System Analysis and Design

Lecture 1

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Course ILOs

- Analyze the business needs for information and to develop an appropriate strategy to provide the required information service.
- Use various information gathering techniques for eliciting user information requirements and system expectations.
- Construct and interpret a variety of system analysis and design models including UML diagrams and structured models.
- Produce the required systems documentation including project plan at each point in the analysis and design of an information system.
- Design an effective graphical user interface and apply the general guidelines for assessing the system usability.
- Differentiate and evaluate testing, installation, configuration and maintenance strategies.

Course Content

- Introduction to SDLC and Business Analysis Basic Concepts
- Planning Phase
- Analysis Phase
  - Requirement Elicitation Techniques
  - Requirement Structuring
  - Requirement life cycle and traceability
  - Process Modeling
- Development Frameworks
- Design Phase
  - Program Design
  - Interface Design
  - Test Case Design

Grades Distribution for Mainstream

- Total Grade:
  - Final Exam: 60
  - Year Work: 40

- Year Work:
  - Mid-Term: 15
  - Year work (practical): 20
  - Quiz: 5

Grades Distribution for CHP

- Total Grade:
  - Final Exam: 50
  - Year Work: 50

- Year Work:
  - Mid-Term: 15
  - Year work: 10
  - Practical: 20
  - Quiz: 5

Systems Development Life Cycle (SDLC)

- Traditional **methodology** for **developing**, **maintaining**, and **replacing** information systems
- Orderly **set of activities conducted** and **planned** for each development project.
- Each phase has specific **outcomes** and **deliverables** that **feed** important information to other phases
- Phases in SDLC:

1. **Planning** 2. **Analysis** 3. **Design**	4. **Implementation** 5. **Testing** 6. **Maintenance**

- Outp
  - Software
  - Documentation about the system and how it was developed
  - Training for users

SDLC Planning Phase

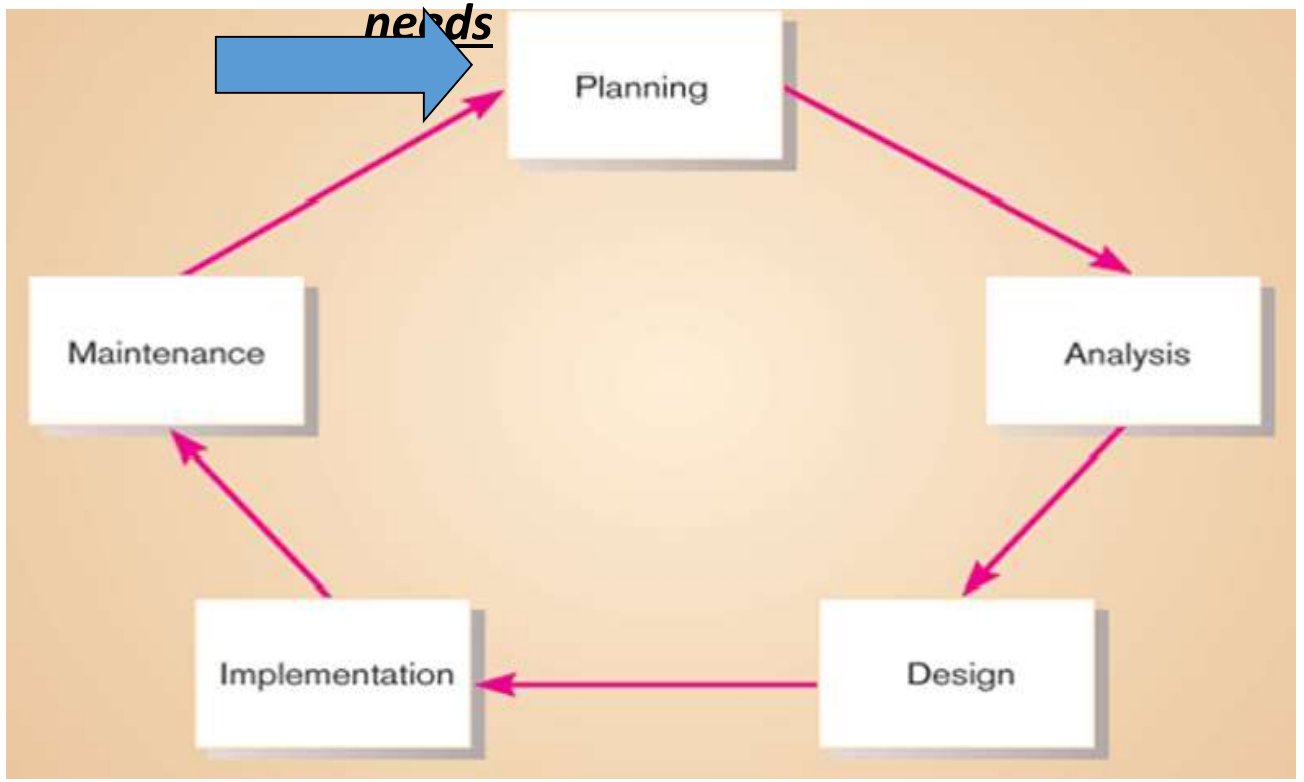
- **Why** Information system should be **built**. **(need)**
- **How** the project team will go building it. **(plan)**

1- **Project Initiation:**
- Business **needs** and how the system create a **business value**.
- Feasibility Analysis.
  - The technical feasibility (Can we build it?)
  - The economic feasibility (Will it provide business value?)
  - The organizational feasibility (If we build it, will it be used?)

2- Once Approved, **Project Management.**

Project manager creates a **project work plan**, **staffs** the **project**, **decide on techniques**.

