Management Information System

Ch-1: Information Systems in Global Business Today

Handouts by: Er. Shirish Raj Sharma

Opening Case : The New Yankee Stadium looks to the Future

- Though there are different games and sports, they are not considered as pure of their form rather they are considered as business too and so is applicable for baseball.
- In this modern age, people prefer to sit at home and play online games so its quite difficult to make them satisfied regarding real life scenario.
- This case is about New Yankee Stadium which were designed to focus on these type of viewer. The new Yankee Stadium, opened on April 2, 2009, was designed as the stadium of the future.
- It is the most wired, connected, and video-enabled stadium in all of baseball.
- Although the new stadium is similar in design to the original Yankee Stadium, built in 1923, the interior has more space and amenities, including more intensive use of video and computer technology.

Opening Case : The New Yankee Stadium looks to the Future

- Baseball fans love video. According to Ron Ricci, co-chairman of Cisco Systems' sports and entertainment division, "It's what fans want to see, to see more angles and do it on their terms."
- Cisco Systems supplied the computer and networking technology for the new stadium.
- Throughout the stadium, including the Great Hall, the Yankees Museum, and in-stadium restaurants and concession areas, 1,200 flat-panel high-definition HDTV monitors display live game coverage, up-to-date sports scores, archival and highlight video, promotional messages, news, weather, and traffic updates.
- Also, there is also a 101 feet wide and 59 feet high monitor in center field which provide up-to-the moment traffic information to the nearest stadium exits at the end of game

Opening Case : The New Yankee Stadium looks to the Future

- The monitors are designed to surround fans visually from the moment they enter the stadium, especially when they stray from a direct view of the ball field.
- The purpose of implementing this technology is that they never miss a play in case they leave their seats.
- Monitors are located at concession stands, around restaurants and bars, in restrooms, and inside 59 luxury and party suites.
- If a Yankee player wants to review a game to see how he played, monitors in the team's video room will display what he did from any angle.
- Also, each Yankee player has been provided a computer at his locker.

Opening Case : The New Yankee Stadium looks to the Future

- The luxury suites have special touch-screen phones for well-heeled fans to use when ordering food and merchandise.
- Players will be able to videoconference and talk to fans before or after the games.
- Eventually data and video from the stadium will be delivered to fans' home televisions and mobile devices. Inside the stadium, fans in each seat will be able to use their mobile phones to order from the concessions or view instant replays.
- If they have an iPhone, an application called Venuing lets them communicate with other fans at the game, find nearby facilities, obtain reviews of concessions, play pub-style trivia games, and check for news updates.

Opening Case : The New Yankee Stadium looks to the Future

- The Yankees also have their own Web site, Yankees.com, where fans can watch in-market Yankees games live online, check game scores, find out more about their favorite players, purchase tickets to games, and shop for caps, baseball cards etc.
- The site also features online fantasy baseball games, where fans compete with each other by managing “fantasy teams” based on real players’ statistics.

The Role of IS in Business

- There is a large amount of investment on software and hardware for the establishment of IT infrastructure. These infrastructure have to be established and maintained by the responsible person of an organization.
- Information systems are used by making large investments in information technology and are intensive used by most of the managers.
- Since the investment is so high, there is no chance of making poor decisions as it will be wasting valuable capital.
- As the investment is smart, the choice of selection of technology is also getting smarter by buying newer type of system rather than the traditional one.

The Role of IS in Business

- The growth of cell phone users have been increasing day per day in comparison with landline phones.
- Also there is the growth of online transaction and business is getting increased per period of time.

Transformation of Business with IS

- The use of different kinds of devices and technology for making calls and establishing connection such as cell phones, video conferencing etc.
- Online business made a revolution in business as their demand were increased so high.
- Along with these, the regular activities of human also get changed. People preferred to read newspapers online due to the attraction towards Internet and also to save time.

The Role of IS in Business

- In the same period the use of social media increased and many sources made available their data over Internet as well.

New in MIS

- The things that made MIS newer every time is the change in technology. Every time we get chance to learn new things and make ourselves updated.
- Basically, in the technology area there are three interrelated changes:
  a. the emerging mobile digital platform
  b. the growth of online software as a service, and
  c. the growth in “cloud computing”.

The Role of IS in Business

- The concept of cloud computing made a revolution in business world as the data could be shared so easily over Internet.
- Though different gadgets and handheld devices were designed for entertainment, they supported very well in business transaction also.
- A trend of following traditional way of making business transactions is being dimmed through the period of time.

Globalization Challenges & Opportunities

A Flattened World

- There are many assumption and theories regarding globalization which has made different forms of positive and negative effect in business
- Globalization brings both opportunities and challenges for a business firm in different aspects when it deals with different nature of customers.
- Different logistic data shows different kinds of ups and down of different organization
- These days not only goods are transferred across the borders but also different kinds of services are also being exchanged among different countries.

Globalization Challenges & Opportunities

- These activities made different countries grow in economical level.
- Also, the handshaking among countries helps to improve their relationship and taste of a single country can be experienced worldwide and this is made only by globalization.
- Since the consumption becomes high as the business is made worldwide, many people get opportunity for jobs.
- When dealing in Global business, it made to improve in quality of the business it makes.
- Also, in global market everyone is free to buy and sell anytime anywhere.

Globalization Challenges & Opportunities

- Customer gets information about their product so that they can be guaranteed for genuineness and of right price.

The Emerging Digital Firm

- A **digital firm** is one in which nearly all of the organization's *significant business relationships* with customers, suppliers, and employees are digitally enabled and mediated.
- *Core business processes* are accomplished through digital networks spanning the entire organization or linking multiple organizations.

Globalization Challenges & Opportunities

- **Business processes** refer to the set of logically related tasks and behaviors that organizations develop over time to produce specific business results and the unique manner in which these activities are organized and coordinated. On the other hand, it also refers dealing from collecting raw data to make it consumed in the market.
- For making all these happened, key corporate assets such as intellectual property, core competencies, and financial and human assets, have to be dealt with all digital means.

Globalization Challenges & Opportunities

- Digital firms sense and respond to their environments far more rapidly than traditional firms, giving them more flexibility to survive in turbulent times.
- Making digital world it has focused on two major aspects of business viz. Time Shifting and Space Shifting.
- Time Shifting refers to the working mechanism of any business that is being run over 24 Hr. a day and 7 days a week which has enhanced the growth of business.
- Space Shifting refers to the business that is made all over the world which crosses International boundaries.
- Not every organization is digitized in every manner but they are considered to be adopted for enhancement

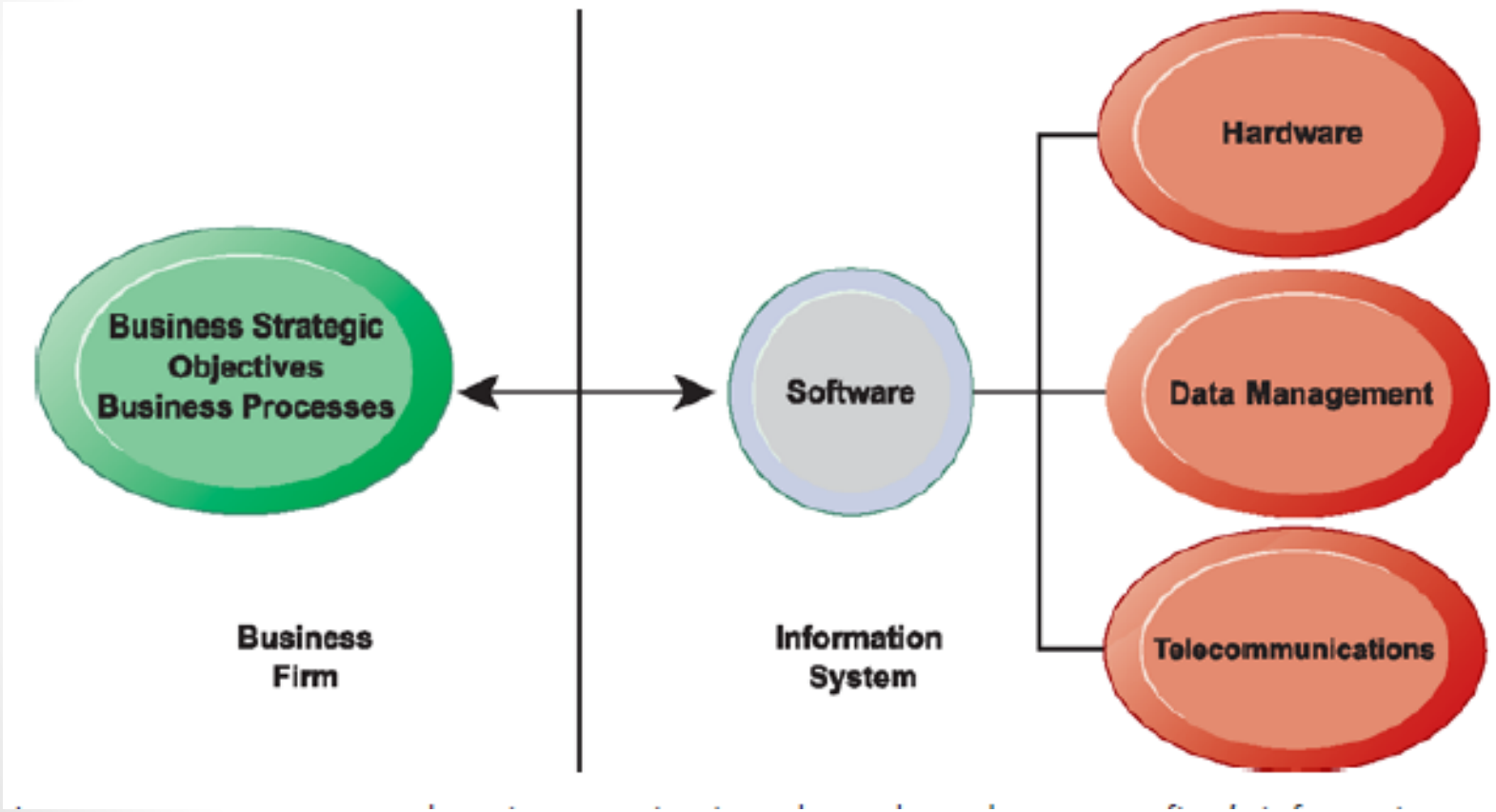
Globalization Challenges & Opportunities

- Along with the physical aspects getting digitized also deals with some virtual kind of environment such as video conferencing, making business chats etc.

Strategic Business Objectives of Information System

- For the implementation of Information System, there should be clear vision for bringing it into practice.
- Getting into digital world by coming out of original track of working in traditional type of working environment, is quite challenging task and accepting those challenges ti has to perform the mission and goal of an organization in global market.

Globalization Challenges & Opportunities



Globalization Challenges & Opportunities

- Making a business successful adopting new technologies is really a big challenge and getting success with its use is really an achievement.
- Many examples can be seen around the world for these type of challenges such as amazon, ebay, google, facebook etc.
- Not only for services but also for physical aspects it has to be done in same manner so that different types of equipment, goods, machinery materials can be exported and imported in proper manner.

Globalization Challenges & Opportunities

- Specifically, business firms invest heavily in information systems to achieve six different strategic business objectives:
  - operational excellence
  - new products, services and business models
  - customer and supplier intimacy
  - improved decision making
  - competitive advantage and
  - survival.

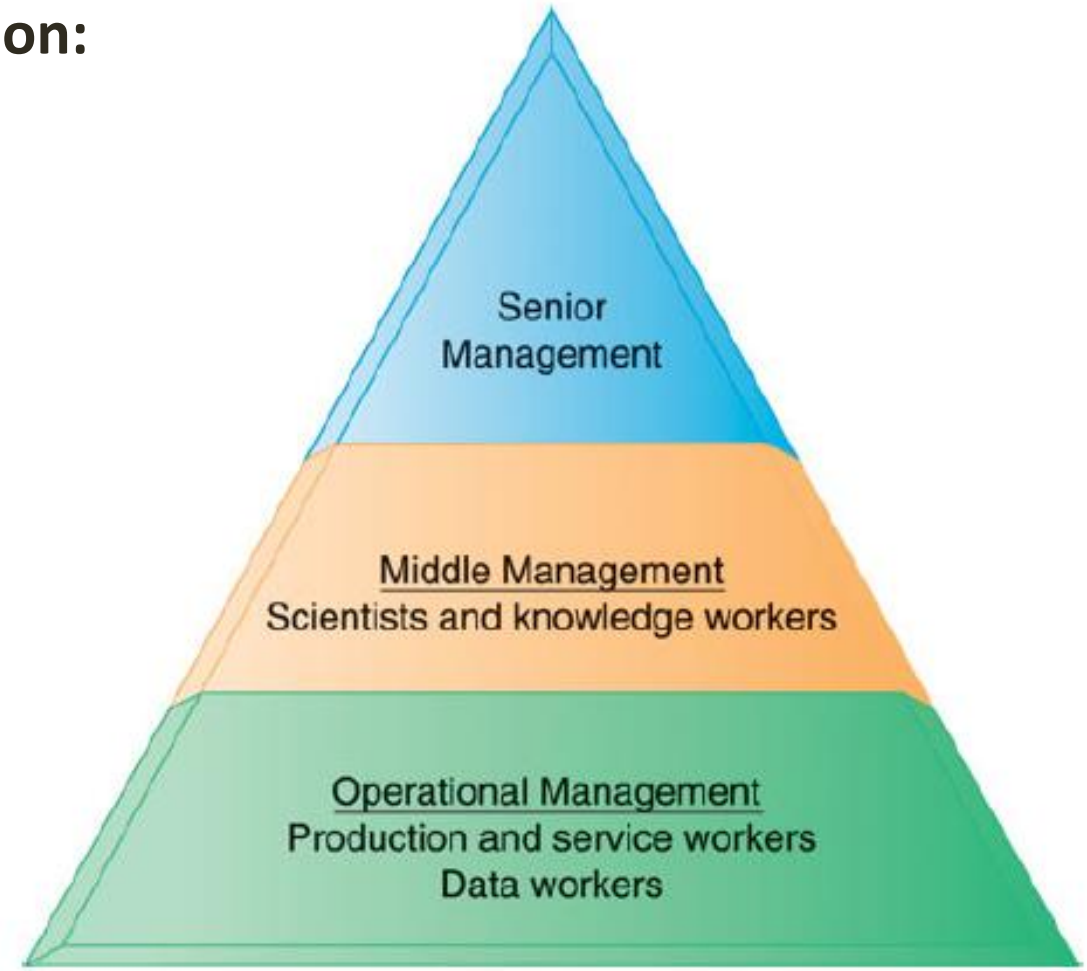
Dimension of IS

- When we are dealing with the dimension of Information System there are lots of issues that is needed to be sorted out
- The issues could be in context of technical literacy, impact of technical use, adaptation of employees (from lower to higher level) with the new system, achievement of goal of an organization in technical environment.
- These issues can be sorted out with the proper coordination among the dimensions of Information System. These dimensions can be listed as below:
  - organizations,
  - management, and
  - information technology.

Dimension of IS

Dimension of IS

Organization:



Dimension of IS

- Information systems are an integral part of organizations without which many companies would not run any business.
- Organizations have a structure that is composed of different levels and specialties which has a hierarchy, or a pyramid structure.
- The upper levels of the hierarchy consist of managerial, professional, and technical employees, whereas the lower levels consist of operational personnel.

Dimension of IS

- **Senior management** makes long-range strategic decisions about products and services as well as ensures financial performance of the firm.
- **Middle management** carries out the programs and plans of senior management and
- **Operational management** is responsible for monitoring the daily activities of the business.
- The major **business functions**, or specialized tasks performed by business organizations, consist of sales and marketing, manufacturing and production and are performed by differently skilled person.

Dimension of IS

- An organization coordinates work through its hierarchy and through its business processes, which are logically related tasks and behaviors for accomplishing work.
- Each organization has a unique **culture** or **pattern** that has been accepted by most of its members which real life examples can be seen around.
- Different levels and specialties in an organization create different interests and points of view. These views often conflict over how the company should be run and how resources and rewards should be distributed.

