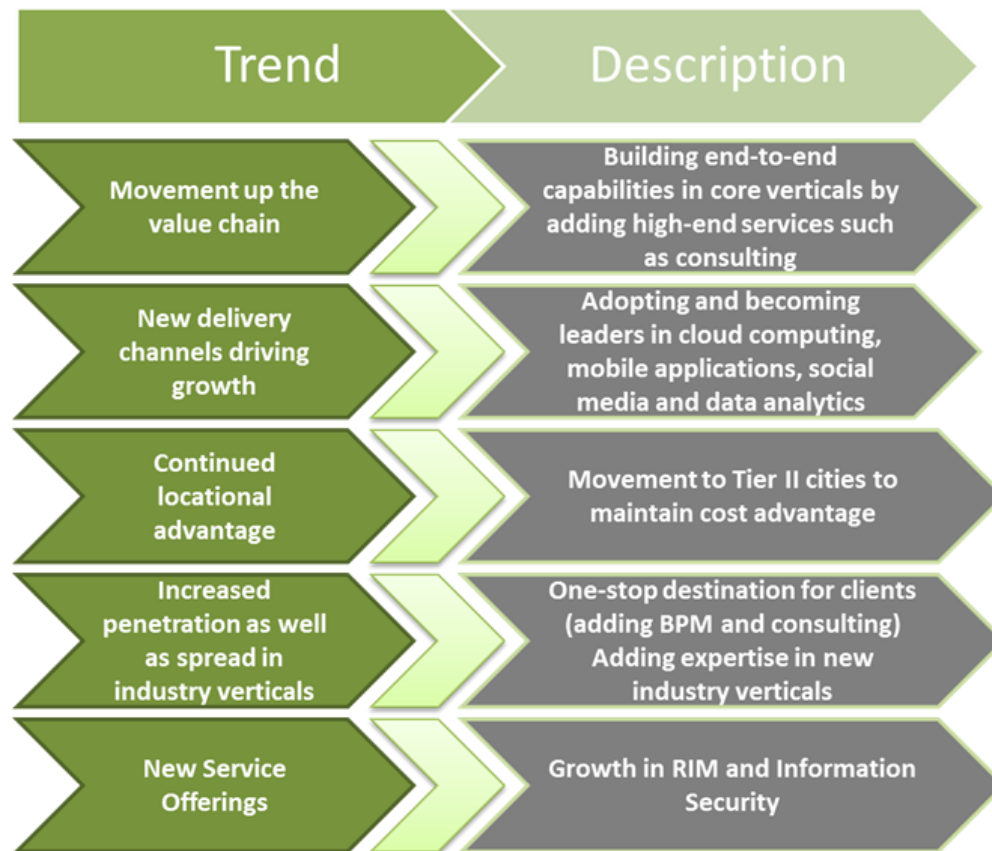


Figure 2: Trends in the IT Services sub-sector

The IT-BPM industry is standing at a watershed moment in history. In FY 2013, the industry achieved a stellar landmark of crossing \$ 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 redefined 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 characterized 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:

New Delivery Channels Driving Growth: Growth of the different delivery channels like cloud computing, mobile applications, social media and data analytics have 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

environment⁴. While traditionally, 70% of the Industry is located in Tier I cities, focus on controlling costs has created a gradual move to have centers in Tier II cities as well, thus widening the talent pool and spread.

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, mobile computing gained credence this year as it offered clients access to best-in-class process management at reduced capital expenditure levels⁵.

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 etc. Advancements in technology have led to these services being increasingly offshored – a trend that is being welcomed by all major IT-BPM organizations in the Industry.

In FY 2011, RIM observed a CAGR of 26 percent and it is being touted as the next growth engine for IT Services sub-sector⁶.

⁴A. T. Kearney Global Services Location Index, 2011

⁵ The IT –BPM Sector in India – Strategic Review 2013, NASSCOM

⁶ NASSCOM Strategic Review 2011

What are the requirements for being an ITS professional?



Skills

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

Key Generic skills requirements:

- Communication Skills
- Analytical skills
- Problem Solving
- Working with influence

Key Functional skills requirements:

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

Learning Opportunities

IT Services 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 programs and on the job learning opportunities.

Increasing sector focus is leading to many IT services organizations looking to acquaint the employees with domain specific (Retail, manufacturing, insurance etc.) 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 organization as a preferred employer

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

- Advanced technical degree courses like MCA, M. Tech, M.E., M Sc. etc.
- Advanced business courses like MBA/PGDBM
- Domain related certifications in the areas of Software languages, Infrastructure Management, Information Security etc.
- Industry related certifications in various verticals like BFSI, Telecom, and Retail etc.

One of the key objectives of the IT-ITeS SSC NASSCOM is to develop avenues for learning and skill development in the IT-ITeS 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 standardized formal and non-formal learning opportunities that are accepted and endorsed by the Industry

Qualifications, Knowledge and Understanding

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

Nearly 70% 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.

What are the roles in IT services sub-sector?



The job roles in the 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

91 unique Job roles at the Middle Level

25 unique Job roles at the Leadership Level

***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 yrs.*

***Middle Level:** 2-10 yrs.*

***Leadership Level:** >10 yrs.*

Occupations and tracks within the within the IT Services Sub-sector



- IT Support Services/Helpdesk

IT Support Services /
Helpdesk

- Storage Management
- Network Management
- Server Management
- Messaging and Collaboration
- Security Management
- End-user devices Management
- Infrastructure Applications Management
- Infrastructure Tools Management
- Database Management

Infrastructure Management
Services (IMS)

- IT Forensics
- Application Security
- Risk Management,Audit and Compliance
- Incident Management
- BCP/DR
- Network Security management
- Security Testing
- Privacy

Information Security

- Project /Program Management

Project/Program
Management

- Business Development
- Relationship Management

Sales and Pre-sales

- Solution Architecting

Solution Architecting

- Manual Testing
- Automated Testing
- Quality Assurance

Testing and QA

Opening doors to 'Application Development'



Application Development

Application Development involves

- Developing and delivering customized 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** roles are responsible for creating software applications by coding using programming / scripting languages like C, C++, Java, HTML, .Net, PHP, and VB etc.
- **Functional Development** roles are responsible for providing function-specific inputs towards application development. These roles provide a domain perspective in the areas of CRM, Financial Management, and ERP etc.
- **Media Development** roles are responsible for designing and improving the look and feel, functionality and graphic appeal of the developed application.
- **Web Development** roles are responsible for designing and maintaining web-based applications that include static and dynamic content.
- **User Interface (UI) Development** roles are responsible for designing rich UI for the developed applications, such as computer programs, databases and websites.
- **Technical writing/documentation** serves 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** roles are responsible for translating software into different languages that end-users may be well-versed with.

Role of Application Development Professional

•Application/Functional Developer

- Captures data and translate and transform it into a processing language
- Develops codes from relevant information, schedules, processes and monitors them
- Contributes to development of test scripts and test scenarios

•Media Developer

- Develops visual.audio/video media content
- Use software tools to develop media content for applications with smart graphics and enhanced look and feel and usability features

•Web Developer

- Develops programming code for web based applications/websites
- Uploads the site onto a server and registers it with different search engines

•UI Developer

- Designs UI applications using HTML, Javascript, XML, JSP, JAVA, CSS among others
- Designs and implements front-end business applications while working closely with application/functional developers to help generate requirements for backend system development

•Language Translator

- Works to translate codes in multiple end languages. For example, translating a Microsoft Windows into local Indian languages. With the advent of Uni-code compliant applications, this role is slowly becoming obsolete.

