CHAPTER 2

THEORETICAL

2.1. Information

Juris and Kelley (2002) – They have suggested the "information is much more refined data that has evolved to the point of being useful for some form of analysis"According to Business Dictionary.com, it says that data that is accurate and timely, specific and organized for a purpose, presented within a context that gives it meaning and relevance, and can lead to an increase in understanding and decrease in uncertainty.Information is valuable because it can affect behavior, a decision, or an outcome. For example, if a manager is told that his/her company's net profit decreased in the past month, he/she may use this information as a reason to cut financial spending for the next month.

A piece of information is considered valueless if, after receiving it, things remain unchanged. For a technical definition of information see information theory.

2.1.1. Qualities of Good Information

According to Jim Riley (ICT – BUSINESS & TECHNOLOGY), there are several qualities of a good information. These are as follows:

1. **Relevant**

The information obtained and used should be **needed** for decision-making. it doesn't matter how interesting it is. Businesses are often criticised for producing too much information simply because their information systems can "do it". A good way of ensuring relevance is to closely define the objectives of any information reports. Another way to improve relevance is to produce information that focuses on "exceptions" - e.g. problems, high or low values, where limits have been exceeded.

2. **Up-to-date**

Information needs to be timely if it is to be actioned. For example, the manager of a large retail business needs daily information on how stores are performing, which products are selling well (or not) so that immediate action can be taken. To improve the speed with which information is produced, businesses usually need to look at upgrading or replacing their information systems.

3. **Accurate**

As far as possible, information should be free from errors (e.g. the figures add up; data is allocated to the correct categories). The users of information should be informed whenever assumptions or estimates have been used. Accruate information is usually a function of accurate data collection. If information needs to be extremely accurate, then more time needs to be allocated for it to be checked. However, businesses need to guard against trying to produce "perfect" information - it is often more important for the information to be up-to-date than perfect.

4. **Meet the needs of the User**

Users of information have different needs. The managing director doesn't have time to trawl through thick printouts of each week's production or sales listings - he or she wants a summary of the key facts. The quality control supervisor will want detailed information about quality testing results rather than a brief one-line summary of how things are going. It is a good idea to encourage users to help develop the style and format of information reporting that they require.

5. **Easy to use and understand**

Information should be clearly presented (e.g. use summaries, charts) and not too long. It also needs to be communicated using an appropriate medium (e.g. email, printed report, presentation. Businesses should also consider developing "templates" which are used consistently throughout the organisation - so that users get used to seeing information in a similar style.

6. **Worth the cost**

Often forgotten. Information costs money. Data is costly to collect, analyse and report. Information takes time to read and assimilate. All users should question whether the information they recieve/have requested is worthwhile.

7. **Reliable**

Information should come from authoritative sources. It is good practice to quote the source used - whether it be internal or external sources. If estimates or assumptions have been applied, these should be clearly stated and explained.

2.2 System

A system isa group of elements that are integrated with the common purpo se of achieving an objective.Organization having common goal for the achievement are functionally interactive units. All system have inputs, outputs, and feedback, and maintain a basic level of equilubrium. For example, in the human body the heart functions to support the circulatory system, which is vital to the survival of the entire body.

In a system, network of components work towards a single objective, if there is lack of co-ordination among components, it leads to counterproductive results.
There for according to aaccording to Vangie Beal (webopedia), a system is:

1. A group of interdependent items that interact regularly to perform a task.

2. An established or organized procedure; a method.

2.2.1 Features of a System

A system may have following features:

1. **Adaptability:** some systems are adaptive to the exterior environment, while some systems are non-adaptive to the external environment.
2. **Limitation:** every system has pre-defined limits or boundaries within which it operates. This limits or boundaries can be defined by law or current state of technology.

2.2.2 Components of a System

Every system comprises of basic components which in coordination formulate a system. These are as follows.

1. **Input elements**

The information entered into a system. For instance raw data input to the computer system.

