Skill India
कौशल भारत-कुशल भारत

सत्यमेव जयते
GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP

N·S·D·C
National
Skill Development
Corporation
Transforming the skill landscape

Introduction to the Industry, Sub-Sector, Occupation and Job-Role

IT - ITeS SSC
NASSCOM

The IT-ITeS sector - An introduction

IT services - An introduction

Cyber Security - An introduction

Introduction

Key Learning Outcomes

At the end of this unit, you will be able to:

1. Explain relevance of the IT-ITeS industry
2. State the various sub-sectors in the IT-ITeS sector
3. Explain the relevance of IT services sector
4. State the various occupations and tracks in the IT-ITeS sector
5. Explain the relevance of cyber security in the society
6. Explain the basics of cyber security
7. List some key tends in IT security infrastructure
8. Explain the role of a penetration tester
9. List the tasks to be carried out by a penetration tester
10. State and explain solutions, recommendations for network security issues

Topic Plan

The introduction is not based on any NOS, however is important in order to understand the context of the course and the role. It is divided into 3 topics that are further divided into sub-topics as given below:

TOPIC IT-ITeS/BPM industry – An introduction

Relevance of IT-ITeS sector
Sub- Sectors within the IT-BPM industry

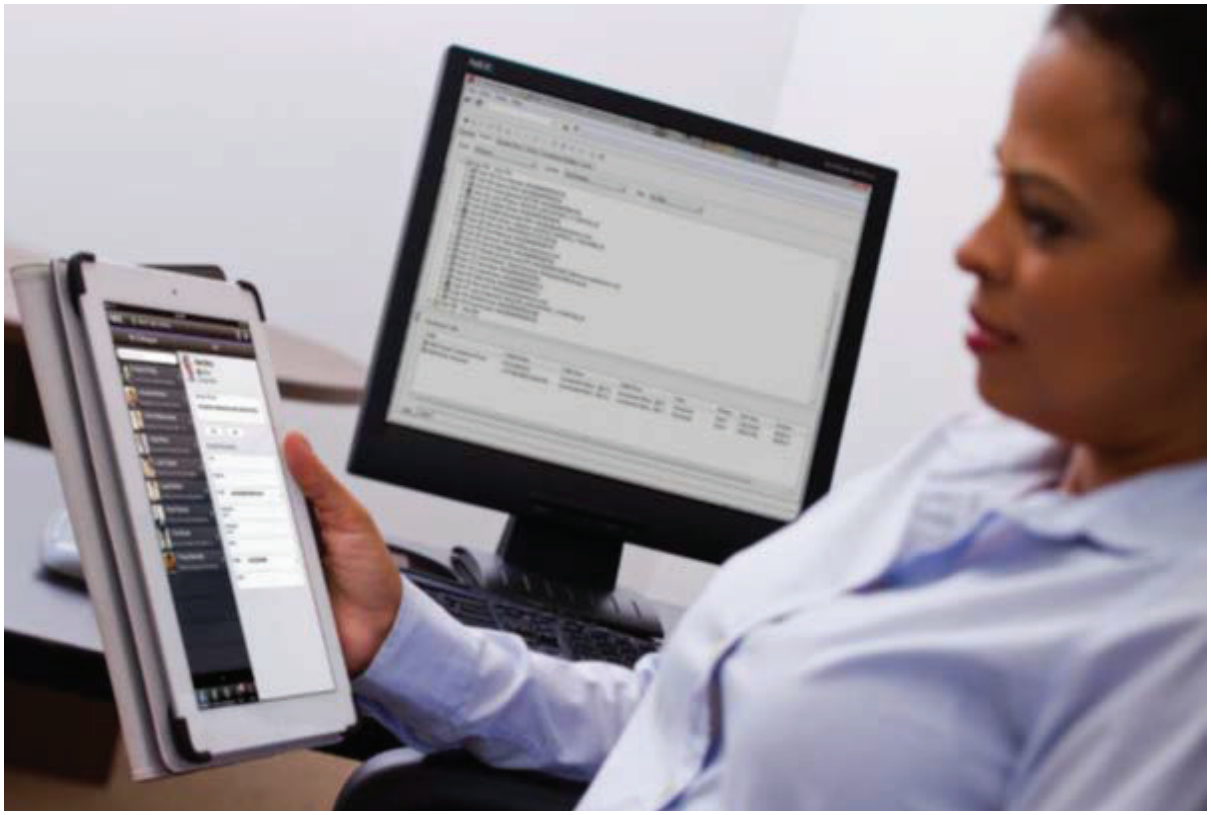
TOPIC IT services – An introduction

IT services sub sector
Occupations and tracks in IT services

TOPIC Information/Cyber Security – An introduction

Information/cyber security – general overview
Information/cyber security career map
Penetration Tester – an introduction
Job role/qualification pack – Penetration Tester

IT-ITeS/BPM Sector – An Introduction



This topic presents the knowledge and conceptual understanding of the IT-ITeS Industry. It will help explain the context of the role that this course is preparing the learner for, it's positioning in the sector and relevance to society. The purpose of providing the learner with this information is to enhance the learner's motivation and interest in taking up this training and the role.

Unit Objectives

At the end of this unit, the learner will be able to know and understand:

1. A general overview of the IT-BPM industry
2. About the organizations within IT-BPM industry
3. Various sub-sectors within the IT-BPM industry

A Snapshot of the Indian IT-BPM industry

Key sector for India

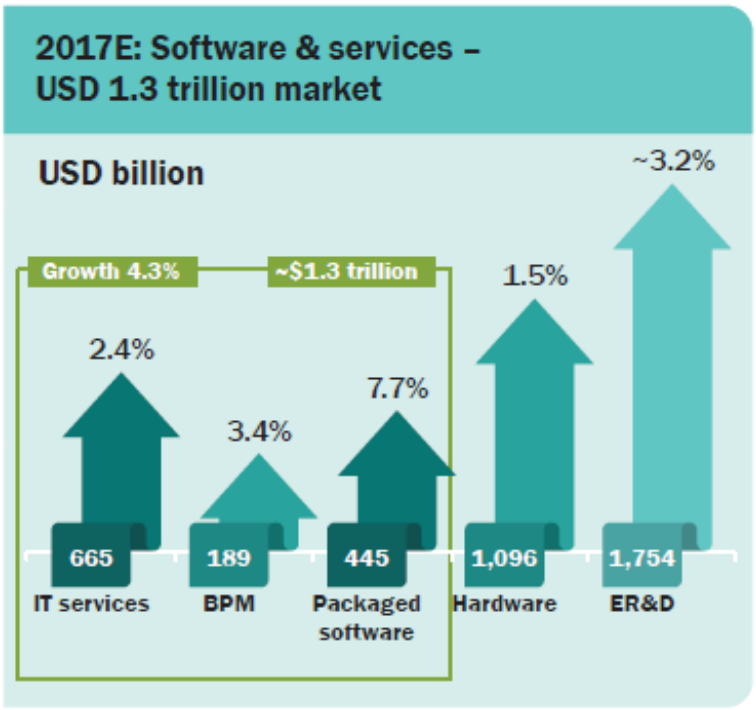
NASSCOM®

Industry Snapshot in Fiscal 2018

7.9%	Relative to India's GDP	No. 1	Global Sourcing Destination – 55% share	Global In-house Centres	1140+
~50%	Contributor to India's export basket	~17000	Firms in India	Fast growing domestic market	41 USD bn
~30%	Share of India's forex reserves	167 USD bn	Industry revenue	Vibrant Start-up Ecosystem	3rd largest
~11%	Share of FDI Inflows into India	~4 mn	Employees; 3X impact on indirect jobs	Rapidly growing internet base[1]	481 mn
1st	Largest employer of women in private sector	18-20%	Digital Revenues	Strong focus on diversity and inclusion	34+% women