•Technical writer

- Works using documentation software to create job aids and other technical manuals/documents highlighting specifications and usability features of the applications developed

Qualifications and Skills

•Software Developers, Functional Developers :

- BCA / MCA or Engineer with certification in relevant areas
- Problem Solving and strong analytical capability
- Knowledge of programming logic and SDLC is essential
- Functional skills like software languages (Java, C/C++, dot net) are highly essential for professionals in the Software/Functional Development tracks.

•UI Developers

- BCA / MCA or Engineer with certification in relevant areas
- Graduates/Diploma holders with relevant skills are also eligible
- Knowledge of programming logic and SDLC is essential
- Strong HTML and JavaScript (AJAX, DOM, JSON) and Java skills

•Media and Web Developers:

- Any graduate/diploma course with a specialist training program in Media designing.
- For a relevant skill even under-graduate candidates are eligible.
- Knowledge of programming logic and SDLC is desirable.
- Creative thinking and Attention to Detail are the key skills for these roles

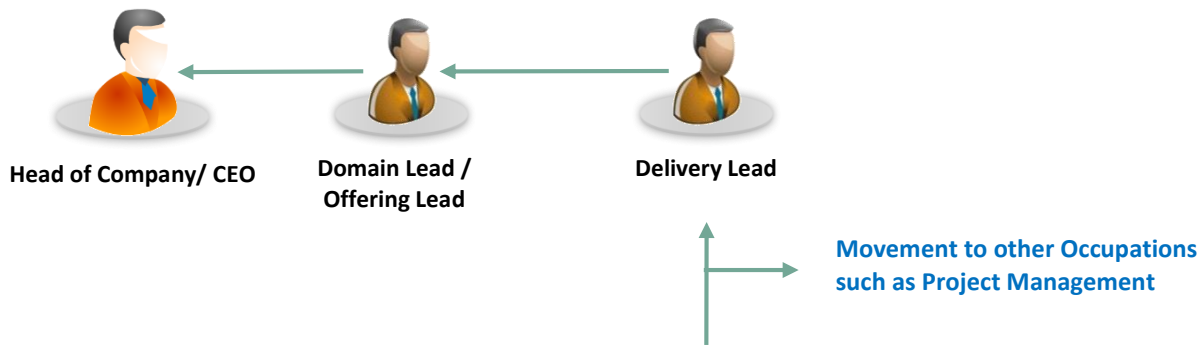
•Technical writing/documentation:

- Any graduate/diploma course. For a relevant skill even under-graduate candidates are eligible
- Knowledge of programming logic and SDLC is desirable.
- Attention to detail and accuracy are the key skills for these Job roles

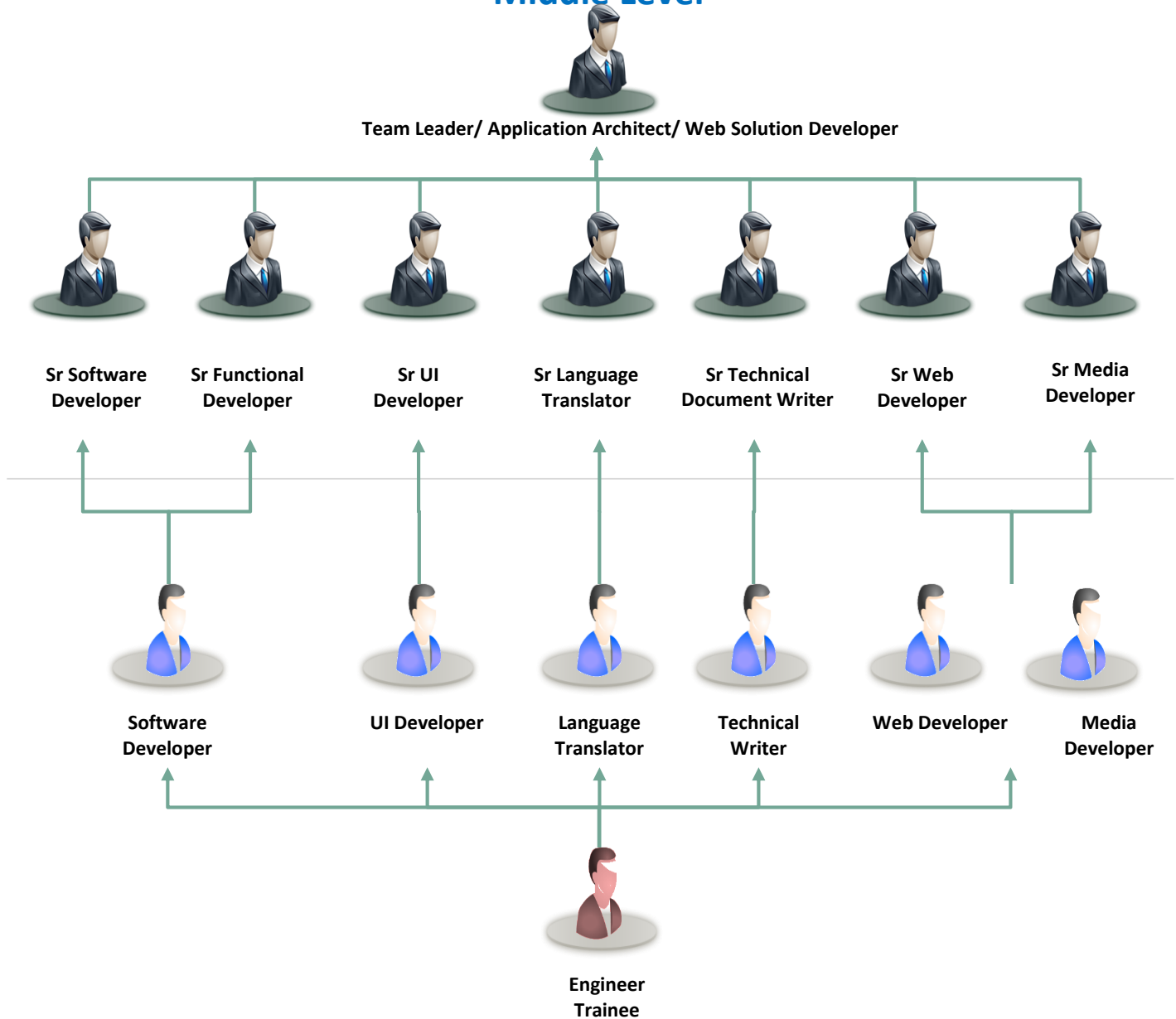
•Translation:

- Any graduate/diploma course. For a relevant skill even under-graduate candidates are eligible
- Knowledge of programming logic and SDLC is desirable
- Certified Language courses

Leadership Level



Middle Level



Entry Level

Career Path - Application Development

Opening doors to 'Application Deployment'