2. **Process**

Any specific treatment defined in the system to be performed on the data entered into the system, for instance, computation, analysis, application of any model.

3. **Output elements**

The results given by the system after the process has been performed on the data being input to the system.

4. **Control mechanism**

Every system is expected to generate some sort of standardized output. Hence actual output needs to be compared with what it is supposed to generate. This comparison of actual with expected output is done with the help of control mechanism.

5. **Feedback system**

Once the control mechanism has been devised, it needs to a reporting mechanism, which should respond with a corrective action, if required.

6. **Objectives**

We just mentioned that a control mechanism should compare actual output with expected/Ideal output. But before this is being done, there needs to be a list of specific objectives which define expected output.

2.2.3. Types of System

1. **Open System**

An open system is one that interacts with its environment and thus exchangeinformation, material, or energy with the environment, including random and undefined inputs. Open systems are adaptive in nature, as they tend to react with the environment in such a way, so as to favor their continued existence. Such systems are ‘self organizing’, in the sense that they change their organisation in response to changing conditions.

2. **Closed System**

Closed system is one, which does not interact with its environment. Such systems in business world, are rare, but relatively closed systems are common. This, the systems that are relatively isolated from the environment but not completely closed, are termed closed system.

3. **Open Loop System**

In open-loop architecture, business decisions made by management have an impact in the marketplace, and theimpact of that decision is measured only indirectly by the company's computer systems.

4. Closed Loop System

Closed loop system is a system where part of the output is feedback to the system to initiate control to change either the activities of the system or input of the system. In a closed-loop decision environment, the impact of decisions can be measured very precisely.

2.3 Information Systems

According to Encyclopaedia Britannica Information System is an integrated set of components for collecting, storing, and processing data and for delivering information, knowledge, and digital products. Business firms and other organizations rely on information systems to carry out and manage their operations, interact with their customers and suppliers, and compete in the marketplace. For instance, corporations use information systems to reach their potential customers with targeted messages over the Web, to process financial accounts, and to manage their human resources. Governments deploy information systems to provide services cost-effectively to citizens. Digital goods, such aselectronic books and software, and online services, such as auctions and social networking, are delivered with information systems. Individuals rely on information systems, generally Internet-based, for conducting much of their personal lives: for socializing, study, shopping, banking, and entertainment.

2.3.1. Components of Information System

An information system is essentially made up of five components hardware, software, database, network and people. These five components integrate to perform input, process, output, feedback and control.

1. **Hardware** consists of input/output device, processor, operating system and media devices.

2. **Software** consists of various programs and procedures.

3. **Database** consists of data organized in the required structure.

4. **Network** consists of hubs, communication media and network devices.

5. **People** consist of device operators, network administrators and Cashier or Staff.

Information processing consists of input; data process, data storage, output and control. During input stage data instructions are fed to the systems which during process stage are worked upon by software programs and other queries. During output stage, data is presented in structured format and reports.

2.4 Understanding Website

A website is a collection of web pages (documents that are accessed through the Internet), such as the one you're looking at now. A web page is what you see on the screen when you type in a web address, click on a link, or put a query in a search engine. A web page can contain any type of information, and can include text, color, graphics, animation and sound.When someone gives you their web address, it generally takes you to their website's home page, which should introduce you to what that site offers in terms of information or other services.

From the home page, you can click on links to reach other sections of the site. A website can consist of one page, or of tens of thousands of pages, depending on what the site owner is trying to accomplish.According to Nadine Ubelhor, 174702, a person's company's internet presence on the world wide web (WWW) is called website. It contains numerious pages written in HTML language,which together combine the corperate appearance. A website can be reach by entering its domain name into an address field of an internet browser. The main page such as www.helifax.com is called home page,the term "landing page" mean while defines ther sub site – a web page of a webiste which ine is forwarded to via an on – line shop or a search entry in a search engine. Therefore the aim here focuses on not forwarding a potential customer to the homepage itself but directly transmitting the information which was searched after.

