Mc Graw Hill Education

# System Analysis and Design

## Lecture 4

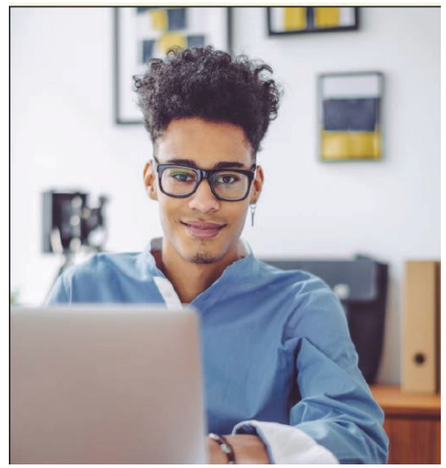
**Dr. Hala Najwan Sabeh**

EMAIL: hala.najwan@tiu.edu.iq


Mc
Graw
Hill
Education
System Analysis and Design
Because learning changes everything.™

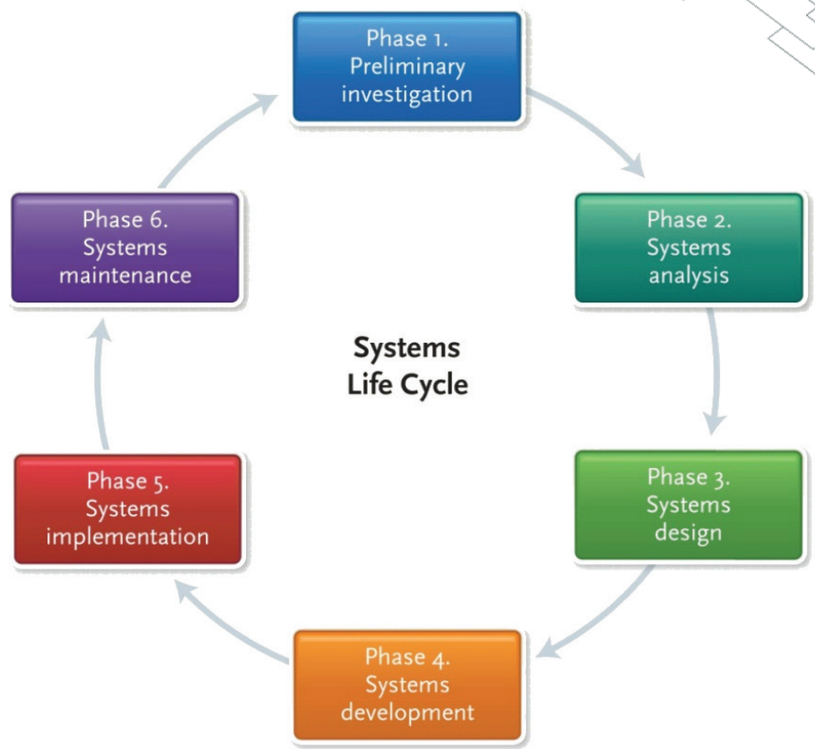
# Introduction

- Most people in an organization are involved with an information system of some kind.
- For the organization to create and use the system requires thought and effort.
- Need to be aware of the relationship of an organization's chart to its managerial structure.



# System Analysis and Design

- **A system** is defined as a collection of activities and elements organized to accomplish a goal.
- **System Analysis and Design** is defined as the Six-phase problem-solving procedure for examining and improving an information system.