Dimension of IS

Management

- Management's job is to make sense out of the many situations faced by organizations, make decisions, and formulate action plans to solve organizational problems.
- Managers set the organizational strategy for responding to those challenges; and they allocate the human and financial resources to coordinate the work and achieve success.
- Managers are also responsible to create new products and services and even re-create the organization from time to time.

Dimension of IS

- A substantial part of management responsibility is creative work driven by new knowledge and information. Information technology can play a powerful role in helping managers design and deliver new products and services and redirecting and redesigning their organizations.

Information Technology:

- Information technology is one of many tools managers use to cope with change. The main components can be considered as Computer hardware, software, Data management technology, Networking and telecommunications technology etc.

Dimension of IS

- Beside these technologies, there is also need of connection technology such as Internet, Intranet and Extranet.
- For the flow of information in the form of text, graphics and videos there is also need of websites which is published on world wide web.
- For the management of these all things, there is also need of technical resource person who take participation in establishment and preservation of these systems.

Interactive Session:

Technology UPS competes Globally with Information Technology:

- This interactive session has to be prepared by students in groups.

A Business Perspective on IS

- The reason on investing on Information Technology and system is to get good return from it.
- These kind of investment is as important as investment in land, building, machines and other assets.
- The increase in productivity is always expected in such type of investment as it increase revenue and future value of the shares of an organization.
- Use of Information System drives one to make smart decisions and it makes good execution of a firm as well.
- The transparency, effectiveness and efficiency also get increased with the help of such type of investments.

A Business Perspective on IS

- Including all these, an implementation of IS brings a business to be run on chain order that drives an organizational operation follow hierarchical order.
- From business perspective, information systems are part of a series of value-adding activities for acquiring, transforming, and distributing information that managers can use to improve decision making, enhance organizational performance, and, ultimately, increase firm profitability.
- An information system represents an organizational and management solution, based on information technology, to a challenge or problem posed by the environment.

A Business Perspective on IS

- These systems provide a solution that takes advantage of new interactive digital technology and opportunities created by the Internet.

Complementary Assets

Organizational capital and the right business model

- There should be awareness that why the Information System is required and what are the benefits it can give to an organization.
- There are so many facts that the investment on IT gives returns with so many variations.
- Some firms invest a great deal and receive a great deal, others invest an equal amount and receive few returns, other firms invest little and receive much, whereas others invest little and receive little.
- These kind of variation occurs due to various factors.

Complementary Assets

- Information technology investments alone cannot make organizations and managers more effective unless they are accompanied by supportive values, structures, and behavior patterns in the organization and other complementary assets.
- Business firms need to change how they do business before they can really reap the advantages of new information technologies.
- On he same flow, some firms fail to adopt the right business model that suits the new technology, or seek to preserve an old business model that is doomed by new technology

Complementary Assets

- **Complementary assets** are those assets required to derive value from a primary investment on some other factors that helps to enhance the business.
- Research on business information technology investment indicates that firms that support their technology investments with investments in complementary assets, such as new business models, new business processes, management behavior, organizational culture, or training, receive superior returns.
- Key organizational complementary investments are a supportive business culture that values efficiency and effectiveness, an appropriate business model, efficient business processes, decentralization of authority, highly distributed decision rights, and a strong IS development team.

Complementary Assets

- Important managerial complementary assets are strong senior management support for change, incentive systems that monitor and reward individual innovation, an emphasis on teamwork and collaboration, training programs, and a management culture that values flexibility and knowledge.
- Important social investments are the Internet and the supporting Internet culture, educational systems, network and computing standards, regulations and laws, and the presence of technology and service firms.

Hands on MIS

- Management Decision Problems; Improving Decision Making; Using Databases to analyze Sales Trends

Case Study

What's the Buzz on Smart Grids?

- This section has to be prepared by Student in Groups.

Management Information System

Ch-2: Global e-business and Collaboration

Handouts by Er. Shirish Raj Sharma

Case Study: America's Cup 2010, USA wins with Information Technology

- The 33rd America's Cup yacht race was held in Valencia, Spain in Feb. 18 2010.
- The competition was between two billionaire Larry Ellisn and Ernest Bertarelli.
- The 114 foot long, made of carbon fiber yacht won by winning first two races in best of three series.
- The speed of yacht was 35 miles per hour which was assumed three times faster than the wind.
- It then made record as a fastest sailboat.
- Due to its light weight the hull sink only six inches into the water.
- Stretchy aeronautical fabric was used instead of cloth sail over the carbon frame

Case Study: America's Cup 2010, USA wins with Information Technology

- The massive collection of data was done at lightening speed with the help of powerful data management, rapid real time data analysis, quick decision making and immediate measurement of the result.
- 250 sensors were attached with the wings, hull and rudder to gather real time data on pressure, angles, loads etc
- The sensors help our to monitor the strains on the effectiveness of each adjustments.
- The sensors were able to collect 4000 types of data.
- The database management software used was Oracle 11g.
- Data were transferred wirelessly for real time analysis using velocity prediction formulas.

Case Study: America's Cup 2010, USA wins with Information Technology

- For more preciseness, data were sent to Oracle's Austin data center for real time calculation and prediction with deep calculation.
- It was made possible over years of practice and result improvement in performance.
- Each crew member were give a small mobile handled computer on their wrist to display data.
- They were given a sunglass which display data with the occasional glance the deck crew, sea state and competition.
- Using technology in the race was both challenge and opportunity.
- Technology refined the sailing ability of crew members.

Case Study: America's Cup 2010, USA wins with Information Technology

- The high tech devices and sensors were used to make historic winning race which yield as result of billions of profit as result.

Business Process

- Business has to deal with many aspects of information such as supplies, customers, employees, invoices and payments along with its product and services.
- It is a collection of activities required to produce a product or services in which organizations coordinate work information and knowledge
- It is considered as strength of any business firm which helps to sustain a company or organization with its rivals by executing in better ways.
- New business process enable a business organization to perform on better way overcoming the weak points.
- To make plan, implementing it into real and bring into practice is considered as business process in real life.

Business Process

- In a business organization, as they have different area of performance, they all go through different business process.
- Many examples can be seen as business process around us.
- Example such as from collecting raw material to delivering among the consumers.

Business Improvement with IT

- Information Technology has automated the working mechanism in an business organization
- It has eased in many aspects that such as to perform different tasks simultaneously, eliminating delay, improved decision making etc.
- It changes the working mechanism in rapid speed so that the performance of an organization get improved.
- From study material to entertainment, all the things can be achieved with the help of Internet (a part of IT), which helps an organization to grow faster and gives better result in comparison.
- The concept of globalization has made the world smaller and thus the business can be spread in larger area.

Business Improvement with IT

- IT enables an organization to analyze data of previous transactions and helps to perform precisely in future
- If business process can be analyzed in better way, the whole system becomes more effective and efficient.
- Ultimately we can see innovation can be achieved by acquiring IT in the field of business process.

Types of Information System

- We can see there are different interest, specialties and levels in an organization to handle different kinds of information.
- The different kinds of systems may be sales and marketing, manufacturing and production, finance and accounting and human resources.
- The functions used to manipulate these kind of systems should be cross functional so that there should not be any kind of conflict to manage different nature of data of different units.
- Many features are supported by the system to make ease in decision making.
- Different level of management uses their respective systems viz. operation, middle management and senior management.

System for different Management Group

Basically systems which consists of transaction processing systems, management information systems, decision support system and system for business intelligence are supportive to different groups or level of management.

Transaction Processing System

- The key elements of an business organization can be considered as sales, receipts, cash deposit, payroll, credit decisions and the flow of material.
- The Transaction Processing System (TPS) works on these kind of data and keep record of daily routine.
- It is used to determine flow of transaction, credit record of some party etc. It makes easy to find out these kind of data in computerized way

TPS…

- By viewing the past record of a customer it helps to determine to provide further credit or loan i.e. it supports in decision making also.
- At managerial level, it is very much useful to monitor the status of internal operations and the firm's relations with the external environment.
- It is very useful and responsible tool for maintaining records of the firm's income and expenses so that its can produce reports such as income statements and balance sheet.
- It also helps to keep record of expenses made to employees such as pension, insurance etc.
- Failure of any component of this system is not affordable as it may make another rival companies to lead.

Business Intelligence System

- Middle management needs systems to help with monitoring controlling, decision making and administrative activities.
- MIS provide middle managers with reports on the organizations current performance. This information is used to monitor and control the business an predict future performance.
- The reports are generated and delivered online which serves the information about basic operations using data supplied by transaction processing systems.
- These kind of systems typically provide answers to routine questions that have been specified in advance and have a predefined procedure for answering them in desired time interval like on daily, weekly or monthly basis.

BIS …

Such MIS are not flexible and have little analytical capability as it serves to compare total annual sales figure for specific products to planned targets.

On the other hand, **Decision Support Systems (DSS)** support more non routine decision making. They focus on the problems that are unique and are rapidly changing.

For e.g. they are capable of answering questions like what would be the impact on production schedules if we were to double the sales in particular month OR what would happen to our return on investment if the factory schedule is delayed for certain period.

They take information from TPS and MIS but they are capable of predicting decisions on the basis of available current stock or price of a product

BIS …

- It works on the available data gained from financial calculation as well technical detail.
- It looks for options to provide the service in cheaper way so that it can minimize cost.
- It take useful information from large amount of data and works on decision making.
- **Business intelligence**, which is considered as the collection of data and software, is used to organize analyze an provide access to all level of users.
- **Executive Support System (ESS)** is used by senior management addressing non routine decisions which requires judgment, evaluation and insight and generates decisions with the help of graphs and different data through web portal

BIS …

- All the information required by the senior level of management is present in the form of **digital dashboard** which displays in graphs and charts of key performance indicators for managing a company.

System for linking an Enterprise

All system holds the information in their respective manner. These information can be linked up with corresponding systems so that they can share information and managers and employees are able to coordinate their work.

Enterprise Application:

- Corporates are put together both through normal organic growth and through acquisition of smaller firms.
- Minimize the complexity of getting into touch by gathering together and talking
- It help businesses become more flexible and productive by coordinating their business processes more closely and integrating groups f process so they focus on efficient management of resources and customer services.

Enterprise Application

- This applications can be categorized in different aspects such as enterprise systems, supply chain management system, customer relationship management system and knowledge management systems but performs as a whole
- It is used to integrate business process in manufacturing and production, finance and accounting, sales and marketing and human resource into a single system.
- Whenever a product is subject to be moved from its place, it effects many section of an enterprise or an organization.
- **Supply Chain Management System** helps to manage relationship with the suppliers as these kind of systems serves suppliers, purchasing firms, distributors and logistics companies to share information about orders, production, inventory levels and delivery of products or services

Enterprise Application

- The ultimate goal is to get the right amount of the product from the source to the point of consumption the least amount of time and at lowest cost.
- **Customer Relationship Management System** are used to manage their relationship with their customers in terms of sales, marketing and service to optimize revenue, customer satisfaction and customer retention.
- Knowledge Management System serves about how to create, produce and deliver products and services.
- It is used to bind up different level of skill and knowledge to perform effectively and efficiently.

Interactive Session: Domino's sizzles with Pizza Tracker

- Domino's owns the highest pizza delivery chain in United States.
- It is maintaining its reputation for maintaining the quality of its pizza and its delivery service throughout the Nation since the time of its establishment.
- It was established in 1960 by Tom Monaghan and his brother James from a small pizza store in Ypsilanti, Michigan.
- By the year 1978, it had 200 stores.
- Today it has headquarter in Ann Arbor, Michigan and operates almost 9000 stores in all U.S. States.
- In 2009, it earned $80 million. In profit.
- It tries to deliver best customer services against its rivals Pizza Hut and Papa John's

Interactive Session: Domino's sizzles with Pizza Tracker

- A point of sale system called Pulse was used to keep all kind of records in computerized way.
- Pulse was brought into practice in 2003, for improved customer service, reduced mistakes and shorten training time in its stores and all its franchises.
- Later Pulse was replaced by its improved version which was known as Pulse Evolution which was better than its previous version in many ways.
- It works on thick client mode. Which required all machines using the software to be fully equipped personal computers running windows.
- Its easier to update and more secure as it works on the concept of centralized system.

Interactive Session: Domino's sizzles with Pizza Tracker

- It also implemented online ordering system which is called Pizza tracker which gives a simulated photographic version of the pizza as they customize its size, sauces and topping .
- Once a order is placed, customer are able to view the progress through a horizontal bar which on fulfillment of order shows the bar as red. This can be seen online through Pizza Tracker.
- Domino's tried to experience all its franchises use Pulse which was opposed by them and the matter went to the District Court of Minnesota
- Pizza Hut and Papa John's also have online ordering application but they lack Pizza Tracker and simulation.
- Around 20 percent of all pizza orders are made through online system though Pizza Hut and Papa John's have their respective ordering system.

Interactive Session: Domino's sizzles with Pizza Tracker

- Answer the Case Study Question
- Refer page no. 55
- Be precise with your answers.
- Also look at MIS in Action to be familiar with Real Time Questionnaire.

System for Collaboration & Teamwork

Information system cant make decisions, hire or fire people, sign contract, agree on deals or adjust the price of goods of a product. For these, businesses need special kind of system to support collaboration and teamwork.

- Collaborating is working with other to achieve shared and explicit goals. It can be short lived, lasting a few minutes or longer terms depending on the nature of the task and the relationship among participants.
- Teams are the part of an organization for getting things done. It has a specific mission that someone in the business has assigned to them. Team are often short lived, depending upon the problems they tackle and the length of time needed to find a solution and accomplish the mission.

System for Collaboration & Teamwork

Collaboration and Teamwork are important for the following reasons:

- Changing nature of work.
- Growth of Professional work.
- Changing organization of the firm.
- Changing scope of the firm.
- Emphasis on innovation.
- Changing culture of work and business.

System for Collaboration & Teamwork

Business benefits of Collaborations and Teamwork

- Increased Productivity
- Improve Quality
- Innovation.
- Better Customer Service.
- Better financial performance (profitability, sales and sales growth).

Tools and Technologies for Collaborations and Teamwork

- Email and Instant Messaging.
- Social Networking
- Wikis
- Virtual World
- Internet Based Collaboration Environment such as Virtual Meeting System, Google Apps, Microsoft SharePoints, Lotus Notes etc.

Interactive Session: Virtual Meeting: Smart Management

- Technology has made business meetings that is made outside of country or town, so much easier by innovating a way to be held with the help of technology
- This technology helps two or more people to sit in their business places and can talk with each other.
- This features is done by transmitting video and audio compression by a device called codec.
- At the beginning it was considered as a poor substitute for face to face meetings.
- Videoconferencing is growing at an annual rate of 30 percent which makes an organization to reduce cost.
- Many companies like Power Grid Corporation of India is using this feature to get firsthand reports.

Interactive Session: Virtual Meeting: Smart Management

- As the technology has grown up in a gigantic way, the quality of video conference has been much improved.
- The videoconferencing technology is known as telepresence.
- Telepresence products provide the highest quality videoconferencing available on the market. Only the handshake and exchange of business cards cannot be taken place.
- Companies which can afford this kind of technology can make large saving. The saving is not only money but its time also as it reduces the complexity of travelling remote places.
- From the record of 2010, it is found that the carbon emission is reduced by 20 percent.
- It is also helpful to keep MRP of different multinational companies at reasonable price as it minimizes travelling cost.

Interactive Session: Virtual Meeting: Smart Management

- Other applications are also there which are free of cost like Skype but the applications like this have limitations of video quality and storing capacity.
- Companies look for web based applications for training and sales presentation also.
- Using this type of applications reduces cost of travelling by 60 percent and the average time to close a new sale by 30 percent.
- Videoconferencing figures to have and Impact on the business world in other ways as employees may be able to work closer at home and balance their work and personal lives more efficiently.

Interactive Session: Domino's sizzles with Pizza Tracker

- Answer the Case Study Question
- Refer page no. 65
- Be precise with your answers.
- Also look at MIS in Action to be familiar with Real Time Questionnaire.

The IS function in Business

Business needs Information System to get an Organization operated and thus they use many kind of systems. But the problem is who is the key person who is responsible for maintenance of the components which are used to get all system functional.

