



INFORMATION SYSTEMS PROJECT MANAGEMENT COURSE.

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ABBREVIATION

ABBREVIATION	FULL MEANING
AIU	Atlantic International University
PM	Project Management
PMS	Project Management System
IS	Information System
PMIS	Project Management Information System
CIO	Chief Information Officer
CEO	Chief Executive Officer
CFO	Chief Financial Officer
COO	Chief Operating Officer
CTO	Chief Technical Officer
CISO	Chief Information Security Officer
CPU	Computer Processing Unit

GIS	Geographic Information System
GIS	Global Information System
FAIS	Functional Area Information System
POM	Production Operation Management
SDLC	System Development Life Cycle
LIS	Land Information System
DIS	Disaster Information System
CIS	Computer Information System
CSFs	Critical Success Factors
ROPM	Real Options Pricing Models
PERT	Program Evaluation Review Technique
CPM	Critical Path Method

DBMS	Data Base Management System
LAN	Local Area Network
MAN	Metropolitan Network
WAN	Wide Area Network
TPS	Transaction Processing System
MRS	Management Reporting Systems
DSS	Decision Support System
EIS	Executive Information System
OIS	Office Information System
PSS	Professional Support System
MIS	Management Information System
RAD	Rapid Application Development

RFI	Request For Information
RFB	Request for Bid
RFP	Request For Proposal
SLA	Service Legal Agreement
FAIS	Functional Area Information System
ASP	Application Service Providers

INFORMATION SYSTEMS PROJECT MANAGEMENT

1. INTRODUCTION

1.1. DEFINITION AND MEANING OF TERMS:

Project: According to the American National Standard ANSI/PMI 99-001-2004) project is defined as a temporary endeavor undertaken to create a unique product, service or result;

According to the ISO 10006 refers to a unique process consist of a set of coordinated and controlled activities with starts and finished dates undertaken to achieve an objective confirming to specific requirements and needs including the constraints of time, cost and resource;

Example of projects include the development of water sheds, creation of irrigation facilities, development of a new variety of crops, construction of and rehabilitation of commercial facilities, construction of road infrastructures, development of public and green spaces and construction of pedestrian footpaths. It should be noted that the above-mentioned projects differ in composition, type, scope, size and time;

CHARACTERISTICS OF PROJECTS

1. Unique in nature;
2. Have a definite objective or goal to achieve;
3. Requires set of resources (material and personnel);
4. Have a specific time frame for completion with a definite start and finish time frame;
5. Involve risk and uncertainties;
6. Requires cross-functional team and interdisciplinary approach.

Project Management System: This focuses on integrated planning and control;

Project Management: It is a distinct area of management that deals with projects. It refers to the application of knowledge, skills, tools and techniques in a project environment. Globally Project Management has

attained a great level and has emerged as a distinct area of management practices carried out to meet the challenges of recent times such as new economic environment, globalization, rapid technological advancement, and quality concerns of stakeholders such as increased in the world's population.

Project Management is therefore divided into three (03) main features such as:

Project Manager \longrightarrow the Project Team \longrightarrow Project Management System (Organization, Structure, Information processing, Decision-making and the procedures for the integration of horizontal and vertical elements of the project organization).