Application Deployment

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

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

Role of Application Deployment professional

- Gathers, analyzes, and documents customer infrastructure requirements
- Plans the roll-out process and sequence of new systems and platforms
- Deploys, configures, manages, and troubleshoots the software solution
- Provides technical support and perform quality assurance of new software updates

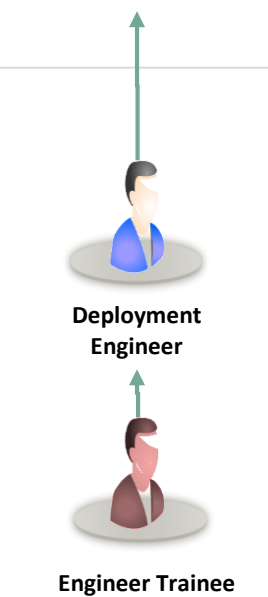
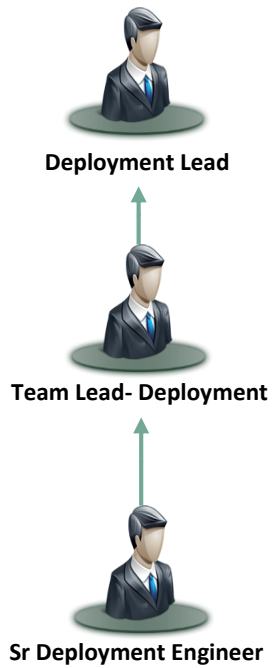
Qualifications and Skills

- BCA / MCA or Engineer with certification in relevant areas
- Experience of implementing IT projects –deployment or maintenance
- Knowledge and experience with SDLC and different methodologies
- Strong communication skills

Leadership Level



Middle Level



Entry Level

Career Path - Application Deployment

Opening doors to 'Application Maintenance'



Application Maintenance

Application Maintenance covers a range of services which involve providing on-going/ad-hoc support to software products or customized applications. These services are aimed towards 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

Role of Application Maintenance Professional

- Optimizes and maintains the reliability of current business applications
- Interacts with senior client personnel to understand the application issues
- Provides technical support and resolves issues for current business applications
- Monitors system security, application and system event log files. Communicate and work with users as necessary to resolve application errors
- Establishes, monitors and evaluates system metrics to identify vulnerabilities and identify problem trends. Monitor disk status, system processes, and user process activity
- Provides operational support, ensuring production systems and devices are online and available

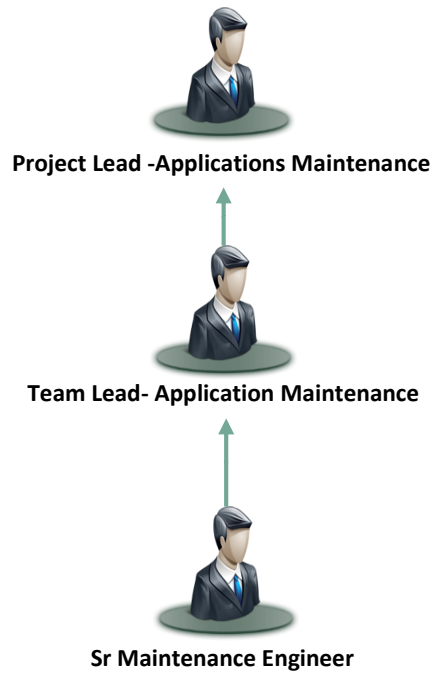
Qualifications and Skills

- BCA / MCA or Engineer with certification in relevant areas
- Graduates/under-graduates/diploma holders with relevant skills and experience are also eligible
- Experience of working on Software projects –deployment or maintenance
- Knowledge and experience with SDLC and different methodologies
- Strong communication skills

Leadership Level



Middle Level



Entry Level

Application Maintenance

Opening doors to 'Data Scientists'



Data Scientists

Data Scientists are responsible for designing and implementing processes and layouts for complex, large-scale data sets used for modeling, 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

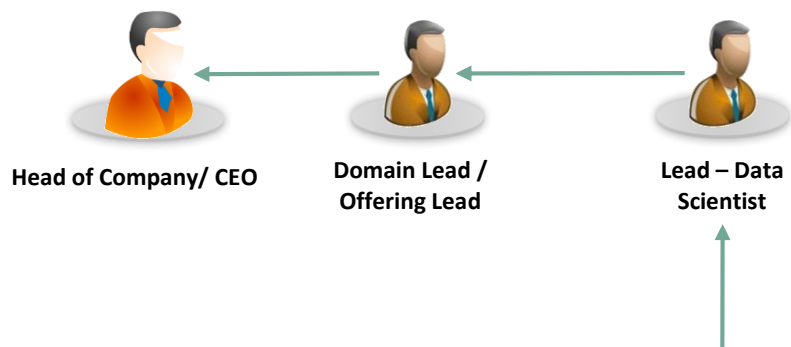
Role of Data Scientist

- Designs and builds large and complex data sets
- Thinks strategically about uses of data and how data use interacts with data design
- Designs and implements statistical data quality procedures around new data sources
- Performs data studies and data discovery around new data sources or new uses for existing data sources
- Implements any software required for accessing and handling data appropriately
- Visualizes and reports data findings creatively in a variety of formats

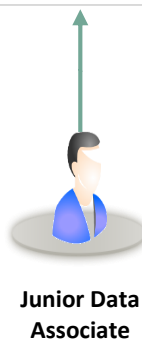
Qualifications and Skills

- Bachelors or Masters Degree in Computer Science, Statistics or Mathematics
- Engineers with exposure and/or experience to large scale database and processes are also eligible
- Proficiency in specific data analysis packages (SPSS, SAS, STATA, and/or Excel)
- Strong mathematics and statistics skills
- Coursework or practical experience with data mining
- Coursework or practical experience building algorithms

Leadership Level



Middle Level



Entry Level

Opening doors to 'IT Consulting'



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 analyze user requirements and recommend appropriate applications or modifications for an organization, which is typically the client. It is their responsibility to develop, install, maintain and modify system application programs and business application programs.

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 etc., 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