# System Analysis and Design

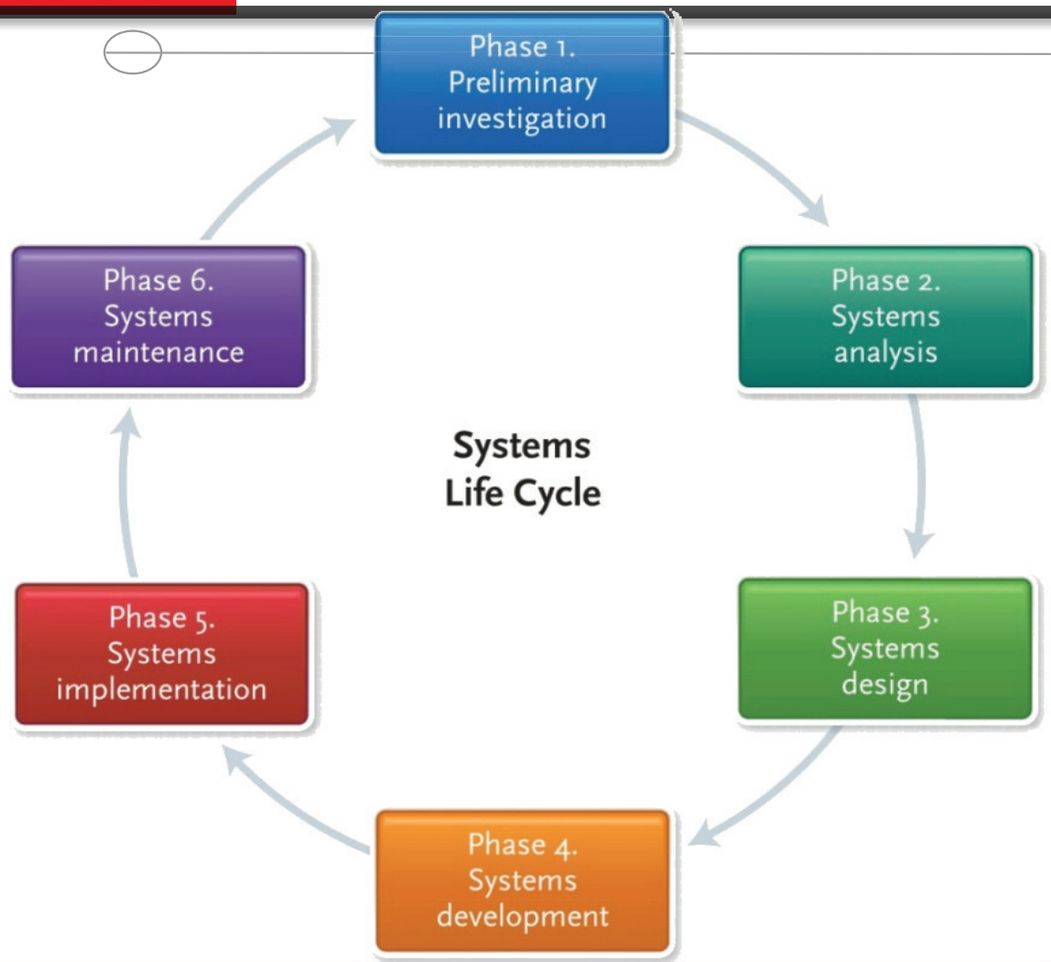
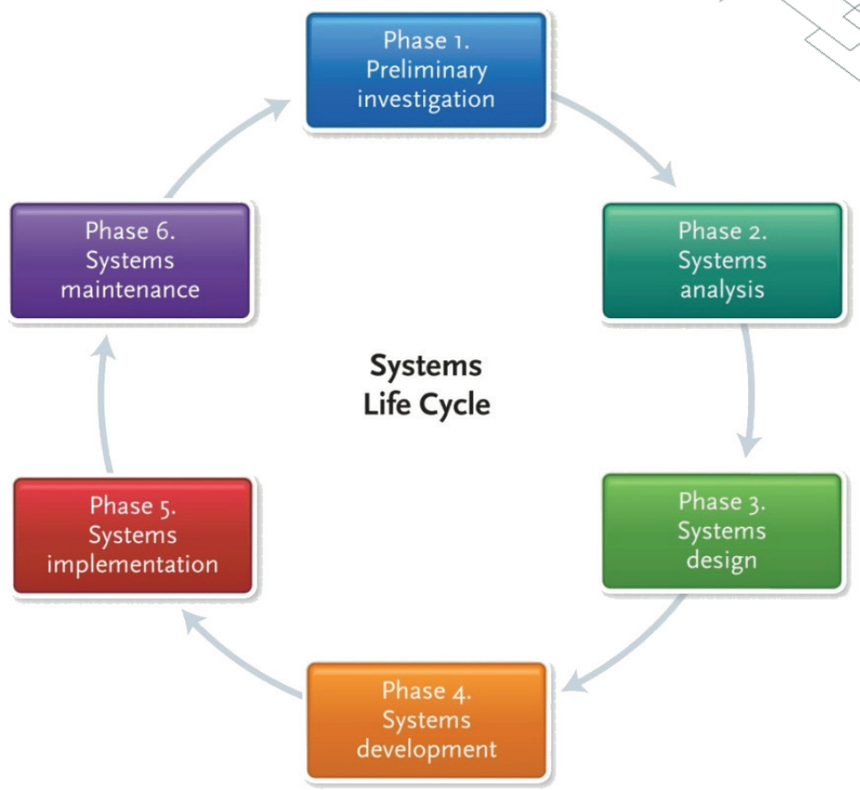



**Figure .The six-phase systems life cycle**

# System Analysis and Design

- These six stages make up the **systems life cycle**.
- The Life Cycle is used by computer professionals known as **systems analysts** to study systems and determine what actions to take and how to use computer technology to assist.
- The six-phase systems life cycle is used by computer professionals knows as systems analysts.