Identify, analyze, prioritize, and arrange IS *needs*



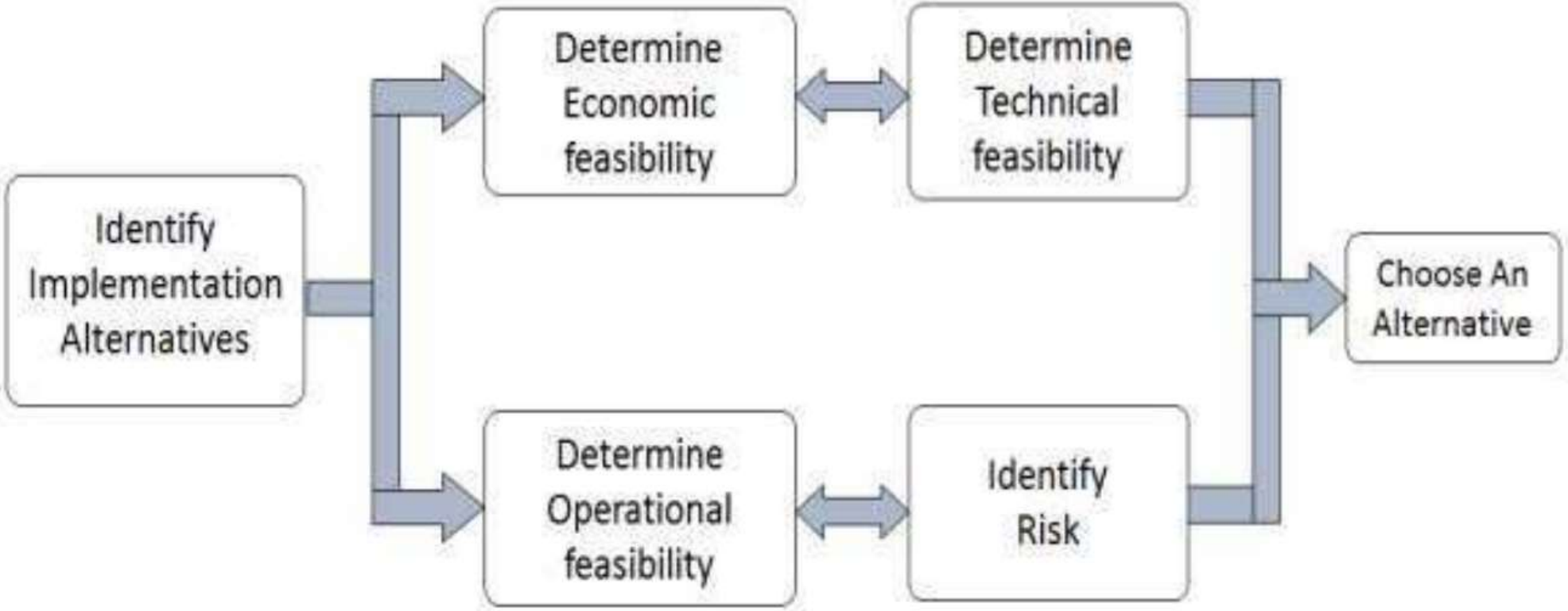
Feasibility Study

- Feasibility Study can be considered as **preliminary investigation** that helps the management to take decision about whether study of system should be feasible for development or not.
- It identifies the possibility of improving an existing system, developing a new system, and produce refined estimates for further development of system.
- The **main objective** of a feasibility study is to **acquire problem outline and scope** (not solving the problem).
- The output of a feasibility study is a **formal system proposal** act as decision document which includes the complete nature and scope of the proposed system.

Steps Involved in Feasibility Analysis

1. Form a project team and appoint a project leader.
2. Develop system flowcharts.
3. Identify the deficiencies of current system and set goals.
4. Enumerate the alternative solution or potential candidate system to meet goals.
5. Determine the feasibility of each alternative such as technical feasibility, operational feasibility, etc.
6. Weight the performance and cost effectiveness of each candidate system.
7. Rank the other alternatives and select the best candidate system.
8. Prepare a system proposal of final project directive to management for approval.

Feasibility Study



Feasibility Study

- **Economic Feasibility Analysis (EFS)** estimates the economic requirements of candidate system before investments funds are committed to proposal. It is evaluating the effectiveness of candidate system by using cost/benefit analysis method.

- **Technical Feasibility** analyses and determines whether the solution can be supported by existing technology or not. The analyst determines whether current technical resources be upgraded or added it that fulfil the new requirements.

Feasibility Study

- **Operational Feasibility** analyses whether the users will be affected, and they accept the modified or new business methods that affect the possible system benefits.

- **Schedule Feasibility** ensures that the project should be completed within given time constraint or schedule. It also verifies and validates whether the deadlines of project are reasonable or not.

SDLC Analysis Phase

- **Who** will use the system.
- **What** the system will do.
- **Where** and **when** it will be used.