As of Dec 2017 (IAMAI)

Global IT-BPM industry



Source: IDC

In 2017, global IT-BPM industry stood at USD 1.3 trillion (excl. hardware) showing a growth of 4.3% over 2016:

- IT services grew a modest 2.4% driven by the continuous need for digital solutions
- BPM (3.4%) saw greater implementations of RPA
- Packaged software: Was the fastest growth segment (7.7%) - SaaS driving growth esp. FMS, HCM, analytics
- Hardware segment grew 1.5% to cross USD 1 trillion
- Global ER&D spend saw a decent 3.2% growth (as compared to previous two years which saw more or less flat growth); the push for autonomous vehicles & equipment, connectivity and smart products were key growth drivers

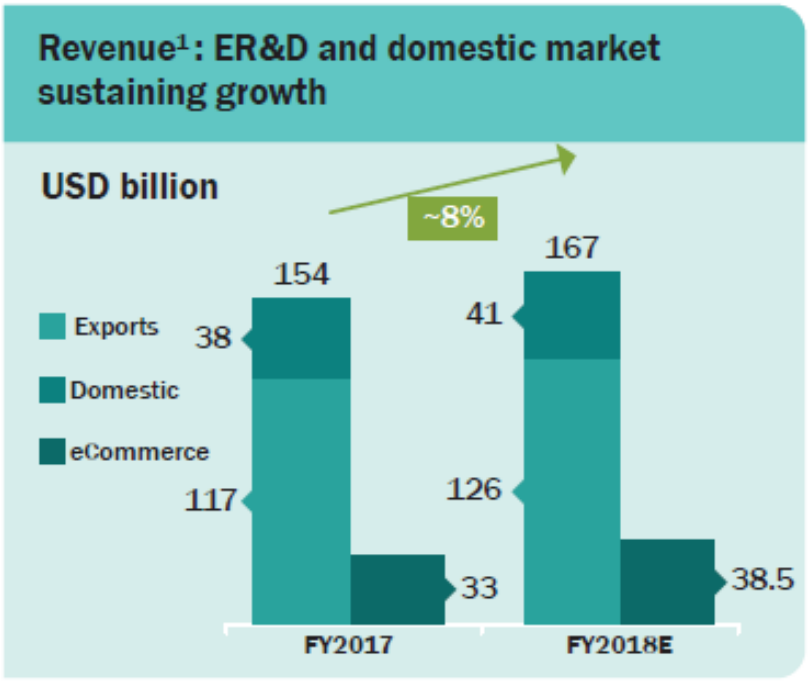
Global sourcing growth outperformed global IT-BPM spend growth in 2017, global sourcing grew 1.4X to reach USD 185-190 billion. India continued as the world's No.1 sourcing destination with a share of 55 per cent. 271 new global delivery centres were set up worldwide (by US headquartered firms) in 2017 - India accounted for 24% share and Europe (29%).

Indian IT-BPM industry growth and diversification

India's IT-BPM industry is set to grow ~8% in FY2018 – from USD 154 billion in FY2017 to USD 167 billion (excl. eCommerce), an addition of USD 13 billion. Share in total service exports is estimated at >45% and the industry's contribution relative to India's GDP is ~7.9%. Overall, the industry is estimated to employ 3.97 million people, an addition of 105,000 people over FY2017.

The industry comprises 17,000+ firms that offer a complete range of services. In the age of digital technologies, the industry has been adept at building the necessary skills and capabilities to address new and changing customer demands. Over the past few years, firms have made substantial investments in building their portfolio of capabilities around these technologies and have set up a number of labs and CoEs to deliver digital services to customers. Consequently, the industry is now well equipped to manage the stage of Bi-modal IT. While Global sourcing growth outperformed global IT-BPM spend growth in 2017, global sourcing grew 1.4X to reach USD 185-190 billion. India continued as the world's No.1 sourcing destination with a share of 55 per cent. 271 new global delivery centres were set up worldwide (by US headquartered firms) in 2017 - India accounted for 24% share and Europe (29%). currently the traditional services (ISO, CADM, software testing, F&A, HRO, etc.) continue to have a

major share of revenue (~80%), the share of digital revenue is increasing rapidly. From about 14% in FY2016, it is now 18+% and is expected to reach 38% by 2025.



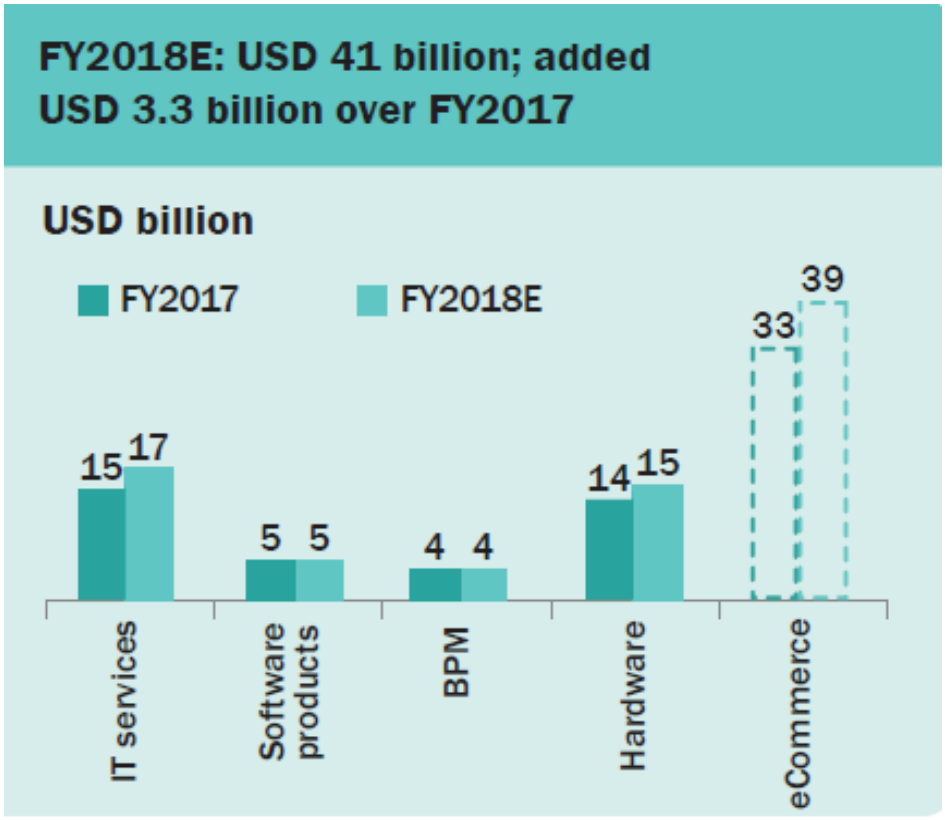
Source: NASSCOM, E: Estimate

The industry also has an ever-growing set of start-ups – 5,000-5,200 – making India the world 3rd largest start-up ecosystem. Many of these are digital first companies and are working on very niche technologies like – AI, blockchain, robotics, etc.