# Concept Check

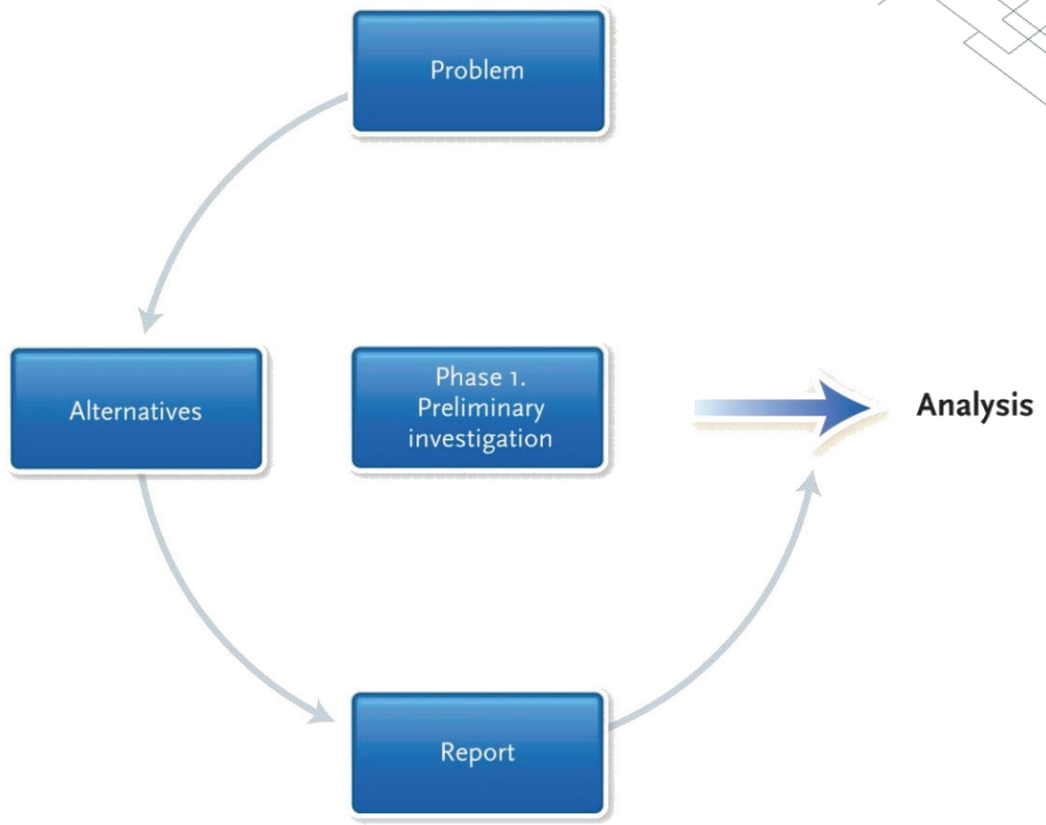
1) Draw a figure that shows the six-phase systems life cycle.
2) Define the system.
3) Define the System Analysis and Design.
4) List the six-phase of the systems life cycle.

# Phase 1: Preliminary Investigation

The preliminary investigation determines the need for a new information system.

There are three tasks to be completed in this phase:

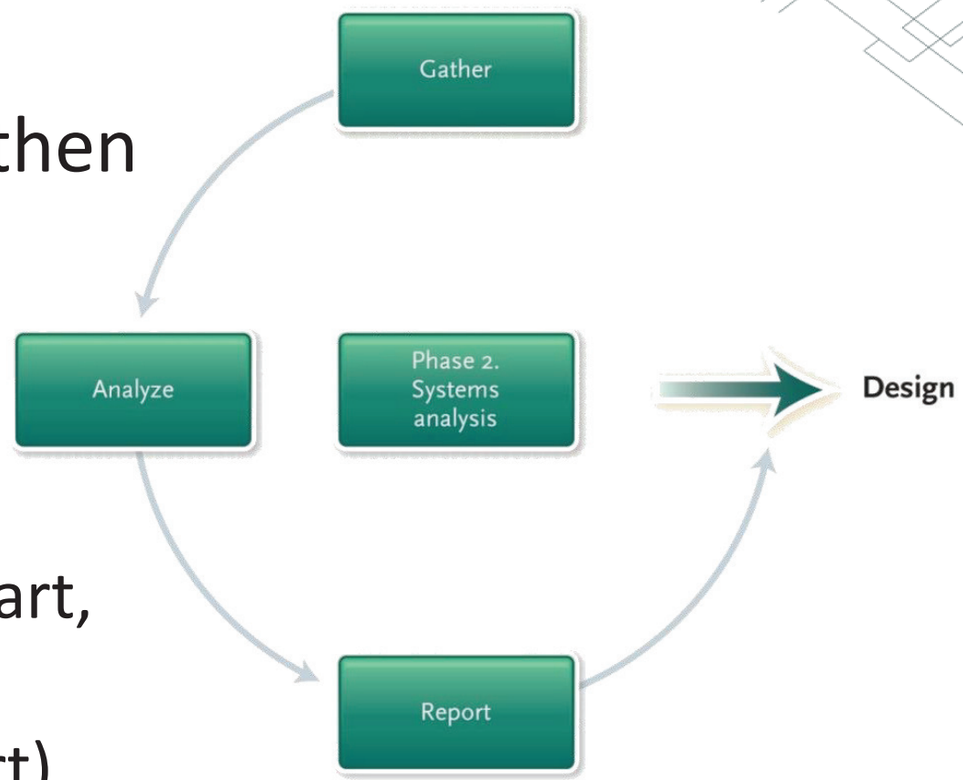
1. **Define the problem**
2. **Suggest alternatives**
3. **Prepare report**