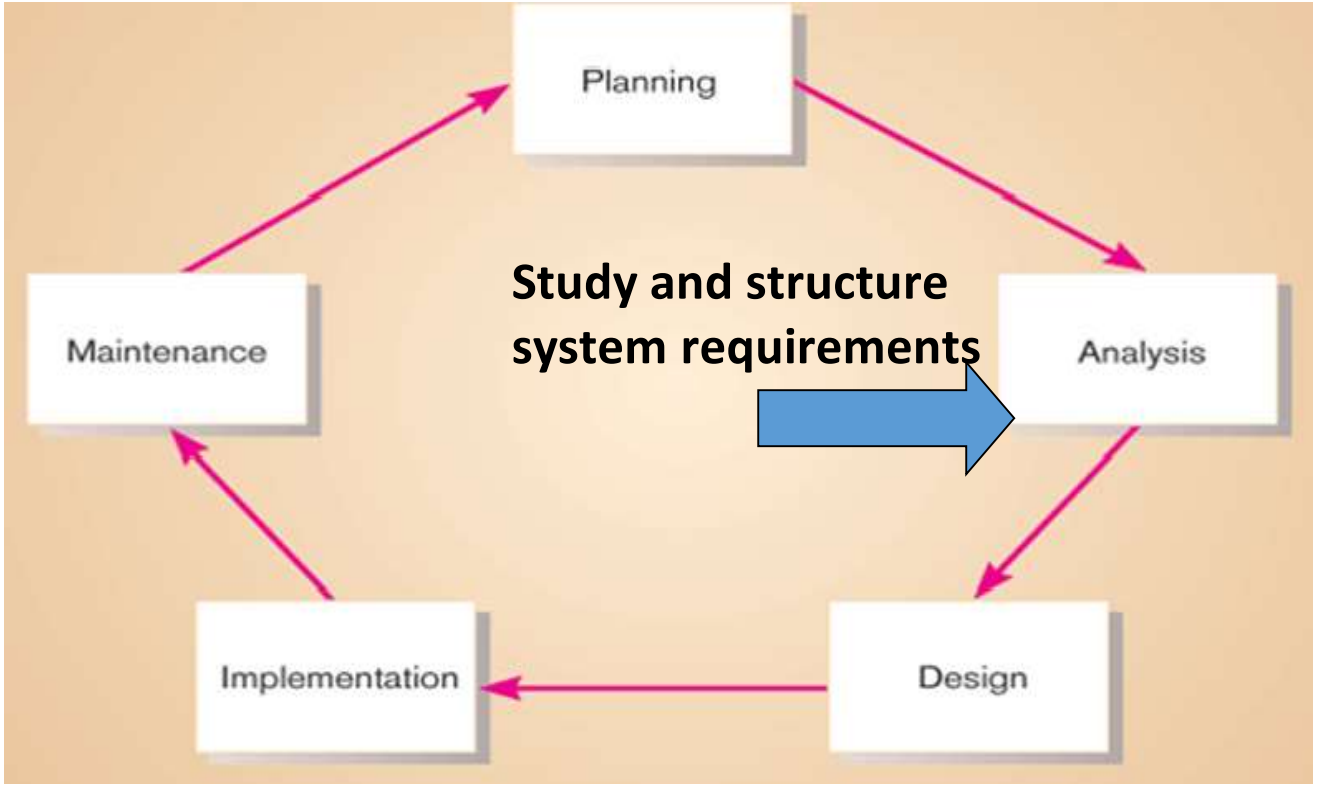
Two Sub phases:

1- **Requirements Determination:**

Careful study of organization **current procedures** and the **information systems used** to perform organizational tasks.

2- Requirements Structuring

Relationships between requirements and eliminating redundancy



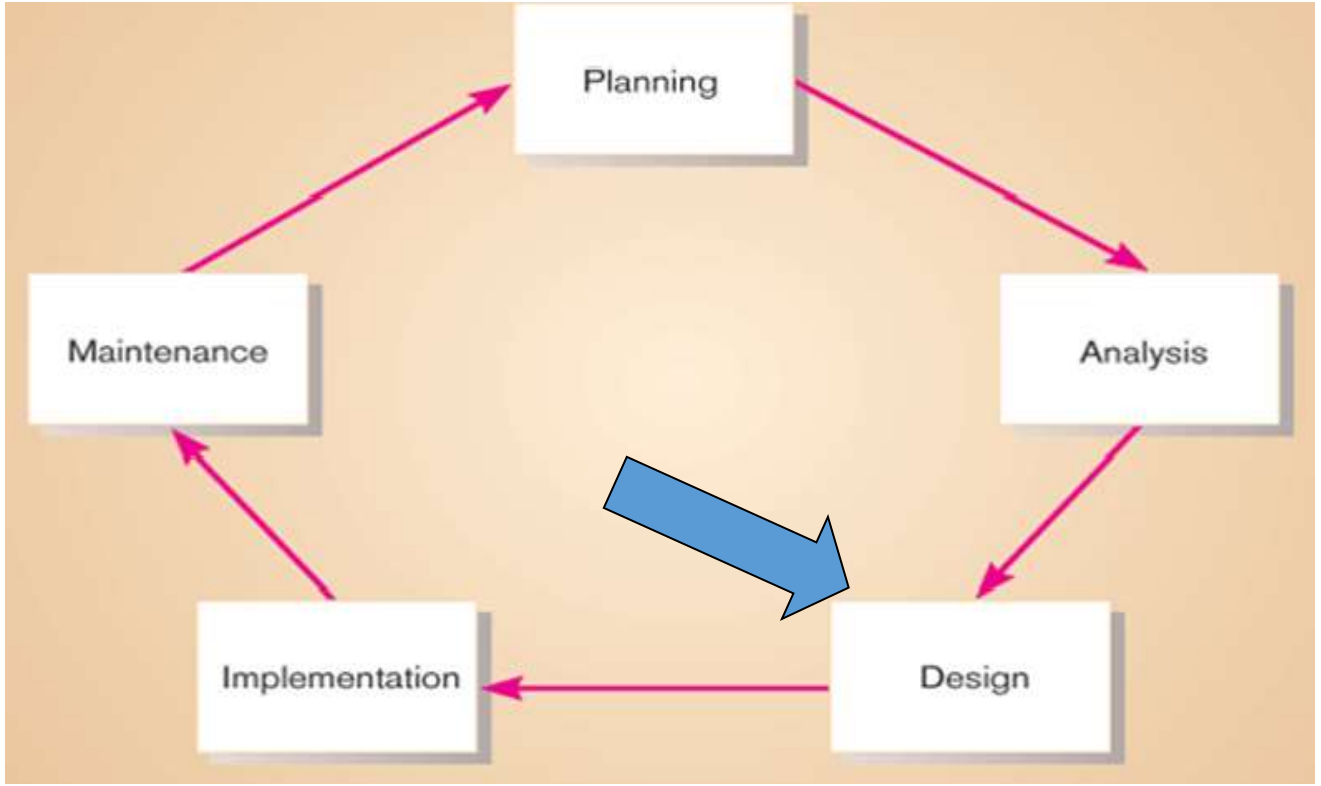
SDLC Design Phase

- **Convert** recommended solution to system specifications.

- ***How*** the system will ***operate*** in terms of the ***hardware***, ***software***, and ***network infrastructure***, the ***user interface***, ***forms***, and ***reports***, specific ***programs***, ***databases***, and ***files***.