(cf,Strauss/Frost2014,p.336)

2.4.1. Web Design

According to TechTerms.com, Web design is the process of creating websites. It encompasses several different aspects, including webpage layout, content production, and graphic design. While the terms web design and web development are often used interchangeably, web design is technically a subset of the broader category of web development.Websites are created using a markup language called HTML. Web designers build webpages using HTML tags that define the content and metadata of each page. The layout and appearance of the elements within a webpage are typically defined using CSS, or cascading style

sheets. Therefore, most websites include a combination of HTML and CSS that defines how each page will appear in a browser.Some web designers prefer to hand code pages (typing HTML and CSS from scratch), while others use a "WYSIWYG" editor like Adobe Dreamweaver. This type of editor provides a visual interface for designing the webpage layout and the software automatically generates the corresponding HTML and CSS code.While HTML and CSS are used to design the look and feel of a website, images must be created separately. Therefore, graphic design may overlap with web design, since graphic designers often create images for use on the Web.

2.5 Understanding Database

According to Vangie Beal (Webopedia), "Often abbreviated *DB,* a database is basically a collection of information organized in such a way that a computer program can quickly select desired pieces of data. You can think of a database as an electronic filing system."

Traditional databases are organized by *fields*, *records*, and *files.* A field is a single piece of information; a record is one complete set of fields; and a file is a collection of records. An alternative concept in database design is known as *Hypertext.* In a Hypertext database, any object, whether it be a piece of text, a picture, or a film, can be linkedto any other object. Hypertext databases are particularly useful for organizing large amounts of disparate information, but they are not designed for numerical analysis.

2.6. Database Management System (DBMS)

According to Mike Chapple (Databases Expert) “A database management system (DBMS) is the software that allows a computer to perform database functions of storing, retrieving, adding, deleting and modifying data” .A DBMS makes it possible for end users to create, read, update and delete data in a database. The DBMS essentially serves as an interface between the database and end users or application programs, ensuring that data is consistently organized and remains easily accessible.

2.7. Understanding Cinema Management System

Based onChristie Avias-TMS™ Theater Management System they provide simple and efficient central management of a multiplex’s entire projection operation. Through a user-friendly Web interface, theater managers can create and schedule screen playlists with simple drag-and-drop functionality, monitor the status of all their screens and manage their Key Delivery Messages (KDMs) from a single location. The existing system do not support the advance models of interaction between the viewers of the cinema destination. It is believed that it is a serious limitation of the DMS’s and therefore this project will propose an expanded funtionality that provides the viewers fair knowledge based on a virtual community concept of viewers from different provonces and locals who have a common interest. Inforamtion that supports virtual community over the web.

2.8. PHP Programming

The PHP programming language is a server-side HTML embedded Scripting language.The PHP language runs on the server-side. This means that the execution (read starting) of the scripts are done on the server where the web-site is hosted. HTML embedded means that you can use PHP statements (read a piece of PHP code) from within an HTML code. PHP files are returned to the browser as plain HTML.PHP is probably the most popular scripting language on the web. It is used to enhance web pages. With PHP, you can do things like create username and password login pages, check details from a form, create forums, picture galleries, surveys, and a whole lot more. If you've come across a web page that ends in PHP, then the author has written some programming code to liven up the plain, old HTML.PHP is known as a server-sided language. That's because the PHP doesn't get executed on your computer, but on the computer you requested the page from. The results are then handed over to you, and displayed in your browser. Other scripting languages you may have heard of are ASP, Python and Perl.

2.9. JavaScript

Originally developed by Brendan Eich and originally known asLiveScript, the programming language JavaScript was renamed in 1995. JavaScript is an interpreted client-side scripting language that allows a web designer the ability to insert code into their web page. JavaScript is commonly placed into an HTML or ASP file, and runs directly from the web page. It is utilized to

perform tasks such as printing the time and date, create a calendar, or other tasks that are not possible through plain HTML.