We consider Information System Department or Information Technology Department as responsible to handle all formal and informal issues being happened in an organization.

- Let have a look on different key persons who are considered as specialist on their work at the hierarchical level who are responsible to maintain their respective jobs.
- **Programmers** are assigned to develop different kind of software application in accordance with the need of an organization.

The IS function in Business

- **System Analyst** are the responsible to collect business problems and requirements and further translate to their seniors.
- **Information System Managers** are team leader of these two along with other many, who take participation in the operations being performed daily as well as are concerned with long term planning of IT.
- Also, **Chief Information Officers** are the senior Manager who oversees the use of Information Technology in a firm.
- **Chief Security Officer** is in charge of Information System security of a firm and is responsible for enforcing the firm's Information Security Policy. This security is different from the physical security.

The IS function in Business

- For the sake of keeping private data safely and ensuring that the company complies with existing data privacy laws, **Chief Privacy Officer** are assigned for the job.
- Similarly**, Chief Knowledge Officer** are responsible to design programs and systems t find new sources of knowledge or to make better use of existing knowledge.
- This all have their importance if **End Users** are there who plays great role in making these designated person to be functional.

Organizing IS Functions

- All the technical person who belongs to IS Department, are responsible for their respective jobs and thus a chain is created from operational level to the higher level to make the system being complete in itself.
- All these are focused on the target provided to them such as to analyze data, giving input to the system, develop program, maintaining networking etc.
- IT Governance includes the strategy and policies for using Information Technology within an organization.
- It focus on few factors such as
  1. Centralization of Information System functions
  2. Effectiveness of management must be ensured with the use of Information Technology

Organizing IS Functions

3. About key person who makes the decisions.
4. The methodology of making and monitoring decisions.

Hands in MIS

This section will cover the way of analyzing opportunity to business process using new Information System using a spreadsheet to improve decision making and using Internet Software to plan efficient transportation route.

Improving Decision Making: Using a Spreadsheet to Select Suppliers.

- New Transaction Data could be stored in a large spreadsheet about suppliers. This could be done by differentiating them in different criteria.
- The criteria could be determined on the basis of nature of material or good that has a regular flow in the company.
- The list of all the items can be seen in the spreadsheet in accordance with the priority.

Hands in MIS

- The fields of the spreadsheet may contain vendor name, vendor identification number, purchaser's order number, item identification number and item description including cost and order detail.
- This kind of data could be stored in a spreadsheet to filter things of our need such as supplier who can provide us some kind of goods in lowest price.

Hands in MIS

Achieving Operational Excellence: Using Internet Software to Plan Efficient Transportation Routes.

- Many business organization use some kind of online software system to map out their transportation routes and select the most efficient one.
- Many of the websites offer some kind of features which is so helpful in planning trips.
- These kind of websites are able to calculate the distance between two points and provide selection options to select best route for the trip.
- This feature is also used to deliver or dispatch some kind of goods to the desired destination. Its like a courier service that is helpful to track a route.

Hands in MIS

- The user should also be formal with the system that he/she uses to calculate the distance or the route.
- This feature is also helpful to minimize the time taken to deliver a good.

System for Functional Perspective

- IT enables collaboration and Teamwork:
- Challenge of using business information system
- Organizing the Information system function

Management Information System

Ch-3: Information Systems, Organizations and Strategy

Handouts by: Er. Shirish Raj Sharma

Opening Case: Verizon or AT&T – Which Company has the best Digital Strategy

- Verizon and AT&T are the two largest telecommunication companies in United States.
- They give the service of surfing Internet, send e-mail, text and video messages, share photos, watch videos and high definition TV and conduct videoconference along with voice communication
- They have a competition by providing their services in refined way for wireless and high speed Internet services.
- Since the profit is high in wireless services, both the companies work hard to provide better services in the same field.
- Verizon had made high investment in both of its landline and wireless services .

Opening Case: Verizon or AT&T – Which Company has the best Digital Strategy

- Verizon is renowned for its services in United States and now it is pouring billions of dollars into a rollout of fourth generation cellular technology.
- This technology is capable of highly data intensive applications such as downloading large stream of video and music through smart phones.
- The return from this investment is still uncertain.
- On the other hand AT&T choose different strategy such as to capitalize their innovation by their partners and thus it made a contract with Apple Computer.
- AT&T subsidize the cost of iPhone to the consumers where Apple streamlined design, touch screen, exclusive access to the iTunes music services

Opening Case: Verizon or AT&T – Which Company has the best Digital Strategy

- Over 250,000 download applications were there which made it an instant hit along with which it provide cellular services for other network applications such as Amazon's Kindle e-book and netbooks.
- The iPhone has became AT&T 's primary growth engine which lead 43 percent of U.S. market of smartphone customers compared to 23 percent of the U.S. market occupied by Verizon
- The iPhone became so widely popular so that users overstrained AT&T 's network, leaving many of the urban areas such as New York and San Francisco.
- To fulfill the demand it was estimated that it would cost $5 billion to $7 billion to meet Verizon's network quality.

Opening Case: Verizon or AT&T – Which Company has the best Digital Strategy

- Then AT&T moved to tiered pricing model for iPhone customers in which charges are based on the consumption.
- Its monopoly on iPhone might be in the ending phase when Apple make agreement with Verizon as iPhone was supposed to be compatible with Verizon's Network.
- Users switched to the Verizon's network in the hope of finding better network services
- It offers leading-edge smartphones based on Google's android operating system that compete well with iPhones.

Organization & Information System

- Information systems are built by managers to serve the interests of the business firm. Organization must be aware of and open to the influences of information system to benefit from new technologies.
- The interaction between Information Technology and organizations is quite complex and is influence by many mediating factors including the organization‘s structure, business processes, politics, culture, surrounding environment and management decisions.
- To design a new system, one should have to understand the nature of his own organization.
- According to the nature of an organization, it is seen that which technology shall be used & is decided by the managers

Organization & Information System

- This implementation of technology makes an organization to work differently. The difference can be of or not of expectation.
- If we need to define an organization, we can say that it is a stable, formal, social structure that takes resources from the environment and processes them to produce outputs.
- An organization takes basic elements, capital and labor, as a primary production factors which transforms them into product and services.
- When technology get changed, there are different methodologies which are implemented in an organization to create output in a different way.

Organization & Information System

- Building Information Systems involves much more than a technical rearrangement of the workers that some information system change different elements such as organizational balance of rights, privileges, obligations, responsibility, and feelings that have been established over long period of time.
- Making changes in these elements can take a long time and required more resources to support training and learning.
- The technical and behavioral definitions of an organization are complementary to each other in a way that technically it combines capital, labor and information technology whereas the behavioral model takes us inside the individual firm to see how that technolgy affects the organization's inner working.

Impact of IS in Organization & Business Firms

Information System have fundamentally altered the economics of organizations and greatly increased the possibilities for organizing work. Theories and concept from economics and sociology help us to understand the change brought about by IT.

Economic Impact:

- Information systems can be viewed as a factor of production that can be substituted for traditional capital and labor.
- Information technology is substituted for labor which historically has been a rising cost. Hence, information technology should result in a decline in the number of middle managers and clerical workers as information technology substitutes for their labor.

Impact of IS in Organization & Business Firms

- As the cost of information technology decreases, it also substitutes for other form of capital such as building and machinery, which remain relatively expensive.
- IT also affects the cost and quality of information and changes the economics of information as it can reduce transaction cost.
- According to transaction cost theory, firms and individuals seek to economize on transaction costs much as they do on production cost.
- Using market is expensive because of cost such as locating and communicating with distant suppliers, monitoring contract compliance, buying insurance, obtaining information on products etc.

Impact of IS in Organization & Business Firms

- Using IT a firm can lower the cost of market participation by shrinking in size to outsource work to a competitive marketplace rather than hire employees.
- According to agency theory, a firm is viewed as a “nexus of contracts” among self interested individuals rather than a unified profit maximizing entity where they have proper supervision and thus IT can also reduce internal management costs
- Information Technology permits organizations to reduce agency cost because it becomes easier for managers to oversee a greater number of employees. IT also helps to increase revenue by shrinking the number of middle managers and clerical workers.

Impact of IS in Organization & Business Firms

- We should expect firm size to shrink over time as more capital is invested in IT and it reduces both agency and transaction cost.

Organizational and Behavioral Impact:

Some theories based on sociology of complex organization provides some understanding about how and why firms change with the implementation of new IT applications.

IT Flattens Organization

- Large organizations which primarily developed before the computer age are often inefficient slow to change and less competitive than newly created organizations which generally prefer to reduce employees and number of level in their hierarchies.

Impact of IS in Organization & Business Firms

- Behavioral researchers have theorized that Information Technology facilitates flattening of hierarchies by broadening the distribution of information to empower lower level employees and increase management efficiency.
- IT pushes decision making rights lower in the organization because lower level employees receive the information they need to make decision without supervision.
- Managers receives so much more accurate information on time and they become much faster at making decisions so fewer managers are required.
- These changes made management span of control has also been broadened enabling high level manager to manage and control more workers spread over great distance.

Impact of IS in Organization & Business Firms

Postindustrial Organization:

- It is based on history and sociology rather than economics which says that IT should flatten hierarchies so that the worker become self managing and decision making
- Information Technology may encourage task force networked organization in which groups of professionals come together-face to face or electronically for short period of time to accomplish a specific task.
- A global consulting service *Accenture* is an example which do not have any operational headquarters and no formal branches.
- New approaches for evaluating organizing and informing workers are required to make this virtual work effective.

Impact of IS in Organization & Business Firms

Understanding Organizational Resistance to change:

- Information systems can affect who does what to whom, when, where and how in an organization.
- Many new IS require changes in personal, individual routines that can be painful for those involved and require retraining and additional effort that may or many not be compensated and it changes organization's structure, culture, business process and strategy.
- In 1965, Leavitt introduced a diamond shaped model which says changes in technology are absorbed, deflected and defeated by organizational task arrangement, structures and people.

Impact of IS in Organization & Business Firms

- This model says changes can be taken place only when the change in technology, task structure, and people are made simultaneously.
- It is found by many researches, failure of any project to reach their objectives is not the failure of the technology but organizational and political resistance to change.

The Internet and the Organization:

- Internet has an important impact on the relationships between many firs and external entities and even on the organization of business processes inside a firm.
- Internet allows a firm the accessibility, storage, and distribution of information and knowledge for any organization.

Impact of IS in Organization & Business Firms

- It helps to save million of money in distribution cost, as one can deliver his internal operating procedures manuals to their employees at distant location by posting them on the website
- Instant updates and information can be achieved using the respective web or email.
- The Web is considered as a key factor to build IT infrastructure by any aware organization as it is used up in many aspects.

Implications for the design and understanding of Information System:

- A clear vision shall be used in building Information System in any organization so that the benefits can be pointed out clearly.

Impact of IS in Organization & Business Firms

- The organizational factors that need to be considered when planning a new system are following:
  - An environment where organization must function
  - Structure of the organization, hierarchy, specialization, routine and business processes.
  - Culture and Politics.
  - Type of organization and its style of leadership.
  - The principal interest groups affected by the system and the attitudes of the workers who will be using the system.
  - The kind of tasks, decision and business processes that the information system is designed to assist

Using IS to achieve Competitive Advantages

- In corporate world, we can see that there are different nature of organizations which satisfy their customers with their services or products they work on.
- Though their nature of job are different, their ultimate goal is to lead in the market in which they are providing their services
- For example, as an online retailer Alibaba, Amazon are the leaders whereas Walmart is the largest offline retailer on the earth. Likewise, Apple iTunes, Timesmusic are largest market leaders regarding online music in their respective market. Similarly Google is leading in all over the place because of its country leading versions.
- Like these brands they do lead because of certain reasons such as they use a special resource that other don't do.

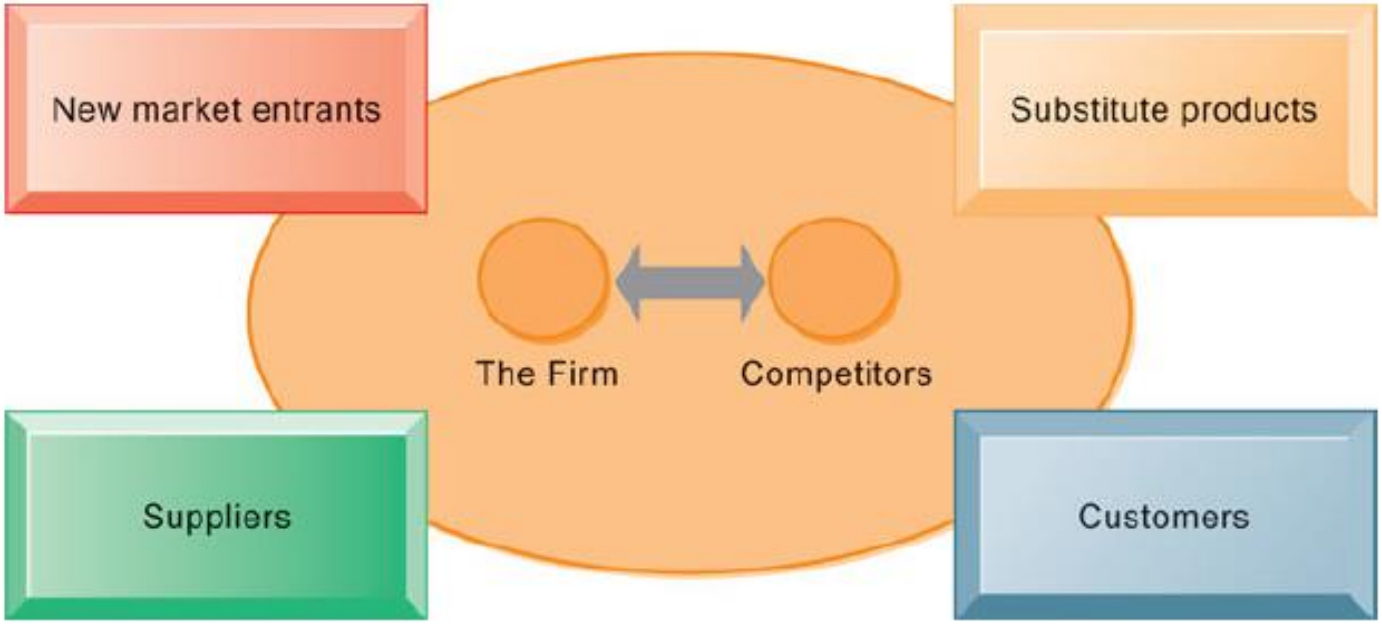
Using IS to achieve Competitive Advantages

- Or in contrast they use the commonly available resources more efficiently with the help of superior knowledge and information assets.

Porter's Competitive Forces Model

- This model provides a general view of the firm its competitors and the firm's environment. Porter's model is all about the firm's general business environment. In this model, five competitive forces shape the fate of the firm.
  - Traditional competitors
  - New Market Entrants
  - Substitute Product and Services
  - Customers
  - Suppliers

Using IS to achieve Competitive Advantages



Using IS to achieve Competitive Advantages

- *Traditional Competitors:* All firms share market space with other competitors who are continuously devising new more efficient ways to produce by introducing new products and services with effective cost.
- *New Market Entrants:* There are different field in the market where a firm can make its entrance. Business with high investment is hard to get started rather than a small business. And in case of new business where big capital is invested, they prefer to hire young employees as they are less expensive and well motivated for innovation.
- *Substitute Products and Services:* Customers always look for a substitute when they find price of certain product get high which they are using. It is also found that the pricing of

Using IS to achieve Competitive Advantages

substitute is less than the product they are using. Just like in the case of music CDs are the substitute for online music, and wind, solar, coal are substitutes for electricity etc. the more substitute products and services are there, the less capital pricing and low profit margins are available.

- *Customers:* Though a customer is attracted towards any product or services, they are very much price conscious and they always look for some alternative ways where they can find a better pricing option. So, it is necessary for any organization that they should be careful about their pricing schemes as pricing of any product can be found out through electronic media.