Indian IT-BPM exports

In FY2018, IT-BPM exports from India are expected to reach USD 126 billion, a 7.7% growth over FY2017 and an addition of USD 9 billion. ER&D and product development continues to be the fastest growing segment at 12.8% driven by the demand for AECS-autonomous, electrification, connectivity

and shared mobility. IT services growing at ~6% driven by growth in software testing and ISO (hosted applications). BPM exports expected to grow faster vis-à-vis FY2017, at 8%; analytics, RPA, chat-bots emerging as areas of growth.

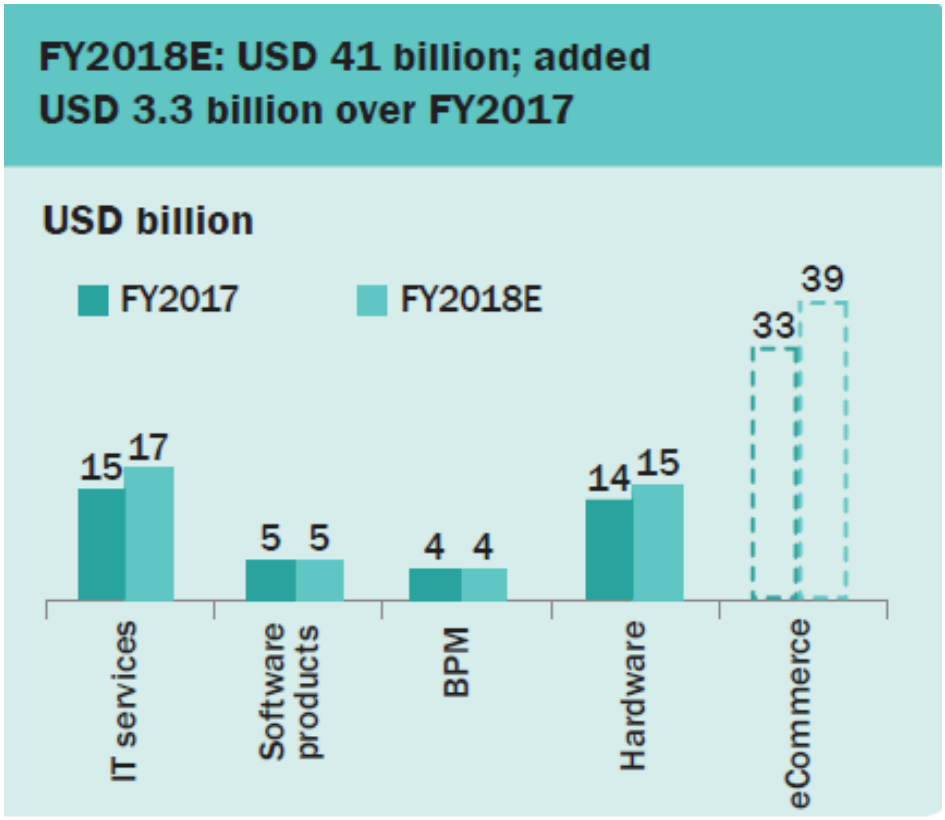


Source: NASSCOM, E: Estimate

Indian IT-BPM domestic market

Domestic IT-BPM industry is also seeing continued growth as various government initiatives encourage technology usage and Indian enterprises rapidly implement digital technologies:

- Government: Technology adoption for its citizen and inter-departmental services
- Enterprises: M-wallets/m-banking for financial inclusion; digital marketing; online payments; analytics; automotive (EV/autonomous vehicles); etc.
- Smart projects: Smart cities, transportation, utilities, buildings, etc.
- Consumers: India is a growing internet market (2016 market size – USD 100-130 billion) and app (2016-USD 21 billion) economy. India is the world's 2nd largest in terms of number app downloads (11+ billion in 2017, a 215% growth over 2016. Internet subscribers stood at ~465 million in 2017
- eCommerce: At USD 38.5 billion, is seen to grow nearly 17% y-o-y. After a slow start in 2017, eCommerce bounced back due to an increase in online transactions to counter the note ban, supported further by the government's push for a cashless economy. Total funding grew >180%; M&A landscape was strong and witnessed some big-ticket deals; 2017 also witnessed the comeback of grocery retail and food-tech



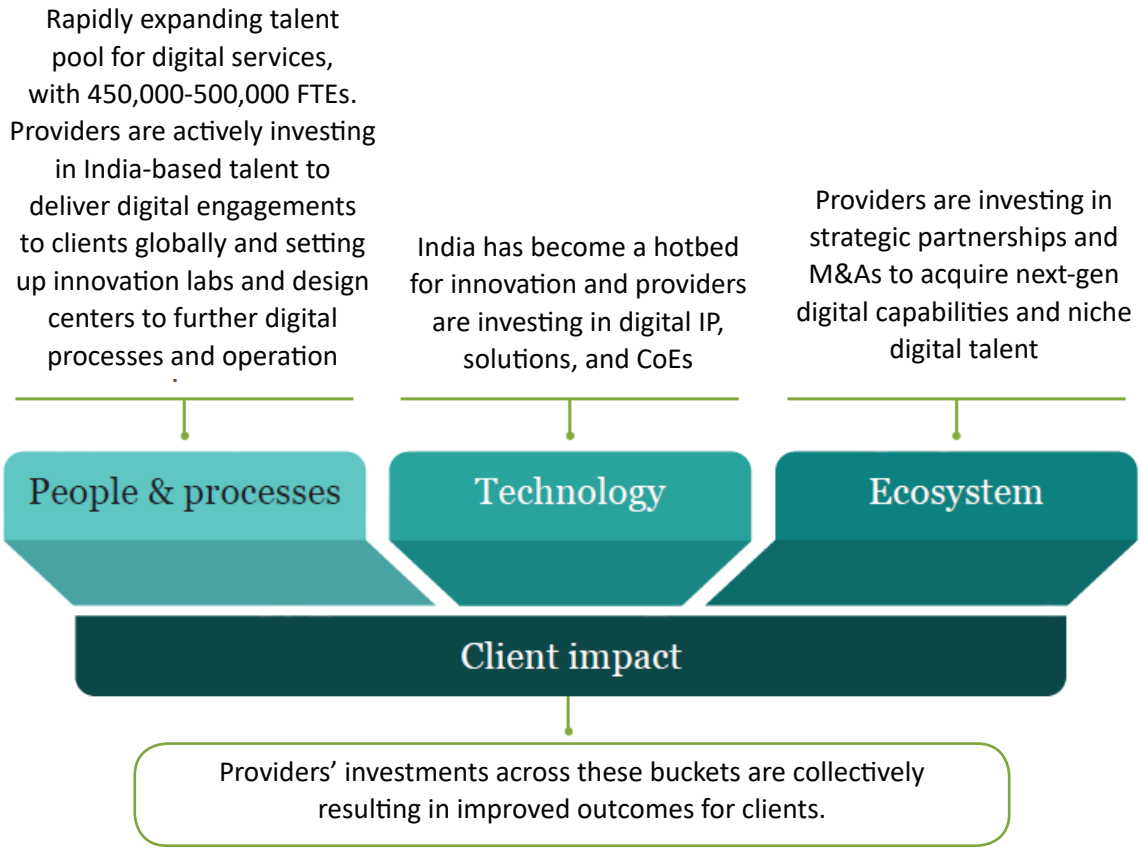
Source: NASSCOM, E: Estimate

Software products: (4.5 per cent y-o-y growth) and IT services (3.9 per cent) are expected to be thefastest growing segments. Software products is being driven by increased adoption of SaaS and cloud and availability of verticalised solutions. IT services growth is due to demand from IS outsourcing and cloud services as also the GOI's Digital India and eGovernance agenda. BPM is being driven by BFSI, telecom eCommerce; also, growing consumption pattern in Tier II/III cities and rural areas is translating into opportunity for value-added services.

eCommerce: eCommerce, a USD 16.7 billion market in FY2016, is set to achieve close to 20 per cent y-o-y growth. eTravel continues to be the flagship segment; eTailing is the fastest growing.

