

## Concept of Data and Information

Data are simply facts or figures — bits of information, but not information itself. When data are processed, interpreted, organized, structured or presented so as to make them meaningful or useful, they are called information. Information provides context for data.

For example, a list of dates — data — is meaningless without the information that makes the dates relevant (dates of holiday).

“Data” and “information” are intricately tied together, whether one is recognizing them as two separate words or using them interchangeably, as is common today. Whether they are used interchangeably depends somewhat on the usage of “data” — its context and grammar.

### Examples of Data and Information

- The history of temperature readings all over the world for the past 100 years is data. If this data is organized and analyzed to find that global temperature is rising, then that is information.
- The number of visitors to a website by country is an example of data. Finding out that traffic from the U.S. is increasing while that from Australia is decreasing is meaningful information.
- Often data is required to back up a claim or conclusion (information) derived or deduced from it. For example, before a drug is approved by the FDA, the manufacturer must conduct clinical trials and present a lot of data to demonstrate that the drug is safe.

### Data Vs. Information

Data versus Information comparison chart

	Data	Information
<b>Meaning</b>	Data is raw, unorganized facts that need to be processed. Data can be something simple and seemingly random and useless until it is organized.	When data is processed, organized, structured or presented in a given context so as to make it useful, it is called information.
<b>Example</b>	Each student’s test score is one piece of data.	The average score of a class or of the entire school is information that can be derived from the given data.
<b>Etymology</b>	“Data” comes from a singular Latin word, datum, which originally meant “something given.” Its early usage dates back to the 1600s. Over time “data” has become the plural of datum.	“Information” is an older word that dates back to the 1300s and has Old French and Middle English origins. It has always referred to “the act of informing,” usually in regard to education, instruction, or other knowledge communication

## Operating Support System (OSS)

**An operational support system (OSS)** is a group of computer programs or an IT system used by communications service providers for monitoring, controlling, analyzing and managing a computer or telephone network system. OSS software is specifically dedicated to telecommunications service providers and mainly used for supporting network processes to maintain network inventory, configure network components, provision services and manage faults.

With the growth of new broadband and Voice over Internet Protocol (VoIP) systems, OSS and network management are now applied to home networks.

An OSS is also known as a **business support system (BSS)**.

Prior to the 1970s, many OSS activities were executed via manual management processes. In the early to mid-1970s, telecommunications companies created numerous hardware and software systems that were used to automate OSS activities. This is considered a driving factor in the

creation of the C programming language and Unix. For example, Bell used multiple OSS systems, including the Remote Memory Administration System (RMAS), Switching Control Center System (SCCS), Service Evaluation System (SES) and Trunks Integrated Record Keeping System (TIRKS).

Cheap and simple OSS integration via automated customer interfaces remains a strategic challenge for telecommunications and Internet service providers (ISP).

The four key OSS elements are as follows:

- Processes
- Data
- Applications
- Technology

In the 1990s, a four-layer OSS model emerged, as follows:

- Business Management Level
- Service Management Level
- Network Management Level
- Element Management Level

## Management Support System (MSS)

**Management support systems** focus on managerial uses of information resources. These systems provide information to manage for planning and decision making. The information provided by these systems is based on both the internal and external data using various data analysis tools.

They also offer a choice to the user to select out of these tools for the purpose of data analysis. These systems serve the information needs of managers at middle and top levels in the managerial hierarchy.

**There are three types of management support systems, namely:**

1. a) Decision Support Systems,
2. b) Executive Information (support) Systems and
3. c) Expert Systems.

### **Decision Support Systems:**

Decision support systems (DSS) are designed to support the decision making process of managers to improve their effectiveness and thereby efficiency of the enterprise. They are based on the premise that managerial judgement cannot be replaced by any computer based solution. However, by offering the support of data and models, it is possible to improve the decision making process even in the case of semi-structured and unstructured problems.

The basic purpose of DSS is to extend the capability of a manager's decision making process by supporting tools and data made available to him under his direct control. DSS neither presupposes specific information requirements and predefined tools for analysis for different types of decisions nor does it impose any solutions on a manager.

Thus, it gives flexibility to the manager to decide the input data, tool of analysis, depth of analysis and reliance on the outcome of Analysis for decision making. DSS offers an interactive environment for users and thus permits manager to experiment with data and models to develop the optimal decision making strategy in a given situation.

### **Executive Information Systems:**

DSS are designed to cater to the information needs of managers at middle to top levels. They relate to rule-based work doing modelling and analysis of data in order to make it useful in decision making.

However, at the top of managerial level, there is a need to focus more on packaging and delivery of information than on generation of information. The top manager deserves better environment for information access than that provided by DSS.

The top executives need fast access to up-to-date, concise information and exception reports with facilities to personalised information and analysis. The information systems designed to cater to such needs of top executives are called Executive Information Systems (EIS) or Executive Support Systems.

These systems act as electronic briefing systems and offer tremendous flexibility in use. EIS uses internal as well as external information and offers an interactive and a user friendly operating environment.

### **Expert Systems:**

The increasing complexities and dynamism in the emerging business environment require greater interaction of functional managers with the experts so as to get timely advice. These experts would not only sift information from vast pools of diverse information, but also use their expertise to offer advice.

Traditionally, the expertise available in an organisation has provided an important basis for achieving, improving and maintaining its competitive position. All other things being equal, firms without comparable expertise are at a disadvantage.

Human experts may not be able to cope with the new challenges, given the constraints of time and complexities of the new environment. Besides, there may not be uniformity and consistency of advice for a given decision situation over a period.

This is so because of the obvious inability of human beings to capture the impact of various decision variables all the time. The Information Fatigue Syndrome and the limitations of human experts in the changing business environment have resulted in increasing popularity of business expert systems (BES).

These systems simulate human activity and keep capturing and systematising business knowledge, extending the decision making capabilities of expensive and scarce human experts, so that others can use their decision experiences. They offer the advantage of flexibility in capturing and representing information of different types in diverse forms.

A business expert system receives a problem from the user, identifies its data requirements, analyses the relevant data against the decision rules (contained in a knowledge system). Once the problem is solved, the system through its inference engine reports the solution to the user and is also able to explain its line of reasoning in reaching that solution.

A business expert system can act as an aid to managerial effectiveness by providing advice. Its solutions/advice are always consistent, uniform, thorough and methodical. It functions as a standardised problem solver. The business expert system is able to explain the line of reasoning it uses for solving a problem.

A user can study the rationale and is free to accept, modify or reject the solution. Unlike other expert systems in the field of medicine, engineering, etc the objective of the business expert system is not to replace evaluation by human expert(s) by the computer program.