Using IS to achieve Competitive Advantages

- *Suppliers:* Suppliers are the key factors for any organization to generate high revenue. When a firm cannot raise the price, a supplier can easily do the job. The number of suppliers bring variety of options in terms of price, quality and delivery schedules. Any firm or organization may have number of suppliers for the same nature of product or services.

IS Strategies for dealing with Competitive Forces

It is a big issue for any business organization to face the competitive forces and prevent substitutes and inhibit new market entrants. There are some generic strategies which often is enabled by using information technology and systems.

Low-Cost Leadership:

- Information Technology can be used to lower the operational cost and thus lower the prices of any product or services.
- And example can be considered of Big Bazaar supermarket, which leads in retail business located in India. It has a chain of supermarkets which have different branches at different places.
- The system sends orders for new merchandise directly to one of its six distribution centers.

IS Strategies for dealing with Competitive Forces

- These distribution centers are located nearest to the supermarket retail branch area and they get order as soon as customers pay for their purchase at the cash register.
- Point-of-sale terminal records the bar code of each item passing the checkout counter and send a purchase transaction directly to the computer at its distribution center.
- Distribution centers can also access its sales and inventory data using web technology.
- Due to the efficiency of the system, it need not spend a great amount of money on maintaining large inventories of good in its own warehouses and can also fulfill the fluctuating customer demands.
- It also reduced the number of receiving locations from 16 to 4 and storage location from 16 to 5.

IS Strategies for dealing with Competitive Forces

- Its competitor Sears spend 24.9 percent of sales on overhead whereas Big Bazaar pays only 16.6 percent of sales revenue for overheads.
- It fulfills the requirement of approximately 0.5 million pieces of 1200 vendors from 119 stores across 76 cities in India.
- It also shows an example of an efficient customer response system that directly links consumer behavior to distribution and production and supply chain

Product Differentiation:

- Technology is used to enable new products and services or greatly change the customer convenience in using existing products and services.

IS Strategies for dealing with Competitive Forces

- Being a consumer, when someone is using any kind of product, he will obviously look for updated version of the exiting product that he is using or look for the new product which will replace it.
- For this a company have to apply an innovative strategy so that the customer would be attached to that certain brands.
- For example, Google always provides new features like Google Maps, Google+ type of services to retain the customer to its premises. Also Apple created an iPhone, iPad tablets as an upgraded version of the existing device iPod. These kind of strategies are used to keep the customer within the brand premises.
- In some cases, manufacturer facilitate customer to design their own product

IS Strategies for dealing with Competitive Forces

- For example, Nike allows customer to design their sneakers by their own. This feature to offer individually tailored products or services using the same production resources as mass production is called mass customization.

Focus on Market Niche:

- Technology is used to focus and serve this narrow target market better than competitors. IS support this strategy by producing and analyzing data for finely tuned sales and marketing techniques
- With the help of technology, companies can analyze customer buying pattern, tastes and preferences closely so that they efficiently pitch advertising and marketing campaigns to smaller and smaller target markets.

IS Strategies for dealing with Competitive Forces

- The data comes out from different range of sources such as credit card transactions, demographic data, purchase data, these data are analyzed by different sophisticated software to find the interest of a group of particular person so that it helps an organization for good decision making
- For example, Taj Hotel Resort and Palace, India, a big hospitality uses CRS system to analyze data of different nature of customer so that they can facilitate the frequent customer for long term business.

Strengthen Customer and Supplier Intimacy:

- We also use Information System to tighten linkage with supplier and develop intimacy with customers.

IS Strategies for dealing with Competitive Forces

- For example, Tata Motors uses IS to facilitate direct access by suppliers to production schedules, and even permits suppliers to decide how and when to ship supplies to. Tata Motors factory.
- On the suppliers side, rediffbooks.com, suning.com, amazon.com etc. keep track of user preferences for book and cd purchases and can recommend titles purchased by other to its customers.
- Strong linkage to customers and suppliers increase switching cost.

The Internet Impact on Competitive Advantage

- Due to the use of Internet, competitive rivalry has become much more intense
- It has made so much easier for any rival company to compete on price alone.
- As Information is available to everyone, it raises the bargaining power of customers who can quickly find the lowest cost provider on the web and thus profit have been dampened.
- Despite of the benefits to the customers, it has almost destroyed some industries and has severely threatened more.
- For example, a printed good like books has been totally replaced by the substitute available in the Internet
- It has significant impact on different things which has drastically lowered the revenue.

The Internet Impact on Competitive Advantage

- Example can be considered of music, book, software, telecommunication, news paper industries etc.
- Internet has also created entirely new markets, formed the basis for thousands of new products, services and business models and provided new opportunities for building brands with very large and loyal customer bases.
- Amazon, eBay, Alibaba, iTunes, YouTube, Facebook, Google, Baidu are the examples.
- For more most forms of media, the Internet has posed a threat to business models and profitability.
- Growth in book sales other than text books and professional publications has been sluggish as new forms of entertainment continue to compete for consumers' time.

The Internet Impact on Competitive Advantage

- With the use of Internet, News papers and magazines have been hit even harder as their readerships diminish, their advertisement shrink and more people get their news for free online.
- Also, the television and film industries have been forced to deal with pirates who are robbing them of some of their profits.

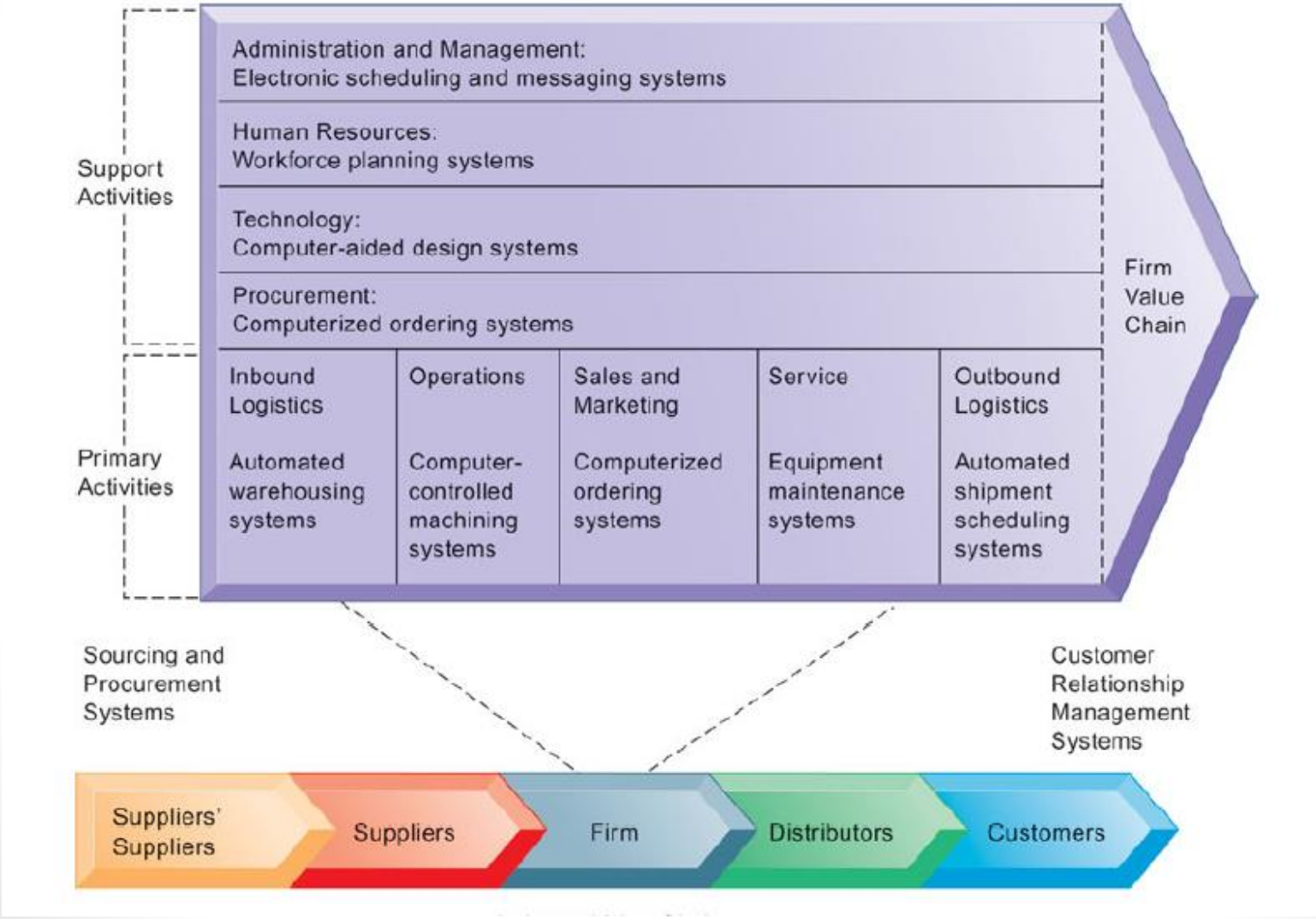
Interactive Session: How much do Credit Card Companies know about You

- This section is subjected to be prepared by students.
- Refer Page no. 102
- Answer the Case Study Question
- Be precise with your answers.
- Also look at MIS in Action to be familiar with Real Time Questionnaire

The Business Value Chain Model

- Porter's model is helpful for identifying competitive forces but it is not that specific for exactly what to do with this the methodologies and achieving competitive advantages.
- The Business Value Chain model highlights the specific activities in the business where competitive advantages can best be applied and where Information Systems are most likely to have a strategic impact.
- This model views the firms as a series or chain of basic activities that add a margin of value to a firm's product or services.
- This activities can be considered as primary activities or support activities.

The Business Value Chain Model



The Business Value Chain Model

- Primary Activities are most directly related to production and distribution of the firm's product and services which create value of the customer
- It include inbound logistics, operations, outbound logistics, sales & marketing and services.
- **Inbound logistics** include receiving and storing materials for distribution to production. **Operation** transforms input in to finished products. **Outbound logistics** consists storing and distributing finished products. **Sales and marketing** consist the promoting and sell the product. The **service** activity include maintenance and repair of the firm's goods and services.
- Support activity make the delivery of the primary activity possible and consist of organization infrastructure, HR , technology and procurement.

The Business Value Chain Model

- Now we can see the use of Information System at every stage of the series where we can experience the operational efficiency of the system.
- Sales and support employees with customers are the most common system application that result from a business value chain analysis.
- Using this model, business processes can be benchmarked against competitors which involves comparing the efficiency and effectiveness of the business process against strict standards and then measuring performance against those standards.
- For consistently and effectively achieving a business objective, best practice are usually identified.

The Business Value Chain Model

- These are done by consulting companies, research organization, government agencies and industry association as the most successful solution and problem solving method.
- When the list of candidate applications of Information system comes out, which one to design first.
- Competitive advantages can be achieved by attaining operational excellence, lowering costs, improving profit margins and forging a close relationship with customer and supplier.

Extending the Value Chain: The Value Web

- The performance of most firms depends not only on what goes on inside a firm but also on how well the firm coordinates with direct and indirect suppliers, delivery firms and customers

The Business Value Chain Model

- Firms, industry participants can use IT to develop industry wide standards for exchanging information or business transaction electronically.
- Such efforts increase efficiency, making product substitution less likely and perhaps raising entry costs thus discouraging new entrants.
- The use of IT is also applied to coordinate activities concerning government agencies, foreign competition and competing industries in the following ways:
  - Making it easy for suppliers to display goods and open stores.
  - Make it easy for customers to pay for goods.
  - Develop systems that coordinates the shipment of goods to customers

The Business Value Chain Model

- Develop shipment tracking system for customers.

- Thus it can simply be said that it is a collection of independent firms that use Information Technology to coordinate their value chain to produce a product or service for a market collection.

Using Systems for Competitive Advantage: Management Issues

- Strategic Information Systems often change the organization as well as its products, services and operation procedure driving the organization into new behavioral pattern.
- To make this thing done, there should be precise coordination of technology, organization and management.

Sustaining Competitive Advantage:

- It is seen that the sustainability of any business model for profit generation is not that long lasting which means the life of any business model is designed for short period of time.
- As competitors can retaliate and copy strategic systems, competitive advantage is not always sustainable.
- The other reason of this sustainability is not long lasting as there is rapid change in customer expectation, market and technology.

Using Systems for Competitive Advantage: Management Issues

- Competitive advantage can be achieved in very short period of time as all companies are smart enough to use the existing technology.
- The companies which are first at their business have been benefitted a lot as the graph of competition was very low at that time.
- It is obvious that Information Technology is not the single reason that has made sustainability in low graph as there are other factors such as strategic changes which affect in high order.

Aligning IT with Business Objectives:

- It is found that the fusion of IT and Business gives some real life assumptions such as:

Using Systems for Competitive Advantage: Management Issues

- The more successfully a business goals are tied up with Information Technology, the more profit a business can make.
- About half of a business firm's profit can be explained by alignment of IT with business

- We see that the use of IT in any firm does not serve the interest of the conservative management and shareholders very well and they refuse to understand the use of IT thinking its just a waste of time and money.
- Its is seen that a successful firm has a good command on the use of IT. The managers know what is the use of IT and how it works.

Using Systems for Competitive Advantage: Management Issues

- For a strategic system analysis, managerial level staffs should have make some checklist: Refer to Page no. 114

Managing Strategic Transitions:

- Adopting the kinds of strategic systems, generally requires changes in business goals, relationships with customers and suppliers and business processes.
- These sociotechnical changes can be considered as strategic transitions which describes about the movement between levels of sociotechnical systems.
- These kind of changes may effect in blurring of organizational internal and external boundaries as a result of which suppliers and customers must become intimately linked and may share each other's responsibilities.

Using Systems for Competitive Advantage: Management Issues

- For this new process are brought into practice by managers for coordinating their firm's activities with those of customers, suppliers and organizations.

Hands on MIS Systems: Management Decision Problems

- Improving Decision Making: *Using a Database to clarify Business Strategy* : Refer to Page no. 116
- Improving Decision Making: *Using Web Tools to Configure and Price and Automobile:* Refer to Page no. 117

Management Information System

Ch-4: Ethical and Social Issues in Information Systems

Handouts by: Er. Shirish Raj Sharma

Opening Case: Behavioral Targeting and Your Privacy: You're the Target

- How would be your feeling when you come to know that somebody is watching your activities being taken place on the web?
- Many of us search for different materials on the Internet using different kinds of search engine for buying or just for getting information about some products.
- The activities that is done over the system is visiting some web pages, viewing web content, clicking ads, watching videos, sharing content purchasing some product.
- The overall form of using Internet is specific by any user and follow some unique pattern.
- Google can be considered as an example which track our activities mentioned above.

Opening Case: Behavioral Targeting and Your Privacy: You're the Target

- The behavior of users is tracked by Google along with other such web sites and it displays ads based on their previous activities.
- In March 2007, when Google began displaying ads on thousands of Google based websites, it said that it would give users the ability to see and edit the information that it has compiled about their interest for the purposes of behavioral targeting.
- Behavioral targeting seeks to increase the efficiency of online ads by using information that web visitors reveal about themselves online.
- Online tracking is used to measure the results in terms of click-throughs and purchase

Opening Case: Behavioral Targeting and Your Privacy: You're the Target

- The technology used to implement online tracking is a combination of cookies, flash cookies and web beacons.
- Web beacons are small programs places on the system during the time of visiting thousand of web sites which report back to servers operated by the beacons owners the domains and web page visited, clicked ads and other online behaviors.
- A recent study of 20 million web pages published by 2 million web domains found Google, Yahoo, Amazon, YouTube, Photobucket and Flickr among the top 10 web bugging sites among which Google alone accounts for 20 % of all web bugs.
- Firms are experimenting with more precise targeting methods (Snapple used behavioral methods) focusing on specific types of things on their interests.