SMART Nation: Following in practice the well-known phrase "You must be the change you want to see in the world", the Government of India is spearheading various initiatives (both internal and citizen facing) that would use technology as the foundation to service its citizens – Digital India, NEGP 2.0, Smart & Safe cities, Digital village, etc.

India's value proposition



India's value proposition for the global technology industry is steadily shifting towards offering end-to-end digital technologies. India is setting itself up as the Digital capabilities hub for the world:

- 8,100+ firms offering digital solutions
- Boasts of a digitally skilled talent pool of 450,000-500,000
- Accounts for ~75% of global digital talent
- Indian IT-BPM firms: 18-20% share of digital in total revenue

Firms are developing an entire portfolio of digital capabilities through various initiatives:

Internal: Re-skilling/up-skilling employees at speed and scale, organisational re-structuring (vertical-specific and digital BUs), setting up CoEs/Labs dedicated to niche technologies, business model shifts (as-a-service, platformisation, risk-reward pricing, etc.)

External: M&As to scale access to talent, markets, customers; partnerships with startups (niche capabilities), academia (talent development and R&D), peer companies (white spaces, etc.)

Apart from this, India continues to be the leader in terms of: cost arbitrage (5X-6X cheaper than the US), has global presence (80+ countries), a fast-growing domestic market (USD 41 billion) and a potential consumer market (1.3 billion population).

All these factors combined are enabling India to maintain its position as the world's No. 1 preferred location for offshoring with a share of 55% in global souring.

IT Services Sub Sector – An Introduction

This topic presents the knowledge and conceptual understanding of the IT-ITeS Industry. It will help explain the context of the role that this course is preparing the learner for, it's positioning in the sector and relevance to society. The purpose of providing the learner with this information is to enhance the learner's motivation and interest in taking up this training and the role.

Unit Objectives

At the end of this unit you will be able to know:

1. General overview of the IT services sub-sector
2. Profile of the IT services sub-sector
3. Key trends in the IT services sub-sector
4. Roles in the IT services sub-sector

IT Services Sub- Sector

General overview

IT Services (ITS) sub-sector involves a range of engagement types that include consulting, systems integration, IT outsourcing/managed services/hosting services, training and support/maintenance. Here is a brief profile of the sub-sector.

Vertical Profile

BFSI is the largest driver in this space, claiming half of the entire IT Services export, while Healthcare, Retail and media have also emerged as key verticals

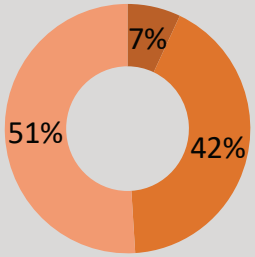
The sector has expanded to provide end-to-end IT solution, including consulting, testing services, infrastructure services and system integration

Customer Profile

Horizontal Profile

While North America continues to be a major importer of Indian IT services, Latin America, Asia-Pacific, and Europe also have major client bases

Share of IT Exports Sub-sector



Project-based Services and Outsourcing are the largest segments in the ITS sub-sector. While the overall revenue of the contribution of each area has remained steady.

- Support and Training
- Project-oriented
- Outsourcing

Fig. Profile of IT Services Sub-sector, Source: IT-ITeS Sector Skill Council NASSCOM