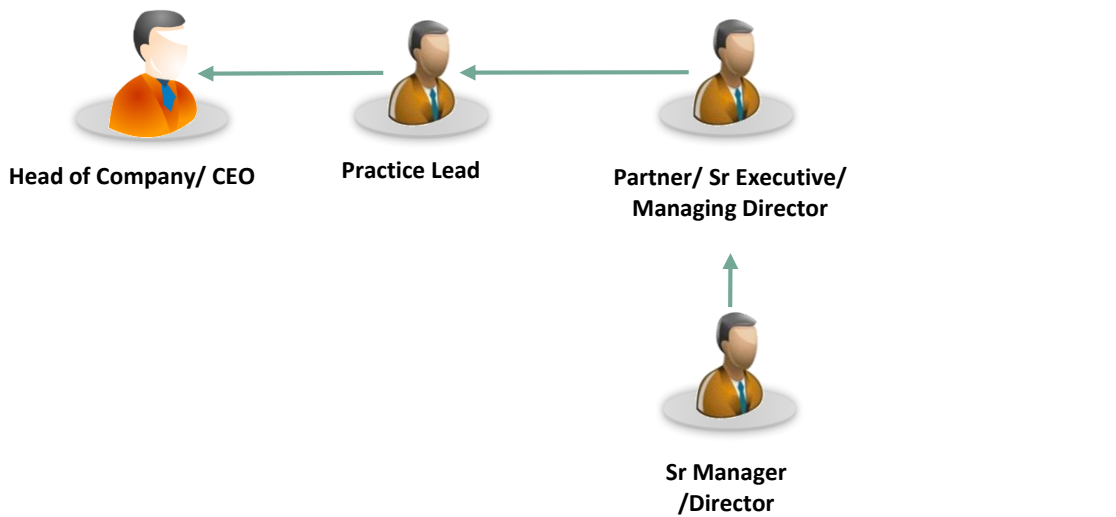
Role of IT Consulting Professional

- Understands a client's business needs and recommend technology based solutions to fulfil the needs
- Advises clients on IT Strategy, Architecture and governance needs
- Identifies user problems and needs, their sources and determine possible solutions
- Participates in the development, implementation, installations and testing of application software
- Investigates recommends and manage installation of new applications

Qualifications and Skills

- BCA / MCA or Engineer with certification in relevant areas and 5-6 years of relevant work experience as an entry level
- MBA candidates are preferred owing to high degree of interaction with senior client representatives and strong business orientation
- Strong skill/ knowledge of various technology trends and processes
- Thorough understanding of the technology environment, Industry best practice and trends

Leadership Level



Middle Level

Manager - Technical Domain

Manager - Business Domain

Consultant

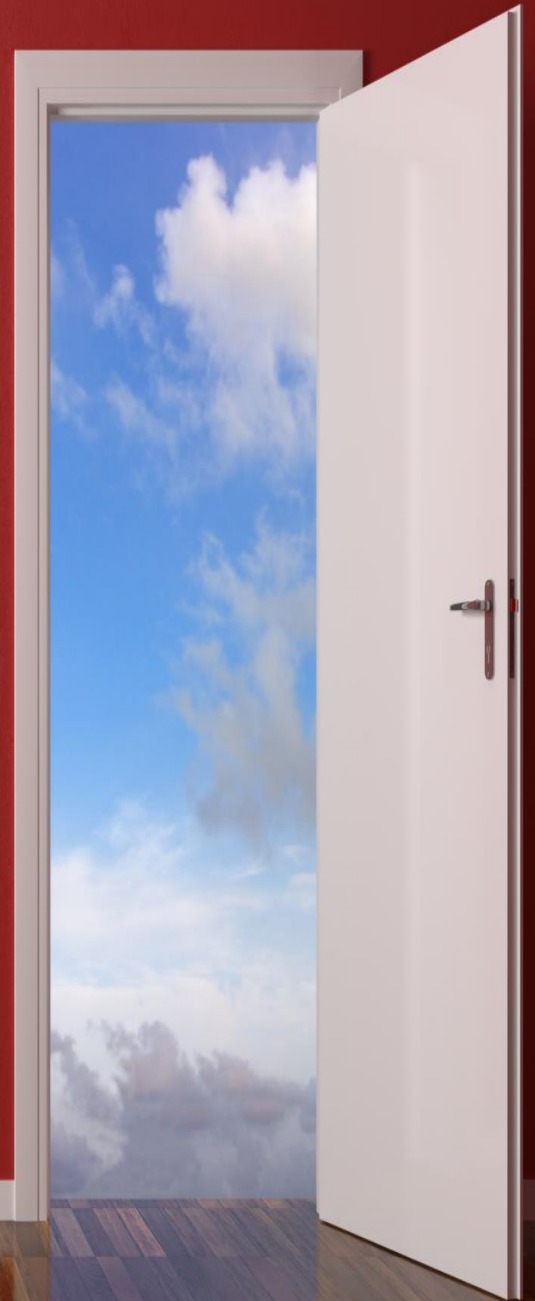
Business
Consultant

Analyst

Entry Level

Career Path - IT Consulting

Opening doors to 'IT Services Management'



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 to 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.

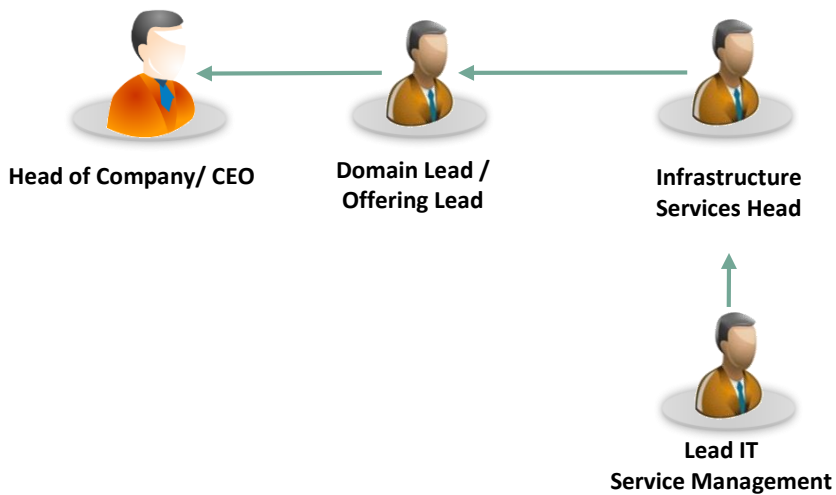
Role of IT Services Management Professional

- Responsible for the lifecycle of Service Management processes ensuring client satisfaction and management of risk to services including:
 - Change Management
 - Release Management
 - Problem Management
 - Incident Management/Major Incident Management
 - Configuration Management
- Identifies, logs, monitors and escalates issues/outages and ensures timely assignment and resolution of incidents to meet SLA's
- Proactively prevents the occurrence of incidents, problems and errors, via the identification, investigation and resolution of client and/or organizational Service Management issues
- Delivers appropriate and effective communications to client/management and/or 3rd party vendor on issue escalation and resolution at all stages
- Proactively prevents problems via trend analysis, targeting support action and communication

Qualifications and Skills

- BCA / MCA or Engineer with certification in relevant areas
- Graduates/diploma holders with relevant skillset are also eligible
- Knowledge of ITIL and Infrastructure standards
- Certifications in the areas of networks/storage/servers etc. is highly desired
- Knowledge of systems management software and networking
- Problem Solving and technical capability

Leadership Level



Middle Level



No Entry-level roles for this occupation. Entry is usually through IMS, IT Support Services and so on

Entry Level

Career Path - IT Services Management

Opening doors to 'IT Support Services / IT Helpdesk



IT Support Services/IT Helpdesk

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

These include level 1 helpdesk services offering simpler solutions to clients- Internal or External to the organization.