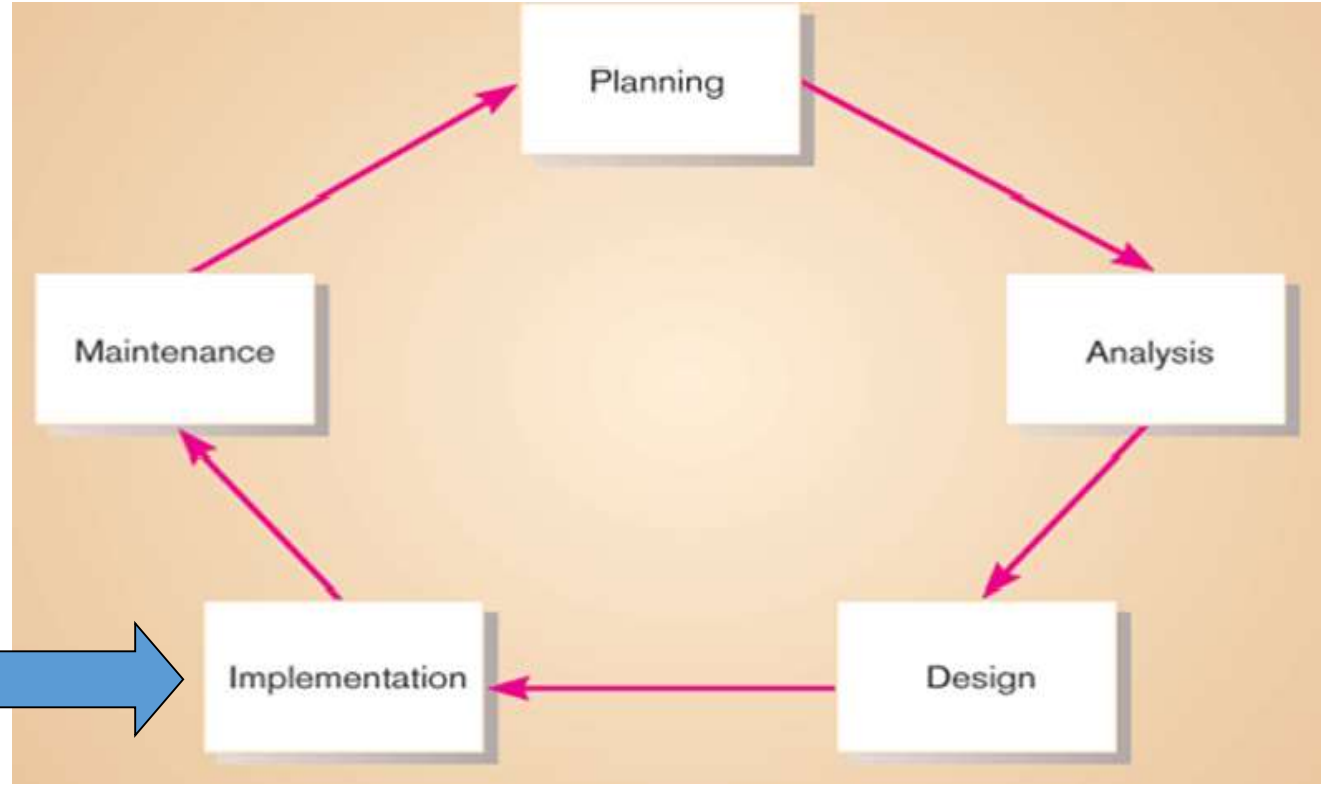
Logical design: functional ***features*** described ***independently*** of computer platform.

Physical design: logical specifications transformed to ***technology-specific details.***



SDLC Implementation Phase

Code, **validate**, **install**, and **support** the information system



SDLC Maintenance Phase

Systematically repair and **improve** the information system.

- Maintenance is not a separate phase but a repetition of the other life cycle phases