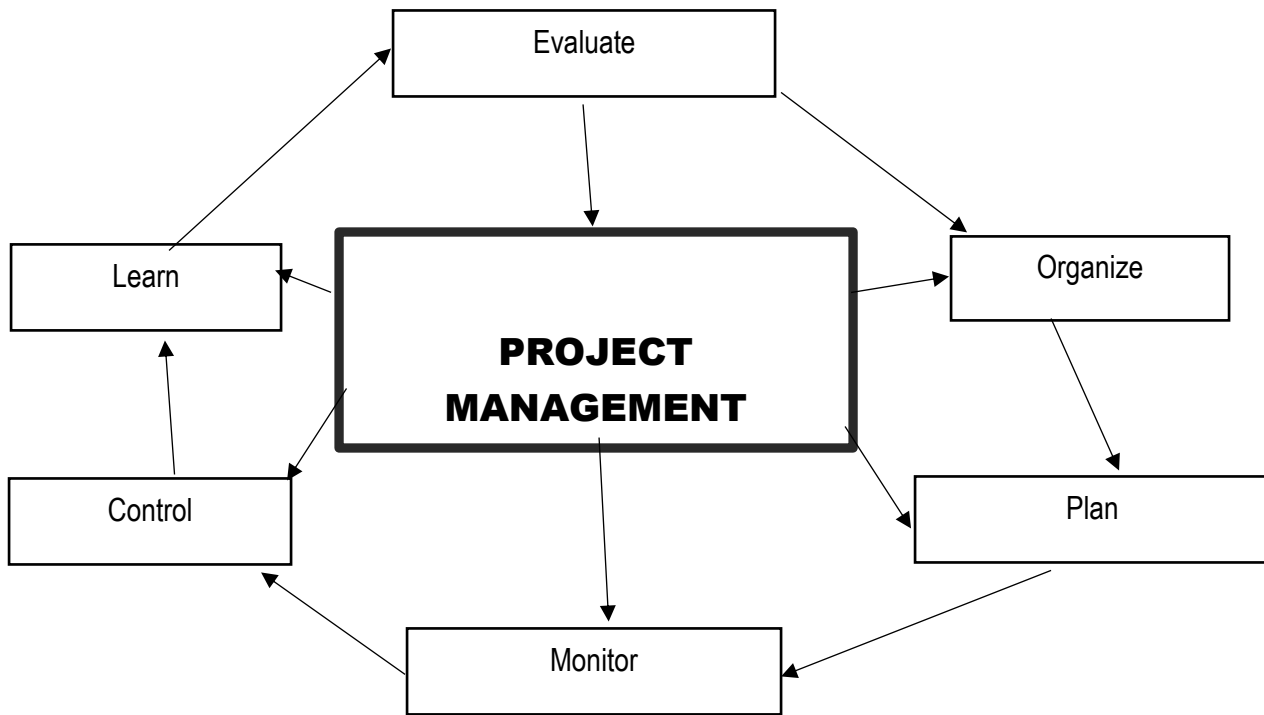


Figure 1: Interactive process of Project Management.

Project Management Information System: This is defined as a coherent arrangement of information required for an organization to execute projects successfully, for example the C2D Program funded by the French Development Agency uses the PMIS for a successful execution of projects. PMIS is also considered as a typically one or more software application and systematic process for collecting and using project information. This software application helps in the planification, execution and closing of project management

goals. It should be noted that PMIS differs in scope, design and features depending on an organization's operational requirements.

Information System: This is defined by Wikipedia, the free encyclopedia as a formal, socio-technical and organizational system designed to collect, process, store and distribute information.

Computer Information System: This is a system that is composed of people and computers that processes or interprets information. CIS is also considered as a field studying computers and algorithmic processes including their principles, their applications and their impact on the society.

Computer Based Information System: This is defined by Langefors as a technologically implemented medium for recording, storing and disseminating linguistic expressions as well as for drawing conclusions from such expressions. Examples of a Computer Based Information System are Geographic Information System (GIS), Land Information System (LIS) and Disaster Information System (DIS).

Gant Chart: This is a sequential programming of project activities from the start to the end.

PERT Chart: is defined as a tool used to schedule, organize and map out tasks within a project. It is also considered as a method of documenting project plans that graphically depicts project tasks and their inter-relationship.

Database is defined as an organized collection of inter-related facts reflecting a major aspect of a firm's activities.

System: This is a set of components or substances that operate together to achieve a common goal.

Telecommunications: These are means of transmitting information over long distances.

Critical Success Factors (CSFs): This involves a small number of easily identifiable operational goals shaped by an industry, manager, firms and the entire environment. These goals are believed to assure the success of the organization.

Portfolio Analysis: This can be used to evaluate alternative system projects once strategic analysis have determined the overall direction of system development.

Implementation: This refers to all the organizational activities working towards the adoption, management, routinization of innovation such as new information system.

Change Agent: This involves an individual acting as a catalyst during the change process to ensure successful organizational adaptation to a new system or innovation. It also refers to the system analyst in the implementation stage.

User-Designer Communication Gap: This involves the difference in backgrounds, interests and priorities that impede communication and problem solving among users and IS specialists.

Internal integration Tools: This is a project management technique that ensure that the implementation team operate as a consistent unit. It also benefits projects with challenging and complex technology for users to master.

Formal Control Tools: Involves project management tools that helps monitor the progress towards the completion of a task and fulfillment of goals.

Formal Planning Tools: This is a PM technique that structures and sequences tasks, budgeting time, money and technical resources required to complete the tasks.

Formal Planning Control Tools: These are tools that benefit large projects for documenting and managing project plans.

External Integration: This consists of ways to link the work of implementation team to users at all organizational level.

Counter implementation: This is a deliberate strategy that prevents the implementation of information system and innovation in an organization.

Ergonomics: This is the integration of people and machines in the environment.

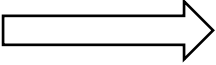
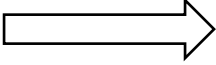
Organizational Impact Analysis: This explains how a proposed system will affect organizational structure, attitudes, decision making and operations.

Socio technical design: This is a design to produce information system that blend technical efficiency with sensitivity to organizational and human needs.

A. SUMMARY OF COURSE

Project Management: It is a distinct area of management that deals with projects. It refers to the application of knowledge, skills, tools and techniques in a project environment. Globally Project Management has attained a great level and has emerged as a distinct area of management practices carried out to meet the challenges of recent times such as new economic environment, globalization, rapid technological advancement, and quality concerns of stakeholders such as increased in the world's population.

Project Management is therefore divided into three (03) main features such as:

Project Manager  the Project Team  Project Management System (Organization, Structure, Information processing, Decision-making and the procedures for the integration of horizontal and vertical elements of the project organization).