Rather, the objective is to acquire the expertise of the human expert and make it available in a standardised form to human expert(s) and others in the organisation. They work out strategies to use knowledge in the application areas so as to develop plausible solutions to the problems.

### **The typical areas of application of expert system in business include:**

1. Make or buy decisions
2. New product launch decisions
3. Determining credit limits
4. Product development
5. Investment counselling
6. Performance evaluation
7. Incentive systems
8. Customer query
9. Project evaluations
10. Production scheduling
11. Routing decisions

## **Transaction Processing System**

**Transaction Processing System** is a type of information processing system, software and hardware combination, which supports Transaction processing. Transaction processing is a type of computer processing in which each individual indivisible task, called a transaction, is worked upon and executed as and when it comes. The response to requests is immediate. In contrast to

this is batch processing in which a batch of requests are stored and then executed all at once. A transaction Processing System is also used to collect, store, retrieve and modify transactions executed by an organization.

In transaction processing, user or customer interaction is required, unlike batch processing. It allows only certain predefined, typically short duration, tasks and transactions to be performed by the user and provides a predictable request execution time, which is pre-programmed. This gives it the following characteristics:

- **Predictability**
- **Reliability**
- **Consistency**

Transaction processing systems are helpful in three areas:

- **System runtime functions:** An execution environment with high response time, reliability of execution and security of data
- **System administration functions:** Administrative support required for managing transactions
- **Application development functions:** Customization support to design and manage the user interface.

Example: ATM (Automatic Teller Machine)

## Process Control System (PCS)

**Process control systems (PCS)**, sometimes called industrial control systems (ICS), function as pieces of equipment along the production line during manufacturing that test the process in a variety of ways, and return data for monitoring and troubleshooting. Many types of process control systems exist, including supervisory control and data acquisition (SCADA), programmable logic controllers (PLC), or distributed control systems (DCS), and they work to gather and transmit data obtained during the manufacturing process.

The PCS can be a relatively simple item with a sensor, often called a primary transducer, that receives an input, along with a controller that processes the input, and a receiver that processes an output.

More complicated PCS devices are robotic and perform many tasks. The PCS devices can communicate their data to a company's enterprise resource planning (ERP) computer application through middleware software called a manufacturing execution system (MES).

### Sensors

A great number of measurements can be taken on production lines. An equipment's sensor can pick up many measurements including pressure, flow rate, density, acidity, velocity, speed, stress, temperature, and weight.

Also, sensors can detect if an operation has occurred, such as the fill of a bottle, whether the correct pressure has been achieved, or if a certain temperature has been reached.

Many sensors exist on production lines, falling under some different areas, such as pressure sensors, flow meters, force sensors, and temperature sensors.

### Checking Pressure

A pressure sensor can be triggered mechanically as an item passes the sensor. In its basic form, a pressure sensor shows the reading on a dial attached to the sensor, but it can also electronically transmit the reading to the MES application. Other types of sensors include:

- **Piston pressure sensor:** The pressure from the item on the production line can push on the piston, which compresses a spring. The movement of the spring indicates the pressure.
- **Diaphragm:** The diaphragm is affected by small amounts of pressure, and these get indicated on a dial.
- **Bourdon tube:** This hollow tube straightens under the application of pressure. It can be used for measuring pressure differences.

### Flow Meters

A flow meter instrument measures the linear, nonlinear, mass, or volumetric flow rate of a liquid or a gas.

When selecting a flow meter for the production line, you need to know information about the fluid involved, the rate of movement, and how to record the flow. Flow meter types include the following:

- **Positive displacement:** These flow meters use a mechanical effect to measure flow. The speed of the rotation of the meter indicates the flow of the liquid.
- **Differential:** The differential flow meter identifies the flow and converts it to a differential pressure that can be measured.
- **Inferential:** The inferential flow meter measures the flow based on the effect of the flow. This could be a simple rotor arm that is moved by the flow. The faster the rotor moves, the faster the flow.

### **Testing Force**

A force sensor measures forces and torque exerted. These sensors usually contain strain gauges and can communicate information required for force measurements. Force sensors can be mechanical, hydraulic, or electrical strain gauges.

- **Mechanical:** These function similarly to the operation of a normal scale, where a spring moves under the application of force. The deflection of a spring is directly proportional to the applied force, so the movement is shown on a scale.
- **Hydraulic:** Often referred to as hydraulic load cells. The cell contains liquid, which becomes pressurized when a force is applied. The sensor takes the measurement by displaying the pressure on a dial.
- **Strain gauge:** This metal cylinder is compressed under application of a force. The contraction in the cylinder can be measured, as the force causes increased resistance measured by an applied electrical current.

### **Detecting Temperature**

A temperature sensor converts the temperature into another quantity such as mechanical movement for a dial or an electric voltage.

- **Thermocouple:** Thomas Seebeck discovered that when any conductor gets subjected to a thermal gradient, it generates a voltage. Thermocouples are usually wires insulated from each other with plastic or glass fiber materials.
- **Liquid expansion:** These sensors work as thermometers that can be filled with mercury or an evaporating fluid used in refrigerators. Temperature changes produce expansion or evaporation of the liquid, so the sensor becomes pressurized. The change is shown on a simple pressure gauge.
- **Bimetallic:** When two metals are rigidly joined together as a two-layer strip and heated, the difference in the expansion rate between the two metals causes the strip to bend. For sensors on the production line, the strip is twisted into a long thin coil inside a tube. One end is fixed at the bottom of the tube and the other turns and moves a pointer on a dial.

## **Enterprise Collaboration System (ECS)**

- An **Enterprise Collaboration System (ECS)** is an information system used to facilitate efficient sharing of documents and knowledge between teams and individuals in an enterprise. ECS tools include the Internet, groupware, various forms of software and hardware and internal and external networks. ECS functions optimally in a collaborative working environment (CWE).
- ECS solutions include a variety of enterprise communication tools, including email, video conferencing, project management software and collaborative software. ECS has facilitated the creation of the modern “**e-professional**” by enabling achieved goals of project teams, workgroups and participants. ECS allows team members to work from different physical locations, divisions, departments or remote areas.

## **Management information System**

**MIS** is the use of information technology, people, and business processes to record, store and process data to produce information that decision makers can use to make day to day decisions.

MIS is the acronym for **Management Information Systems**. In a nutshell, MIS is a collection of systems, hardware, procedures and people that all work together to process, store, and produce information that is useful to the organization.

## The Need for MIS

The following are some of the justifications for having an MIS system

- **Decision makers need information to make effective decisions.** Management Information Systems (MIS) make this possible.
- **MIS systems facilitate communication within and outside the organization:** Employees within the organization are able to easily access the required information for the day to day operations. Facilitates such as Short Message Service (SMS) & Email make it possible to communicate with customers and suppliers from within the MIS system that an organization is using.
- **Record keeping:** Management information systems record all business transactions of an organization and provide a reference point for the transactions.