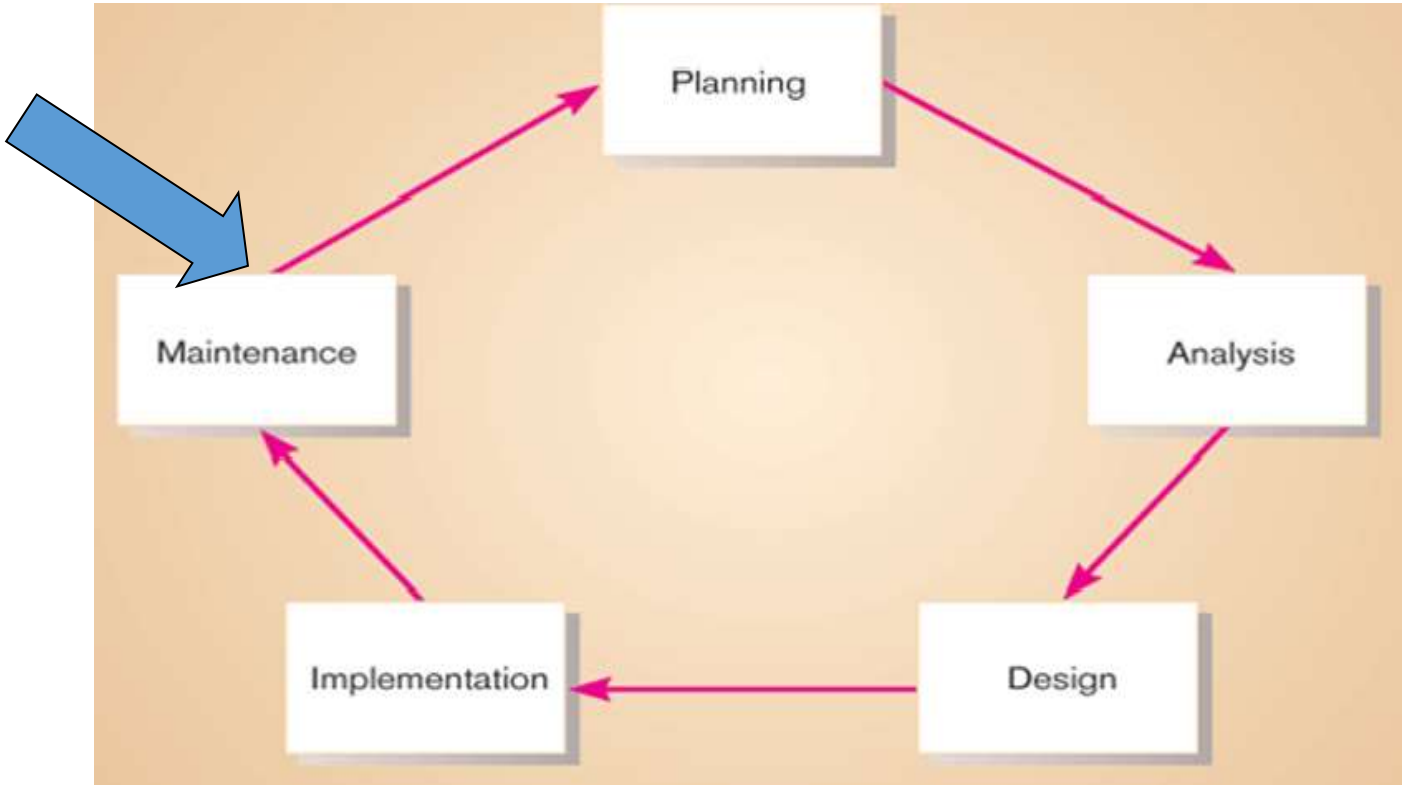


Table 1-2 Products of SDLC Phases

Phase	*Products, Outputs, or Deliverables*
Planning	Priorities for systems and projects; an architecture for data, networks, and selection hardware, and IS management are the result of associated systems;
	Detailed steps, or work plan, for project;
	Specification of system scope and planning and high-level system requirements or features;
	Assignment of team members and other resources;
	System justification or business case
Analysis	Description of current system and where problems or opportunities are with a general recommendation on how to fix, enhance, or replace current system;
	Explanation of alternative systems and justification for chosen alternative
Design	Functional, detailed specifications of all system elements (data, processes, inputs, and outputs);
	Technical, detailed specifications of all system elements (programs, files, network, system software, etc.);
	Acquisition plan for new technology
Implementation	Code, documentation, training procedures, and support capabilities
Maintenance	New versions or releases of software with associated updates to documentation, training, and support

Basic Concepts of Business Analysis

What is Business Analysis?

- ***Business analysis*** is the practice of **enabling change** in an enterprise by **defining needs** and **recommending solutions** that **deliver value** to **stakeholders**.

- Business analysis **enables** an enterprise to **articulate needs** and the **rationale** for **change**, and to **design** and **describe** solutions that can deliver **value**.

Who is a Business Analyst?

- A ***business analyst*** is any person who **performs** business analysis tasks no matter their job title or organizational role.

- Business analysts are **responsible** for **discovering**, **synthesizing**, and **analyzing information** from a variety of sources within an enterprise, including **tools**, **processes**, **documentation**, and **stakeholders**.

- The business analyst is responsible for **eliciting the actual needs** of **stakeholders**—which frequently involves investigating and clarifying their expressed desires—in order to determine **underlying issues** and **causes**.

Who is a Business Analyst? (cont.)

- Business analysts play a role in **aligning** the **designed** and **delivered solutions** with the **needs** of **stakeholders**. The activities that business analysts perform include:
  - **understanding** enterprise **problems** and **goals**
  - **analyzing needs** and **solutions**
  - devising **strategies**
  - **driving change** and
  - **facilitating** stakeholder collaboration

System Analyst?

- The **systems analyst** works **closely** with all **project team members** so that the team develops the right system in an effective way.

- Systems analysts must **understand how to apply technology** to solve business problems.

- Systems analysts may serve as ***change agents*** who:
- **identify** the **organizational improvements** needed
- **design systems** to implement those changes, and
- **train** and **motivate** others to use the systems.

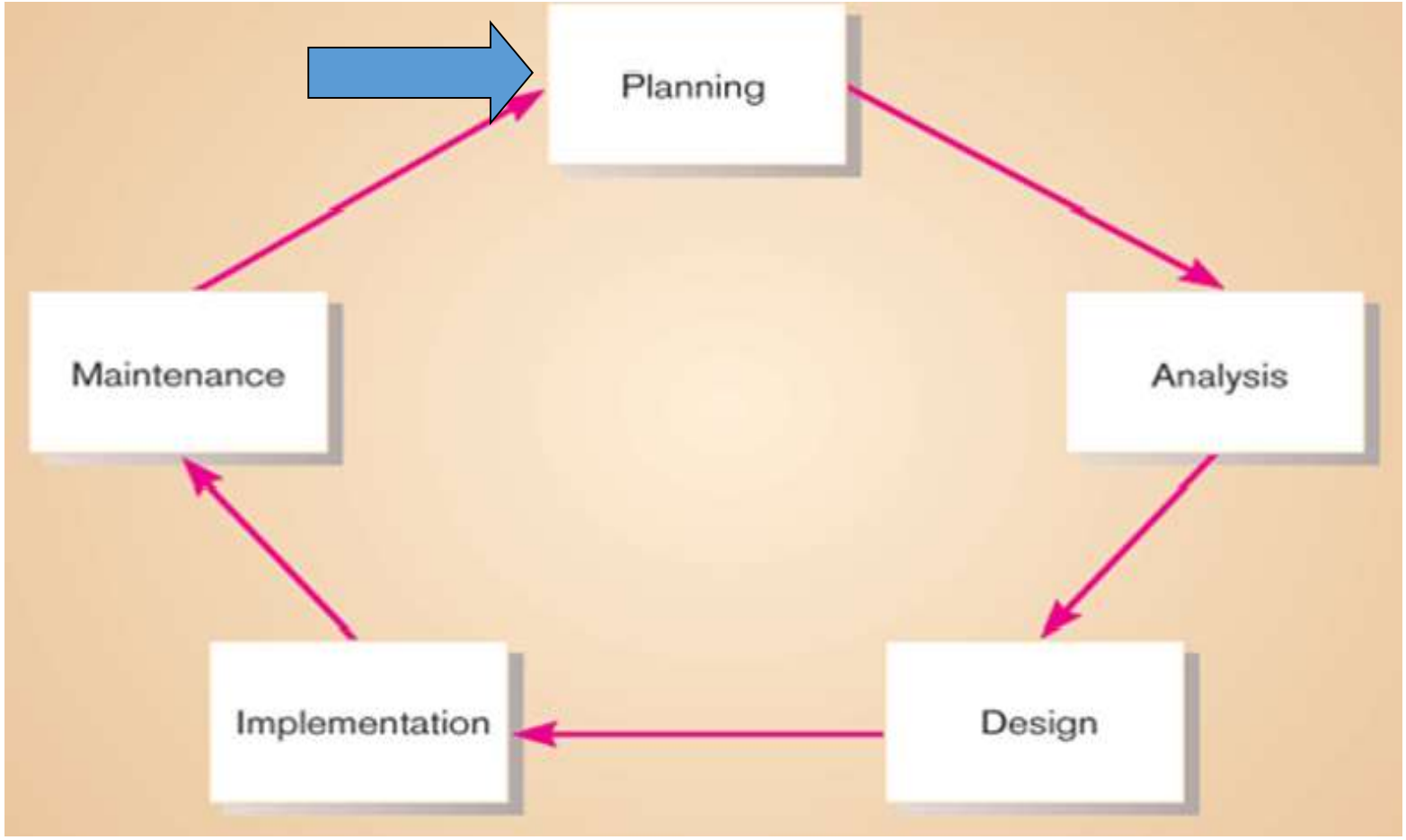
- System Analyst **skills** can be broken down into six major categories: technical, business, analytical, interpersonal, management, and ethical.