Primary purposes of an IT Support Services/service desk include:

- incident control: life-cycle 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, co-ordinate and resolve incidents as quickly as possible at primary support level

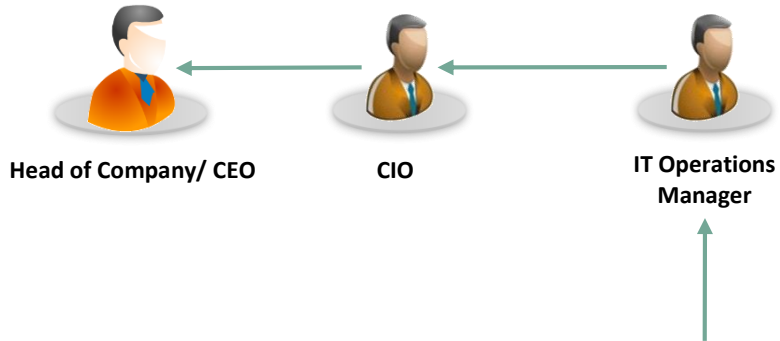
Role of IT Support Services/Helpdesk Professional

- Resolves Level 1/2 incidents affecting the operation/availability of production systems, through troubleshooting and implementing known fixes
- Conducts trend analysis with a focus on proactive identification of events/issues that threaten performance and a consistent & timely resolution and documentation strategies
- Develops long term and short term plans for IT support/Helpdesk
- Develops IT support systems, policies and processes
- Defines and agrees on service levels and metrics
- Consults and advises on IT support requirements and initiatives
- Troubleshoots and resolves all IT issues within the organisation

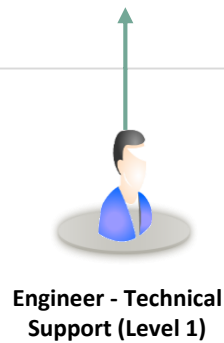
Qualifications and Skills

- Diploma in Computer / Network / Communication
- BCA / Engineer with certification in relevant areas
- Strong skill/ knowledge of various technology trends and processes as well as updated knowledge about IT initiatives

Leadership Level



Middle Level



Entry Level

IT Support Services/ Helpdesk

Opening doors to 'Infrastructure Management Services'



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 etc.

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 organization. Typical roles are Engineers/Technology Leads.

While the responsibilities and the skillsets may vary with the area of operation, both Infrastructure Operations and Infrastructure Engineering can be categorized into the following tracks.

Storage management: Storage management roles are responsible for managing storage equipment deployed in an organization. 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 etc.

Network Management: Network Management roles are responsible for the deployment, configuration, maintenance and monitoring of active network equipment such as switches, routers, firewalls etc. 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 organization. This includes the range of activities involved in installation, administration, maintenance, and improvement of company and/or client/server like UNIX, Windows, and Citrix etc.

Messaging and Collaboration: Messaging and Collaboration roles are responsible for maintaining messaging applications for end-user systems and servers in an organization. This includes the range of activities from cryptic messages to Instant Messaging (IM), server messages etc. within the same/across multiple organizations.

Security Management: Security Management roles are responsible for maintaining security of, application, and network equipment within an organization. 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 organization/client.

End-user devices Management: End-user devices management roles are responsible maintaining end-user devices like desktops/laptops/mobile devices within an organization. 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 organization. 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, life-cycle planning and optimization of infrastructure applications including: mobile device management, unified communications and IT management software. This includes undertaking necessary activities to resolve hardware and software w.r.t. Infrastructure Applications in a timely and accurate fashion.

Infrastructure Tools Management: Infrastructure Tools Management roles are a specialized set of roles responsible for management of infrastructure tools in an organization. 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, optimizing, analyzing 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 organizations. 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

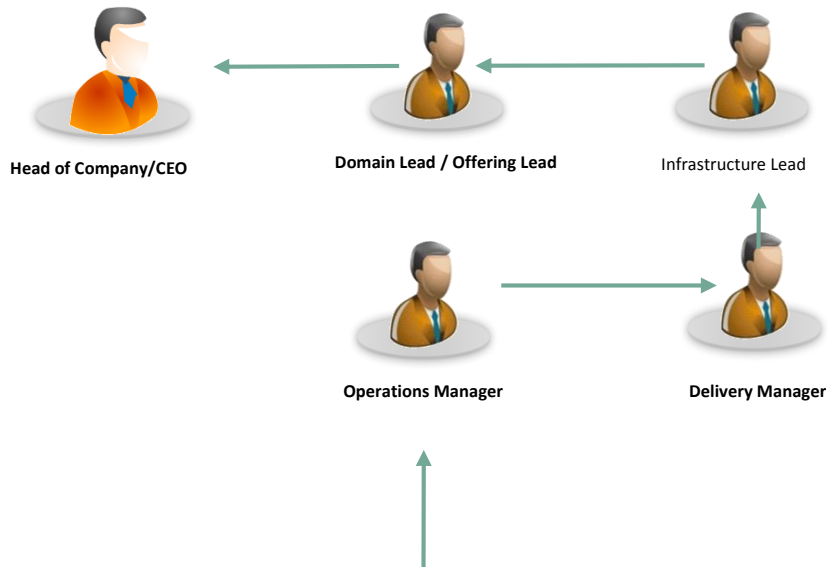
Role of IMS Professional

- Provides diagnosis and resolution of computer hardware and software problems
- Provides planning, design, implementation and technical support of computer hardware, software, and network components
- Develops specifications of new enhancements or systems required
- Maintains daily logs and track systems performance on a day to day basis
- Prepares detailed management standards and procedures and enforcement of processes, including procedures for systems security and recovery

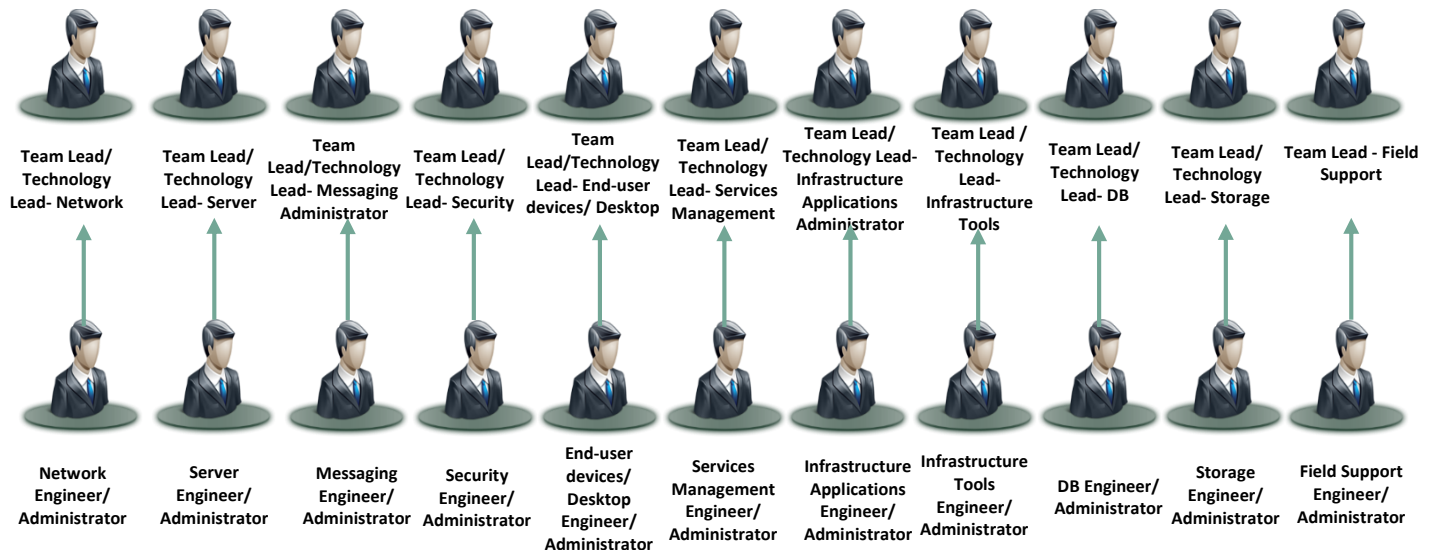
Qualifications and Skills

- BCA / MCA or Engineer with certification in relevant areas
- Graduates/diploma holders with relevant skillset are also eligible
- Certifications in the areas of networks/storage/servers etc. is highly desired
- Knowledge of systems management software and networking
- Problem Solving and technical capability