## Components of MIS

The major components of a typical management information system are;

- **People:** People who use the information system
- **Data:** The data that the information system records
- **Business Procedures:** Procedures put in place on how to record, store and analyze data
- **Hardware:** These include servers, workstations, networking equipment, printers, etc.
- **Software:** These are programs used to handle the data. These include programs such as spreadsheet programs, database software, etc.

## Decision Support System

A **decision support system (DSS)** is a computerized information system used to support decision-making in an organization or a business. A **DSS** lets users sift through and analyze massive reams of data and compile information that can be used to solve problems and make better decisions.

- The benefits of decision support systems include more informed decision-making, timely problem-solving and improved efficiency for dealing with problems with rapidly changing variables.
- A DSS can be used by operations management and planning levels in an organization to compile information and data and to synthesize it into actionable intelligence. This allows the end user to make more informed decisions at a quicker pace.
- **The DSS** is an information application that produces comprehensive information. This is different from an operations application, which would be used to collect the data in the first place. A DSS is primarily used by mid- to upper-level management, and it is key for understanding large amounts of data.
- For example, a **DSS** could be used to project a company's revenue over the upcoming six months based on new assumptions about product sales. Due to the large amount of variables that surround the projected revenue figures, this is not a straightforward calculation that can be done manually. A **DSS** can integrate multiple variables and generate an outcome and alternate outcomes, all based on the company's past product sales data and current variables.
- The primary purpose of using a **DSS** is to present information to the customer in a way that is easy to understand. A DSS system is beneficial because it can be programmed to generate many types of reports, all based on user specifications. A DSS can generate information and output it graphically, such as a bar chart that represents projected revenue, or as a written report.

## Where Can a DSS Be Used?

- As technology continues to advance, data analysis is no longer limited to large bulky mainframe computers. Since a DSS is essentially an application, it can be loaded on most computer systems, including laptops. Certain DSS applications are also available through mobile devices. The flexibility of the DSS is extremely beneficial for users who travel frequently. This gives them the opportunity to be well-informed at all times, which in turn provides them with the ability to make the best decisions for their company and customers at any time.

# Executive Information System

**Executive support systems** are intended to be used by the senior managers directly to provide support to non-programmed decisions in strategic management.

These information are often external, unstructured and even uncertain. Exact scope and context of such information is often not known beforehand.

**This information is intelligence based:**

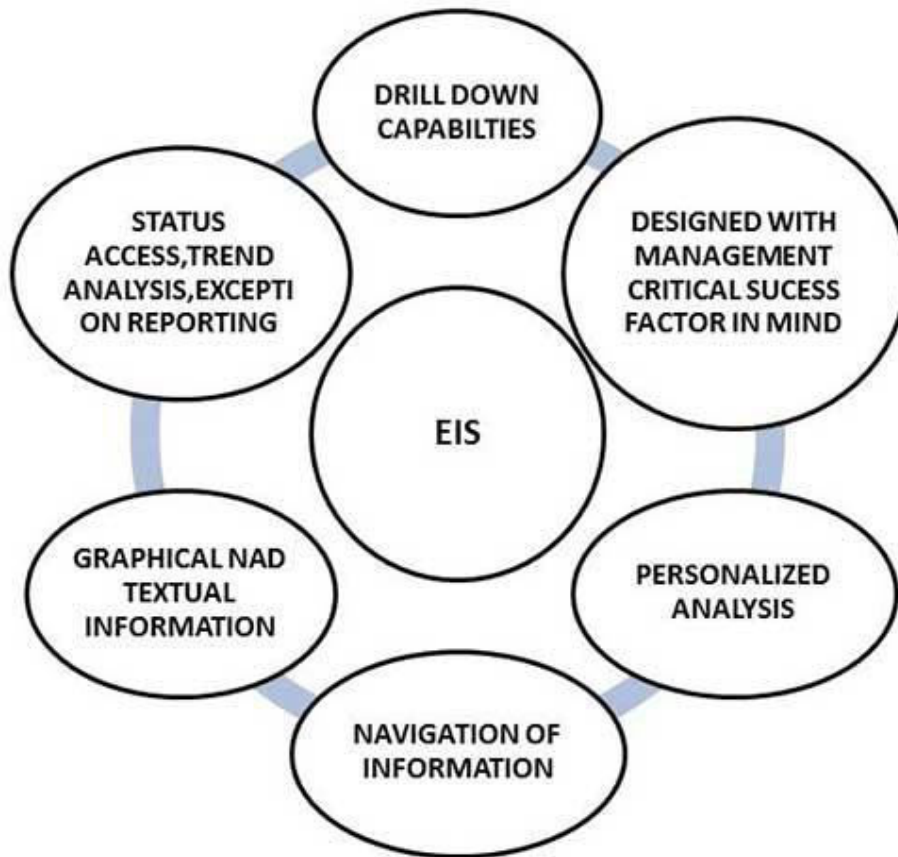
- Market intelligence
- Investment intelligence
- Technology intelligence

Examples of Intelligent Information

Following are some examples of intelligent information, which is often the source of an ESS:

- External databases
- Technology reports like patent records etc.
- Technical reports from consultants
- Market reports
- Confidential information about competitors
- Speculative information like market conditions
- Government policies
- Financial reports and information

**Features of Executive Information System**



**Advantages of ESS**

- Easy for upper level executive to use
- Ability to analyze trends
- Augmentation of managers' leadership capabilities
- Enhance personal thinking and decision-making
- Contribution to strategic control flexibility
- Enhance organizational competitiveness in the market place

- Instruments of change
- Increased executive time horizons.
- Better reporting system
- Improved mental model of business executive
- Help improve consensus building and communication
- Improve office automation
- Reduce time for finding information
- Early identification of company performance
- Detail examination of critical success factor
- Better understanding
- Time management
- Increased communication capacity and quality

**Disadvantage of ESS**

- Functions are limited
- Hard to quantify benefits
- Executive may encounter information overload
- System may become slow
- Difficult to keep current data
- May lead to less reliable and insecure data
- Excessive cost for small company



# Unit 5

## Enterprise Resource Planning (ERP)

**Enterprise resource planning (ERP)** is a process used by companies to manage and integrate the important parts of their businesses. Many ERP software applications exist to help companies implement resource planning by integrating all of the processes it needs to run a company with a single system. An ERP software system can integrate planning, purchasing inventory, sales, marketing, finance, human resources, and more.

You can think of an enterprise resource planning system as the glue that binds together the different computer systems for a large organization. Without an ERP application, each department would have its own system optimized for that division's particular tasks. With ERP software, each department still has its own system, but all of the systems can be accessed through one application with one interface.