Project Management is very important because the world is evolving into a developmental phase and too much pressure on societies to embrace implement sustainable projects. For developmental goals to succeed project management has to be a priority to all project owners.

Project Management has benefits such as:

- Handling of complex, costly and risky assignments by providing appropriate solutions;
- Handling of assignments in a specified way and time (start-finish points);
- Provide task orientation to personnel in an assigned organization.

2. SUMMARY OF AN INFORMATION SYSTEM (IS)

Information System: This is defined by Wikipedia, the free encyclopedia as a formal, socio-technical and organizational system designed to collect, process, store and distribute information. It is a computerized database designed to accept, store, process, transform, make use and analyze data and to report results usually on a regular basis. It can be considered as a larger system including database, software, hardware

used to manage it and people involve in its usage and beneficial purposes and also taking into consideration all the necessary manual and machine procedures and communication systems. IS involves a means of communication, punched card systems, optical coincidence systems based on coordinate indexing and completely computerized methods of storing, searching and retrieving of information.

Information System (IS) is used for the actual academic study of complementary networks of hardware and software that people and organizations use to collect, filter, process, create and distribute data. IS inter-relates with data system on the one hand and activity system on the other hand.

Furthermore, An Information System is a form of communication system in which data is represented and processed as a form of social memory. On another note, IS is a semi-formal language which supports human decision making and action.

In a general sense, IS is the collection of hardware, software, data, people and procedures that work together to produce quality information.

2.1. Background History of Information System (IS)

Some authors like Silver et al. (1995) gave their views on IS which according to them is the collection of software, hardware, data, people and procedures meanwhile Zheng added processes and essential elements like environment, boundary, purpose and interactions to his views.

2.2. Types of Information Systems

There exist several types of IS which are:

Transaction Processing Systems;

Decision support systems;

Knowledge management systems;

Database management systems and office information systems such as Chief Information Officer (CIO), Chief Executive Officer (CEO), Chief Financial Officer (CFO), Chief Operating Officer (COO), Chief Technical Officer (CTO), Chief Information Security Officer (CISO).

2.3. Components of Information System (IS):

The components of IS are made up of:

1. *Hard ware:* This is a machinery which includes the computer known as the Central Processing Unit (CPU) and support equipment such as outputs devices, storage devices and communication devices. Examples of Hard wares are devices like monitor, processor, printer, keyboard which all work together to accept, process, show data and information.
2. *Software:* This involves computer programs and manuals that supports them. Computer programs are known as machine readable instructions that direct circulation within the hardware parts of the system to function in ways that produce useful information from data. Computer programs are generally stored on some input/output devices such as disk, tape, flash drive and hard drive. Soft wares are considered hard ware to process the data for example Microsoft Office Package, Adobe Reader.
3. *Data:* This is one of the components of IS that are comprised of facts that are used by programs to produce useful information. Data are usually stored in machine-readable form on disk/tape until the computer needs them. Data involves gathering of files or table containing related data.
4. *Procedures:* These involves policies that govern the operation of a computer system. Procedures are commands for combining the components above to process information and produce the preferred output.
5. *Network:* This is a connecting system that allows diverse computers to distribute resource.
6. *People:* These are the end users who are responsible for the success or failures of IS.

2.4. Types of Organizational Information System.

This includes Transaction Process System, Management Information System, Decision support system and executive information system as indicated on the diagram below.

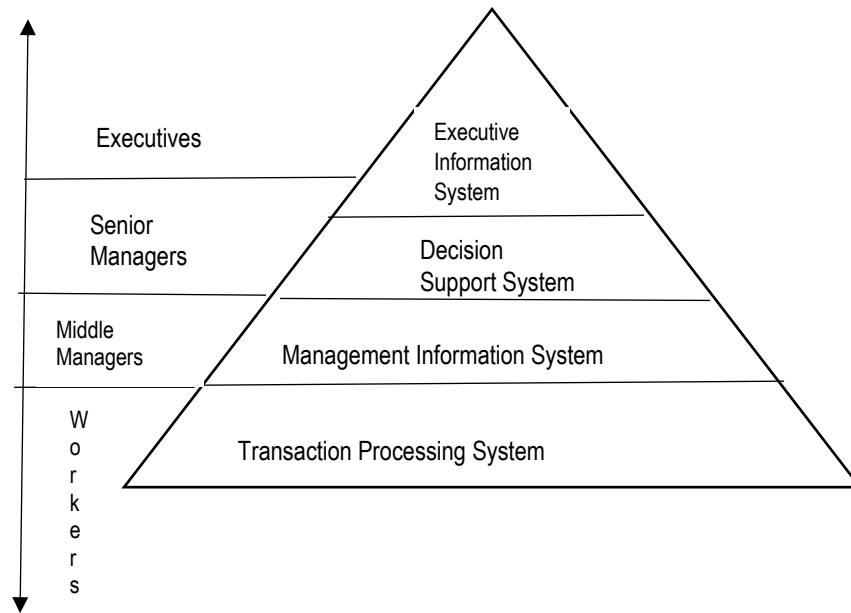


Figure 2: Illustration of a four (04) pyramid model of different types of Information System based on the different level of hierarchy in an organization.