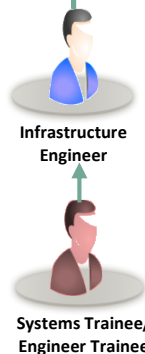
Leadership Level



Middle Level



Entry Level



Career Path - Infrastructure Management Services (IMS)

Opening doors to 'Project / Program Management'



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 upon 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.

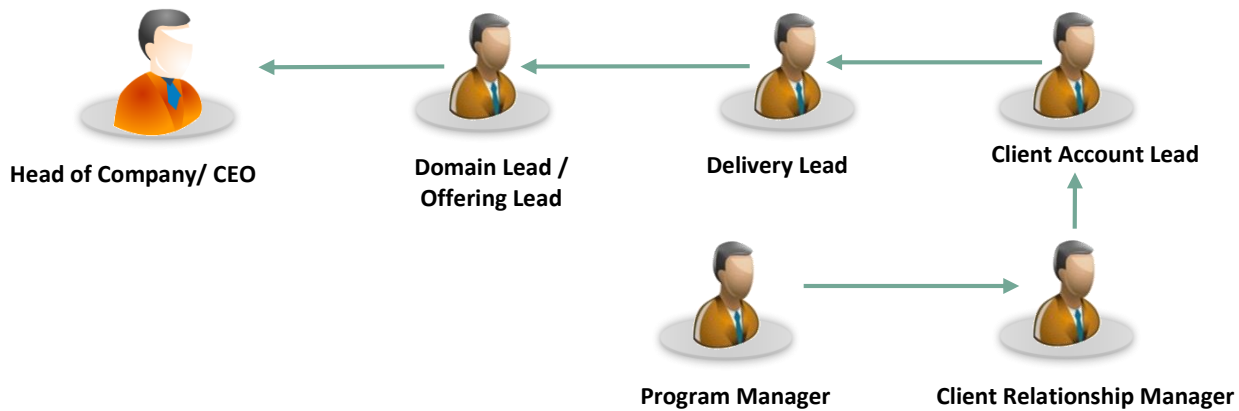
Role of a Project /ProgramManagement professional

- Leads the planning and implementation of projects/program
- Manages project budget and resource allocation
- Manages internal and external stakeholders to ensure smooth completion of project

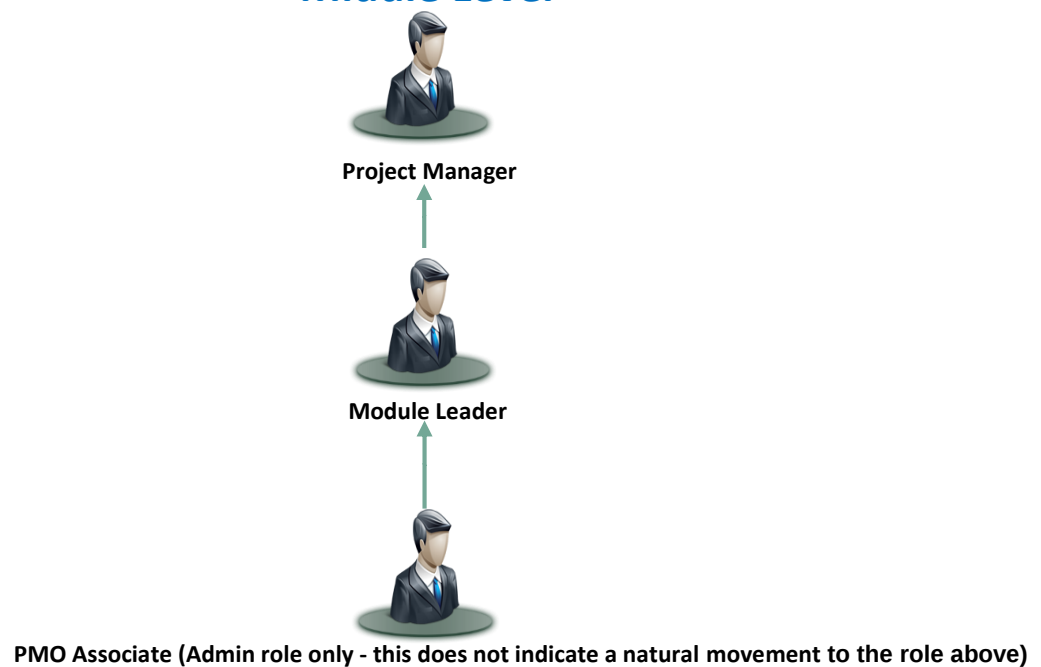
Qualifications and Skills

- Graduate/Postgraduate in any subject
- Experience in managing software development projects
- Excellent communication and presentation skills
- Strong Leadership and stakeholder management skills

Leadership Level



Middle Level



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.

Entry Level

Project/Program Management

Opening doors to 'Sales and Pre-sales



Sales and Pre-sales

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

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 maximize 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 organization. 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.

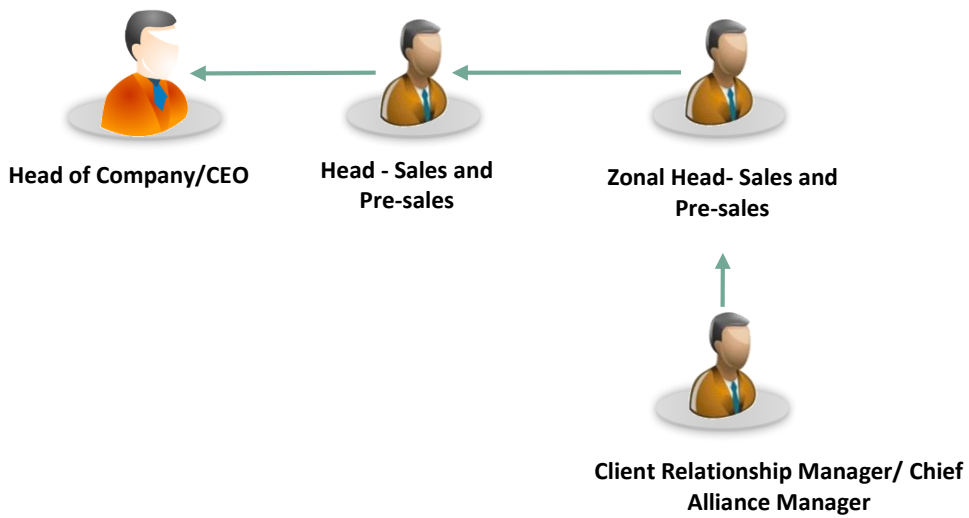
Role of Sales and Pre-sales Professional