Key trends in the IT services sub-sector

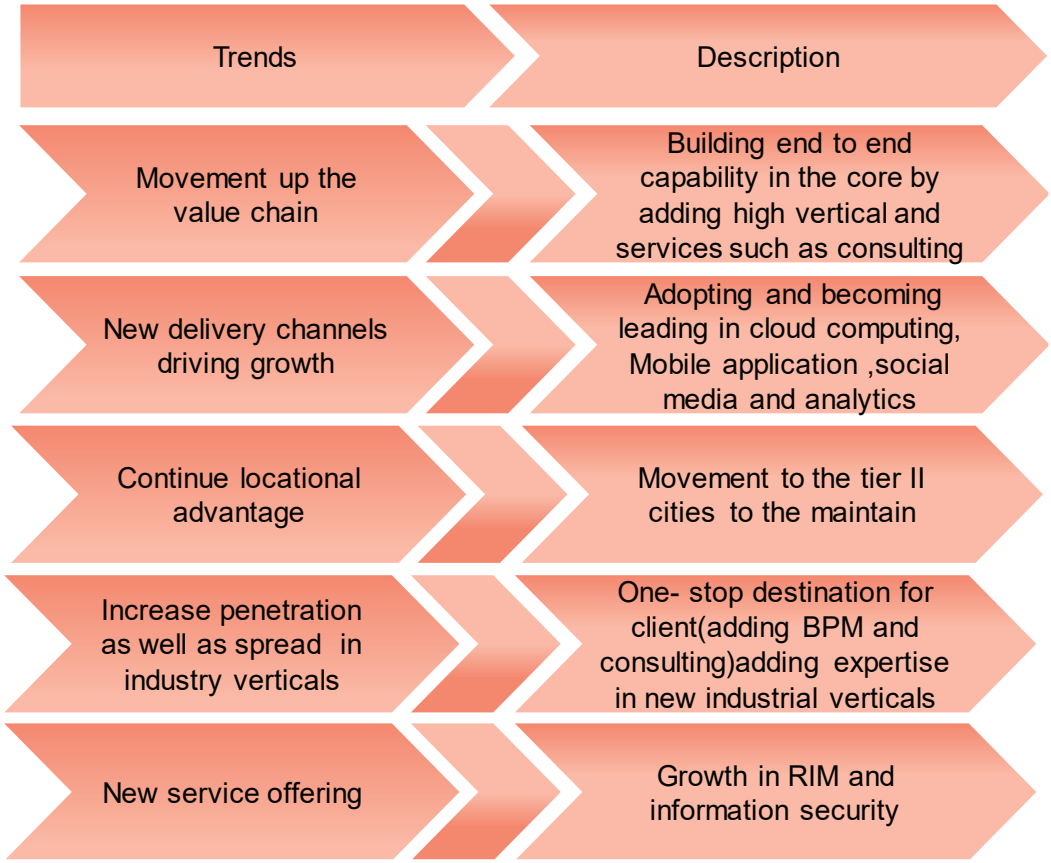


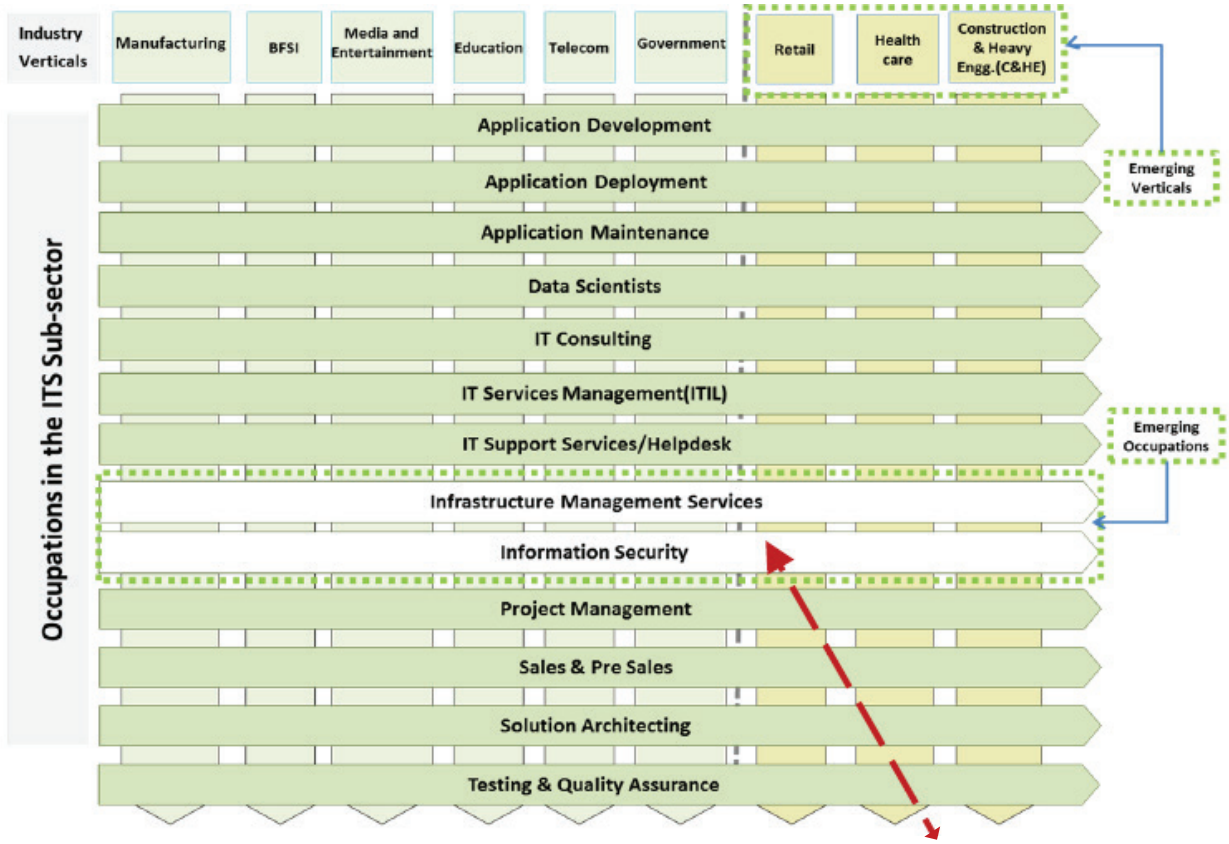
Fig. Trends in the IT Services, Source: IT-ITeS Sector Skill Council NASSCOM

Learning opportunities

The ITS sub-sector is a knowledge-intensive industry, providing ample opportunities to learn and grow.

- 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 employees needing to learn new skills
- Organizations are looking to acquaint the employees with domain-specific (Retail, Manufacturing, Insurance, etc.) knowledge

Occupations and tracks within the IT services sub-sector



Note: All the Horizontals - Occupations, Tracks and Job Roles cut across the Industry Verticals.

Fig. IT Services Sub Sector: Matrix Structure, Source: IT-ITeS Sector Skill Council NASSCOM

Penetration Tester is from the Occupation "Information Security" under the IT Services

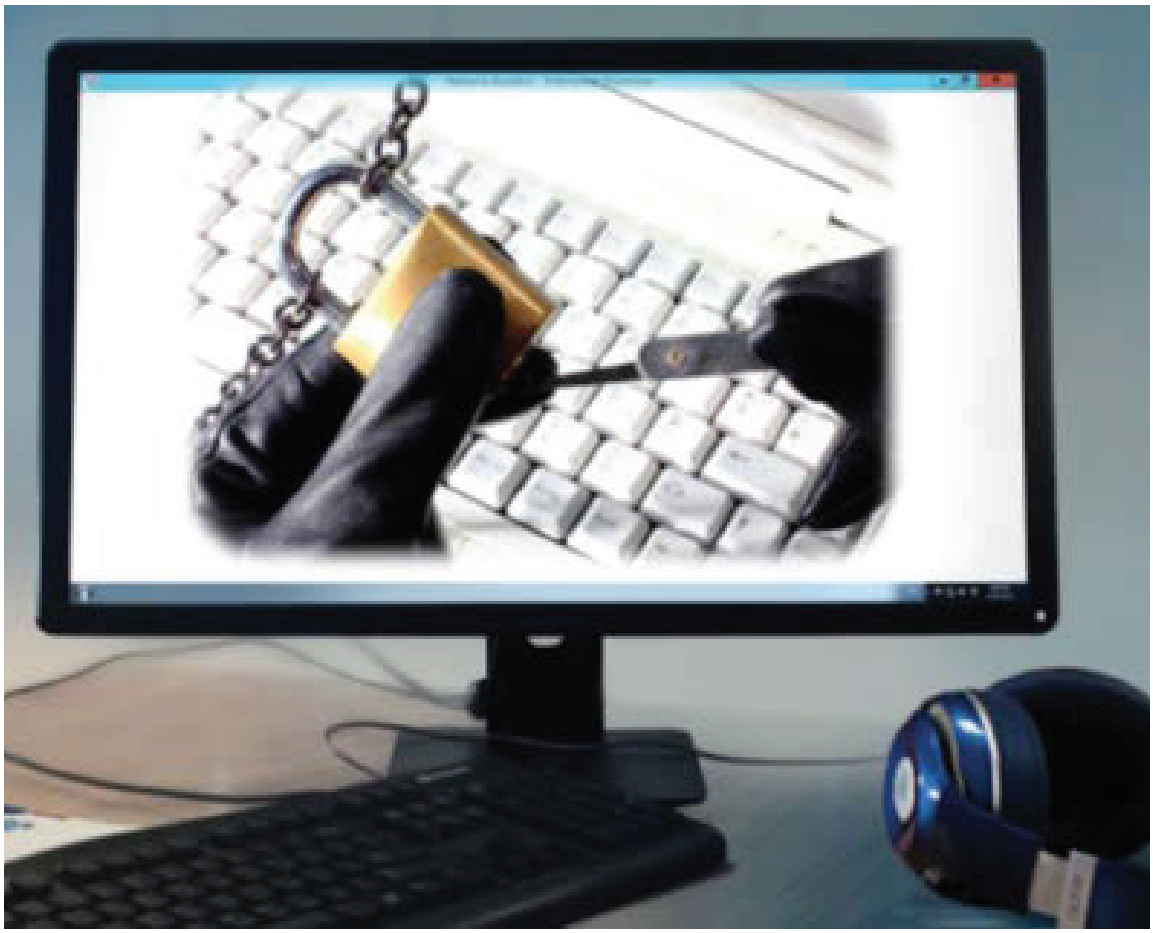
Occupations, tracks and verticals

For most entry-level job roles, there is a possibility of a vertical or horizontal movement in their tracks and also into other occupations