ERP applications also allows the different departments to communicate and share information more easily with the rest of the company. It collects information about the activity and state of different divisions, making this information available to other parts, where it can be used productively.

ERP applications can help a corporation become more self-aware by linking information about production, finance, distribution, and human resources together. Because it connects different technologies used by each individual part of a business, an ERP application can eliminate costly duplicate and incompatible technology. The process often integrates accounts payable, stock-control systems, order-monitoring systems, and customer databases into one system.

ERP offerings have evolved over the years from traditional software models that make use of physical client servers to cloud-based software that offers remote, web-based access.

### Special Considerations

An ERP system doesn't always eliminate inefficiencies within the business. The company needs to rethink the way it's organized, or else it will end up with incompatible technology.

ERP systems usually fail to achieve the objectives that influenced their installation because of a company's reluctance to abandon old working processes that are incompatible with the software. Some companies are also reluctant to let go of old software that worked well in the past. The key is to prevent ERP projects from being split into many smaller projects, which can result in cost overruns.

### ERP Solutions Providers

Some familiar names are leaders in ERP software. Oracle Corp. (ORCL) originally supplied a relational database that integrated with ERP software developed by SAP (SAP) before entering the broader enterprise market in a big way in the early 2000's. Microsoft (MSFT) has long been an industry leader, with many customers using multiple software applications from the company. As cloud-based solutions have grown in popularity in recent years, the traditional ERP industry leaders have seen challenges from upstarts such as Bizowie and WorkWise.

### TAKEAWAYS

- ERP software can integrate all of the processes needed to run a company.
- ERP solutions have evolved over the years, and many are now typically web-based applications that users can access remotely.
- An ERP system can be ineffective if a company doesn't implement it carefully.

## Customer Relationship Management

Business people started using the term Customer Relationship Management (CRM) since the early 1990s when the concept of business started to change from being transactional to relational. CRM directly contributes towards customer benefits and the growth of businesses.

Information Technology plays a very critical role in identifying, acquiring, and retaining the customers, and thereby managing a healthy relationship with them.

Here in this chapter, we will discuss the very basics of CRM.

# What is CRM?

There can be multiple definitions of CRM from different perspectives –

- From the viewpoint of the Management, CRM can be defined as *an organized approach of developing, managing, and maintaining a profitable relationship with customers.*
- By equating the term with technology, the IT organizations define CRM as *a software that assists marketing, merchandising, selling, and smooth service operations of a business.*
- As per Franics Buttle, World's first professor of CRM, it is the core business strategy that integrates internal processes and functions, and external networks, to create and deliver value to a target customer at profit. It is grounded on high quality customer data and information technology.

The primary goal of CRM is to increase customer loyalty and in turn improve business profitability.

## Ingredients of CRM

Take a look at the following illustration. It shows the ingredients that work together to form a successful CRM system.



Here are some of the important ingredients of CRM –

- **Analytics**– Analytics is the process of studying, handling, and representing data in various graphical formats such as charts, tables, trends, etc., in order to observe market trends.
- **Business Reporting**– Business Reporting includes accurate reports of sales, customer care, and marketing.
- **Customer Service**– Customer Service involves collecting and sending the following customer-related information to the concerned department –
  - Personal information such as name, address, age
  - Previous purchase patterns.
  - Requirements and preferences.
  - Complaints and suggestions.
- **Human Resource Management**– Human Resource Management involves employing and placing the most eligible human resource at a required place in the business.
- **Lead Management**– Lead Management involves keeping a track of the sales leads and distribution, managing the campaigns, designing customized forms, finalizing the mailing lists, and studying the purchase patterns of the customers.
- **Marketing**– Marketing involves forming and implementing sales strategies by studying existing and potential customers in order to sell the product.
- **Sales Force Automation**– Sales Force Automation includes forecasting, recording sales, processing, and keeping a track of the potential interactions.

- **Workflow Automation**– Workflow Automation involves streamlining and scheduling various processes that run in parallel. It reduces costs and time, and prevents assigning the same task to multiple employees.

## Objectives of CRM

The most prominent objectives of using the methods of Customer Relationship Management are as follows –

- **Improve Customer Satisfaction**– CRM helps in customer satisfaction as the satisfied customers remain loyal to the business and spread good word-of-mouth. This can be accomplished by fostering customer engagement via social networking sites, surveys, interactive blogs, and various mobile platforms.
- **Expand the Customer Base**– CRM not only manages the existing customers but also creates knowledge for prospective customers who are yet to convert. It helps creating and managing a huge customer base that fosters profits continuity, even for a seasonal business.
- **Enhance Business Sales**– CRM methods can be used to close more deals, increase sales, improve forecast accuracy, and suggestion selling. CRM helps to create new sales opportunities and thus helps in increasing business revenue.
- **Improve Workforce Productivity**– A CRM system can create organized manners of working for sales and sales management staff of a business. The sales staff can view customer’s contact information, follow up via email or social media, manage tasks, and track the salesperson’s performance. The salespersons can address the customer inquiries speedily and resolve their problems.

## History of CRM

### 1970s – Emergence of Material Resource Planning (MRP)

The complex and expensive MRP solutions emerged. They needed a large technical staff to execute MRP software on mainframe computers.

1972: Five German engineers started System Analysis and Programming (SAP) business to develop a software for providing business solutions.

1977: Larry Ellison started Oracle Corporation.

1978: Baan started The Baan Corporation for financial and administrative consultation.

1979: Oracle offered first commercial SQL Relational Database Management System (RDBMS).

### The 1980s: Formation of Database Marketing

- Robert and Kate Kestnbaum pioneered database marketing, collected customer contacts, and analyzed customer information.
- 1986: ACT! created Contact Management System (CMS) to store the data and organize customer information.
- 1987: PeopleSoft created Human Resource Management System (HRMS).

### The 1990s: Industrial Growth

- Brock Control Systems started Sales Force Automation (SFA), and added the features of database marketing, CMS, inventory control, and customer interaction tracking.
- 1993: Tom Siebel started Siebel Systems, soon became leading provider of SFA.
- 1995: SFA and CMS evolved as very similar modern CRM software, soon settled as Customer Relationship Management System (CRMS or simply, CRM). Enterprise Resource Planning (ERP) solution vendors Oracle and Baan entered the CRM market, and added more marketing, sales, and service applications to CRM.
- 1999: ECRM vendors emerged. CRM also entered into the mobile market.

### The 2000s: The modern CRM

- Microsoft entered CRM market with its product Dynamics CRM.
- Oracle acquired Siebel, and numerous other enterprise application vendors.
- 2007: Salesforce introduced the world to cloud-based CRM.

