INTRODUCTION TO COMPUTER INFORMATION SYSTEMS/INFORMATION SYSTEMS

7.1 What is an Information System? A system is a group of procedures and different elements that work together in order complete a task. Now we can add on to this to get information systems. Information systems are much the same, there are elements and procedures to work to complete a task. The difference is information systems are used to generate information for the users on a need bases. Information systems manage and process data as soon as they are created, they can also be used for long term planning or just the day to day work. While systems are great and can ease your life, they are static, which means someone will need to change the systems when new needs arise. This is called system development. While it could be costly, there really is a need for system development since things change constantly. Whether there are new laws or a new policy within the company.

Some information systems are meant to be used by all levels of employees while others are specifically designed to handle the needs of employees with certain responsibilities. As one goes higher up the company ladder, it can be seen how responsibilities may increase relative to position. It is for this reason that some information systems are designed to hone in on the needs of certain level employees. At the ground level, employees generally make job related decisions that are based on "on-the-job" input without having to consider how those decisions will effect other departments or employees in other positions. These usually involve transaction systems such as point-of-sales or warehouse systems that record stock and inventory. Operational managers such as supervisors or foremen use separate information systems designed to meet short term goals and gains. They might use systems that show the productivity of employees or the cost effectiveness of certain changes they've made in production. Middle managers are a step up from this and use information systems that house a broader range of information to make more tactical decisions. These decisions are usually aimed at a farther sighted goal than those of Operational managers and often need more intelligence pulled from data systems in order to reach these objectives. Middle managers might be more concerned with how to improve yearly gains and may use systems that will deliver more detailed information about specific locations of factories or retailers in certain states. Executive managers think in terms of the future and the direction of a company related to their peer corporations. They make

very strategic decisions to ensure the survival of the entire company as a whole in relation to the economy and competition. The systems they use might include the stock market, which tracks the progress of multiple businesses. Because the needs of each position increases, the decision support systems needed to make well judged verdicts must increase as well.

Types of Information Systems

The Four Essential Information Systems

Which information system do you use the most?

There are many different types of information systems. Even though there are many systems, the four that will be elaborated are the following: transaction processing systems, customer relationship management systems, business intelligence systems, and knowledge management systems. Transaction processing systems are used for processing and outputting functions for the core operations of a business, storage, and data collection. The purpose of this system is to collect input and then produce the output. An online air ticket booking system is an example of a TPS. Customer relationship management systems are usually used by business owners for sales and marketing efforts. This system helps businesses keep record of customer activities, purchasing trends, product defects, and customer inquiries. CRM systems also allow business partners to communicate with each other which contributes to a successful business. Business intelligence systems are essential for businesses to predict sale patterns for their company. BIS are essential in collecting data from different companies. Financial Institutions are an example of this type of system; it is used to create credit risk models that study the number and amount of lending given to the sectors. Knowledge management systems organize the knowledge within an organization and then share it. KMS brings innovation, top quality performance, integration, and knowledge to an organization. Small and large enterprises can benefit from this type of system. Business owners view this system as a valuable attribute to their company because it provides quick responses to their customers and partner questions. [4]

System Development

The Information Systems Department

The information systems department is also referred to as the information technology department. It is responsible for running, maintaining, and developing

the computers and information systems in an organization. They also make sure for the programs to run smoothly. It includes all the computer and network personnel of that organization. The IT person that is most involved in system development is the system analyst. The system analyst manages the things related to designing and implementing modified systems. A person that is very important to system development is the business analyst. It is one of the biggest growing jobs because of the large increase in the use of technology. It is all about finding the most effective use of electronic communication.

Outsourcing

Offshore Outsourcing

In the industry today, many businesses have been outsourcing their work. Outsourcing occurs when businesses hire others outside of their company to perform different tasks, like creating new software or databases for the company. [6] Some examples of outsourcing today include customer service, technical support, payroll accounting, and credit card processing. This is becoming more prevalent through the years because outsourcing has many advantages to the business itself. Offshore outsourcing is another term used, but the work is done in another country. India, for example, is one country that generates much revenue from offshore outsourcing alone. Although many speculate that American jobs are at risk, outsourcing to other countries benefits the business as a whole. The company saves a lot more money, than if they were to keep technical support, customer service, etc. in the primary country of that company. Another advantage of having offshore outsourcing is that there can always be someone working on a project, gathering information, and helping a client because of the different time zones. A lengthy project can be completed faster than would a normal project worked on in just the United States because 24 hours a day, somebody is always working on the project. Home-sourcing is a new trend that many companies are taking advantage of, and adopting. This is the transfer of service industry employment from offices to home-based employees with appropriate telephone and Internet facilities. One downfall of outsourcing is cultural differences. Language barriers can be detrimental to a company at times. Another aspect that companies have to look into is security with newly outsourced employees when they are first hiring.