Some examples of Information system also known as modern day IS include:

- Data warehouses;
- Expert Systems;
- Enterprise Resource Planning;
- Search Engines;
- Geographical Information Systems (GIS);
- Global Information System (GIS);
- Office Automation.

2.5. Information System Development is done using the following stages:

- ❖ Problem Recognition and Specification;
- ❖ Information Gathering;

- ❖ Requirements Specification for a new system;
- ❖ System Design;
- ❖ System Construction;
- ❖ System Implementation;
- ❖ Review and Maintenance.

2.6. Information System has many disciplines which are:

- ✚ Analysis and Design of systems;
- ✚ Computer Networking;
- ✚ Information Security;
- ✚ Database Management and Decision Support Systems;
- ✚ Mathematics;
- ✚ Engineering;
- ✚ Computer Science;
- ✚ Cybernetics etc.

2.7. Impact of Information System (s) on Economic Models

This has to do with the following Models:

- Micro-economic Theory Model;
- Transaction Cost Theory;
- Agency Theory

The relationship between computer science and information system in the economic/business world is described on the diagram below:

Computer Science & Information Systems Relationships In the Business World

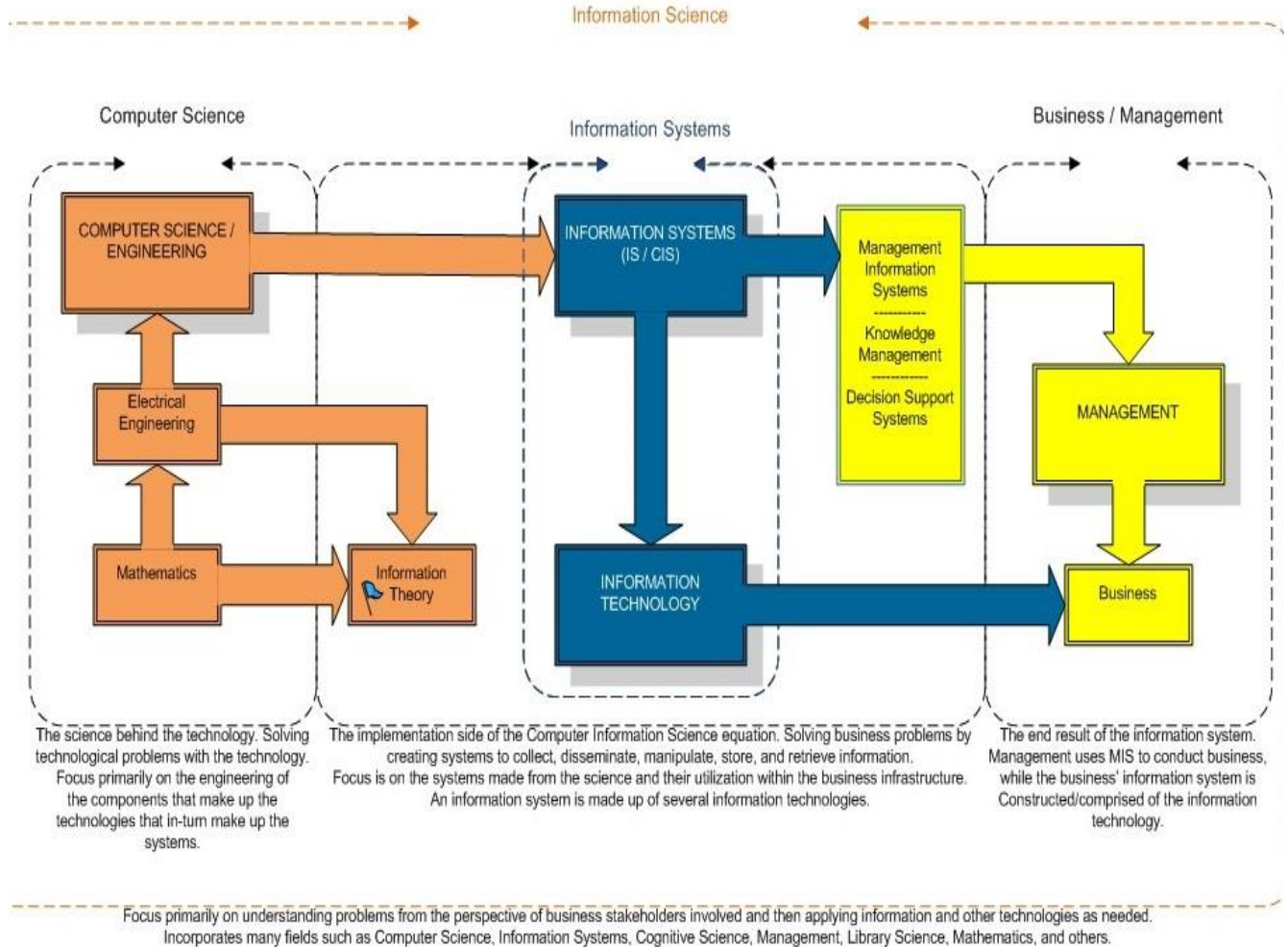


Figure 3: Illustration of IS-Relationships-Chart.