CRM systems are divided based on their prominent characteristics. There are four basic types of CRM systems –

- Strategic CRM
- Operational CRM
- Analytical CRM
- Collaborative CRM

The following table lists the types of CRM and their characteristic features –

Type	Characteristic
Strategic CRM	Customer-centric, based on acquiring and maintaining profitable customers.
Operational CRM	Based on customer-oriented processes such as selling, marketing, and customer service.
Analytical CRM	Based on the intelligent mining of the customer data and using it tactically for future strategies.
Collaborative CRM	Based on application of technology across organization boundaries with a view to optimize the organization and customers.

## Strategic CRM

Strategic CRM is a type of CRM in which the business puts the customers first. It collects, segregates, and applies information about customers and market trends to come up with better value proposition for the customer.

The business considers the customers' voice important for its survival. In contrast to Product-Centric CRM (where the business assumes customer requirements and focuses on developing the product that may sometimes lead to over-engineering), here the business constantly keeps learning about the customer requirements and adapting to them.

These businesses know the buying behavior of the customer that happy customers buy more frequently than rest of the customers. If any business is not considering this type of CRM, then it risks losing the market share to those businesses, which excel at strategic CRM.

## Operational CRM

Operational CRM is oriented towards customer-centric business processes such as marketing, selling, and services. It includes the following automations: Sales Force Automation, Marketing Automation, and Service Automation.

**Salesforce** is the best suitable CRM for large established businesses and **Zoho** is the best CRM for growing or small-scale businesses.



### Sales Force Automation

SFA is the application of technology to manage selling activities. It standardizes a sales cycle and common terminology for sales issues among all the sales employees of a business. It includes the following modules –

- **Product Configuration**– It enables salespersons or customers themselves to automatically design the product and decide the price for a customized product. It is based on if-then-else structure.

- **Quotation and Proposal Management**– The salesperson can generate a quotation of the product prices and proposal for the customer by entering details such as customer name, delivery requirements, product code, number of pieces, etc.
- **Accounts Management**– It manages inward entries, credit and debit amounts for various transactions, and stores transaction details as records.
- **Lead Management**– It lets the users qualify leads and assigns them to appropriate salespersons.
- **Contact Management**– It is enabled with the features such as customers’ contact details, salespersons’ calendar, and automatic dialing numbers. These all are stored in the form of computerized records. Using this application, a user can communicate effectively with the customers.
- **Opportunity Management**– It lets the users identify and follow leads from lead status to closure and beyond closure.

### Marketing Automation

Marketing automation involves market segmentation, campaigns management, event-based marketing, and promotions. The campaign modules of Marketing Automation enable the marketing force to access customer-related data for designing, executing and evaluating targeted offers, and communications.

**Event-based (trigger) marketing** is all about messaging and presenting offers at a particular time. For example, a customer calls the customer care number and asks about the rate of interest for credit card payment. This event is read by CRM as the customer is comparing interest rates and can be diverted to another business for a better deal. In such cases, a customized offer is triggered to retain the customer.

### Service Automation

Service automation involves service level management, resolving issues or cases, and addressing inbound communication. It involves diagnosing and solving the issues about product.

With the help of Interactive Voice Response (IVR) system, a customer can interact with business computers by entering appropriate menu options. Automatic call routing to the most capable employee can be done.

Consumer products are serviced at retail outlets at the first contact. In case of equipment placed on field, the service expert may require product servicing manual, spare parts manual, or any other related support on laptop. That can be availed in service automation.

## Analytical CRM

Analytical CRM is based on capturing, interpreting, segregating, storing, modifying, processing, and reporting customer-related data. It also contains internal business-wide data such as **Sales Data** (products, volume, purchasing history), **Finance Data** (purchase history, credit score) and **Marketing Data** (response to campaign figures, customer loyalty schemes data). **Base CRM** is an example of analytical CRM. It provides detailed analytics and customized reports.

Business intelligence organizations that provide customers’ demographics and lifestyle data over a large area pay a lot of attention to internal data to get more detail information such as, “Who are most valuable customers?”, “Which consumers responded positively to the last campaign and converted?”, etc.

Analytical CRM can set different selling approaches to different customer segments. In addition, different content and styling can be offered to different customer segments. For the customers, analytical CRM gives customized and timely solutions to the problems. For the business, it gives more prospects for sales, and customer acquisition and retention.

## Collaborative CRM

Collaborative CRM is an alignment of resources and strategies between separate businesses for identifying, acquiring, developing, retaining, and maintaining valuable customers. It is employed in B2B scenario, where multiple businesses can conduct product development, market research, and marketing jointly.



Collaborative CRM enables smooth communication and transactions among businesses. Though traditional ways such as air mail, telephone, and fax are used in communication, collaborative CRM employs new communication systems such as chat rooms, web forums, Voice over Internet Protocol (VoIP), and Electronic Data Interchange (EDI).

There are collaborative CRMs with in-built **Partner Relationship Management (PRM)** software application which helps in managing partner promotions. **SugarCRM** is a popular collaborative CRM. It enables expert collaboration and provides state-of-the-art social capabilities.

### CRM Software Buying Considerations

A business needs to consider the following points while selecting a CRM software –

- **Business strategy and processes**– It helps to automate a customer management strategy. Hence before selecting a CRM software, a business should be clear with its strategies and desired processes.
- **Business requirements**– CRM systems range from domain specialty solutions that focus on solving a specific area such as sales force automation, marketing automation, services automation, partner management, etc., to complete enterprise management solutions.
- **Size of business**– Small businesses require tools that are easy to learn and can handle a wide range of the most common tasks. Large businesses opt for applications that handle more complex tasks and thousands of users.
- **Customer base**– The size of the customer base a business is required to handle.
- **Budget**– A business needs to set a budget prior vendor selection. The budget allocated for CRM varies according to the degree of customization required.
- **Context**– The context in which a business is functioning, e.g., B2B or B2C, determines which CRM the business should go for.
- **Sales channels**– The sales channels a business is employing: Direct sale, channel sale such as distributors, or Direct to customers via retail. They matter while selecting the most suitable CRM software.
- **System integration**– All the interfaces the business needs and the CRM vendor can support without requiring too much custom services effort.
- **Strength of partners**– The partners must be able to provide a business with additional support, or help to implement the CRM successfully.

### Security and Ethical Challenges of IT

- **Information Systems** have made many businesses successful today. Some companies such as Google, Facebook, eBay, etc. would not exist without information technology. However, improper use of information technology can create problems for the organization and employees.
- Criminals gaining access to credit card information can lead to financial loss to the owners of the cards or financial institute. Using organization information systems i.e. posting inappropriate content on Facebook or Twitter using a company account can lead to lawsuits and loss of business.