2.10. HTML

First developed by Tim Berners-Lee in 1990,**HTML** is short for **HyperText Markup Language**. HTML is used to create electronic documents (called pages) that are displayed on the World Wide Web. Each page contains a series of connections to other pages called hyperlinks. Every web page you see on the Internet is written using one version of HTML code or another. HTML code ensures the proper formatting of text and images so that your Internet browser may display them as they are intended to look. Without HTML, a browser would not know how to display text as elements or load images or other elements. HTML also provides a basic structure of the page, upon which Cascading Style Sheets are overlaid to change its appearance. One could think of HTML as the bones (structure) of a web page, and CSS as its skin (appearance).

2.11. Cascading Style Sheets (CSS)

Short for **Cascading Style Sheet**, **CSS** is a concept first created by Håkon Wium Lie in1994. In December 1996, CSS was made a specification by the W3C and today allows web developers to alter the layout and appearance of their web pages. For example, CSS may be used to change the font used in certain HTML element, as well as its size and color. A single CSS file may be linked to multiple pages, which allows a developer to change the appearance of all

the pages at the same time.Although most often used to change the style of web pages and user interfaces written in HTML and XHTML, the language can be applied to any kind of XML document, including plain XML, SVG and XUL. Along with HTML and JavaScript, CSS is a cornerstone technology used by most websites to create visually engaging webpages, user interfaces for web applications, and user interfaces for many mobile applications.

2.12. MySQL

MySQL, pronounced either "My S-Q-L" or "My Sequel," is an open source relational database management system. It is based on the structure query language (SQL), which is used for adding, removing, and modifying information in the database. Standard SQL commands, such as ADD, DROP, INSERT, and UPDATE can be used with MySQL.

MySQL can be used for a variety of applications, but is most commonly found on Web servers. A website that uses MySQL may include Web pages that access information from a database. These pages are often referred to as "dynamic,"meaning the content of each page is generated from a database as the page loads.

Websites that use dynamic Web pages are often referred to as database-driven websites.Many database-driven websites that use MySQL also use a Web scripting language likePHP to access information from the database. MySQL commands can be incorporated into the PHP code, allowing part or all of a Web page to be generated from database information. Because both MySQL and PHP

are both open source (meaning they are free to download and use), the PHP/MySQL combination has become a popular choice for database-driven websites.

2.13.UML (Unified Modeling Language)

UML is a standard language for specifying, visualizing, constructing, and documenting the artifacts of software systems. UML was created by Object Management Group (OMG) and UML 1.0 specification draft was proposed to the OMG in January 1997.

OMG is continuously putting effort to make a truly industry standard.

1. UML stands for **U**nified **M**odeling **L**anguage.
2. UML is different from the other common programming languages like C++, Java, COBOL, etc.
3. UML is a pictorial language used to make software blue prints.

2.13.1. UML Architecture

UML plays an important role in defining different perspectives of a system. These perspectives are: Design; Implementation; Process; and Deployment .And the centre is the **Use Case** view which connects all these four. A **Use case** represents the functionality of the system. So the other perspectives are connected with use case.

1. **Design** of a system consists of classes, interfaces and collaboration. UML provides class diagram, object diagram to support this.
2. **Implementation** defines the components assembled together to make a complete physical system. UML component diagram is used to support implementation perspective.
3. **Process** defines the flow of the system. So the same elements as used in *Design* are also used to support this perspective.
4. **Deployment** represents the physical nodes of the system that forms the hardware. UML deployment diagram is used to support this perspective.

2.13.2. Structural Diagrams:

The structural diagrams represent the static aspect of the system. These static aspects represent those parts of a diagram which forms the main structure and therefore stable.