2.8. Information System Research

Researchers such as Hevner et al (2004) categorized IS research into behavioural Science which are meant to develop and verify theories that explain or predict human and organizational behaviour. These researchers went ahead to design science which extends boundaries of human and organizational capabilities by creating new innovations. Salvatore March and Gerald Smith on their part proposed outputs research and activities to carry out this research. To this regard a number of research outputs were identified as follows:

- a) **Construct:** This constitutes a conceptualization used to describe problems within the domain and to specify their solutions;
- b) **A Model:** This is a set of propositions or statements expressing relationships among constructs;
- c) **A Method:** This is a set of steps (a guideline) used to perform a task. It should be noted that methods are based on a set of underlying constructs and a representation (mode) of the solution space;
- d) **An Instantiation:** This is realization of an artifact in its environment.

2.9. Activities of Information System (IS) Research

- Build an artifact to perform a specific;
- Evaluate the artifact to determine if any progress has been achieved;
- Given an artifact whose performance has been evaluated, it is important to determine why and how the artifact worked or did not work within its environment.

2.10. Information Systems Plan

This is a road map indicating the direction of system development, the rationale, the current situation, the management strategy, the implementation plan and budget;

In order to identify information system projects that will deliver the most important business value, organizations have to develop an information systems plan;

To support overall business plan, strategic systems must be incorporated with a top-level planning;

Information System Plan contains corporate goals and specifies how information technology will support the attainment of those goals.

2. PROJECT MANAGEMENT

PM in a general sense refers to application of knowledge, skills, tools and techniques to achieve specific targets within specified budget and time constraints. It constitutes of activities such as work planification, risk assessment, estimation of resource required to accomplish the work, work organization, acquisition of human and material resources, assigning tasks, directing activities, controlling project executions, reporting progress and analyzing the results.

An Information System Project Management must deal five (05) variables to accomplish its task. These variables are:

- **Scope:** This defines what work is and is not included in the project;
- **Time:** This involves the amount of time required to complete the project;
- **Cost:** It is based on the time to complete the project multiplied by the cost of human resource required to complete the project;
- **Risk:** This involves the uncertainties incur in the process of project execution;
- **Quality:** This indicates how well the end results of a project is satisfactory to the objectives specified by management.

2.1. Methods of Project Management

There are two main types of Project Management (PM).

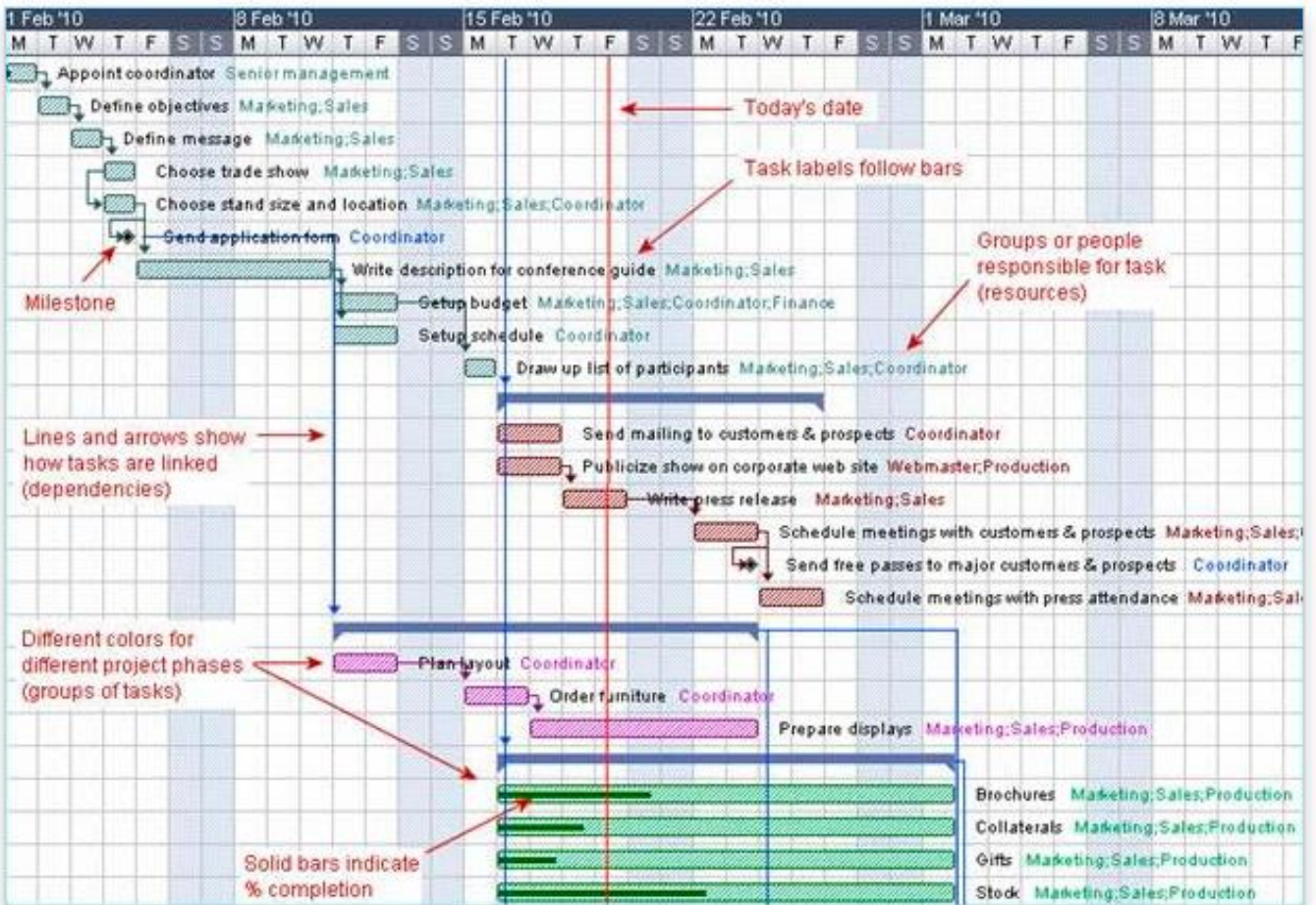
2.1.1. GANTT CHART:

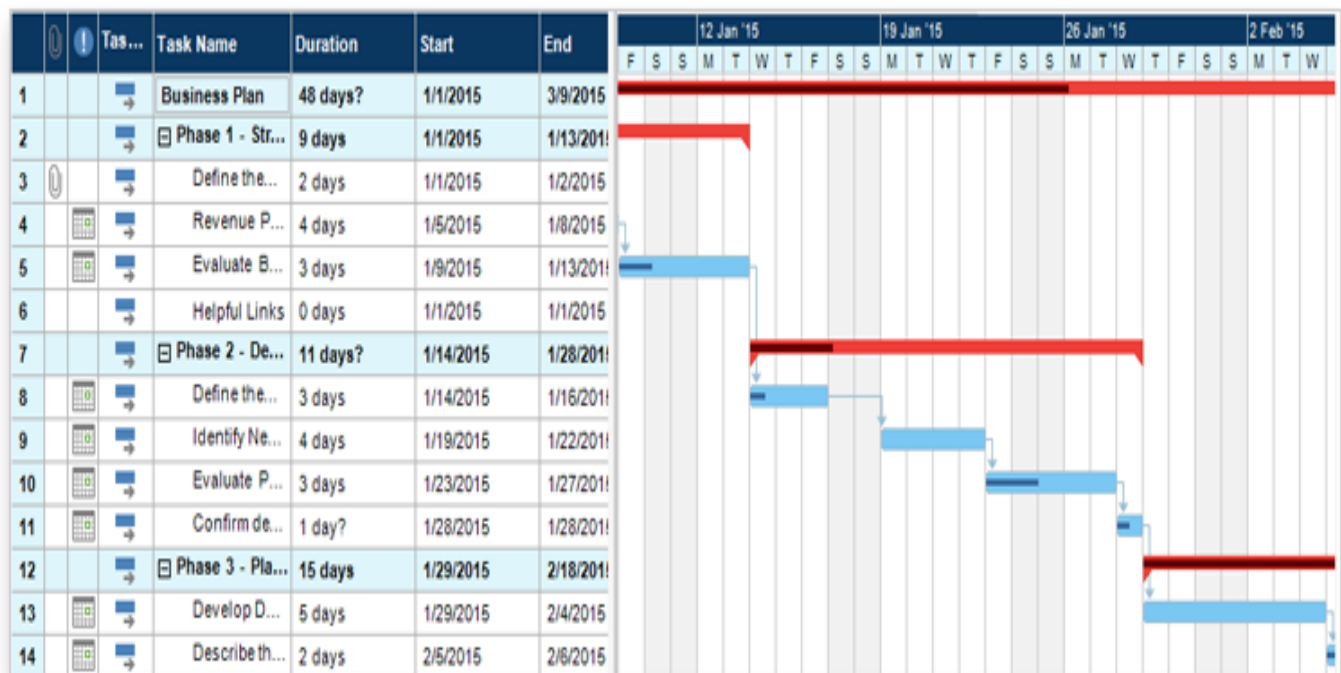
This is a sequential programming of project activities from the start to the end. This method helps the project management team to integrate activities at every point in time. A Gantt chart, commonly used in project management, is one of the most popular and useful ways of showing activities (tasks or events) displayed against time. On the left of the chart is a list of the activities and along the top is a suitable time scale. Each

activity is represented by a bar; the position and length of the bar reflects the start date, duration and end date of the activity. This allows you to see at a glance:

- What the various activities are;
- When each activity begins and ends;
- How long each activity is scheduled to last;
- Where activities overlap with other activities, and by how much;
- The start and end date of the whole project.