Business Analyst vs. System Analyst

Business Analyst	System Analyst
more business **focused** on **the business process side.**	more technically **focused** on the **technical side**.
Where a business analyst might work on something that **doesn't actually involve a software** change because they just might fix the business process.	systems analysts only **come** in when there is a **software change**.
	they're focused more in on the **software aspect** of the **solution**. They might be doing more data modeling, more data design, how does data move between systems, how are the systems connected, working and integrated together to meet a feature.

System Analyst & SDLC

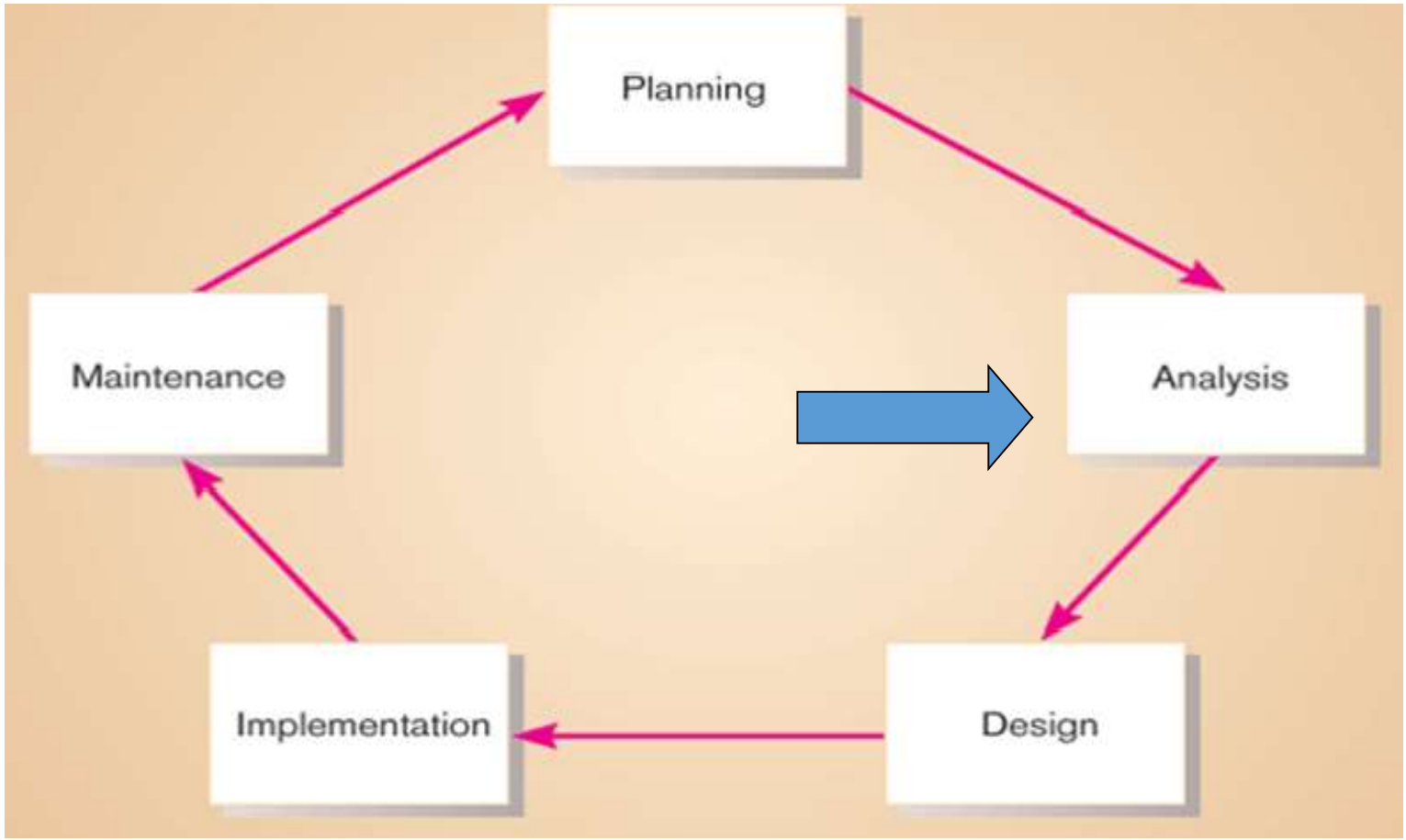
Revises the **plan** for the proposed project that the team will follow through the SDLC.



System Analyst & SDLC

- Do **requirement Gathering and structuring**.

-The analyst **thoroughly studies** the **organization's current procedures** and the **information systems** used to perform the organizational tasks.