- Gathers information about new / changed technical offerings from Business Model & Strategy and Technology Integration and summarizes as per client requirements
- Manages Alliances and relationships with sales partners like ERP product organisations
- Develops demonstrations of the technical and functional capabilities of the organisation to drive sales
- Supports key accounts by conducting demonstrations and defining special agreements with the clients
- Provides inputs about client requirements to product development teams

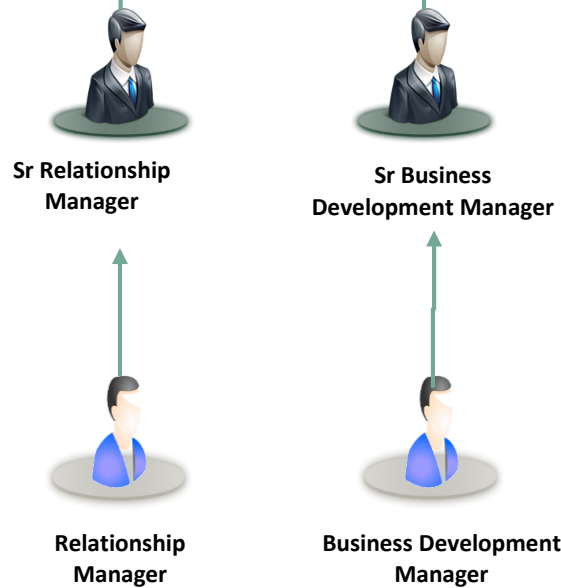
Qualifications and Skills

- Postgraduate in Technology/Management related areas with graduation in Technology areas
- Graduates can move laterally into pre-sales and sales after developing experience and requisite skillset
- Good command over English language
- Action orientation and a go-getter spirit are the key skills needed in a pre-sales and sales profile

Leadership Level



Middle Level

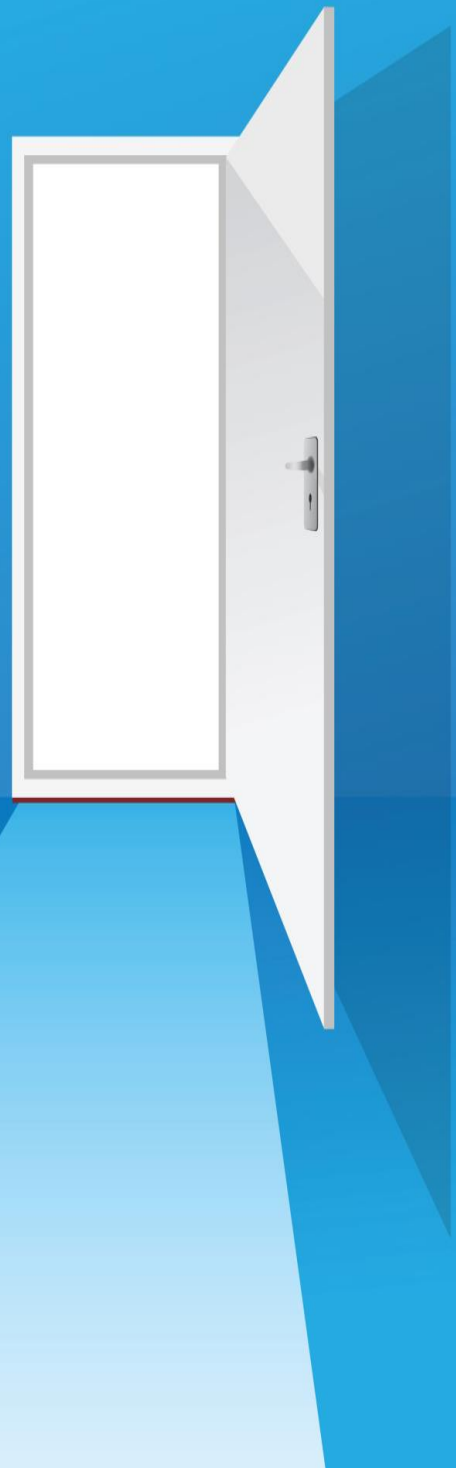


Sales and Pre-sales Analyst

Entry Level

Career Path - Sales and Pre-sales

Opening doors to 'Solution Architecting'



Solution Architecting

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

Role of Solution Architecting Professional

- Creates high as well as low level design components and designs their working with each other as well as independently
- Provides architectural, user interface (UI),and functional design specifications to the development team
- Defines roadmap for capability, shared assets, training plan

Qualifications and Skills

- BCA / MCA or Engineer with certification in relevant areas
- 4-6 years of experience of having worked intensively on the architecture, design and implementation of projects
- Knowledge of architecture principles, design methodologies, best practices and problem troubleshooting techniques
- Solution Architects have advanced skills in the area of Problem Solving and thinking out of the box. Professionals need to be able to have an overall solution and break it to smaller modules for the development/delivery teams to develop and deliver

Leadership Level



Enterprise Architect

Middle Level



Technical Architect
(Solution/ DB/ Application)



Solution Designer

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.

Entry Level

Solution Architecting

Opening doors to 'Testing and QA'



Testing and QA

Testing and QA includes conducting scheduled and unscheduled tests in the areas of integration, performance and application etc. 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 programs like TQM, ISO etc. 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) etc. 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 (QA): QA roles are responsible for setting quality standards for products, systems, and processes within the organization. These roles implement quality norms that are based on industry accepted standards, such as Total Quality Management (TQM), International Standards Organization (ISO) and conduct audits and compliance related activities. Depending upon the organization they may be responsible for conducting a final quality check on every application that is delivered to the client.

Role of Testing and QA Professional

- Develops and coordinates test plans
- Documents, reports and tracks software defects - manually using testing software
- Conducts software compatibility tests with programs, hardware, operating systems, or network environments
- QA professionals design and implement Quality Assurance, norms, standards and guidelines. to be followed across the organisation

Qualifications and Skills

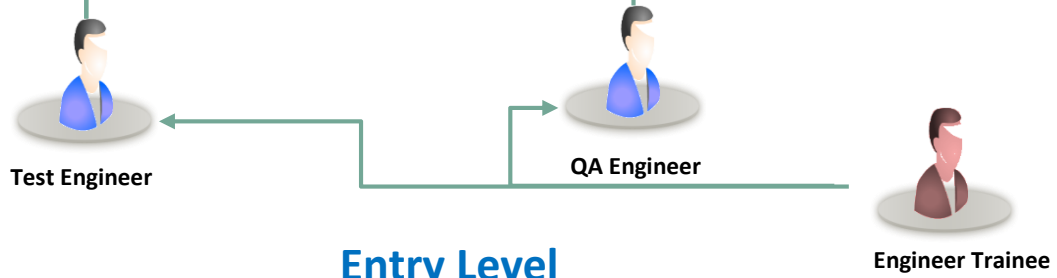
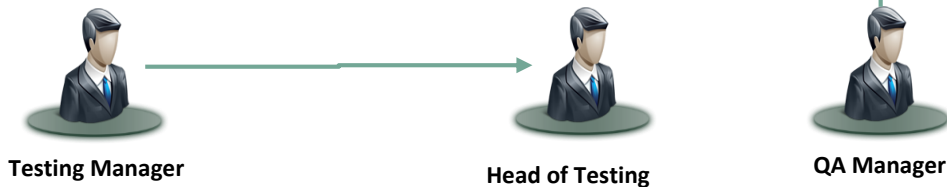
- BCA / MCA or Engineer with certification in relevant areas
- Strong communication skills – written and verbal
- Attention to detail and perseverance are the key skills to success at **Testing** roles

Leadership Level



Head of Quality Assurance

Middle Level



Entry Level

Testing and QA

Opening doors to 'Information Security'



Information Security

Information Security includes the activities relating to protecting information and information systems from unauthorized 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 organization.

