Management Information System

Ch-8: Building Information System

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*