These static parts are represents by classes, interfaces, objects, components and nodes. The four structural diagrams are:

1. Class diagram
2. Object diagram
3. Component diagram
4. Deployment diagram

1. **Class Diagram**

Class diagrams are the most common diagrams used in UML. Class diagram consists of classes, interfaces, associations and collaboration. Class diagrams basically represent the object oriented view of a system which is static in nature. Active class is used in a class diagram to represent the concurrency of the system. Class diagram represents the object orientation of a system. So it is generally used for development purpose. This is the most widely used diagram at the time of system construction.

2. **Object Diagram**

Object diagrams can be described as an instance of class diagram. So these diagrams are more close to real life scenarios where we implement a system. Object diagrams are a set of objects and their relationships just like class diagrams and also represent the static view of the system. The usage of object diagrams is similar to class diagrams but they are used to build prototype of a system from practical perspective.

3. **Component Diagram**

Component diagrams represent a set of components and their relationships. These components consist of classes, interfaces or collaborations. So Component diagrams represent the implementation view of a system. During design phase software artifacts (classes, interfaces etc) of a system are arranged in different groups depending upon their relationship. Now these groups are known as

components. Finally, component diagrams are used to visualize the implementation.

4. **Deployment Diagram**

Deployment diagrams are a set of nodes and their relationships. These nodes are physical entities where the components are deployed. Deployment diagrams are used for visualizing deployment view of a system. This is generally used by the deployment team.

2.13.3. Behavioral Diagrams

Any system can have two aspects, static and dynamic. So a model is considered as complete when both the aspects are covered fully. Behavioral diagrams basically capture the dynamic aspect of a system. Dynamic aspect can be further described as the changing/moving parts of a system.

UML has the following five types of behavioral diagrams:

1. Use case diagram
2. Sequence diagram
3. Collaboration diagram
4. Statechart diagram
5. Activity diagram

1. **Use case Diagram**

Use case diagrams are a set of use cases, actors and their relationships. They represent the use case view of a system. A use case represents a particular functionality of a system. So use case diagram is used to describe the relationships among the functionalities and their internal/external controllers. These controllers are known as actors.

2. **Sequence Diagram**

A sequence diagram is an interaction diagram. From the name it is clear that the diagram deals with some sequences, which are the sequence of messages flowing from one object to another. Interaction among the components of a system is very important from implementation and execution perspective. So Sequence diagram is used to visualize the sequence of calls in a system to perform a specific functionality.

3. **Collaboration Diagram**

Collaboration diagram is another form of interaction diagram. It represents the structural organization of a system and the messages sent/received. Structural organization consists of objects and links. The purpose of collaboration diagram is similar to sequence diagram. But the specific purpose of collaboration diagram is to visualize the organization of objects and their interaction.

4. Statechart Diagram

Any real time system is expected to be reacted by some kind of internal/external events. These events are responsible for state change of the system. Statechart diagram is used to represent the event driven state change of a system. It basically describes the state change of a class, interface etc. State chart diagram is used to visualize the reaction of a system by internal/external factors.

5. Activity Diagram

Activity diagram describes the flow of control in a system. So it consists of activities and links. The flow can be sequential, concurrent or branched. Activities are nothing but the functions of a system. Numbers of activity diagrams are prepared to capture the entire flow in a system. Activity diagrams are used to visualize the flow of controls in a system. This is prepared to have an idea of how the system will work when executed.

2.14. Object-Oriented Analysis and Design (OOAD)

Object-oriented analysis and design (OOAD) is a technical approach used in the analysis and design of an application or system through the application of the object-oriented paradigm and concepts including visual modeling. This is applied throughout the development life cycle of the application or system, fostering better product quality and even encouraging stakeholder participation and communication

According to the popular guide Unified Process; OOAD in modern software engineering is best conducted in an iterative and incremental way. Iteration by iteration, the outputs of OOAD activities, analysis models for OOA and design models for OOD respectively, will be refined and evolve continuously driven by key factors like risks and business value.