Gantt charts are most commonly used for tracking project schedules. For this it is useful to be able to show additional information about the various tasks or phases of the project, for example how the tasks relate to each other, how far each task has progressed, what resources are being used for each task and so on.





Figures 4&5: Illustration of Gantt Charts.

2.1.2. PERT CHART:

This is a tool used to schedule, organize and map out tasks within a project. It actually provides a visual representation of a project time line and breaks down individual tasks. It can also be defined as a method of documenting project plans that graphically depicts projects tasks and their inter-relationship.

2.1.2.1. Steps to make a PERT Chart.

Below are some steps that are used to prepare a PERT Chart.

- i. Identify project tasks: This involves the identification and collection of necessary project information and tasks;
- ii. Defined task dependencies: This is a task that relies on another task to be completed before the task at hand starts;
- iii. Connect Project Tasks: This involves connecting project tasks to one another;

iv. Estimate project time frame: This involves the time to estimate overall project time frame using the critical path method (CPM). The estimated time is calculated based on optimistic time, pessimistic time and most likely time as described below:

- Optimistic time: This is the minimum amount of time needed to accomplish a task;
- Pessimistic time: This is a maximum time needed to accomplish a task;
- Most likely time: This is the best estimate of how long it will likely take to accomplish a task.

The PERT formula used to calculate the expected duration of a task and accomplish a task is as follows:

$$(O + (4X M) + P)/6.$$

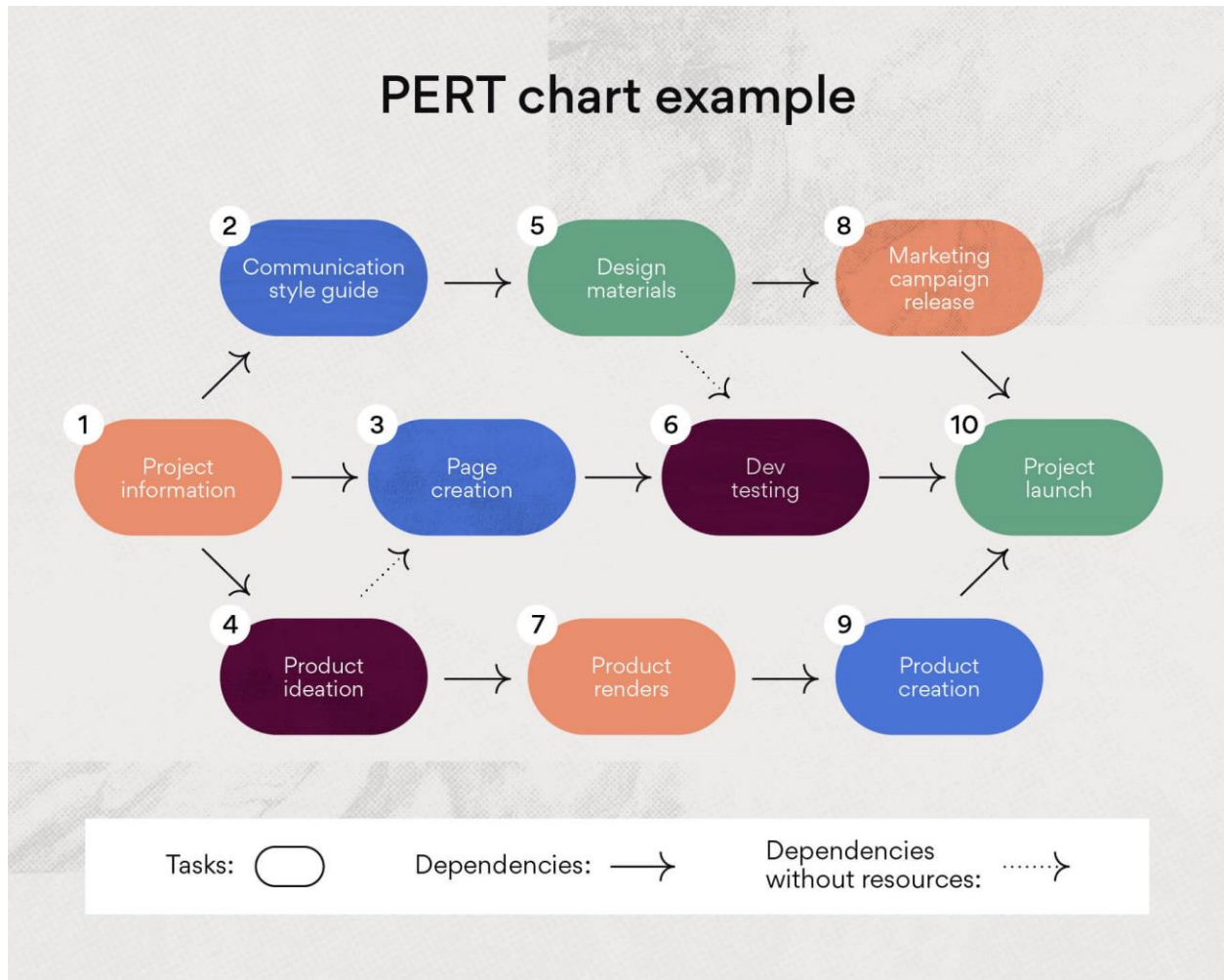
O = optimistic

M = Most likely time

P = Pessimistic time

It should be noted that this formula can be measured by minutes, hours, days and even weeks.

v. Manage task progress: This is the final step in creating a PERT Chart.



Figures 6: Illustration of a PERT Chart.

2.1.2.2. Description of terms on a PERT Chart

- **Nodes:** This represents project events;
- **Tasks:** These are items needed to be computed for nodes to be implemented;
- **Dependencies:** This happens when a task is connected to another task. These tasks rely on one another and one cannot be completed without the other;
- **Dependencies without resources:** This is one that while connected to another does not have tangible tasks that need to be completed.

2.1.2.3. When to use a PERT Chart

A PERT Chart is used:

- To determine the critical path;
- To evaluate resources. This helps to easily determine which tasks require resources and which don't;
- To estimate time. This helps to understand the expected time line during the initial project planning phase.

2.1.3. DIFFERENCE BETWEEN PERT AND GANTT CHARTS:

S/N	PERT	GANTT
01	Flow Charts	Bar Graphs
02	Offers customization	Offers Organization
03	Used before the start of a project	Used during a project

Table 1: Difference between PERT and GANTT Charts.

1. DECISION MAKING IN THE ACQUISITION OF INFORMATION SYSTEMS AND TECHNOLOGY

Acquisition refers to all stages from buying, introducing, applying, adapting, localizing and developing through to diffusion. Acquisition is built for reasons like IT applications, rapid change in new technology and involvement of several business entities in the organization. The acquisition process should involve the identification and analysis of alternative solutions that are each compared with the established business requirements.

The decision making to acquire a typical IT application consists of the following stages:

Stage 1: This consists of identifying, planning, and justifying the information and system requirements.

This stage is very important because it helps in the identification of business objectives and provide solutions to any problems identified.

Secondly, in procuring an information system, the system requirement has to be defined. This system requirement defined the problems to be solved, business goals, system process to be accomplished, user expectations and deliverables for the system. It is also incorporate information about system inputs, processing information and expected out come.

It should be noted that the acquisition of IS can be done through interviews, questionnaires, existing system sources, bench marking with related system, prototyping and Rapid Application Development.

Stage 2: Restructuring Information System Architecture.

This stage describes how organization's information objectives are met by the capabilities of the specific applications. This structural design describes the flow of information, data hierarchy, application functionality, technical feasibility and organization. The output from this stage should be a strategic planning level.

Stage 3: Identifying a development alternative.

The available alternatives used in the procurement of a software solution involves:

- Developing the system in-house;
- Off-the self solutions (purchasing commercially available solutions);
- Buying a custom-made system for a vendor;
- Leasing software from an application service provider or through utility computing;
- Out sourcing a system from other companies;
- Participating in auction, e-market place or a public exchange.

Stage 4: Conducting a Feasibility Analysis

One of the decision-making processes involves feasibility analysis whose aim is to identify the constraints for each alternative from both technical and economic perspectives.

Feasibility Analysis involves the following:

- 1) **Economic Analysis:** This describes cost-benefit justification depending on the expenses of the system such as procurement, project-specific, start-up and operational costs.
- 2) **Technical Feasibility:** This evaluates whether the company has attained a certain level and the resources acquired such as infrastructure, hardware, software and network capabilities to support the application.
- 3) **Operational Feasibility:** This reviews the extent of organizational changes required to accommodate the proposed system. The proposed system should be able to solve the business problems and provide better opportunity for the business.
- 4) **Legal and Contractual Feasibility:** The proposed solution must pass any related legal or contractual obligations associated with. Corporate legal counsel should ensure that there are no illegal practices corresponding to the new system related with any pre-existing regulations. Companies and Organizations may also prefer to work in close collaboration with Computer Law Association to make sure this analysis is strictly enforced.
- 5) **Political Feasibility:** This evaluates how the internal organization will accept the new system. It also incorporates the user expectancy regarding the new system and the corporate culture response toward the proposed solution.

Stage 5: Performing the selection procedure.

This is a process of identifying the best match between the available options and identified requirements. In the process, the Company request for a proposal from prospective providers.

CONCLUSION

To conclude, Information System development has evolved over time and it's the most used in the world today especially in the field of project management and the economic world at large to attain objectives, solve problems and innovate new ideas.

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