Occupation	Tracks	Entry-level Job Roles	
Application Development	Software Development	Software Developer	Engineer Trainee
	Functional Development		
	UI Development	UI Developer	
	Web Development	Web Developer	
	Media Development	Media Developer	
	Technical Documentation	Technical Writer	
	Language/Translation	Language Translator	
Application Deployment	Application Deployment	Deployment Engineer	Engineer Trainee
Application Maintenance	Application Maintenance	Application Maintenance Engineer	
Data Scientists	Data Scientist	Junior Data Associate	
IT Consulting	Technology Consulting	Analyst	
	Technical Functional		
IT Service Management	IT Service Management	-	
IT Support Services/Help Desk	IT Support Services/Help Desk	Engineer - Technical Support (Level 1)	Domestic IT Helpdesk Attendant
Infrastructure Management Services (IMS)	Storage Management	Infrastructure Engineer	Systems Trainee/ Engineer Trainee
	Network Management		
	Server Management		
	Messaging and Collaboration		
	Security Management		
	End-user Devices Management		
	Infrastructure Applications Management		
	Infrastructure Tools Management		
	Services Management		
	Database Management		
	Field Support		
Information Security	Application Security	Security Analyst	Security Trainee (Security Engineer)
	Risk Management, Audit and Compliance		
	Security Testing		
	Incident Management		
	BCP/DR		
	Network Security Management		
	IT Forensics		
Project Management/ Programme Management	Project Management/Programme Management	-	
Sales and Pre-sales	Business Development	Sales and Pre-sales Analyst	
	Relationship Management/ Alliance Management		
Solution Architecting	Solution Architecting	-	
Testing and QA	Manual Testing	Test Engineer	Engineer Trainee
	Automated Testing		
	Quality Assurance	QA Engineer	

Fig. Occupations, Track and Verticals in IT Services, Source: IT-ITeS Sector Skill Council NASSCOM

Information/Cyber Security – An Introduction



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Unit Objectives

At the end of this unit you will be able to know:

1. General overview of information/cyber security and its roles
2. Career map for information/cyber security

Information/Cyber Security – General Overview

The key objective of Information/Cyber Security is the protection of information and its critical elements, including the systems and hardware that create, use, store, transmit and delete that information.

Through the selection and application of appropriate safeguards, Information/Cyber Security helps the organization's mission by protecting its physical and financial resources, reputation, legal position, employees, and other tangible and intangible assets. It is the practice of defending information from unauthorized access, use, disclosure, disruption, modification, perusal, inspection, recording or destruction.

The Key Tracks that comprise of Information/Cyber security are

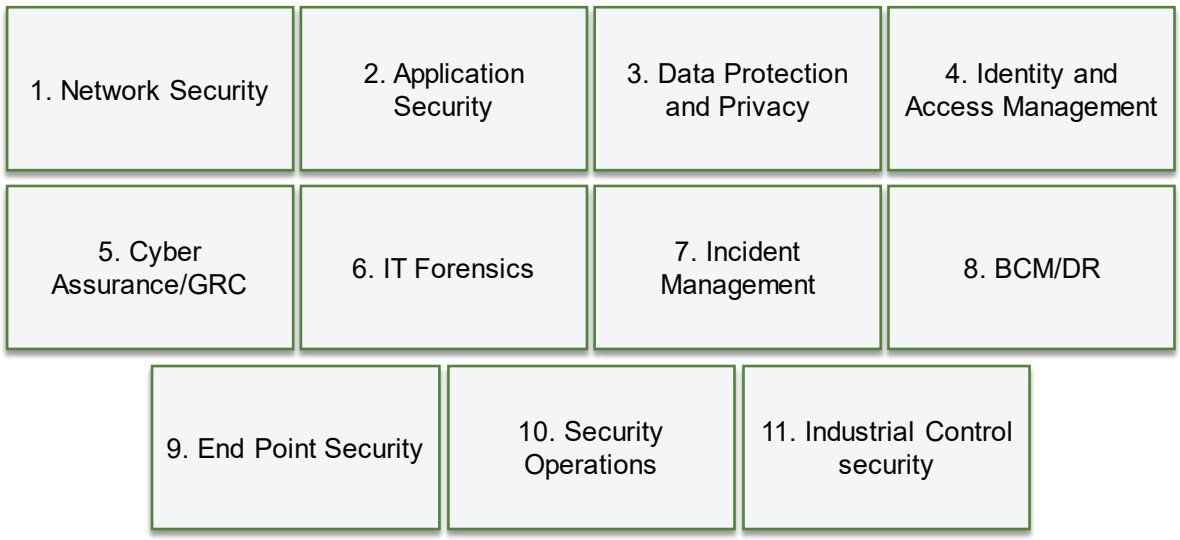

Fig. Key Tracks in Information/Cyber Security, Source: IT-ITeS Sector Skill Council NASSCOM

The organisations, and hence job roles in Information/Cyber Security fall under the following categories:

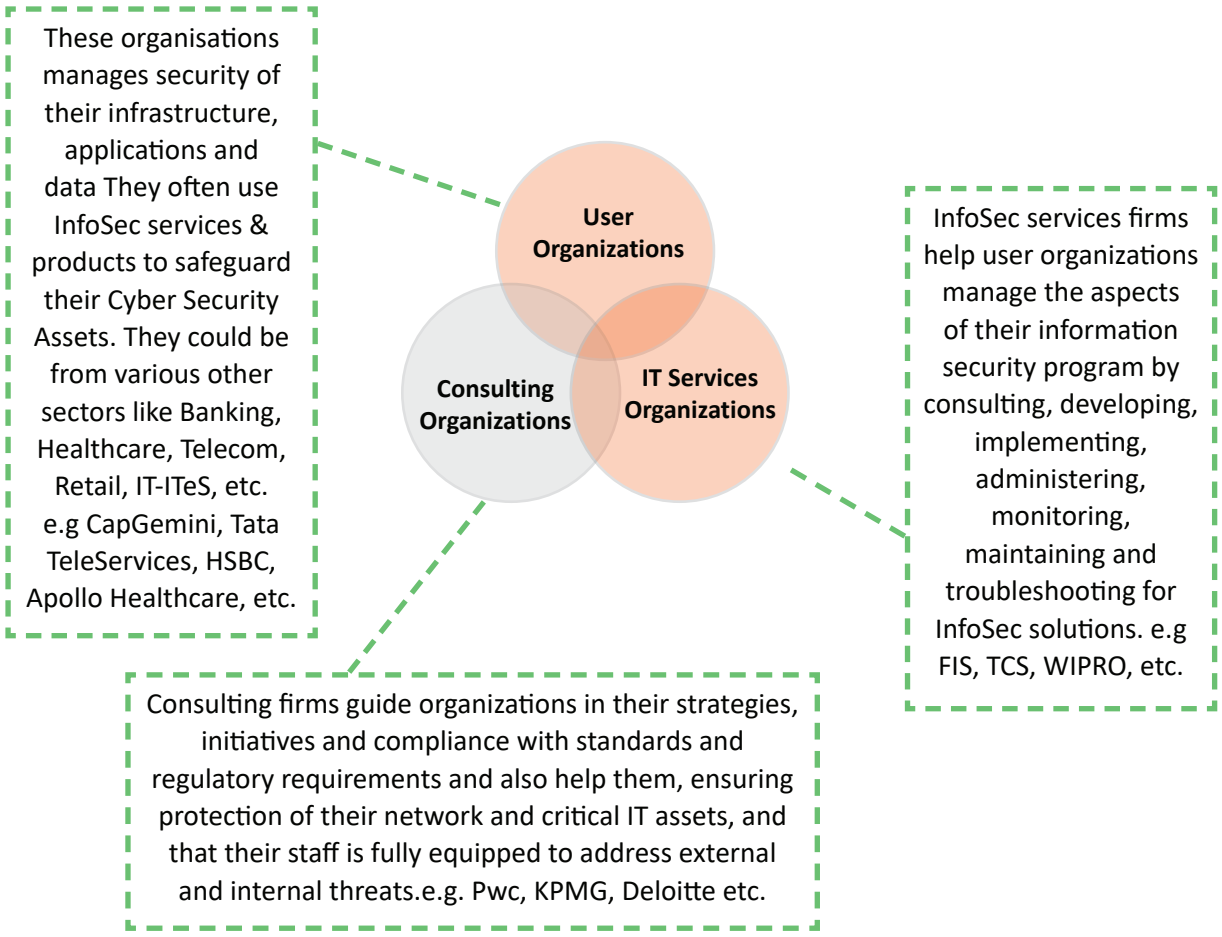

Fig. Types of organisations in Cyber Security, Source; IT-ITeS Sector Skill Council NASSCOM