Opening Case: Behavioral Targeting and Your Privacy: You're the Target

- Following the same trend, Microsoft offers MSN advertisers to access to personal data derived from 270 million worldwide users to identify their personal interests and behaviors so that they can show ads precisely targeted on them.
- The growth in the power, reach and scope of behavioral targeting has drawn the attention of privacy groups and the Federal Trade Commission and web tracking is unregulated.
- In 2007, the FTC opened hearing to consider proposals from privacy advocates to develop a "do not track list".
- Hearing on behavioral targeting were held throughout 2009 and the first half of the 2010 with attention shifting to the privacy of personal location information.
- While Google, Microsoft and Yahoo pleaded for legislation to protect them from consumer lawsuits.

Opening Case: Behavioral Targeting and Your Privacy: You're the Target

- The FTC refused to consider new legislation to protect the privacy of the Internet users.
- In 2010, Congressional committees pressed leading Internet firms to allow users more opportunities to turn off tracking tools and to make users aware on entry to a page that they are being tracked.
- All of these regulatory efforts emphasize transparency, user control, over their information, security an the temporal stability of privacy promises.
- This technology is useful to develop a smart system which can response in accordance with the behavior of user though 70% of Americans do not want to receive targeted ads as they consider their information are only owned by them.

Understanding Ethical & Social Issues Related to a System

- In past days, we can see many examples of failed ethical judgment by senior and middle managers which lead them to pay different types of penalty.
- In today's new legal environment, managers who violate the law and are convicted will most likely spend time in prison.
- In the past business firms would often pay for the legal defense of their employees enmeshed in civil charges and criminal investigations, now firms are encouraged to cooperate with prosecutors to reduce charges against the entire firm for obstructing investigations.
- In many cases, the perpetrators of these crimes artfully used financial reporting information systems to bury their decisions from public scrutiny in the vain hope they would never be caught.

Understanding Ethical & Social Issues Related to a System

- Ethics refers to the principles of right and wrong that individuals acting as free moral agents use to make choices to guide their behaviors.
- Information systems raise new ethical questions for both individuals and societies because they create opportunities for intense social change and thus threaten existing distributions of power, money, rights and obligations.
- Ethical issues in Information System have been given new urgency by the rise of the Internet and electronic commerce, Internet and digital firm technologies make it easier than ever to assemble, integrate and distribute information unleashing new concerns about the appropriate use of customer information, the protection of personal privacy and the protection of intellectual property.

A model for thinking about Ethical, Social & Political Issues

- Ethical, social and political issues are interrelated with each other.
- If we consider a society as a calm pond, a delicate ecosystem in partial equilibrium with individuals and with social and political institutions, every individual knows how to act in the pond because social institutions have developed well-honed rules of behavior and these are supported by laws developed in the political sector that prescribe behavior and promises sanctions for violations.
- If a disturbing and powerful shock of new information technology and system hits a society, individuals related with them are confused with new situations and cannot response overnight to this ripples.

A model for thinking about Ethical, Social & Political Issues

- Political institutions also require time before develop the meantime
- A model is to be designed that connect ethical, social and political issues to identify the main moral dimensions of the information society which cut across various levels of actions.
- Refer Page No. 128 for figure.

Five Moral Dimensions of the Information age.

The major ethical, social and political issues raised by Information System include the following moral dimensions

- *Information rights and obligations*: Its about what an individual and organization can do to protect the system.
- *Property rights and obligations*: Its about the protection of traditional intellectual property rights in digital society in which tracing and accounting for ownership are difficult and ignoring such property rights.
- *Accountability and Control*: This part explains who can and will be held accountable and liable for the harm done to individual and collective information and property rights.
- *System quality*: To protect individual rights and the safety of society, standards of data and system quality demand are considerable.

Five Moral Dimensions of the Information age.

- *Quality of Life*: Its about the data or information which is stored in an information and knowledge based society. It is on the priority basis for the preservation of data.

Key Technology Trends that raise Ethical Issues

- Information Technology has heightened ethical concerns, taxed existing social arrangements and made some laws obsolete or crippled. The trends responsible for these ethical stresses are mentioned below:

Trends	Impact
Computing power doubles every 18 months	Organizations depend on advance computer systems for critical operations
Data Storage cost rapidly declining	Organizations can easily maintain detailed databases on individuals.
Data Analysis advances	Companies can analyze vast quantities of data gathered on individuals to develop detailed profile of individual behavior
Networking Advances	Access data from remote system, sharing files and devices has been easier.

Key Technology Trends that raise Ethical Issues

- The use of computers to combine data from multiple sources and create electronic dossiers of detailed information on individuals is called *profiling*.
- DoubleClick and ChoicePoint are the examples of profiling application which gathers data for different purposes and those information are sold in different business and government agencies.
- A data analysis technology called nonobvious relationship awareness (NORA) has given both the government and private sector even more powerful profiling capabilities by collecting data from different sources.
- This technology scans data and extracts information to provide homeland security by providing a detailed picture of the activities and associations of any individual.

Key Technology Trends that raise Ethical Issues

- Advances in networking, including the Internet, promise the greatly reduce the cost of moving and accessing large quantities of data and open the possibility of mining large pools of data remotely using small system.
- See figure in Page No. 131

Interactive Session:

- Interactive session 1 and 2 shall be prepared by students

Management Information System

Ch-5: Information Technology Infrastructure

Handouts by: Er. Shirish Raj Sharma

Opening Case: BART speeds up with new IT Infrastructure

- Bay Area Rapid Transit is a heavy rail public transit system that connect San Francisco to Oakland, California and other neighboring cities.
- BART is considered as most fast and reliable transportation medium which covers 104 miles of track and 43 stations.
- It provides an alternative by driving on bridges and highways decreasing travel time and the number of cars on the Bay Area's congested code.
- It is considered as fifth busiest rapid transit system in the United States.
- With some modernization made in the system, BART has improved in its services.
- This modernization was made to overcome aged system.

Opening Case: BART speeds up with new IT Infrastructure

- The aged system could no longer provide information rapidly enough for making timely decision and they were too unreliable to support its 24/7 services.
- To overcome from this demerit, BART upgraded both of its hardware and software.
- It replaced old legacy mainframe application with Oracle's PeopleSoft Enterprise Application running of HP Integrity Blade Servers and the Oracle Enterprise Linux Operating System.
- BART wanted to create a high availability IT infrastructure using grid computing where it could match computing and storing capacity more closely to actual demand.
- It run its server in grid architecture .

Opening Case: BART speeds up with new IT Infrastructure

- Multiple Operations share capacity and computing resources that can be provisioned, distributed and redistributed as needed over the grid.
- Despite of different data center as they use different servers for different applications and use its server typically uses only a fraction of its capacity, BART uses its server virtually so that multiple task can be performed increasing server capacity utilization to 50 percent or higher which enable fewer server can be used to perform multiple task.
- As it uses Blade servers, it can add another system to the main server and energy used is minimized.
- With the use of existing hardware and computing resources, BART saves power and cooling cost.

Opening Case: BART speeds up with new IT Infrastructure

- The use of new system reduced energy usage by 20 percent which saves a lot of money.

Defining IT Infrastructure

- Along with the set of physical devices and software application that are required to operate the entire enterprise, it is also considered as a set of firmwide services budgeted by management and comprising both human and technical capabilities.
- These services can be considered as follows:
  - Computing Platforms
  - Telecommunication Services
  - Data Management Services
  - Application Software Services
  - Physical Facilities Management Services
  - IT Management Services

Defining IT Infrastructure

- IT Standard Services
- IT Education Services
- IT Research and Development Services

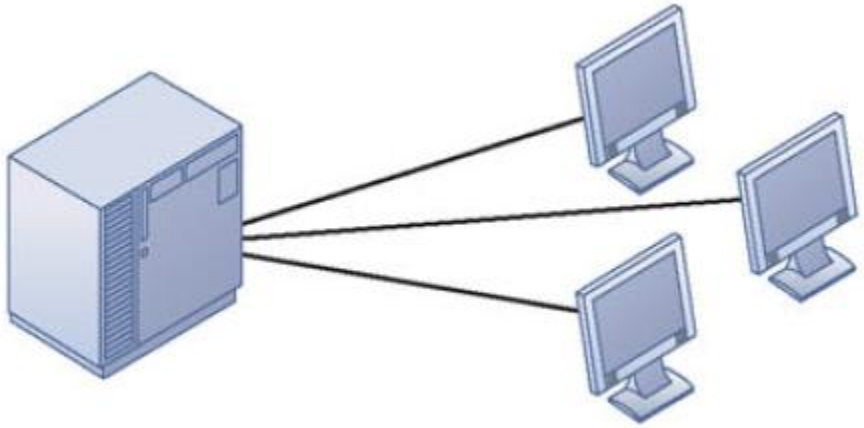
- To build a service platform perspective makes easier to understand the business value provided by infrastructure investments.
- For instance, if a transaction takes certain time with normal Internet connection, it can be upgraded to high speed Internet connection as the overall time saving will be higher than the usual one which may benefit an organization by reducing the number of staff.

Evolution of IT Infrastructure

- The evolution of IT infrastructure have covered a long journey of over 50 years to be categorized in five different stages.
- The different era determines different purpose of using the computers or systems.

General Purpose Mainframe and Minicomputer Era (1959 to Present):

Mainframe/
Minicomputer
(1959–present)



Evolution of IT Infrastructure

- This era began in 1959 when IBM introduced its mainframe model IBM-1401 and 7090. Later in 1960 when IBM introduces its advanced model IBM 360 series, it was a great revolution in business sector.
- This series was designed for commercial purpose that could provide multitasking, time sharing and virtual memory management.
- These computers were powerful enough to handle thousands of online remote terminals connected to the centralized mainframe.
- These computers were highly centralized computing under the control of professional programmers and system operations

Evolution of IT Infrastructure

- This pattern began to change with the introduction of minicomputers produced by Digital Equipment Corporation in 1965.
- It introduced PDF-1 and VAX machines which offered powerful machines at far lower price than IBM mainframe taking under consideration the needs of individual department or business unit rather than time sharing on a single huge mainframe.

Personal Computer Era: (1981 to Present)

Personal
Computer
(1981–present)

Evolution of IT Infrastructure

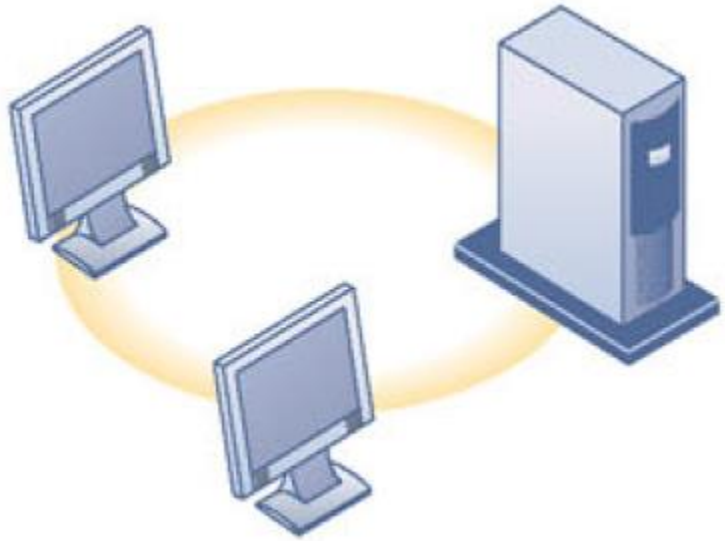
- Though the very first personal computer appeared in 1970s (Xeros Alto, MITS Altair 8800 and Apple I & II), it is considered as the beginning of this era. This era began when IBM PC was introduced in 1981 as it was widely adopted by American Businesses.
- At the beginning, the computers were brought in to market with DOS operating system which is a text based command language and later it was upgraded to Microsoft Windows Operating System in *Wintel* PC.
- In the starting of 1990s, some productivity tools were introduced such as word processors, spreadsheets, electronic presentation software and small data management program which were helpful for both home and corporate users.

Evolution of IT Infrastructure

Client-Server Era: (1983 to Present)

- In this model, desktop or laptop computers are called client system or workstation which are networked to the powerful computer system which are called servers which provides the client computers with a variety of services and capabilities.

Client/Server
(1983–present)



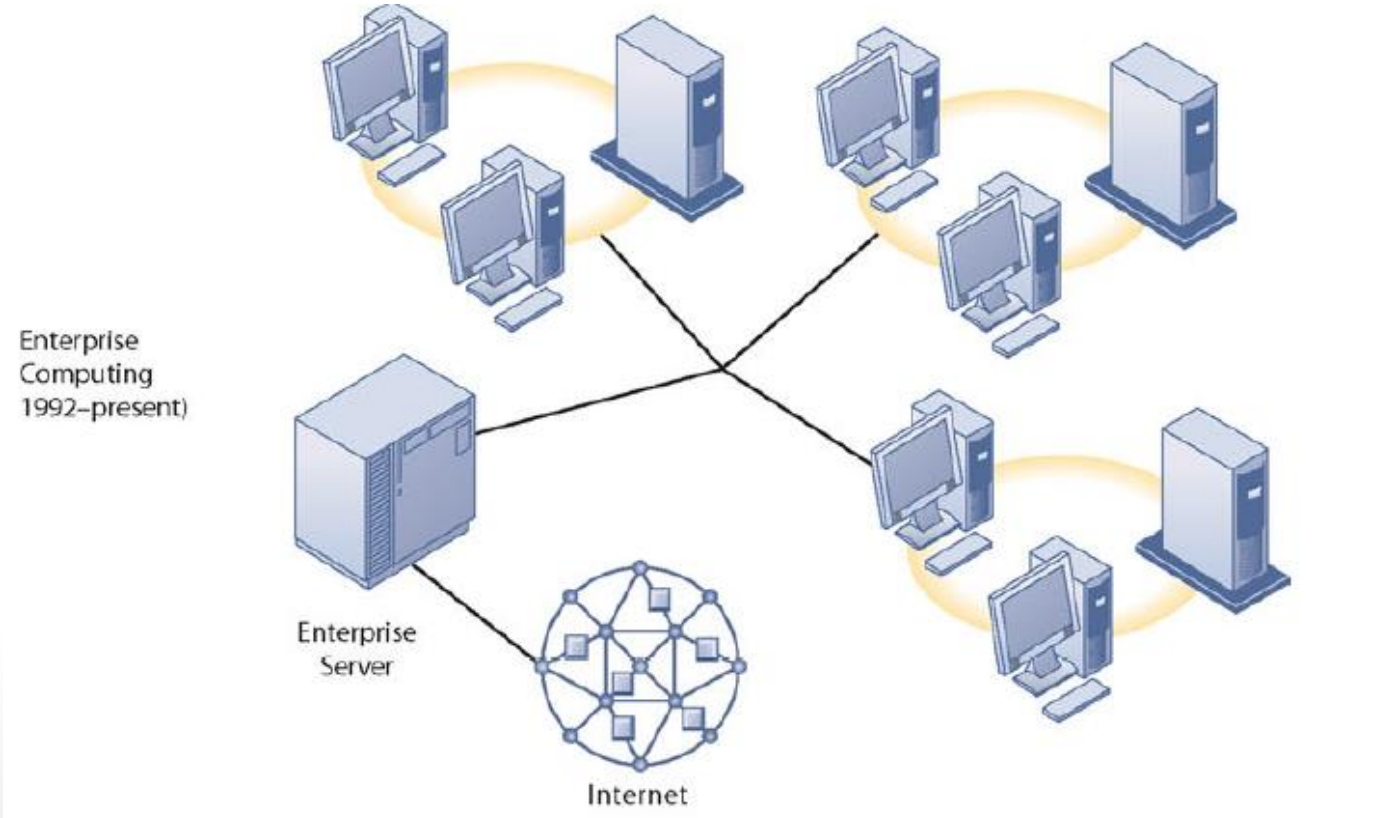
Evolution of IT Infrastructure

- The client is the user point of entry whereas the server typically processes and stores shared data, serves up web pages or manages network activities.
- The term server refers to both the software application and the physical computer on which the network software runs.
- When client-server computers are being performed in two working layer then it is said to be 2 tier client-server architecture. On the other hand, if it is making multiple layer then it is said to be multi-tiered or N-tired client server architecture.
- Client-Server computing enables businesses to distribute computing work across a series of smaller, inexpensive machines that cost much less than other one.

Evolution of IT Infrastructure

- Novell NetWare was the leading technology for client-server networking in the beginning of the client-server era.