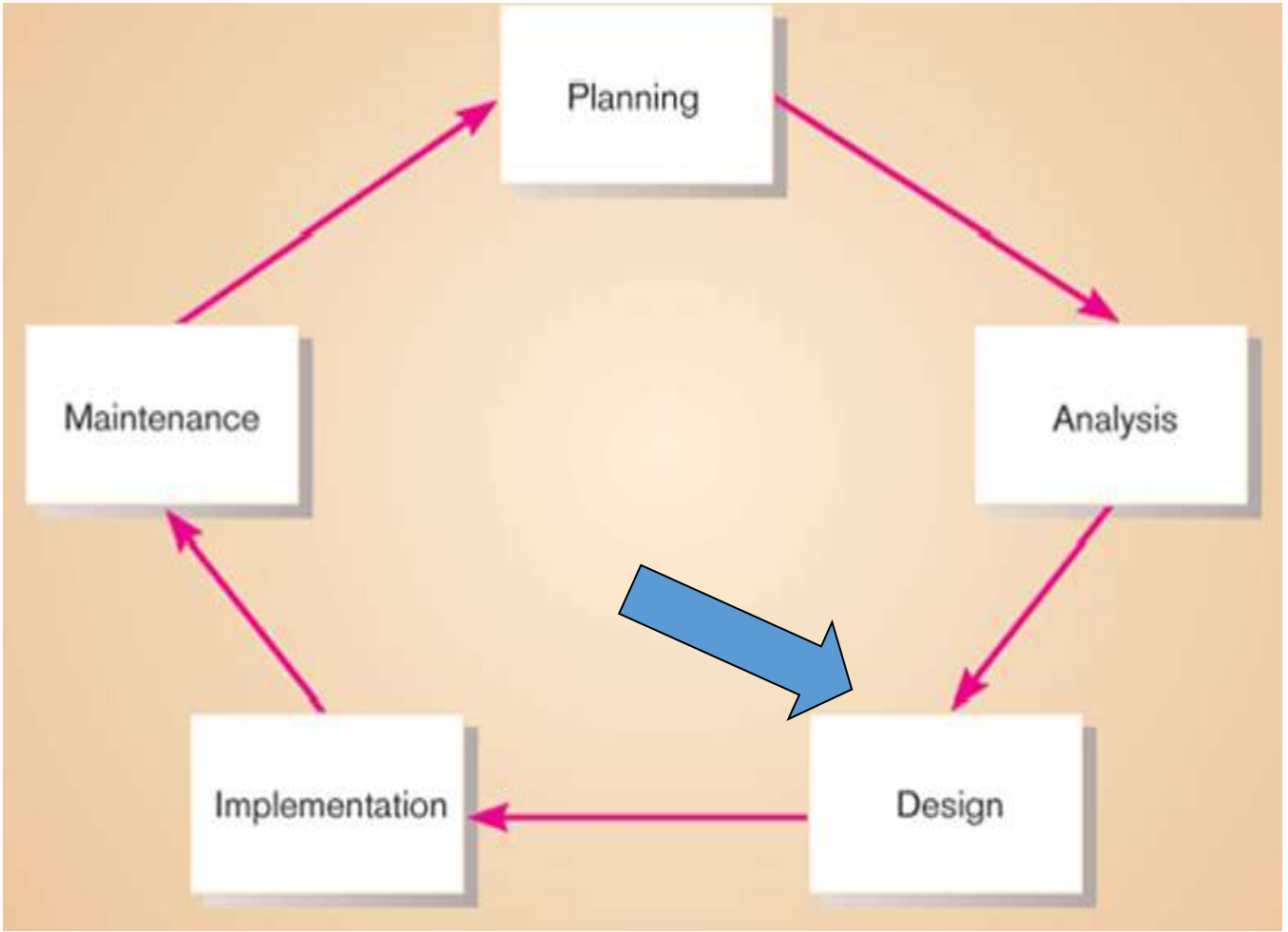


System Analyst & SDLC

- **Convert** the **description** of the recommended alternative solution into **logical** and then **physical** system specifications.

- **Design** all **aspects of the system**, from **input** and **output screens** to **reports**, **databases**, and **computer processes**.