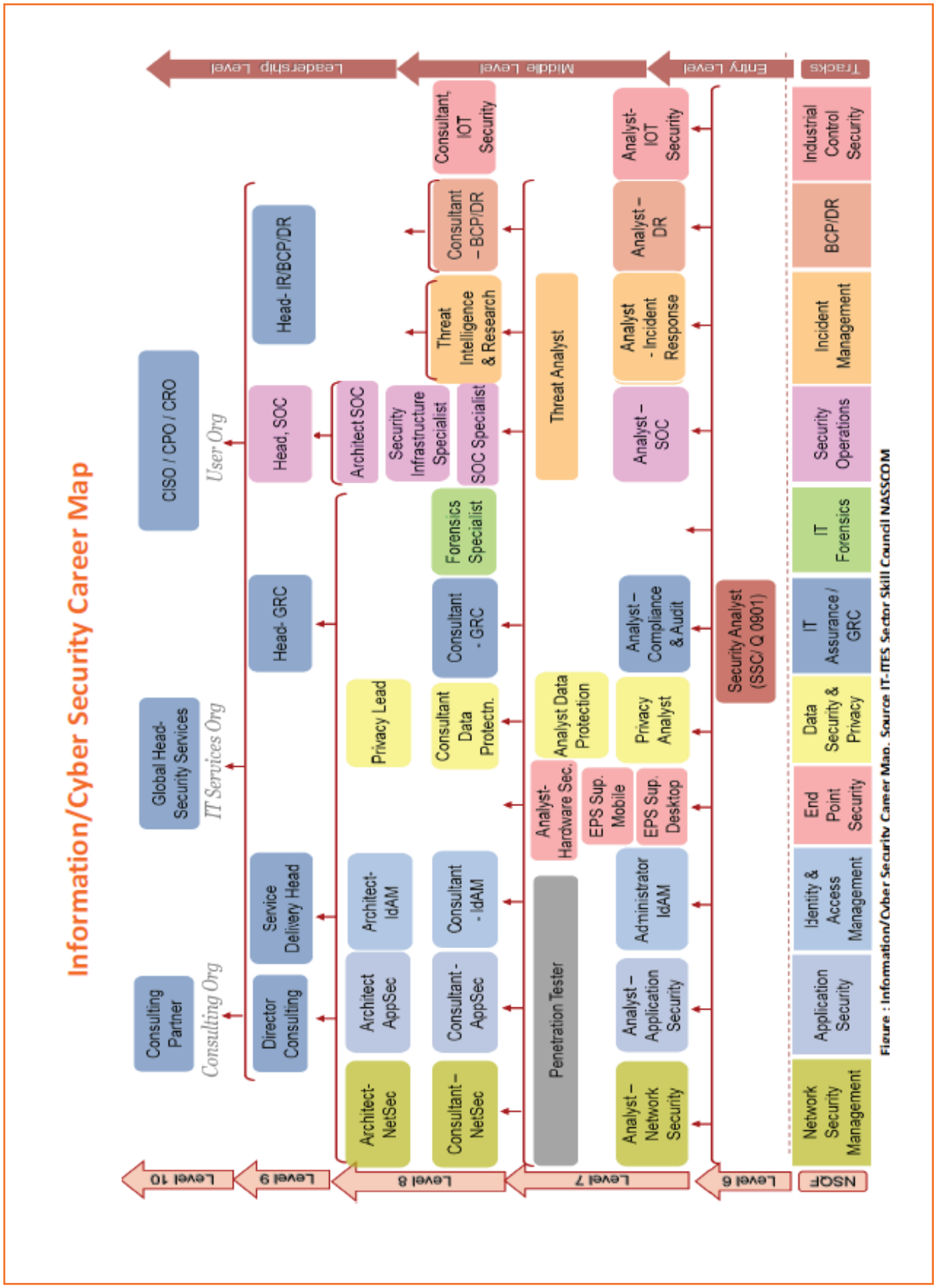

Figure : Information/Cyber Security Career Map, Source IT-ITES Sector Skill Council NASSCOM

At the bottom of the Information/Cyber Security Career Map are the key tracks that were mentioned earlier. A brief description of is as follows:

1. Network Security	to protect networking components, connections, and contents from unauthorized access, misuse, malfunction, modification, destruction, or improper disclosure.
2. Application Security	to protect various applications or the underlying system (vulnerabilities) from external threats or flaws in the design, development, deployment, upgrade, or maintenance.
3. Data Prevention & Privacy	to prevent unauthorized access to computers, databases and websites and protect data from corruption. It also includes protective digital privacy measures.
4. Identity and Access Management	to enable the right individuals to access the right resources at the right times for the right reasons by authentication and authorisation of identities and access.
5. Cyber Assurance / GRC	to develop and administer processes for Governance, Risk and Compliance
6. IT - Forensics	to collect analyse and report on digital data in a way that is legally admissible. It can be used in the detection and prevention of crime and in any dispute where evidence is stored digitally
7. Incident Management	to manage information security incidents and identify, analyze, and correct hazards to prevent a future re-occurrence
8. BCM/DR	to develop and administer processes for creating systems of prevention and recovery to deal with potential threats to a company thus protecting the protecting an organization from the effects of significant negative events
9. End Point Securtiy	to protect the corporate network when accessed via remote devices such as laptops or other wireless and mobile devices. Each device with a remote connecting to the network creates a potential entry point for security threats.
10. Securtiy Operations	to monitor, assess and defend enterprise information systems (websites, applications, databases, data centers and servers, networks, desktops, etc.)
11. Industrial Control Security	to secure control systems used in industrial production, including supervisory control and data acquisition (SCADA) systems, distributed control systems (DCS), and other smaller control system configurations such as programmable logic controllers (PLC) often found in the industrial sectors and critical infrastructure

Penetration Tester - An Introduction

Information security is changing at lightning speed. Hackers are progressively tireless, making the response to data security incidents a perpetually complex challenge. Point arrangements (antivirus, IDS, IPS, fixing and encryption, and so on.) remain a key control for combating the present known assaults; however, they become less effective over time as hackers find new ways to circumvent controls. Preparing for known attacks is hard enough. Getting ready for known assaults is sufficiently hard. however, they become less effective over time as hackers find new ways to circumvent controls. Preparing for known attacks is hard enough. Organizations may not be able to control when information security incidents occur, but they can control how they respond to them.

For every organization, IT infrastructure has become essential to provide various solutions, using modern tools and techniques, but it is not aloof from vulnerability, disruption, and potential attack. Threats in information technology are multifarious and affected various components such as operating systems, computer systems, networks, wireless technologies, software applications, the Intranet, and the internet.