# **Phase 2**: Systems Analysis

In Phase 2, Systems Analysis, Data is collected about the present system and then analyzed to determine the new requirements.

1. Gather data (observation, interviews, studying documents)
2. Analyze data (grid chart, system flow chart, Data flow diagrams)
3. Create summary (systems analysis report)



# Analyzing the Data in Phase 2

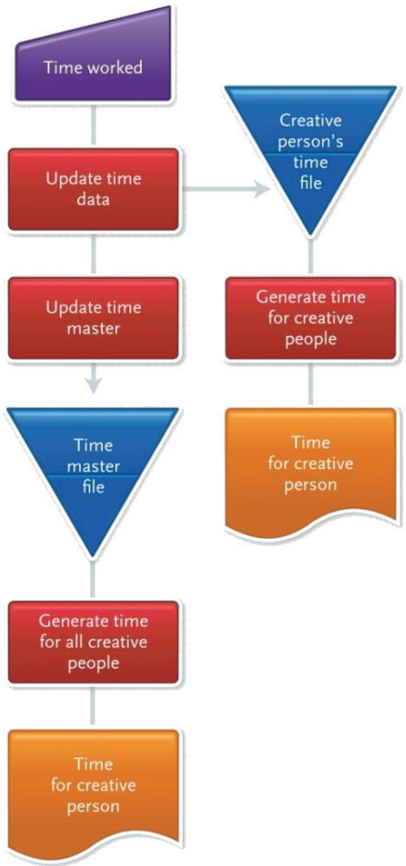
- Top-down analysis method is used to identify the top-level components of a complex system and each component is broken down into small components making analysis easier
  - Grid charts show the relationship between input and output documents
  - System flowcharts show the flow of input data to processing and finally to output or distribution of information
  - Data flow diagrams show the data or information flow within an information system
  - Automated design tools
    - Computer-aided software engineering tools (CASE)
  - Documenting
    - Systems Analyst Report

# Data Analysis Tools – Grid Chart

**Grid Chart** : Show the relationship between input and output documents

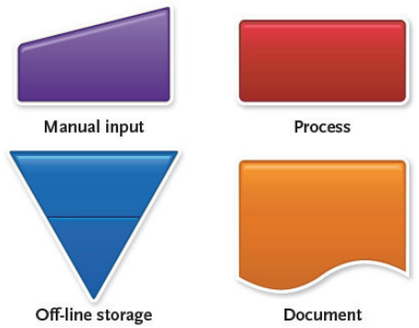
| | Reports (output) | | |
|---|---|---|---|
| Forms (input) | Client billing | Personnel expense | Support cost |
| Time sheet | ✓ | ✓ | |
| Telephone log | ✓ | | ✓ |
| Travel log | ✓ | | ✓ |