- This tutorial will address such challenges that are posed by information systems and what can be done to minimize or eliminate the risks.
- **Information system Ethics**
- Ethics refers to rules of right and wrong that people use to make choices to guide their behaviors. Ethics in MIS seek to protect and safeguard individuals and society by using information systems responsibly. Most professions usually have defined a code of ethics or code of conduct guidelines that all professionals affiliated with the profession must adhere to.
- In a nutshell, a code of ethics makes individuals acting on their free will responsible and accountable for their actions. An example of a Code of Ethics for MIS professionals can be found on the British Computer Society (BCS) website

## Business Ethic

**Ethics** means the set of rules or principles that the organization should follow. While in business ethics refers to a code of conduct that businesses are expected to follow while doing business.

Through ethics, a standard is set for the organization to regulate their behavior. This helps them in distinguishing between the wrong and the right part of the businesses.

The ethics that are formed in the organization are not rocket science. They are based on the creation of a human mind. That is why ethics depend on the influence of the place, time, and the situation.

Code of conduct is another term that is used extensively in businesses nowadays. It is a set of rules that are considered as binding by the people working in the organization.

Business ethics comprises of all these values and principles and helps in guiding the behavior in the organizations. Businesses should have a balance between the needs of the stakeholders and their desire to make profits.

While maintaining these balances, many times businesses require to do tradeoffs. To combat such scenarios, rules and principles are formed in the organization.

This ensures that businesses gain money without affecting the individuals or society as a whole. The ethics involved in the businesses reflect the philosophy of that organization.

One of these policies determines the fundamentals of that organization. As a result, businesses often have ethical principles. There is a list of ethical principles involved in the businesses.

### **Ethical Principles in Businesses from an Indian Perspective**

Essentially, any businesses that run in India comprises of these ethical principles.

#### ***Integrity***

Whenever there is great pressure to do right instead of maximizing profits, this principle is tested. The executives need to demonstrate courage and personal integrity, by doing what-they think is right.

These are the principles, which are upright, honorable. They need to fight for their beliefs. For these principles, they will not back down and be hypocritical or experience.

#### ***Loyalty***

No ethical behavior can be promoted without trust. And for trust, loyalty needs to be demonstrated. The executives need to be worthy of this trust while remaining loyal to the institutions and the person. There should be friendship in the time of adversity and support and devotion for the duty.

They should not use or disclose personal information. This leads to confidence in the organization. They should safeguard the ability of a professional to make an independent decision by avoiding any kind of influence or the conflicts of interest.

So, they should remain loyal to their company and their colleagues. When they accept the other employees, they need to provide a reasonable time to the firm and respect the proprietary information attached to the previous firm. Thus, they should refuse to take part in any activity that might take the undue advantage of the firm.

#### ***Honesty***

The ethical executives are honest while dealing with their regular work. They also need to be truthful and do not deliberately deceive or mislead the information to others. There should be an

avoidance of the partial truths, overstatements, misrepresentations, etc. Thus, they should not have selective omission by any means possible.

### ***Respect and Concern***

These are two necessarily different forms of behavior in the organization. But they go in tandem that is why they have been put under one principle. When the executive is ethical he is compassionate, kind, and caring.

There is one golden rule which states that help those who are in need. Further, seek their accomplishments in such a manner that the business objectives of the firm are achieved.

The executives also need to show respect towards the employee's dignity, privacy, autonomy, and rights. He needs to maintain the interests of all those whose decisions are at stake. They need to be courteous and treat the person equally and rightly.

### ***Fairness***

The executives need not be just fair in all the dealings, but they also should not exercise the wrong use of their power. They should not try to use over each or other indecent manners to gain any sort of advantage. Also, they should not take undue advantage of anything or other people's mistakes.

Fair people are inclined more towards justice and ensure that the people are equally treated. They should be tolerant, open-minded, willing to admit their own mistakes. The executives should also be able to change their beliefs and positions based on the situation.

### ***Leadership***

Any executive, if ethical, should be a leader to others. They should be able to handle the responsibilities. They should be aware of the opportunities due to their position. The executives need to be a proper role model for others.

## **Technology Ethics**

**Technology ethics** (tech ethics) is a field of study that seeks to understand and resolve moral issues that surround the development and practical application of mechanical and electronic technology. Tech ethics focuses on subjects such as the relationship between technology and human values and well-being, the condition in which technological advances occur and the social repercussions for technological advancements.

The John J. Reilly Center for Science, Technology and Values at the University of Notre Dame compiles an annual list of what it determines to be that year's top 10 ethical dilemmas in science and technology. In 2019, for example, the list includes DNA testing, pet cloning, the collection of data generated by children and 3-D printing schematics for weapons. In the United Kingdom, the House of Lords Select Committee recommended that ethics should be put at the center of artificial intelligence (AI) adoption to ensure cognitive technology is developed and used for the common good and benefit of humanity.

Although developers are still in the early stages of AI adoption, it's important for enterprises to take ethical and responsible approaches when creating AI systems. To that end, a non-profit institute founded by MIT cosmologist Max Tegmark, Skype co-founder Jaan Tallinn and DeepMind research scientist Viktoriya Krakovnahas have helped establish a set of guiding principles for AI ethics which are now referred to as the Asilomar AI Principles. Among other things, the Asilomar AI code of ethics mandates that:

- Highly autonomous AI systems should be designed so that their goals and behaviors can be assured to align with human values throughout their operation.
- AI systems should be designed and operated so as to be compatible with ideals of human dignity, rights, freedoms, and cultural diversity.
- The power conferred by control of highly advanced AI systems should respect and improve, rather than subvert, the social and civic processes on which the health of society depends.

### **Technology Ethics Problems and Challenges**

Another common subject of technology ethics in the enterprise surrounds the use of customer data on social media platforms. A company can collect information users put on a social media website to profile each user and use that information to target advertising to them. The same information can be sold and used to sway political opinions. This circumstance occurred in 2018



when it was revealed that the consulting firm, Cambridge Analytica was collecting information of around 50 million Facebook users. There was a large uproar (many people feel third-party companies collecting and selling user data is wrong) in which the occurrence became a major news story in 2018.

In 2018, the European Union enacted a new directive, called the General Data Protection Regulation (GDPR). GDPR aims to keep businesses transparent and expand the privacy rights of data subjects for EU citizens. Organizations outside of the EU must comply with GDPR regulations if they wish to be active in the EU market. Data policy rights included in the GDPR include the right for data to be erased upon request, letting users review data stored about them, giving users the right to request a company not utilize their data, letting users transfer their data, and allowing users to correct incorrect information.