To manage various threats and bring efficiencies to the whole IT landscapes, tools and technologies are highly required. But sometimes, various components that comprise organization's IT infrastructure, which need to be protected in a systematic manner. To maintain the degree of security across IT landscape, we need of tools & technology for it infrastructure management.

Moreover, Operating systems, applications, and network protocols have become so complex over the last decade that requires dedicated security administrator to safeguard the IT infrastructure. The advancement of technology has also brought about innumerable security holes.

Big organizations are required to be aware of the increasing threats at the disposal cybercriminals. Cybercriminals use various attack techniques to get what they need in a network of the organization.

A penetration testing (PT) is a technical approach which explores and exploits vulnerabilities. This technique confirms the actual existence of vulnerability and proves that exploiting it leads to the application damage or network damage. As an intrusive process, it causes damage to the systems. Before initiating PT, a lot of precautions need to be undertaken.

Pen-test is different from security functional testing. The latter validates the correct behavior of the system's security controls while Pen-test determines the trouble for somebody to penetrate security controls of an organization against illegal access to its information and information systems.

Organizations are required to engage in conducting penetration testing with a view to:

- Identify gaps between security tools
- Discover backdoors and misconfiguration
- Test against multiple attack vectors
- Confirm the value of your investment
- Prioritize risks in order of importance, so they can be handled appropriately
- Improve security response time
- Provide a great deal of useful information when you're measuring your company's overall security risk.
- Provide a unique macro-level view of your entire security posture through micro-level tests

Organizational Structure of Penetration Testing

Penetration testing has become the need of the hour. Every organization comes across various threats and vulnerabilities. In an organization, penetration testing is done by two methods: Internal and external. To ensure the level of security, organizations are required to use both internal and external penetration testing techniques. In recent times, a wide range of penetration testing services are offered by penetration testing vendors to ensure the level of security across the IT landscape.

Job Role – Penetration Tester

Penetration Tester - This job role is responsible for performing penetration testing for applications, networks, and systems. The main duties consist of testing and identifying the vulnerabilities in applications, networks, and computer systems, then integrating the test results into a report, enhancing the testing tools and existing security services.

This job may require the individual to work independently and take decisions for his/her own area of work. The individual should have a high level of analytical thinking ability, passion for information security and attention for detail, should be ethical, compliance and result oriented, should also be able to demonstrate interpersonal skills, along with willingness to undertake desk-based job with long working hours

Let's Summarize

The IT-BPM industry is the fastest growing industry, not only in India but across the world, providing growth impetus to the various sectors. The various types of Organizations in the IT-BPM industry include:

- Multi-national Companies (MNCs)
- Indian Service Providers (ISPs)
- Global In-house Centre (GIC)

The 4 Sub-Sectors within the IT-BPM sectors are:

1. IT – Services
2. Business Process Management
3. Engineering and R&D
4. Software Products

IT Services (ITS) sub-sector involves a range of engagement types that include consulting, systems integration, IT outsourcing/managed services/hosting services, training and support maintenance. The ITS sub-sector is a knowledge-intensive industry, providing ample opportunities to learn and grow.

The various Occupation under the IT-Services Sub-Sector are:

- Application Deployment
- Application Maintenance
- Data Scientists
- IT Consulting IT Service Management
- IT Support Services/Help Des
- Infrastructure Management Services (IMS)
- Information Security
- Project Management/Program Management
- Sales and Pre-sales
- Solution Architecting
- Testing and QA

The key objective of **Information/Cyber Security** is the protection of information and its critical elements, including the systems and hardware that create, use, store, transmit and delete that information. The Key Tracks that comprise of Information/Cyber security are:

- Network Security
- Application Security
- Identity and Access Management
- End Point Security
- Data Security and Privacy
- Cyber Assurance / GRC
- IT Forensics
- Incident Management
- Security Operations

Exercise

1. What is Cybersecurity? How to build a Cybersecurity strategy?

2. Which of the following would best describe a virus?
   a. When individuals or organizations break the law through using computers illegally access a computer system
   b. A piece of malicious code that is written by programmers and is used to corrupt data and systems.
   c. When an employee goes against the company ICT code of practice e.g leaving workstation logged on

3. Anti-Virus software is installed on systems to detect and delete viruses. Which of the following is a type of virus?
   a. Snake
   b. Worm
   c. Toad
   d. Trojan
   e. Horse

4. What is social engineering?
   a. Using force to gain access to the information you need
   b. Hacking either telecommunication or wireless networks to gain access to the information you need
   c. Using manipulation to deceive people that you are someone you are not to gain access to the information you need

Notes

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1.1.1 Fundamentals to IT Infrastructure and IT Assets

The face of Information Technology is changing at a rapid speed. The current economic necessities and ongoing developments in technologies have brought about several fundamental shifts in IT landscapes. As a driving force behind every business entity, IT has changed the model of any business and imbibed pro-activeness in operation. In the name of promotion of products and services, business entities are becoming more customer-centric and service oriented with the help of digital marketing techniques and tactics. Many new IT trends have been developed to fulfill the aims and objectives of the organizations. Building an intelligent and efficient IT infrastructure is a stupendous task because of dynamic nature of IT landscapes. Any organization having robust and up-to-date IT infrastructure can achieve success. IT Infrastructure management varies organization to organization. The primary objective of the organization is to create a strong security and efficient system by reducing IT infrastructure complexities.

Before building IT infrastructure, many processes and technologies are to be considered. Here, some pertinent questions arise that IT infrastructure is well protected by IT companies or not? Are they able to provide competitive advantage? Are their workplace IT services ready for the needs and demands of the next generation? If yes, no issue. If no, then it will create a detrimental factor for your organization.

Gone are the days, IT managers were bound to act under the control of the management team of the enterprises. They had to work under some limitations, but today's IT landscape is very open and scalable, so IT heads are free now to think out of the box. They know people, processes, policies, equipment, data, and external contacts, and take independent decisions to implement various tools and techniques, considering stability, scalability, competitiveness, cost-effectiveness and security breaches. Thus, the real development of IT infrastructure lies in the development of predictive analytics and autonomics for building excellent credentials. IT infrastructure incorporates processes and modern technologies to solve various problems of organizations, and it also enables business entities to refocus on their core services and products, focusing to deliver business values, bring cost-effectiveness and efficiency to the business. However, many emerging trends in IT have also accelerated the whole process of the organization towards the development and glory. So, the relevance of IT infrastructure can never be undermined from the business landscape. As a multi-discipline subject, information security requires a number of diverse skills sets and knowledge. For a security specialist, it is essential to have a definite knowledge of IT infrastructure. We find different types of IT infrastructure may be on-premise, a virtual cloud service or a hybrid, etc. It is very difficult to frame a robust pedestal of IT security infrastructure for ensuring safety and security across the organization. We find various emerging technologies and coupled with our network infrastructure experience. Various applications have been developed in order to provide optimal infrastructure solutions with a view to provide support and assistance to a large number of business segments. In addition, protecting IT infrastructure security has become an indispensable part of every organization and helps to avoid the negative business impact, reduce cost and ensures business continuity and effective disaster management. Many emerging business entities are focused on various robust systems with a view to prevent outages, productivity loss, leak of information, violations of network and threats of virus, as well as defamation of brand due to malevolent, unsuitable or deceitful activity on a network.

The complex and pervasive nature of security threats to Information Technology has become a foremost worry for business entities. For every organization, IT infrastructure has become essential to provide various solutions, using modern tools and techniques, but it is not aloof from vulnerability, disruption, and potential attack. Threats in information technology are multifarious and affected