Enterprise Computing Era: (1992 to Present)



Evolution of IT Infrastructure

- In the starting of this era, firms turned to networking standards and software tools that could integrate disparate networks and applications throughout the first into an enterprise wide infrastructure .
- Since the time, Internet has been come in the trusted region of communication, corporate world started to use it to link the small networks to make a complete network so that information can flow freely across the organization and between the firm and other organizations.
- It enables different kinds of computer hardware, including mainframes, servers, PCs, mobile phones and other handhold devices using public infrastructure such as the telephone system, Internet and public network services.

Evolution of IT Infrastructure

- For the purpose, it requires software to link disparate applications and enable data to flow freely among different parts of the business such as enterprise applications and web services.

Cloud and Mobile Computing Era: (2000 to Present)

Cloud and Mobile Computing (2000–present)

Evolution of IT Infrastructure

- The bandwidth of Internet has facilitated us to make communication to work in better way and thus it brought the concept of *"Cloud Computing"*.
- Cloud Computing refers to a model of computing that provides access to a shared pol of computing resources over a network, generally the Internet.
- There are numerous computers which are located in cloud data centers, where they can be accessed by desktop computers, laptops, mobile devices and other client machines linked to the Internet.
- It is very useful medium to maintain IT infrastructure from remote place over Internet.

Technology Drivers of Infrastructure Evolution

- The change in IT infrastructure resulted from development in computer processing, memory chips, storage devices, telecommunication and networking hardware & software design that exponentially reducing cost.
- These developments are achieved on the basis of different theories which can be described as below:

Moore's Law and Microprocessing Power:

- Gordon Moore, Director of Fairchild Semiconductor's Research and Development Laboratories stated that the number of component on a chip with the smallest manufacturing cost per component has doubled each year.
- But he later reduced the rate of growth to a doubling every two year.

Technology Drivers of Infrastructure Evolution

- There are three variations in Moore's Law which he didn't stated ever, can be listed as follows:
  1. The power of microprocessor doubles every 18 months.
  2. Computing power doubles every 18 months.
  3. The price of computing falls by half every 18 month
- Today the size of chip is so much reduced that the thickness of hair can be seen greater in size.
- This thing has become possible with the help of nanotechnology which uses individual atoms and molecules to create computer chips and other devices that are thousand of times smaller than current technology permit.
- These days the production of nanotube processor is in air at economic rate.

Technology Drivers of Infrastructure Evolution

The law of Mass Digital Storage:

- It is based on the assumption that the world produces as much information as 5 exabytes of unique information per year.
- According to Layman and Varian, 2003, this amount of digital information is roughly doubling every year.
- Storing these information is easy as the rate of storing devices are getting reduced every year.

Metcalfe's Law and Network Economics:

- Though the Moore's Law and the Law of Mass Digital Storage tell about the availability of computing resources, but it is still unexplained that why people need more computing and storage power.

Technology Drivers of Infrastructure Evolution

- It was explained by Robert Metcalfe, inventor of Ethernet local area network, in 1970, that the value or power of a network grows exponentially as a function of the number of network members.
- This theory showed that as more and more people become the network member, the value of the system grows exponentially and continues to grow forever as members increase.
- The demand of Information Technology has been driven by the social and business value of digital networks which rapidly multiply the number of actual and potential links among network members.

Technology Drivers of Infrastructure Evolution

Declining Communication Costs and the Internet:

- It tells about the rapid decline in the costs of communication and the exponential growth in the size of the Internet.
- According to the Internet World stats, 2010, an estimation of 1.8 billion people worldwide are using Internet.
- Due to the use of Internet, the cost of communication has been exponentially declining over Internet and telephone.
- As communication costs fall forward, utilization of communication and computing facilities explodes.
- A business firm that take huge advantage of the Internet must expand its Internet connection, including wireless connectivity and greatly expand the power of their network, desktop clients and mobile computing devices.

Technology Drivers of Infrastructure Evolution

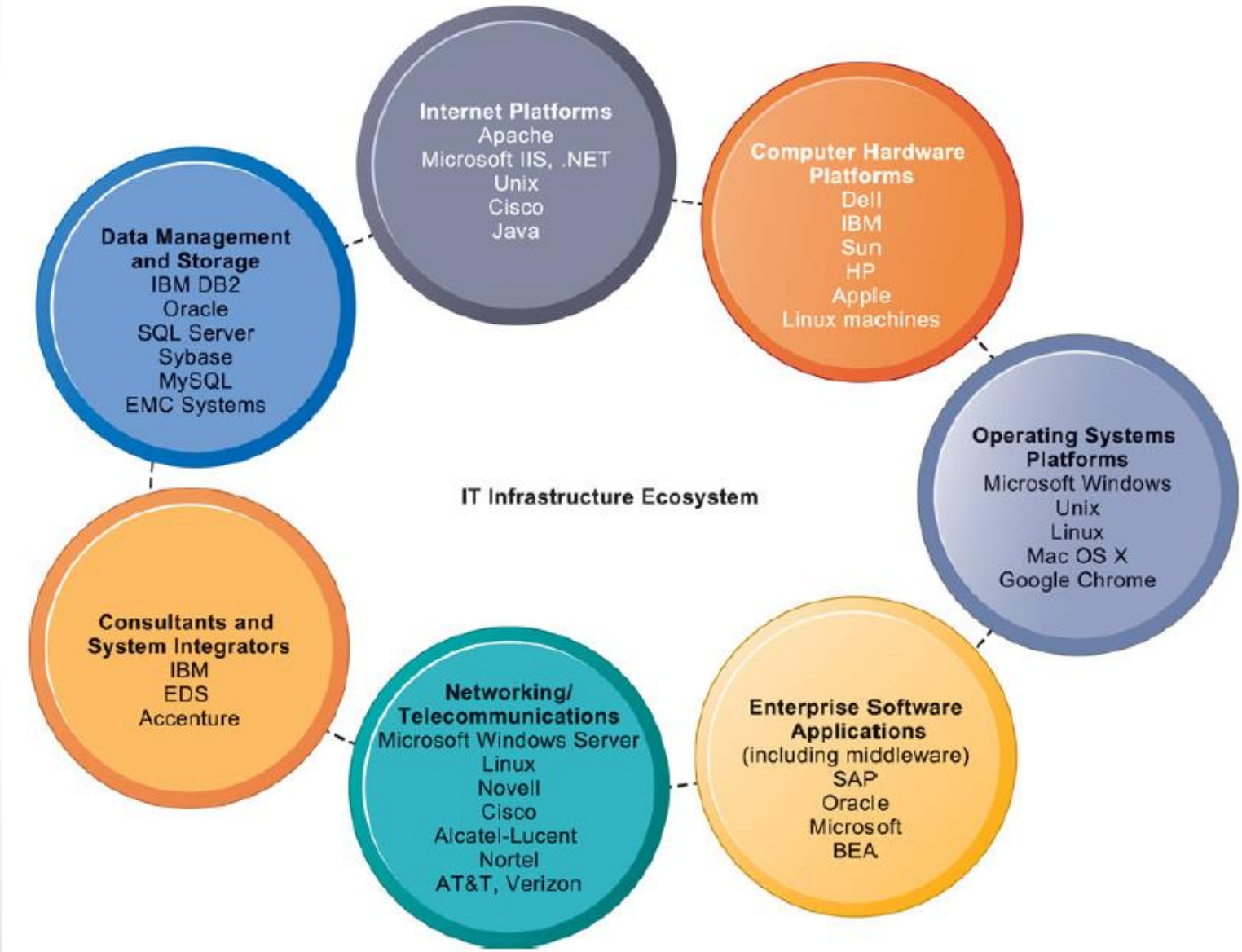
Standard and Network Effects:

- Technology Standards are specification that establishes the compatibility of products and the ability to communicate in a network with the help of which enterprise infrastructure and Internet computing would be impossible.
- Technology standards unleash powerful economics of scale and result in price declines as manufacturers focus on the products built to a single standard.
- At the beginning of 1990s, corporates started moving toward standard computing and communication platform. For instance, Wintel PCs with the Windows Operating System and Microsoft Office desktop productivity application became the standard desktop and mobile computing platform.

Technology Drivers of Infrastructure Evolution

- In telecommunication, the Ethernet standard enabled PCs to connect together in small Local Area Network and the TCP/IP standard enabled these LANs to be connected in firm wide networks and ultimately to the Internet.

Infrastructure Components



Infrastructure Components

- The different components constitute investments that must be coordinates with one another to provide the firm with a coherent infrastructure.
- In previous time, technology vendors supplying these components were often in competition with one another offering purchasing firms a mixture of incompatible, proprietary, partial solution. But increasingly the vendor firms have been forced by large customers in cooperate in strategic partnership with one another.

Computer Hardware Platforms

- If we see the past sell of computer hardware in different market such as US or India, we can find that there were a huge sell of hardware devices in respective markets.

Infrastructure Components

- According to the stat of sold devices, we can see that US spend about $109 billion on computer hardware in 2010 which includes desktop PCs, mobile computing devices and server machines. Along with these US spent about $90 billion on PCs.
- On the other hand, India raised its sell by 9.1 percent in 2012 with sell of $79.8 billion
- Also if we consider the server market, it is seen that it uses mostly Intel or AMD processors in the form of blade servers in racks. Blade servers are ultrathin computers which are stored in racks in which secondary storage may be embedded as a hard drive in each blade servers or by external mass storage device.

Infrastructure Components

- Chip providers like Intel, AMD and IBM have collectively settled on Intel as a standard processor.
- Mainframe computers are still in use but the production is minimized as the use of it is not that much though it can run up to 17,000 instances of Linux or Windows Servers software of replacing thousand of smaller blade servers to look after a massive enterprise network and corporate web sites.

Operating System Platforms:

- Microsoft Windows comprises about 78 percent of the server operating system market with 25 percent of corporate servers using some form of the Unix Operating system or Linux.
- Unix and Linux are scalable, reliable and much less expensive than Mainframe Operating Systems.

Infrastructure Components

- These systems are compatible with different types of processors though they differ in vendors such as IBM, HP and Sun Microsystems.
- On the other hand, the client level users prefer to uses PCs of Microsoft Windows operating system. But the use of different operating system are also used due to the use of different handheld mobile digital devices or cloud connected systems.
- Google Chrome OS provides a lightweight operating system for cloud computing using netbooks. In this operating system program are not stored in the PC but are used over the Internet and accessed through the Chrome Web Browser.
- Another operating system used in mobile computing devices called Android is in air which is developed by Android, Inc.

Infrastructure Components

- There are another platform also which provides the features of multitouch interface such as iPhone OS which is used in iPad, iPhone and iPod where users use their fingers to manipulate objects on the screen rather using keyboard and mouse.

Enterprise Software Application:

- It is assumed that U.S. firms spend about $165 billion in 2010 on software for enterprise applications that are treated as components of IT infrastructure.
- In India, the market for enterprise application grew by 20 percent in 2009 during the recessionary trends and in 2010 it expanded nearly at the same rate by 18 percent which is likely to continue next year

Infrastructure Components

- The largest providers of enterprise application software are SAP and Oracle.
- There is requirement of middleware software applications for achieving firmwide integration by linking the firm's existing application system

Data Management and Storage:

- Enterprise database management software is responsible for organizing and managing the firm's data so that they can be efficiently accessed and used.
- The leading database software providers are IBM, Oracle, Microsoft and Sybase which supply more than 90 percent of the U.S. database software marketplace.

Infrastructure Components

- Digital information is supposed to be growing at 1.2 zettabytes a year due to tweets, blogs, videos, e-mails and Facebook postings.
- With the amount of new digital information in the world growing so rapidly, the market for digital data storage devices has been growing at more than 15 percent over last stats.
- For manipulation of large data, *Storage Area Network* connect multiple storage devices on a separate hi-speed network dedicated to storage that can be rapidly accessed and shared by multiple servers.

Networking/ Telecommunication Platforms:

- U.S. firms spend %100 billion a year on networking and telecommunication hardware.

Infrastructure Components

- Along with this, they also spend $700 billion on networking services.
- Windows Server is predominantly used as a local area network operation system followed by Linux and Unix and they prefer to use TCP/IP protocol suite as standard.
- The leading networking hardware providers are Cisco, Alcatel-Lucent, Nortel and Juniper Networks.
- Regarding telecommunication services in India, the market is expected to be the largest contributor to the IT segment with spending forecast to reach $54.7 billion in 2012.
- They widely offer voice and data connectivity, wide area networking, wireless services and Internet access.

Infrastructure Components

Internet Platforms:

- Internet Platforms play role of bridge between the firm's general networking infrastructure and hardware & software platforms.
- U.S. firms spend an estimated $40 billion annually on Internet based infrastructure which includes hardware, software and management services to support a firm's website, web hosting, routers and cabling or wireless equipment.
- The Internet revolution created a veritable explosion in server computers with many firms collecting thousands of small servers to run their Internet based operations.
- The leading Internet hardware providers are considered as IBM, Dell and HP

Infrastructure Components

- The major web software are provided by Microsoft, Oracle and the host of independent software developers including Adobe and Real Media.

Consulting and System Integration Services:

- The unavailability of employees, budget or necessary experience and skills to deploy and maintain a entire IT infrastructure may unable to create a new infrastructure significantly changed in business processes and procedures, training and education and software integration.
- The leading consulting firms provide these kind of expertise.
- These leading consulting firms includes Accenture, IBM Global Services, HP Enterprise Services, Infosys and Wipro Technologies.

Infrastructure Components

- Software Integration refers ensuring the new infrastructure work with the firm's older one, generally called Legacy System, ensuring the new elements of the infrastructure work with one another
- Legacy system are generally older transaction processing systems created for mainframe computers that continue to be used to avoid the high cost of replacing or redesigning them.
- Replacing these systems is cost prohibitive and generally not necessary if these older systems can be integrated into a contemporary infrastructure.

Interactive Session: Technology new to the touch

- This section is subjected to be prepared by students.
- Refer Page no. 183
- Answer the Case Study Question
- Be precise with your answers.
- Also look at MIS in Action to be familiar with Real Time Questionnaire

Interactive Session: Is Green Computing Good for Business

- This section is subjected to be prepared by students.
- Refer Page no. 191
- Answer the Case Study Question
- Be precise with your answers.
- Also look at MIS in Action to be familiar with Real Time Questionnaire

Hands on MIS

- Improving Decision Making: *Using a Spreadsheet to Evaluate Hardware and Software Options*

  Refer to Page No. 204

- Improving Decision Making: *Using Web Research to Budget for a Sales Conferences.*

  Refer to Page No. 205

Management Information System

Ch-7: Securing Information System

Handouts by: Er. Shirish Raj Sharma

Opening Case: You're on Facebook? Watch Out

- Facebook is one of the most social networking website for sharing photos and videos, messaging, creating events and also it's a platform where businesses are advertised and promoted.
- But if we do not be careful it can also harm with malicious software.
- Security is made up by the security team of the site but its hard to control all the threats which are ready to attack the system which can come from 500 million users.
- Since users trust the message coming from their friend, it is a successful medium for criminal minded person which can affect users rather than email based attack
- This was shown by the team of Kaspersky lab.

Opening Case: You're on Facebook? Watch Out

- On February 2010, a IT security firm Sophos reported that Facebook poses the greatest security risk
- Examples
- According to the report submitted by the Internet Security Company NetWitness in February 2010, hackers were able to attack and get the information of financial data of users by revealing their passwords and downloading a rogue program.
- This is done by some kind of hackers who send email to the facebook users giving notification to update their information. When user click on the link to update his/her information, a bogus page is opened which interface is resembled with facebook. When user click on update button to update information a Trojen Horse is installed in the system and data is retrieved.

Opening Case: You're on Facebook? Watch Out

- These hackers are mostly eastern European criminal group who have stolen as many as 68,000 login information from 2400 companies and government agencies for online banking, social networking sites and email.
- A warm, Koobface, targets Microsoft Windows users of facebook, twitter to get the sensitive information from the victims such as credit card numbers.
- Koobface was first detected in December 2008
- This is used to get the information from the system which is already infected and transfers all the information to third party website.