# Data Analysis Tools – System Flowchart

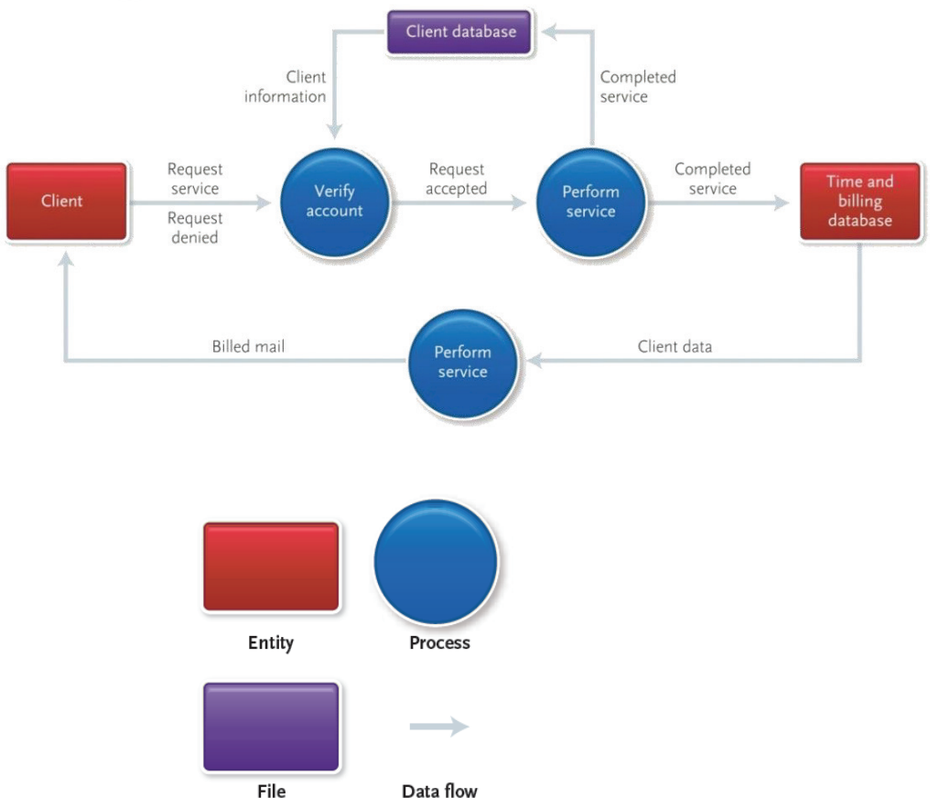



- **System flowcharts** show the flow of input data to processing and finally to output or distribution of information.

- System flowchart is to the left
- System flowchart symbols are to the right



# Data Analysis Tools – Data Flow Diagram




- **Data Flow Diagram**: Show the data or information flow within an information system.

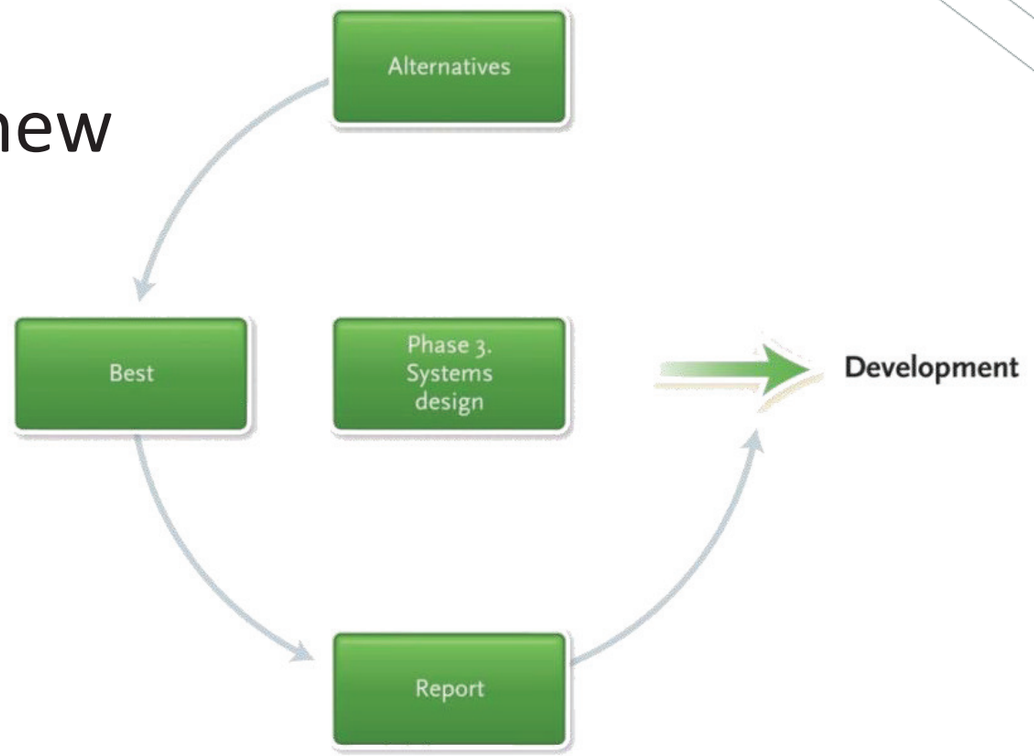
- Data is traced from its origin through processing, storage, and output
- Top diagram shows data flow
- Bottom diagram shows data flow symbols

# Phase 3: Systems Design

Phase 3 – System Design- The third phase is to design a new model or make adjustments to the current model to fit new needs or changes in technology