The GDPR policy can be viewed as a general pushback to the ethical misconduct of the way data was being used by organizations like Cambridge Analytica, while also assuring any policy or data breaches by companies such as Facebook must be reported within 72 hours of occurrence.

## Cyber Crime and Privacy Issues

Cyber-crime refers to the use of information technology to commit crimes. Cyber-crimes can range from simply annoying computer users to huge financial losses and even the loss of human life. The growth of smart phones and other high-end Mobile devices that have access to the internet have also contributed to the growth of cyber-crime.

### Types of cyber-crime

#### Identity Theft

Identity theft occurs when a cyber-criminal impersonates someone else identity to practice malfunction. This is usually done by accessing personal details of someone else. The details used in such crimes include social security numbers, date of birth, credit and debit card numbers, passport numbers, etc.

Once the information has been acquired by the cyber-criminal, it can be used to make purchases online while impersonating himself to be someone else. One of the ways that cyber-criminals use to obtain such personal details is phishing. **Phishing involves creating fake websites that look like legitimate business websites or emails.**

For example, an email that appears to come from YAHOO may ask the user to confirm their personal details including contact numbers and email password. If the user falls for the trick and updates the details and provides the password, the attacker will have access to personal details and the email of the victim.

If the victim uses services such as PayPal, then the attacker can use the account to make purchases online or transfer funds.

Other phishing techniques involve the use of fake Wi-Fi hotspots that look like legitimate ones. This is common in public places such as restaurants and airports. If an unsuspecting user logs on into the network, then cyber-crimes may try to gain access to sensitive information such as usernames, passwords, credit card numbers, etc.

According to the US Department of Justice, a former state department employee used email phishing to gain access to email and social media accounts of hundreds of women and accessed explicit photos. He was able to use the photos to extort the women and threatened to make the photos public if they did not give in to his demands.

#### Copyright infringement

Piracy is one of the biggest problems with digital products. Websites such as the pirate bay are used to distribute copyrighted materials such as audio, video, software, etc. Copyright infringement refers to the unauthorized use of copyrighted materials.

Fast internet access and reducing costs of storage have also contributed to the growth of copyright infringement crimes.

#### Click fraud

Advertising companies such as Google AdSense offer pay per click advertising services. Click fraud occurs when a person clicks such a link with no intention of knowing more about the click but to make more money. This can also be accomplished by using automated software that makes the clicks.

### **Advance Fee Fraud**

An email is sent to the target victim that promises them a lot of money in favor of helping them to claim their inheritance money.

In such cases, the criminal usually pretends to be a close relative of a very rich well-known person who died. He/she claims to have inherited the wealth of the late rich person and needs help to claim the inheritance. He/she will ask for financial assistance and promise to reward later. If the victim sends the money to the scammer, the scammer vanishes and the victim loses the money.

### **Hacking**

Hacking is used to by-pass security controls to gain unauthorized access to a system. Once the attacker has gained access to the system, they can do whatever they want. Some of the common activities done when system is hacked are;

- Install programs that allow the attackers to spy on the user or control their system remotely
- Deface websites
- Steal sensitive information. This can be done using techniques such as SQL Injection, exploiting vulnerabilities in the database software to gain access, social engineering techniques that trick users into submitting ids and passwords, etc.

### **Computer virus**

Viruses are unauthorized programs that can annoy users, steal sensitive data or be used to control equipment that is controlled by computers.

## **Cyber Laws**

**Cyber law** is the part of the overall legal system that deals with the Internet, cyberspace, and their respective legal issues. Cyber law covers a fairly broad area, encompassing several subtopics including freedom of expression, access to and usage of the Internet, and online privacy. Generically, cyber law is referred to as the Law of the Internet.

Like any law, a cyber law is created to help protect people and organizations on the Internet from malicious people on the Internet and help maintain order. If someone breaks a cyber law or rule, it allows another person or organization to take action against that person or have them sentenced to a punishment.

## **The Information Technology Act, 2000- Definition/Intro**

### **Salient Features of I.T Act**

The salient features of the I.T Act are as follows:

- Digital signature has been replaced with electronic signature to make it a more technology neutral act.
- It elaborates on offenses, penalties, and breaches.
- It outlines the Justice Dispensation Systems for cyber-crimes.
- It defines in a new section that cyber café is any facility from where the access to the internet is offered by any person in the ordinary course of business to the members of the public.
- It provides for the constitution of the Cyber Regulations Advisory Committee.
- It is based on The Indian Penal Code, 1860, The Indian Evidence Act, 1872, The Bankers' Books Evidence Act, 1891, The Reserve Bank of India Act, 1934, etc.
- It adds a provision to Section 81, which states that the provisions of the Act shall have overriding effect. The provision states that nothing contained in the Act shall restrict any person from exercising any right conferred under the Copyright Act, 1957.

### **Scheme of I.T Act**

The following points define the scheme of the I.T. Act:

- The I.T. Act contains **13 chapters** and **90 sections**.

- The last four sections namely sections 91 to 94 in the I.T. Act 2000 deals with the amendments to the Indian Penal Code 1860, The Indian Evidence Act 1872, The Bankers' Books Evidence Act 1891 and the Reserve Bank of India Act 1934 were deleted.
- It commences with Preliminary aspect in Chapter 1, which deals with the short, title, extent, commencement and application of the Act in Section 1. Section 2 provides Definition.
- Chapter 2 deals with the authentication of electronic records, digital signatures, electronic signatures, etc.
- Chapter 11 deals with offences and penalties. A series of offences have been provided along with punishment in this part of The Act.
- Thereafter the provisions about due diligence, role of intermediaries and some miscellaneous provisions are been stated.
- The Act is embedded with two schedules. The First Schedule deals with Documents or Transactions to which the Act shall not apply. The Second Schedule deals with electronic signature or electronic authentication technique and procedure. The Third and Fourth Schedule are omitted.

### Application of the I.T Act

As per the sub clause (4) of Section 1, nothing in this Act shall apply to documents or transactions specified in First Schedule. Following are the documents or transactions to which the Act shall not apply –

- **Negotiable Instrument**(Other than a cheque) as defined in section 13 of the Negotiable Instruments Act, 1881;
- A **power-of-attorney** as defined in section 1A of the Powers-of-Attorney Act, 1882;
- A **trust** as defined in section 3 of the Indian Trusts Act, 1882;
- A **will** as defined in clause (h) of section 2 of the Indian Succession Act, 1925 including any other testamentary disposition;
- Any **contract** for the sale or conveyance of immovable property or any interest in such property;
- Any such class of documents or transactions as may be notified by the Central Government.

### Amendments Brought in the I.T Act

The I.T. Act has brought amendment in four statutes vide section 91-94. These changes have been provided in schedule 1-4.