System Vulnerability and Abuse

- System should be used only after it get protected from different kind of malicious attacks otherwise it may cause a system to be damaged which takes a long time to get recovered
- This may cause a business not to be operated for a long time and if data which have been lost could not be recovered, can make a business not to be functional again.
- This implies if a business has adopted any system, it should be careful about the security issues.
- There are large amount of electronic data which are vulnerable to many kinds of threats. These data are interconnected in the form of network and are accessed by different users.

System Vulnerability and Abuse

- The data may be altered by unauthorized access, abuse and fraud
- Mainly during the time of data transfer, data could be hacked by unauthorized users.
- These systems of corporate system are penetrated by unauthorized entities which can destroy the data.
- Many bugs like errors in program, improper installation, or authorized changes can cause system to be failed.
- Other factors like power failure, flood, fires or some natural disaster can also disrupt a system.
- Many kinds of safeguards should be used to protect data not to go in wrong hands which can violates personal privacy.

System Vulnerability and Abuse

- Portability is made possible by making the system programs to be operated by mobile phones or tablet.
- In 2009, security experts identified 30 security flaws in software and operating system made by apple, nokia and blackberry.
- Smartphones used by corporate executives may contain sensitive data such as sales figures, customer names, phone numbers or email addresses which are not supposed to be leaked out.

Malicious Software

- Malicious software are referred to as malware and include a variety of threats such as computer warms, trojan horses and spywares.
- It is operated or executed in a computer without user's knowledge and deliver a payload. The payload may be relatively benign such as the instructions to display a message or image.
- The nature of different viruses could vary but ultimately its target is to alter the normal position of the computer and could be transferred to system to system by human action.
- **Worm** can operate on itself and is transferred over system to system when connected in network whereas **virus** needs computer program files to be executed.

Malicious Software

- Worms and viruses are spread in computer in networks, by emails, by portable devices along with Bluetooth, Wi-Fi connection in mobiles.
- Some applications which are not recognized could be harmful to a system when it is installed in a computer.
- In 2010, according to the Consumer Reports' State, worm and viruses have caused billion of dollars of damage to corporate networks, e-mail systems and data.
- The growth of virus and worms reached at its peak level when users of motile phones and other kinds of system have been increased.
- A **Trojan Horse** is a software which itself is not a virus but is a way for viruses or other malicious code to be introduced in a system

Malicious Software

- The term Trojan Horse is based on the huge wooden horse used by Greeks to trick the Trojans into opening a gate into which soldiers were hidden and reveal themselves when they get inside the city during war.
- **SQL Injection Attacks** are another largest malware threat which attacks in poorly coded web application software to introduce malicious program code into a company's system and networks.
- It enters into a system when a web application fails to properly validate or filter data entered by a user on a web page.
- When fault is seen during the time of input by the user due to the bad coding, attacker sends a rogue SQL query to the database and plant malicious code.

Malicious Software

- Another kind of malicious software can be considered as **Spyware** which is installed in users' system without their knowledge. It retrieves every useful information that is made by every keystroke made by user to steal serial key of a software, retrieve password or any personal information.
- Some spyware programs reset web browser home page, redirect search request or slow performance by using so much memory.

Hackers & Computer Crime

- A **hacker** is an individual who intends to gain unauthorized access to a computer system by finding weakness in the security protections employed by web applications and computer system.
- Similar terminology is used for doing same kind of activity with criminal intension as **cracker**.
- **Spoofing** involve redirecting a web link to an address different from the intended one which helps them to collect the sensitive data regarding business and personal information by showing off the interface of the fake site exactly same as the intended one.
- **Sniffer** is a type of program that monitor and retrieve different type of information travelling over a network

Hackers & Computer Crime

- **Denial-of-service (DoS)** is a process of sending thousand of false request to a network server or web server to crash the network.
- **Distributed-denial-of-service (DDoS)** makes numerous computers to inundate the network from numerous launch points.
- This may cause a web application or web site to be shut down for a long time which alters the buseiness.
- A malicious software **botnet** is installed in a computer without knowledge of owner and makes that computer zombie or slave which then is operated on the instructions of the hacker who now is supposed to be the owner of the computer and thus retrieve the information.

Hackers & Computer Crime

- In 2010, Mariposa botnet affected 12.7 million computers in Spain to retrieve information like credit card numbers and online banking passwords. Among these, 1000 companies, 40 major banks and numerous government agencies were infected without their knowledge.
- **Computer crime** is a criminal offensive activities that involves in altering the position and information of a system.
- According to the 2009 CSI Computer Crime and Security Survey of 500 companies, participants' average annual loss from computer crime and security attacks was close to $234,000.
- Most economically damaging kinds of computer crime are DoS attacks, introducing viruses, theft of service and disruption.

Hackers & Computer Crime

- **Identity Theft** is a crime in which an imposter obtains key pieces of personal information such as social security identification number, driver license numbers or credit card numbers to retrieve credits, merchandise or service in the name of victim.
- This is done over Internet. Moreover e-commerce sites are wonderful sources of customer personal information such as name, address and phone numbers
- Another way of doing cyber crime wish known as **Phishing** which uses the Spoofing technology. In this method, information like social security numbers, bank and credit card information, and other confidential data, are retrieved by showing off bogus web site which look alike the original one.

Hackers & Computer Crime

- **Evil Twins** is new form of Phishing which works on wireless network. A bogus network is seen which looks like identical to the legitimate public network and capture password or credit card numbers etc.
- The name of bogus web site looks like same as the original one but the extension name or arrangement of letters could be different.
- In India, the parliament addressed the threat of cyber crime in 2000 with **Information Technology Act**. This act measures from various enactments and cover the issues like illegally accessing stored electronic communication, stealing trade secrets, transmitting and possessing pornography etc.

Hackers & Computer Crime

- **Click fraud** is another issue. When an ad displayed by a search engine is clicked, the advertiser typically pays a fee for each click which is supposed to direct potential byers to the products. These ads are clicked fraudulently without any intention of learning more about the advertiser or making a purchase.
- Companies hire third parties to click on a competitor's ads to weaken their marketing cost in which sometimes botnet is used.
- Sophos reported that 42 of the malware it identified in early 2010 originated in the United States, whereas 11 percent came from China, and 6 percent from Russia.

Internal Threats: Employees

- Though there are lots of security level maintained to make a system protected, there is an unexpected issue which generally comes out which penetrates the security level.
- This factor is considered as the employees which are rolled up in an organization.
- The information or data can be leaked out knowingly or unknowingly from an business organization.
- This kind of activities can be taken place by carelessness, with intention, criminal mentality, grasping nature etc.
- Malicious intruder seeking system access sometimes trick employees into revealing their passwords by pretending to be legitimate members of the company in need of information. This practice is called **social engineering**.

Internal Threats: Employees

- End users and IS specialist are also a major source of errors introduced into information systems.
- End users introduce errors by entering faulty data or by not following the proper instructions for processing data and using computer equipment.
- IS specialists may create software errors as they design and develop new software or maintain existing programs.

Business Value of Security and Control

Companies have very valuable information assets to protect. These information might be regarding individuals'' taxes, financial assets, medical record or job performance reviews along with the information like corporate operations, trade secrets, new product development plans and marketing strategies. Government systems may also store information on weapons systems, intelligence operations and military targets. These data are supposed to be very sophisticated which are not afforded to be leaked out.

Legal and Regulatory Requirements for Electronic Records Management

- In the health care industry, **Health Insurance Portability and Accountability Act** serves for medical security.

Business Value of Security and Control

- It also outlines privacy rules and procedures for simplifying the administration of health and automating the transfer of health care data between health care providers, payers and plans.
- In financial services providing companies, the **Financial Services Modernization Act** which is also known as **Gramm-Leach-Bliley Act** should be complied with the firm.
- In publicly traded companies, it needs to comply with the Public Company Accounting Reform and Investor Protection Act also known as Sarbanes-Oxley Act which is designed to protect investors after the financial scandals.
- In context of present time, security breaches are reported at Cyber Crime Investigations Cells of the Crime Branch of the respective police departments to tackle cyber crimes.

Business Value of Security and Control

- The cyber crimes are considered as identity thefts phishing, spamming, attacks etc.
- The evolution and amendments are being carried out with the government, in collaboration with the legal experts and advocacy groups with emerging technologies.

Electronic Evidence and Computer Forensics

- Much of the evidence today for stock fraud, theft of company secrets, computer crime and many civil cases in digital form.
- These activities are considered as loss of data from portable devices, computer hard disk, as well as email, instant messages, and ecommerce transactions.
- Generally email is considered as common type of evidence.

Business Value of Security and Control

- **Computer Forensics** is the scientific collection, examination, authentication, presentation, and analysis of data held on or retrieved from computer storage media in such a way that the information can be used as evidence in a court of law.
- It deals with the following problems:
  - Recovering data from computers.
  - Securely storing and handling recovered electronic data.
  - Finding significant information in a large volume.
  - Presenting the information in a court of law.
- Computer forensics experts try to recover various deleted and crashed data through various techniques for presentation as evidence.

Establishing a Framework for Security and Control

- Even with the use of best security tools, information system is not able to make system reliable and secure unless it is properly used.
- Along with the use of information system and security system, some security policy and plans should also be used.

Information System Controls

- Information control can be used in two ways viz. General control and Automated control
- **General Control** is concerned with design, security, use of computer programs and security of data file with the combination of hardware and software using manual procedure. It includes software, hardware, operation, security, administrative control etc

Establishing a Framework for Security and Control

- **Application Controls** are the controls unique to computerized application. They generally use automated procedure along with manual.
- They generally work on the applications which process on payroll, order processing etc.
- This application can be classified in three parts: *input control, output control and processing control*

Risk Assessment

- A risk assessment determines the level of risk to the firm if a specific activity or process is not properly controlled.
- Not all the risks can be anticipated and measured but the managers working on Information Systems should try to determine the value of information assets.

Establishing a Framework for Security and Control

- Once the risks have been assessed, system builders will concentrate on the control points with the greatest vulnerability and potential for loss.

Security Policy

- A security policy consists of statement ranking information risks, identifying acceptable security goals and identifying the mechanisms to achieve these goals.
- **An acceptable Use Policy** defines acceptable uses of the firm's information resources and computing equipment, including desktop and laptop, wireless device, telephones and the Internet.
- This policy defines the proper use of devices by every user even sometimes signing a contract for the right use.

Establishing a Framework for Security and Control

- **Identity Management** consists of business process and software tools for identifying the valid users of a system and controlling their access to system resources.
- It stores the authentication of the user and maintain the log report.

Disaster Recovery Planning and Business Continuity Planning

- In every business there should be backup for protection of unexpected events such as power outages, floods, earthquakes or attacks.
- **Disaster Recovery Planning** devises plans for the restoration of computing and communications services after they have been disrupted.

Establishing a Framework for Security and Control

- Disaster recovery firms provide hot sites housing spare computer at location around the country where subscribing firms can run their critical applications in an emergency.
- **Business Continuity Planning** focuses how the company can restore business operations after a disaster strikes.
- The business continuity plan identifies critical business processes and determines action plans for handling mission critical functions if system go down.
- Business managers and IT specialists must conduct a business impact analysis to identify the firms' most critical systems and the impact a systems outage would have on the business.

Establishing a Framework for Security and Control

The Role of Auditing

- To identify the effectiveness of IS security and controls and the quality of data, auditing is done using an application.
- A **MIS Audit** examines the firms' overall security environment as well as controls governing individual information system.
- Security audits review technologies, procedures, documentation, training, and personnel. A thorough audit will even simulate an attack or disaster to test the response of the technology, information systems staffs and business employee
- The audit lists and ranks all control weaknesses and estimates the probability of their occurrence

Hands on MIS

- **High risk vulnerabilities** include non authorized users accessing applications, guessable passwords, user name matching the password active user accounts with missing passwords and the existence of unauthorized programs in applications systems.
- **Medium risk vulnerabilities** include the ability of users to shut down the system without being logged out, outdated versions' software being used, password setting etc.
- **Low risk vulnerabilities** include the inability of users to change their passwords, user passwords that have not been changed periodically and password smaller than the minimum size.

Hands on MIS

Improving Decision Making: using Spreadsheet software to perform a security risk assessment

- Some companies use spreadsheet software to calculate anticipated annual losses from various security threats.
- The risk assessment identified a number of potential exposures with some probabilities and average losses.

Improving Decision Making: Evaluating Security Outstanding Services

- In today's context, business have a choice of whether to outsource the security function or maintain their own internal staff for the purpose.
- It is important to decide whether to outsource security and to locate security outsourcing services.

Management Information System

Ch-8: Building Information System

Handouts by: Er. Shirish Raj Sharma

Opening Case: CIMB Group Redesign for Account Opening Process

- Headquarter of **CIMB Group** is located in Kuala Lumpur, Malaysia and is second largest financial services provider and the third largest company on the Malaysian Stock Exchange.
- It provides services on full range of financial products and services along with consumer banking, corporate and investment banking, insurance and asset management.
- Its banking network is all over Southeast Asia with over 1100 branches.
- A Business Process Management System **ARIS** was introduced in 2008 to identify 25 different areas for improving technology, people and process and to overcome gaps and inefficiencies in existing process.
- New account opening process was introduced with the help of this technology.

Opening Case: CIMB Group Redesign for Account Opening Process

- The drawbacks like filling forms with all details of opening account with old process was recovered with the help of Government Multipurpose Card also known as **MyKad** which is provided to every Malaysian citizen which carry all the data that a bank needs to open an account.
- This is world first smart identity card, incorporating a microchip with different types of information like name, address, gender etc.
- It reduced the number of data entry screens and consumes less time which attracted customers.
- All the data are retrieved from MyKad card and data are entered using a single screen.
- It made the interaction between customers and bank more effective.

Opening Case: CIMB Group Redesign for Account Opening Process

- The company got benefitted mainly by increasing productivity and increased cost from 8 to 9 percent annually.
- This system also gave idea on organizing problems with existing information system, assessing people's information requirements, selecting appropriate technology and redesigning business processes and jobs.

System as Planned Organizational Change

There is change in organizational behavior regarding different aspects when there is an introduction of new Information System. These changes could be the change in hardware and software along with the working pattern in an organization.

System Development and Organizational Change

- When IT is involved in an organization, it makes changes in some aspects like **automation**, **rationalization**, **business process redesign** and **paradigm shifts**.
- When IT enables **automation** in change in organizational behavior, the employee perform their tasks more efficiently and effectively.
- **Rationalization** further support automation to overcome from the things it cannot explain.

System as Planned Organizational Change

- It is used for making a series of continuous quality improvements in products, services and operations such as ***Total Quality Management*** and ***Six Sigma***.
- **TQM** makes achieving quality and end in itself and the responsibility of all people and functions within an organization.
- **Six Sigma** is a specific measure of quality, representing 3.4 defects per million opportunities.
- In **Business Process Redesign**, business processes are analyzed, simplified and redesigned. It reorganizes workflows, combining steps to cut waste and eliminate repetitive, paper intensive tasks.
- It helps to reduce many complexities in an organization.

System as Planned Organizational Change

- **Paradigm Shift** involves rethinking the nature of the business and the nature of an organization.
- Though its success rate is very low due to hardly acceptance in extensive change, it is used because the rewards are very high as these strategies can lead to achieve results stunning & high order of magnitude in the return of investment

Business Process Redesign

- Many organization today are trying to improve their business processes by adopting Information Technology for incremental process changes.
- Business Process Management provides a variety of tools and methodologies to analyze existing process, design new process and optimize those processes.

System as Planned Organizational Change

- The requirement for continuous change in business process need have to go through following steps:
  1. **Identify process for change**: When systems are used to strengthen the wrong business model or business processes, the business can become more efficient at doing what should not have to be done. Managers need to determine what business processes are the most important and how improving these processes will help business performance.
  2. **Analyze existing processes**: Existing business processes should be modeled and documented, noting inputs, outputs, resources, and the sequence of activities.
  3. **Design the new Process:** Once the existing process is mapped and measured in terms of time and cost, the process is designed as a new one.