SDLC - System Development Life Cycle

The System Development Life Cycle (SDLC) is composed of six steps. These steps are as follows: preliminary investigation, system analysis, system design, system acquisition, system implementation, and system maintenance. Each step is important and builds up on the step(s) that happened previously. While these are generally the steps always used, they do not always occur in the same order. The effects are still the same. Below is an explanation of each of the six steps.

Step 1: Preliminary Investigation

As the first step in the SDLC, preliminary investigation plays a large role in determining whether or not a system or system modification would be worth making. The main point of doing a preliminary investigation is to determine what problems need to be fixed and what is the best way to go about solving those problems, if solutions do in fact exist. A feasibility report is the product of the preliminary investigation in most cases. The feasibility report is essentially a compatibility test between the current business/system and the new system/modifications. The report will tell companies if they can afford the change, if it will work with the other systems and technology already in their company, and if it will be beneficial to the company to make the changes. If all these things come back positively from the systems analyst, then the system will receive the "all clear" to head to the next step of the SDLC.

Step 2: System Analysis

This second step, system analysis, is used to investigate the problem on a larger scale and fine tune all the information a company has on the issue. Data collection and analysis are the two main points of interest inside system analysis. Gathering information about the current system and users allows analysts to develop an idea of what seems to be the real problem and how they should go about fixing it through data analysis. The main outcome from this step is a grouping of organized data about the current system and the new/modified systems improvements to come.

Step 3: System Design

When you're designing a system, you are essentially creating a blueprint with your collected data which you build upon in later steps.

After all of the data has been analyzed, it is time to design a blueprint for the system that specifies what it will look like and how it will work. First you have to

develop the design by using a few key tools. One important tool is the creation of a *data dictionary*, which describes the characteristics of all data that is used in a system. Other important creations that the systems analyst will use include different diagrams which help to better describe the proposed system. It has been argued by some that the ever-increasing rate of developing technology has made it impossible for the everyday systems analyst to do their job thoroughly. The economics of industry are pushing in a way that doesn't favor design, only production.[9] Whether this is truly the case, system design leaves little room for error, as time is money.

Step 4: System Acquisition

System Acquisition is a way of going down your shopping list and comparing prices to get the best deals.

Once the design blueprint has been approved, it's off to the proverbial grocery store. The organization needing a system will have a set budget and a list of components needed to make their system work properly. With this budget comes a few courses of action. The first thing to think about is whether the company should create their own software for their system or buy the software from others. It is typically cheaper and less time consuming to buy preexisting software but the customization options are limited. If the preexisting software doesn't offer the options required of the system blueprint, then the company will likely have to make custom software to meet their needs.

Assuming that it okay for the company to buy preexisting software, the next step is to choose where to buy from. To help them choose, they can prepare an RFP, or request for proposal, which asks vendors what software the company might need to consider buying. If they already know what software they need and just want potential prices, the company can file an RFQ, or request for quotation.[10] After all of the required software has been purchased it is time for the next step.

Step 5: Implementation

This update manager shows all of the updates needed for a computer software, part of the continuous system maintenance

In this step, users get the old data ready to be moved, called data migration. Once that is complete, they can begin installing new hardware and software. There are four ways of converting data to new a system: direct conversion- the old system is

deactivated and the new one is implemented right away; parallel conversion- both systems are operated at the same time until it is known that the new one is working, then the old one gets deactivated; pilot conversion- only one new system is installed within an organization and once it is known that it works then the rest are implemented; and phased conversion- the new system is implemented by modules by using direct or parallel conversion. There are some advantages and disadvantages of using each method. For example, the easiest and fastest method is direct conversion. The final action in this step is training the users with manuals, for example.

Step 6: System Maintenance

Often the system maintenance is the ongoing process throughout the life of the system. Maintenance can include updating software or updating what is already installed. Many of you play an active role in this step already. For example, how many of you keep up with the newest updates for your Apple applications? You are taking part in system maintenance.