- The first schedule contains the amendments in the Penal Code. It has widened the scope of the term “document” to bring within its ambit electronic documents.
- The second schedule deals with amendments to the India Evidence Act. It pertains to the inclusion of electronic document in the definition of evidence.
- The third schedule amends the Banker's Books Evidence Act. This amendment brings about change in the definition of “Banker's-book”. It includes printouts of data stored in a floppy, disc, tape or any other form of electromagnetic data storage device. Similar change has been brought about in the expression “Certified-copy” to include such printouts within its purview.
- The fourth schedule amends the Reserve Bank of India Act. It pertains to the regulation of fund transfer through electronic means between the banks or between the banks and other financial institution.

### Intermediary Liability

Intermediary, dealing with any specific electronic records, is a person who on behalf of another person accepts, stores or transmits that record or provides any service with respect to that record.

According to the above mentioned definition, it includes the following:

- Telecom service providers
- Network service providers
- Internet service providers
- Web-hosting service providers
- Search engines
- Online payment sites
- Online auction sites
- Online market places and cyber cafes

## Highlights of the Amended Act

The newly amended act came with following highlights:

- It stresses on privacy issues and highlights information security.
- It elaborates Digital Signature.
- It clarifies rational security practices for corporate.
- It focuses on the role of Intermediaries.
- New faces of Cyber Crime were added.

## Meaning and Scope of information Technology Act

The Information Technology Act, 2000 or ITA, 2000 or IT Act, was notified on October 17, 2000. It is the law that deals with cybercrime and electronic commerce in India. In this article, we will look at the objectives and features of the Information Technology Act, 2000.

### **Information Technology Act, 2000**

In 1996, the United Nations Commission on International Trade Law (UNCITRAL) adopted the model law on electronic commerce (e-commerce) to bring uniformity in the law in different countries.

Further, the General Assembly of the United Nations recommended that all countries must consider this model law before making changes to their own laws. India became the 12th country to enable cyber law after it passed the Information Technology Act, 2000.

While the first draft was created by the Ministry of Commerce, Government of India as the ECommerce Act, 1998, it was redrafted as the 'Information Technology Bill, 1999', and passed in May 2000.

### **Objectives of the Act**

The Information Technology Act, 2000 provides legal recognition to the transaction done via an electronic exchange of data and other electronic means of communication or electronic commerce transactions.

This also involves the use of alternatives to a paper-based method of communication and information storage to facilitate the electronic filing of documents with the Government agencies.

Further, this act amended the Indian Penal Code 1860, the Indian Evidence Act 1872, the Bankers' Books Evidence Act 1891, and the Reserve Bank of India Act 1934. The objectives of the Act are as follows:

- Grant legal recognition to all transactions done via an electronic exchange of data or other electronic means of communication or e-commerce, in place of the earlier paper-based method of communication.
- Give legal recognition to digital signatures for the authentication of any information or matters requiring legal authentication
- Facilitate the electronic filing of documents with Government agencies and also departments
- Facilitate the electronic storage of data
- Give legal sanction and also facilitate the electronic transfer of funds between banks and financial institutions
- Grant legal recognition to bankers under the Evidence Act, 1891 and the Reserve Bank of India Act, 1934, for keeping the books of accounts in electronic form.

### **Features of the Information Technology Act, 2000**

1. All electronic contracts made through secure electronic channels are legally valid.
2. Legal recognition for digital signatures.
3. Security measures for electronic records and also digital signatures are in place
4. A procedure for the appointment of adjudicating officers for holding inquiries under the Act is finalized
5. Provision for establishing a Cyber Regulatory Appellant Tribunal under the Act. Further, this tribunal will handle all appeals made against the order of the Controller or Adjudicating Officer.
6. An appeal against the order of the Cyber Appellant Tribunal is possible only in the High Court
7. Digital Signatures will use an asymmetric cryptosystem and also a hash function

8. Provision for the appointment of the Controller of Certifying Authorities (CCA) to license and regulate the working of Certifying Authorities. The Controller to act as a repository of all digital signatures.
9. The Act applies to offenses or contraventions committed outside India
10. Senior police officers and other officers can enter any public place and search and arrest without warrant
11. Provisions for the constitution of a Cyber Regulations Advisory Committee to advise the Central Government and Controller.

## **Applicability and Non-Applicability of the Act**

### **Applicability**

According to Section 1 (2), the Act extends to the entire country, which also includes Jammu and Kashmir. In order to include Jammu and Kashmir, the Act uses Article 253 of the constitution. Further, it does not take citizenship into account and provides extra-territorial jurisdiction.

Section 1 (2) along with Section 75, specifies that the Act is applicable to any offense or contravention committed outside India as well. If the conduct of person constituting the offense involves a computer or a computerized system or network located in India, then irrespective of his/her nationality, the person is punishable under the Act.

Lack of international cooperation is the only limitation of this provision.

### **Non-Applicability**

According to Section 1 (4) of the Information Technology Act, 2000, the Act is not applicable to the following documents:

1. Execution of Negotiable Instrument under Negotiable Instruments Act, 1881, except cheques.
2. Execution of a Power of Attorney under the Powers of Attorney Act, 1882.
3. Creation of Trust under Indian Trust Act, 1882.
4. Execution of a Will under the Indian Succession Act, 1925 including any other testamentary disposition by whatever name called.
5. Entering into a contract for the sale of conveyance of immovable property or any interest in such property.
6. Any such class of documents or transactions as may be notified by the Central Government in the Gazette.

**The Information Technology Amendment Act, 2008 (IT Act 2008)** is a substantial addition to India's Information Technology Act (ITA-2000). The IT Amendment Act was passed by the Indian Parliament in October 2008 and came into force a year later. The Act is administered by the Indian Computer Emergency Response Team (CERT-In).

The original Act was developed to promote the IT industry, regulate e-commerce, facilitate e-governance and prevent cybercrime. The Act also sought to foster security practices within India that would serve the country in a global context. The Amendment was created to address issues that the original bill failed to cover and to accommodate further development of IT and related security concerns since the original law was passed.

Changes in the Amendment include: redefining terms such as "communication device" to reflect current use; validating electronic signatures and contracts; making the owner of a given IP address responsible for content accessed or distributed through it; and making corporations responsible for implementing effective data security practices and liable for breaches.

The Amendment has been criticized for decreasing the penalties for some cybercrimes and for lacking sufficient safeguards to protect the civil rights of individuals. Section 69, for example, authorizes the Indian government to intercept, monitor, decrypt and block data at its discretion. According to Pavan Duggal, a cyber-law consultant and advocate at the Supreme Court of India, "The Act has provided Indian government with the power of surveillance, monitoring and blocking data traffic. The new powers under the amendment act tend to give Indian government a texture and color of being a surveillance state."