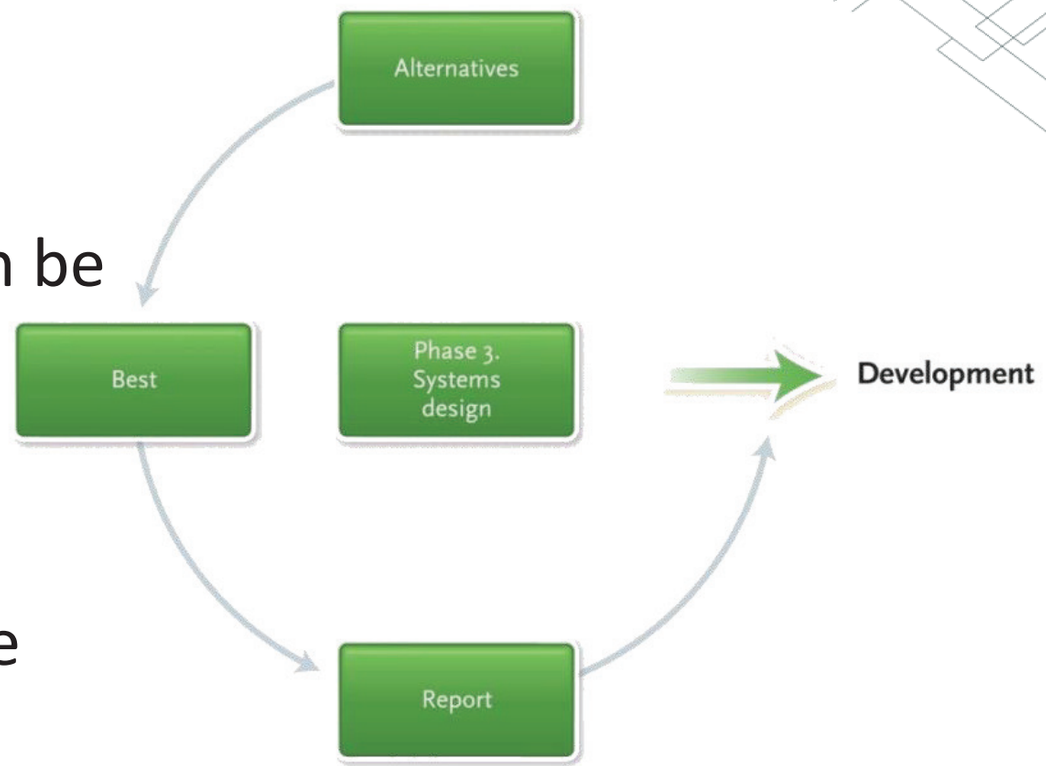
There are three tasks to be completed in this phase:

- Define the alternatives
- Select the best system
- Write a systems design report



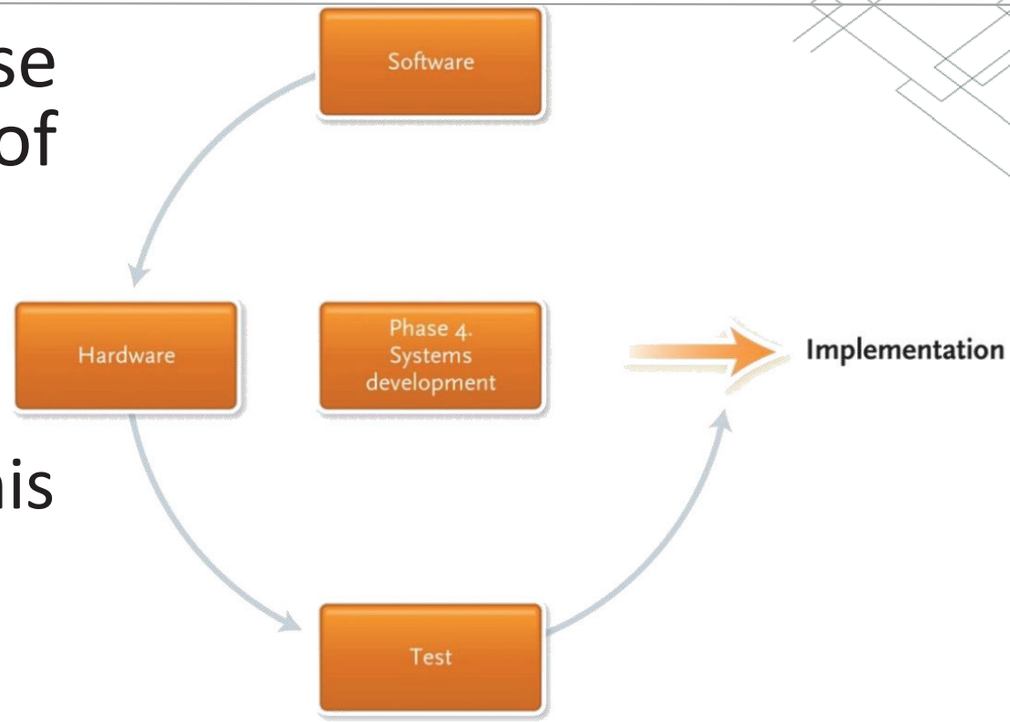
# Phase 3: Systems Design

- Evaluate systems in this phase according to:
  - **Economic feasibility-** asks is a new system be economical?
  - **Technical feasibility-** asks is it technically possible?
  - **Operational feasibility-** asks how it will be received by all users