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 organization:

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

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

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

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

Incident Management: Incident Management roles work towards restoring normal service operations in an organization to minimize 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 organization. These roles provide organizational capability to build resilience in business processes and IT infrastructure. BCP/DR professionals perform the following functions in an organization (own/client organization):

- 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 etc. for an organization. These roles require knowledge of information security norms and data privacy norms and regulations.

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

IT Forensics: IT Forensics roles collect, process, preserve, analyze 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.

Role of Information Security Professional

- Evaluates risks and develops approach to Information Security solutions
- Installs ,configures, monitors and responds to security system requirements
- Performs daily log keeping, status reporting, analytics on set metrics to report security SLAs on a day to day basis
- Supports administration of various firewalls and security systems
- Creates, implements and maintains Information Security plans and systems for the organisation

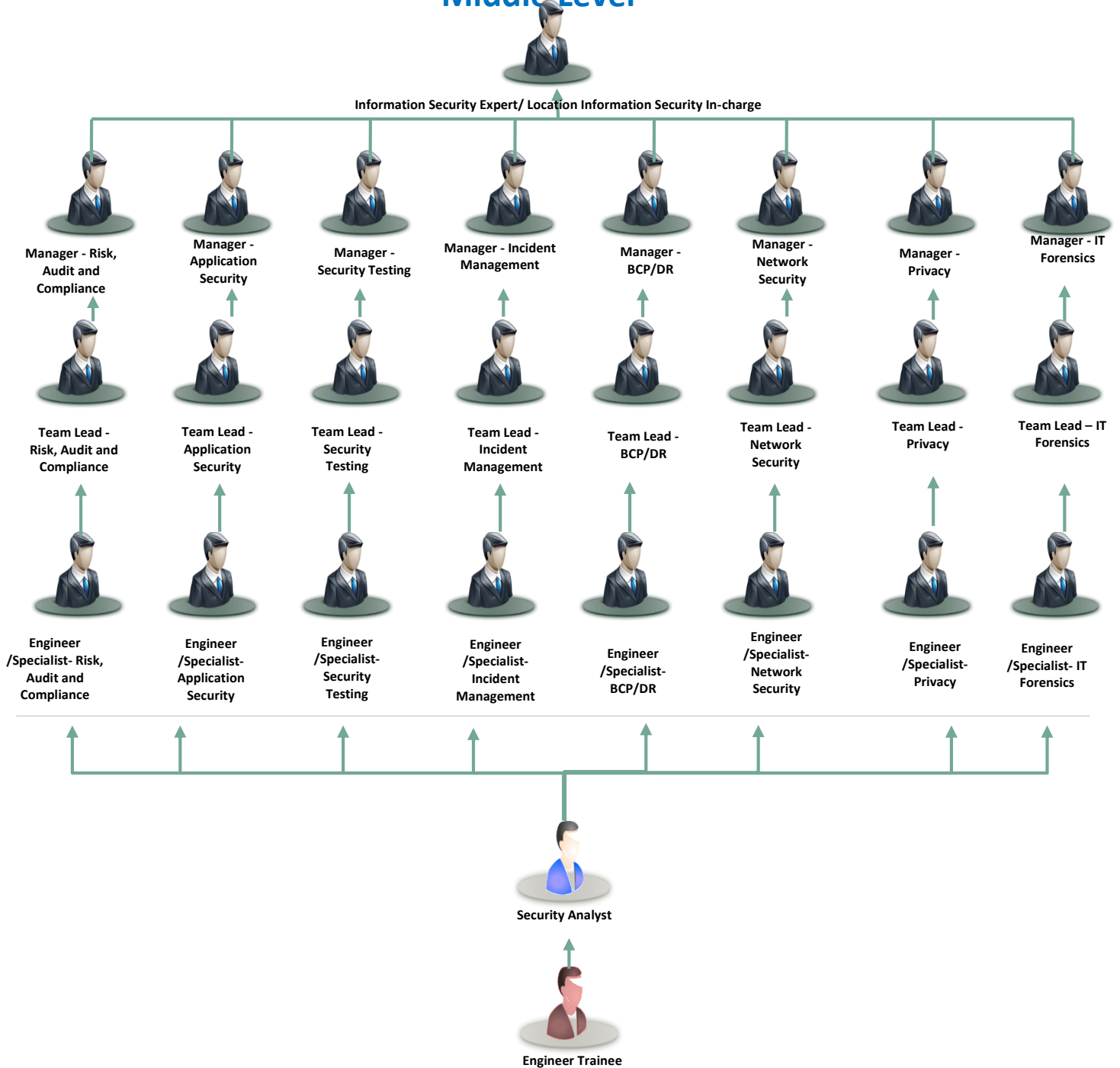
Qualifications and Skills

- BCA / MCA or Engineer in computer, Information systems or related field with certification in Information Security related areas
- Knowledge of Information security principles and practices
- Experience of software and security architecture

Leadership Level



Middle Level



Entry Level

Career Path – Information Security

Movement to Other Occupations, Sub-sectors and Industries

IT Services 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 organization. While some organizations 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 organization'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.

A detailed map indicating possible career movement to related occupations sub-sectors and industries have been highlighted on the following page:

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/Helpdesk ,Solution Architecting	SPD	IT Support roles in any industry
IT Support Services/Helpdesk	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/Helpdesk, 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/Helpdesk	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	NA
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

Figure 38: Movement to Other Occupations, Sub-sectors and Industries

What are the success stories in IT services?





CONRAD COLACO
Manager, Accenture

Entry to IT-ITeS Industry

*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
I added to my knowledge base by undertaking AMDA certifications?*

Career Movement and Growth

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-ITeS Industry

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



CHINMAY PATNAIK

Technical Test Lead, Infosys technologies

Entry to IT-ITeS Industry

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

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

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-ITeS Industry

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



M W Khan
Senior Manager, Accenture

Entry to IT-ITeS Industry

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

I have taken the following certifications:

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

Career Movement and Growth

Wipro: Manager- Business Process Re-Engineering;

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

Was responsible for Leading PMO for a global engagement with about 1000+ resources, responsibility included: Financial Planning and Management, Contract Administration and SQA/Quality Management

Learnings for people looking forward to enter the IT-ITeS Industry

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