System Development Approaches

Traditional Approach

A traditional approach for the system development has five phases which have to be completed in chronological order. First phase is the preliminary investigation. In this process, the team of development investigates the need for possible software automation in the given system. At the end the team creates a document of specific recommendations for the candidate system. It includes the personnel assignments, costs, project schedule, target dates, identifies problems and constraint. The second phase is systems analysis which is the study of a problem, prior to taking some action. It refers to the study of the business area or application, usually leading to the specification of the new system. The third phase is systems design which is defined as those tasks that focus on the specification of a detailed computer-based solution. The analyst focuses on three basic elements: the output that must be provided by the system, the source data, or input that the user will provide to the system, the processing needed to produce the output, given the input. The fourth phase is system acquisition financial institutions should ensure that systems are developed, acquired, and maintained with appropriate security controls. This leads us to the last step which is system implementation, in this phase, the production system is installed, initial user training is completed, user documentation is delivered, and the post implementation review meeting is held. When this phase is

completed, the application is in steady-state production. Installation the biggest aspect is that the entire system is planned and built and built before anyone gets to use it or test it, so every aspect to every phase is essential to the traditional approach for system development.

Iterative Approach

Unlike the traditional approach, the iterative (repetitive) approach allows for system testing during development. The emphasis here is on incremental changes through a process known as prototyping. Prototyping is the creation of software application prototypes. Prototypes, generally speaking, are early models of some product that is created for testing purposes. With software prototyping, developers are able to receive crucial feedback from testers early in the beginning stages of development. For this reason the iterative approach accounts for potential risks that developers face (e.g. accounting for user needs, verifying accuracy of initial project estimates). With that, the iterative approach acts as a response to the traditional development cycle, which is more likely to have "higher software costs and poor estimates of time and cost" due to the expense of changing a finished product. As the product moves closer to release, the cost of implementing changes increases exponentially. It is a difficult task because the whole system has to be modified to incorporate sudden changes, and this can have undesirable results. Prototyping resolves this by knowing what the user really wants, which leads to increased user involvement. Interaction between users and developers is vital because it ensures what tasks need to be accomplished on the end of the developer. Overall the iterative approach addresses some of the problems that might not be possible for the traditional approach to address.

The End-User Development Approach

As opposed to the iterative or traditional approach, which both focus on professional users, the end-user development approach is focused solely on configuring the development of the system and is often done using tools or programs. Instead of having to be highly educated and a professional in the area of software or programming, someone trying to develop a simplistic and easy system can use these programming tools and develop something of their own. A good example of this is sending out an email that someone wanted to be addressed to many people. This is usually used in small businesses, tasks, or daily projects, and is not something that an intricate business would ever use to run their day-to-day

software programs. However, it is a nice alternative from having to start all over from the beginning and developing brand new software for simple tasks. The end user development approach is also convenient for a user who wants to make something their own and customize the way the software runs to fit their personal needs. This approach is extremely useful for individuals who don't have the knowledge, time, or money to put into building new software from the ground up. The software is easy to use, personal, and a great alternative to the other two options.

Review

Vocabulary Words

business intelligence: The process of gathering, storing, accessing, and analyzing data about a company in order to make better business decisions.
computer-aided design: A general term applied to the use of computer technology to automate design functions.
data mart: A collection of data related to a particular subject or department in a company.
decision support system: A type of information system typically used by upper management that provides people with the tools and capabilities to organize and analyze their decision making information.
enterprise architecture: A comprehensive framework used to describe and manage an organization's business functions and systems.
enterprise system: A system that is used throughout an entire enterprise (business, organization, government agency, and so on).
geographic information system: An information system that combines geographic information with other types of data (such as information about customers, sales, and so forth) in order to provide a better understanding of the relationships among the data.
intelligent agent: A program that performs specific tasks to help make a user's work environment more efficient or entertaining and that typically modifies its behavior based on the user's actions.
management information system: A type of information system that provides decision makers with preselected information that can be used to make middle-management decisions.
product lifecycle management (PLM) system: A system designed to manage a product as it moves through the various stages of its life cycle, from design to retirement.
robot: A device, controlled by a human operator or a computer, that can move and

react to sensory input.
robotics: The study of robot technology.
system acquisition: The phase of the system development life cycle in which hardware, software, and other necessary system components are acquired.
system design: The phase of the system development life cycle in which a model of the new system and how it will work is formally established.
system implementation: The phase of the system development life cycle that encompasses activities related to making the system operational.