# Phase 4: Systems Development

**Systems Development** – The fourth phase is Development – This is the acquisition of new software and/or hardware and the testing of that new acquisition



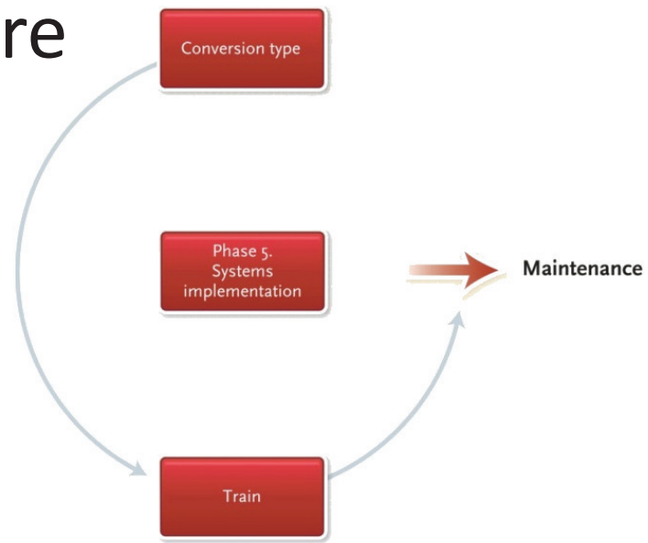

There are three steps to be completed in this phase:

1. Acquire the software
2. Acquire the hardware
3. Test the new system

# Phase 5: Systems Implementation

- **Systems Implementation** – can be called as **conversion**.

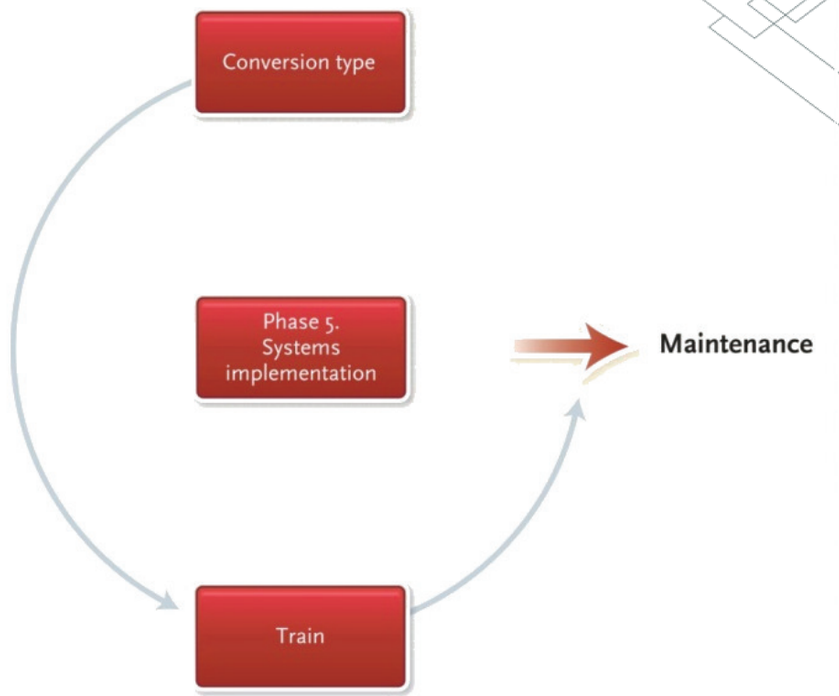
  - In this Phase (Systems Implementation/ conversion ), The information system is installed and people are trained.