System as Planned Organizational Change

The new process design needs to be justified by showing how much it reduce time and cost or enhance customer service and value.

4. **Implement the new Process:** Once the new process has been thoroughly modeled and analyzed, it must be translated into a new set of procedure and work rules. The new process and supporting systems are rolled out into the business organization. Employees working with new process may recommended improvements.
5. **Continuous Measurement:** Once a process has been implemented and optimized, it needs to be continuously measured because processes may lead employee to fall back on old methods or a company may have to face unwanted changes.

System as Planned Organizational Change

- When properly implemented, business process redesign produces dramatic gains in productivity and efficiency and may even change the way the business is run.
- These kind of change is neither simple nor intuitive and companies committed to extensive process improvement need a good change management strategy.

Overview of System Development

- New Information Systems are an outgrowth of a process of organizational problem solving.
- The problem may be one in which managers and employees realize that the organization is not performing as well as expected or that the organization should take advantage of new opportunities to perform more successfully
- The activities that go into producing an information system solution to an organizational problem or opportunity are called System Development. These activities consist of system analysis, system design, programming & testing, conversion and production an maintenance.
- It is done in sequential order but sometime processes need to be performed simultaneously.

Interactive Session: Can Business Process Management make a Difference

- AmerisourceBergen is one of the largest pharmaceutical service company and a member of the Fortune 25.
- It has a large business which has complicated relationship with manufacturers, pharmacies and hospitals.
- Frequently changing business conditions cause contract prices to fluctuate which made trouble to analyze data of contract and price detail associated with each of these relationships.
- To reduce the complexity, it chose Metastorm BPM software in which there were presence of tools for analyzing, managing and redesigning business processes.
- Metastorm has an engine for deploying redesigned processes along with capabilities for integrating the processes it manages with external system.

Interactive Session: Can Business Process Management make a Difference

- With the help of this system creation of rich graphical models of business processes as well as new user interface and business was possible.
- It used the application for the first time on online collaborative contract and chargeback process which was responsible for $10 billion.
- Metasource BPM makes it possible for all contract changes to be recorded into the system and validate against internal business rules and also enables AmerisourceBergen to link with its trading partners for collaborative BPM.
- The BPM project was successful and resulted in lower headcounts, fewer disputes, more accurate pricing information and a high return on investment.

Interactive Session: Can Business Process Management make a Difference

- AmerisourceBergen use Metastorm BPM to create six new specialized process for managing and automating high volume, highly specialized supplier credits which interface with its SAP enterprise system.
- It was adopted by the company as it has ability to receive, track, reconcile and expedite all credit variances.
- AmerisourceBergen has automated nearly 300 processes benefiting from more efficient and accurate record tracking, faster turnaround time, greater management into key performance indicators and an online audit trail of all activities
- The company also won a Global Excellence in BPM and Workflow award in 2009.

Interactive Session: Can Business Process Management make a Difference

- Diebold. Inc. is another company in integrated self service delivery and security system and services with 17,000 associates across 90 countries.
- This company makes, installs and services ATMs, vaults, currency-processing systems and other security systems used in financial, retail and Government market.
- This company selected Progress Savvion's BusinessManager BPM for using business process management to understand and improve its order fulfillment process.
- It was provided a web based application for the purpose which gives managers real time visibility to monitor, analyze, control and improve the execution of those processes and can integrate these processes with existing operational systems.

Interactive Session: Can Business Process Management make a Difference

- Diehold managers are able to track orders in real time at any step in the process and also predict future performance based on past data which helped them to forecast where orders ought to be and compare that with where the system says the orders actually are.
- Also the detection of production of item can be done and where specific item are located can be found out.
- The System was also used for issue resolution which aggregates input from various sources such as worker in field and in factories

Interactive Session: Can Business Process Management make a Difference

- Answer the Case Study Question
- Refer page no. 504
- Be precise with your answers.
- Also look at MIS in Action to be familiar with Real Time Questionnaire.

System Analysis

- System analysis is the analysis of a problem that a firm tries to solve with an information system which consist of defining the problem, identifies the causes, specifying the solution and identifying the information requirements that must be met by a system solution.
- System analysis is done by System Analyst who examines documents, work papers and procedures, observing system operations and interviewing key users of the system
- It consist of feasibility study to determine whether that solution is feasible or achievable from a financial, technical and organizational standpoint.
- The system analysis process identifies several alternative solutions that the organization can pursue and assess the feasibility of each.

System Design

- When the analysis part is over, we move to the design part which shows how the system will fulfill this objective. It is the overall plan or model for that system.
- It consist or system specifications that will deliver that functions identified during system analysis which consist of all of the managerial, organizational and technological components of the system solution.
- Working on design increases users' understanding and acceptance of the system so that they have their sufficient control over the design process to ensure that the system reflects their business priorities and information need not the biases of the technical staff.

Completing the SDP

- After analysis and design, all the components picked up are translated into fully operational information system which includes following steps:
  - **Programming**: it is a process where system specifications that were prepared during the design stage are translated into software program code. In an organization, software are generally purchased from vendor or they outsource.
  - **Testing:** After the completion of the application, it must be tested to check its functionality. During test data must be carefully prepared, result are reviewed, and correction are made in a system. For the preciseness, testing is also done in three parts viz. ***unit testing, system testing*** and ***acceptance testing.***

Completing the SDP

Sometimes conversion is needed to change the old process into new one for which different strategies are used viz. ***parallel strategy, direct cutover strategy, pilot study strategy*** and the ***phased approach strategy***.

- **Production and Maintenance:** After the new system is installed and conversion is completed, the system is said to be in production. During the stage, the system will be reviewed by both users and technical specialists to determine how well it has met its original objectives and to decide whether any revisions or modifications are in order

  After the system has been fine tuned, it must be maintained while it is in production to correct errors, meet requirement or improve processing efficiency.

Completing the SDP

Changes in hardware, software, documentation or procedures to a production system to correct errors, meet new requirements or improve processing efficiency are termed as maintenance.

Modeling & Designing Systems

When we need to design or develop a system we follow different approaches and methodologies. Those approaches are generally picked up as either structured or object oriented programming language.

Structured Approach:

- Structured refers to the technique that it works step by step, with each step building on the previous one.
- Structured methodologies are top-down, programming from the highest, most abstract level to the lowest level of detail.
- These are process oriented, focusing primarily on modeling the processes or action that capture, store, manipulate and distribute data as the data flow through a system

Modeling & Designing Systems

- A separate programming procedure must be written every time if someone wants to take an action on a particular piece of data
- To represent a system's component processes an the flow of data between them is done by using a tool called **Data Flow Diagram**
- The data flow diagram offers a logical graphic model of information flow, partitioning a system into modules that show manageable levels of details specifying processes and transformation that occur within each module and the interface that exist between them.
- Another tool for structured analysis is a **Data Dictionary** which contains information about individual piece of data and data grouping within a system.

Modeling & Designing Systems

- Process Specifications describe the transformation occurring within the lowest level of the data flow diagram.
- Another tool used is Structure Chart which is a top down chart showing each level of design, its relationship to other levels and its place in the overall design structure.

Object Oriented Development:

- To overcome the separation of data and processes, object oriented approach is considered.
- Object oriented development uses the object as a basic unit of systems analysis and design which combines data and the specific process that operate on those data.
- Instead of passing data to a procedure, programs send a message for an object to perform an operation.

Modeling & Designing Systems

- Because processing logic resides within objects rather that in separate software program, objects must collaborate with each other to make the system work.
- Object oriented modeling is based on the concepts of class and inheritance.
- Objects belonging to a certain class or general categories of similar objects have the features of that class.
- The information system is implemented by translating the design into program code, reusing classes that are already available in a library of reusable software objects and adding new ones.
- Since objects are reusable, it could potentially reduce the time and cost of writing software .

Alternative System Building Approaches

System differ in terms of their size and technological complexity and in term of the organization it is meant to be solved using different approaches.

Traditional System Life Cycle

- The one of the oldest method of building a system is a phased approach. In this process, System Development Specialists divide the system building stages.
- Technical Specialists are responsible for much of the system analysis, design and implementation work where end users are limited to providing information, requirements and reviewing the technical staff's work.
- This approach works on requirement analysis, predefined specifications and tight control over system building approach.

Alternative System Building Approaches

- It follow waterfall approach in which next stage can't be touched before completing the existing one.
- In this approach steps can be retraced and specifications can be revised.

Prototyping

- Prototyping consists of building an experimental system rapidly and inexpensively for end users to evaluate.
- Once this model is operational, it will further refined until it conforms precisely to users' requirements. Once the design is finalized, the prototype can be converted into final system.
- It can also be called iterative process because the steps required to build a system can be repeated over an over again.

Alternative System Building Approaches

Steps in Prototyping:

- Step1: identify the users' basic requirements
- Step2: develop an initial prototype
- Step3: use the prototype
- Step4: revise and enhance the prototype

End-User Development:

- Some types of information system can be developed by end users with little or no formal assistance from technical specialists and this phenomenon is called end-user development.
- Fourth generation programming languages enables end users to create reports or develop software application.

Alternative System Building Approaches

- The fourth generation software can be procedural or non procedural programming languages.
- Fourth generation software contain seven categories: PC Software tools, Query Languages, report generations, graphics languages, application generations, application software packages and very high level programming languages.
- End users are most likely to work with PC software tools and query languages.
- End users develop systems can be completed more rapidly.
- The tools developed by end-users are not conventional as it cannot easily handle the processing of large number of transactions or application with extensive logic and updating requirements.

Alternative System Building Approaches

Application Software Packages:

- Most of the applications are build on the basis of package system which includes common applications for many organizations such as payroll, accounts receivable, general ledger or inventory control which are used for long period of time and fulfill the requirements.
- In such cases, a company purchase prewritten, predesigned, pretested software programs from the package to minimize time
- In case of unique requirements that the package cannot fulfill they have the capability of customization which allows a software package to be modified to meet an organization's requirement without destroying the integrity.

Alternative System Building Approaches

- Such packages are evaluated on the basis of package, flexibility, user friendliness, software and hardware resources, database requirements, installation and maintenance efforts, vendor quality, documentation and cost which is asked as *Request for Proposal* submitted to software vendors.
- In the case when customization could not be taken place, the organization have to adopt the package system and change the working procedures.

Outsourcing:

- In case, if a firm does not want to use its internal resources to build or operate information systems, it can outsource the work to an external organization that specializes in providing these kind of services.

Alternative System Building Approaches

- In another case of outsourcing, a company could hire another company, either domestic or of another company, to design and create the software for its system.
- In case of domestic outsourcing for supply chain management, a company require around 50 number of employees with specific expertise and who might need extensive training which is considered as expensive decision rather it outsource a company who can fulfill all the requirement in low cost with better efficiency.
- In contrary, the Internet and low cost communication technology have drastically reduced the expense and difficulty of coordinating the work of global teams in faraway locations & get chance of utilizing global expertise.

Alternative System Building Approaches

- Any company that outsources its applications must thoroughly understand the project, including its requirements, methods of implementation, anticipated benefits, cost components and metrics of measuring performance.
- The vendors should fulfill the contractual obligations & thoroughly understands the business along with the company should need to allocate resources for documenting requirements, sending out RFPs, travel expenses, negotiating contracts and travel expenses so that the project should be delivered in certain time period.
- Outsourcing enables a company to reduce its hidden cost along with the complexity of dealing with Human Resources issues of hiring and firing employees.

Alternative System Building Approaches

- This is also useful in analyzing best case and worst case scenario for the total cost of an offshore outsourcing project.
- Best cases can be picked up for the estimation of total cost in low level and the worst cases can be picked up to eliminate the highest estimation of these cost.

Interactive Session: Zimbra Zooms ahead with OneView

- Zimbra is a software company whose flagship product is Zimbra Collaboration Suite (ZCS) which is an open source messaging and communication software package that relies heavily on Ajax to provide a variety of business functions.
- It was purchased by Yahoo in 2007 but now have its own 50 million users to it provide services like mailbox, contact lists, shared calendar, instant messaging, hosted documents, search and VoIP which can be accessed by any supportive mobile.
- Negative feedback were taken by the company which lead the company and the package to be very successful.
- It offers two type of packages which includes free (as trial) and paid versions which can be downloaded from its web site which visiting rate is 200000 visitors per week.

Interactive Session: Zimbra Zooms ahead with OneView

- The free version has some basic features being used by users who are persuaded to switch to the paid version.
- Salespersons identify the users who use the application most likely to upgrade to the commercial version.
- Those users are identified and contacted by email address and telephone numbers.
- Zimbra uses its website to track its visitors ' activity and tie it to sales lead information in its Customer Relationship Management System (salesforce.com).
- At initial phase, Zimbra used marketing automation software from Eloqua which had a large number of unfavorable features but was too complicated for both marketing and sales staff to use.

Interactive Session: Zimbra Zooms ahead with OneView

- Its was unsuccessful because of various reasons such as salespersons need had to code conditional logic for any data field containing data they wanted to collect which consumes lots of time. Also it only worked with IE while 2/3rd of the Zimbra's Staffs used Mozilla firefox. The application was expensive as well
- Since Zimbra could not afford any of its employee to be administrated use Eloqua's features, it planned to switch the system.
- For this it examined many software products from which it choose OneView from LoopFuse which specialize in sales and marketing automation.
- It was found less time consuming in every aspect.

Interactive Session: Zimbra Zooms ahead with OneView

- The core functions of OneView include Web Site visitor tracking, automated marketing program communication, customer activity alerts and CRM integration.
- It was also convenient pricing options included unlimited seating and pay per use options.
- Other benefits of OneView include easy integration with salesforce..com. Zimbra's preferred CRM solution, simplified reporting processes and the ability to manage large number of leads was solved along with browser compatibility.
- OneView reduced the amount of time Zimbra spent using and maintaining its marketing system by 50 percent and jump in its close rate on qualified sales leads from 10 to 15 percent.

Interactive Session: Zimbra Zooms ahead with OneView

- Answer the Case Study Question
- Refer page no. 521
- Be precise with your answers.
- Also look at MIS in Action to be familiar with Real Time Questionnaire.

Application Development for Digital Firm

- In digital environment, organizations are able to add, change and retire their technology capabilities very rapidly to respond to new opportunities that provide very fast solution.
- With the help of software packages and external service providers, business are relying more heavily on fast cycle techniques.
- These techniques could be considered as rapid application development, joint application design, agile development and reusable standardized software components.
- These features can be assembled together to make a complete set of services as required.

Rapid Application Development

- The term **Rapid Application Development (RAD)** is used to describe the process of creating workable systems in a very short period of time.
- These application are generally developed with the help of object oriented software tools, reusable software, prototyping and fourth generation software.
- Using any method along with the visual programming, it can be performed by close teamwork among the end users and the technical specialists where process does not have to be sequential and key part of the development can occur simultaneously.
- An application which comes from an interactive session among end users and the Information System specialists for system development is termed as **Joint Application Design (JAD)**.

Rapid Application Development

- Likewise, **Agile Developme**nt focuses on rapid delivery of the working software by breaking a large project into a series of small subprojects that are completed in short period of time using iteration and continuous feedback.
- Improvement or addition of new functionality takes place within the next iteration as developers clarify requirements.
- Agile methods emphasize face to face communication over written documents, encouraging people to collaborate and make decisions quickly and effectively.

Component Based Development & Web Services

- This type of development is based on the concept of object oriented programming where object are used.
- The components are said to be the group of objects assembled together to perform some kind of task such as a graphical user interface or online ordering system.
- The approach used in software development is known as component based development and it enables a system to be build by assembling and integrating existing software components.
- This technology is generally used for e-commerce.
- In web services, the combination of markup language and other open protocols and standards enable one application to communicate with other without customization.

Component Based Development & Web Services

- As web services follow universal set of standards being less expensive and less difficult to weave together, it is generally preferred.
- It can complete some complex transactions such as checking credit, procurement or ordering products being independent from operating system, programming language or client device.

Hands on MIS

Improving Decision Making: Using Database Software to design a customer system for auto sales

- *Refer to book, Page no. 525*

Achieving Operational Excellence: Redesigning Business Processes for Web Procurement

- *Refer to book, Page no. 526*