# Phase 5: Systems Implementation

There are Four Types of conversions or ways of systems implementation:

1) **Direct approach** – **out with the old and in with the new**
2) **Parallel approach**– **old and new systems operate side by side until new system is reliable**
3) **Pilot approach** – **new system is tried by one section of the organization, then another, etc.**
4) **Phased approach**– **new system is introduced a little at a time**

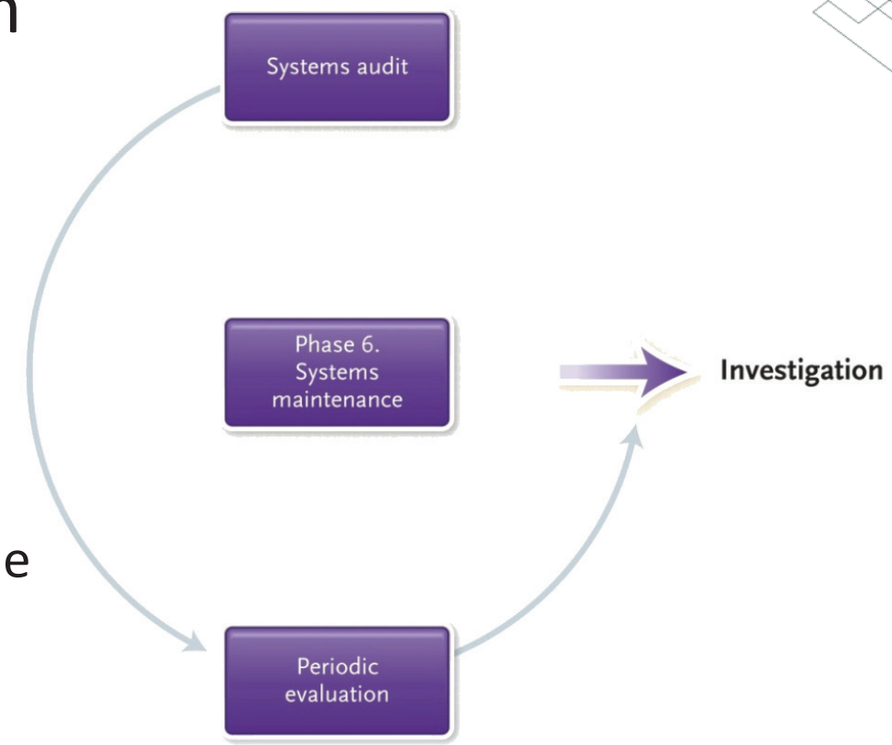


# **Phase 6**: Systems Maintenance

Systems maintenance is ongoing as the system is periodically evaluated and updated if necessary.

**Systems Maintenance phase** has been considered the "**last**" step in implementing systems analysis.

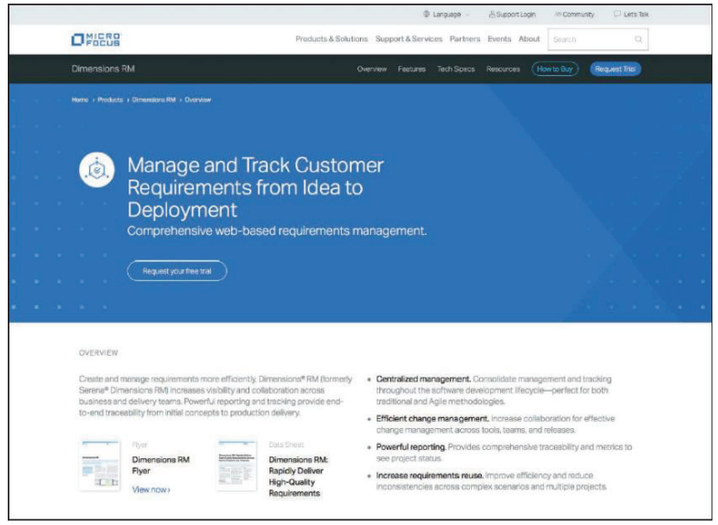
- Two Parts
  - **Systems audit** - system's performance is compared to the original design specs to determine productivity
  - **Periodic evaluation** – all system's should be evaluated time to time



# Prototyping and Rapid Applications Development

## Alternatives to the systems life cycle

- Prototyping - building a model of the new system for trial
- Rapid applications development (RAD) – costly but development is short and quality is better



# Careers in IT

- A systems analyst plans and designs new systems, following the systems life cycle
- Requires a Bachelor's degree in Computer Science or Information Systems
- Technical experience
- Can expect to earn an annual salary of $53,000 to $77,000

# Concept Check

1) Define the Preliminary Investigation phase, then draw a figure that describes this phase.
2) Define the Systems Analysis phase, then draw a figure that describes this phase.
3) Define the Systems Design phase, then draw a figure that describes this phase.
4) Define the Systems Development phase, then draw a figure that describes this phase.
5) Define the Systems Implementation phase, then draw a figure that describes this phase.
6) Define the Systems Maintenance phase, then draw a figure that describes this phase.
7) Define the Grid Chart.
8) Define the System flowcharts.
9) Define the Data Flow Diagram.
10) List the Four Types of conversions or ways of systems implementation.
11) Define Direct approach , Parallel approach, Pilot approach , and Phased approach.