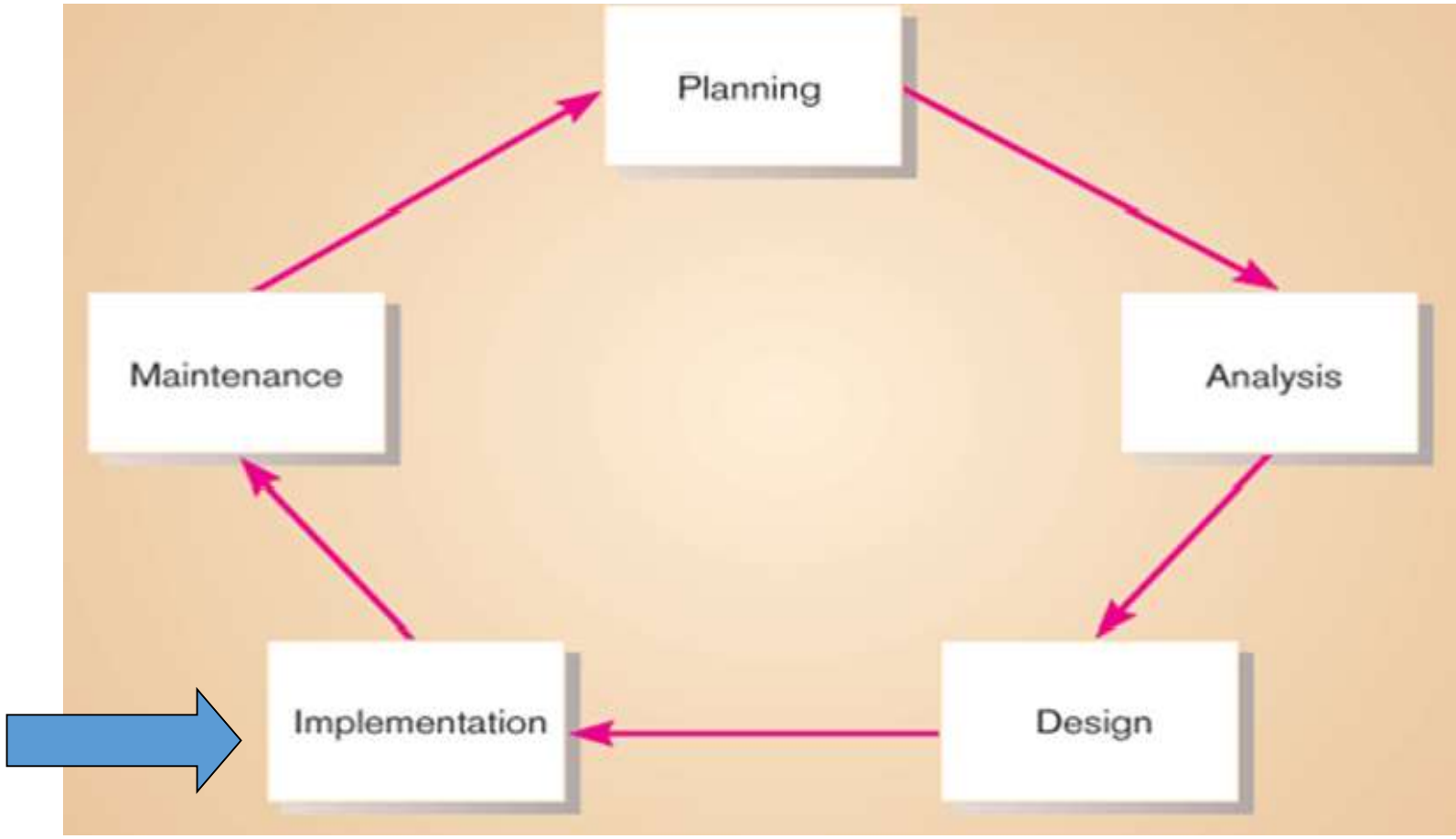
- Provide the **physical specifics** of the system they have designed, either as a **model** or as **detailed documentation**.



System Analyst & SDLC

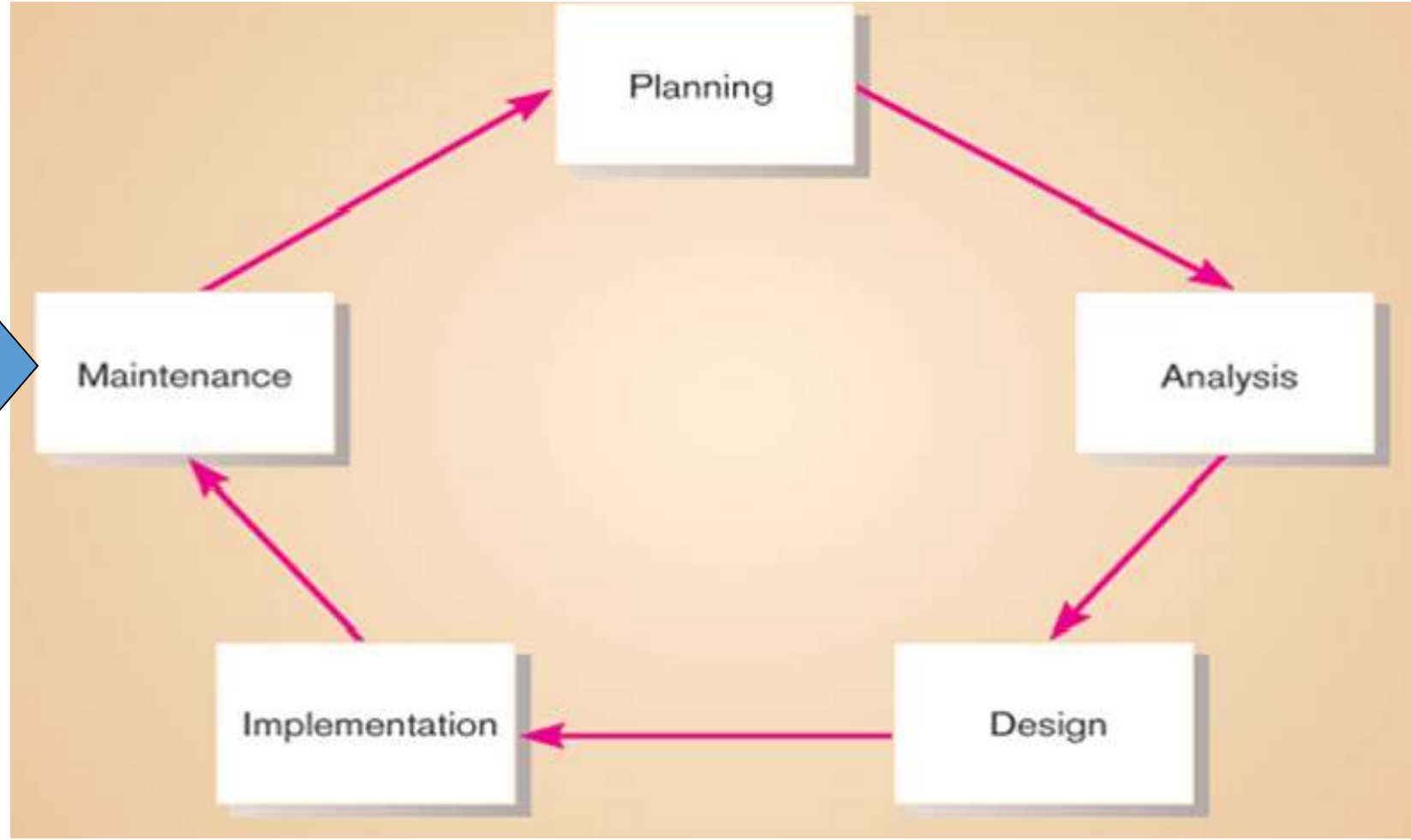
- **Help in turning system specifications** into a **working system** that is tested and then put into use.

- During **testing**, **analysts help in testing** individual **programs** and the **entire system** in order to **find** and **correct** errors.

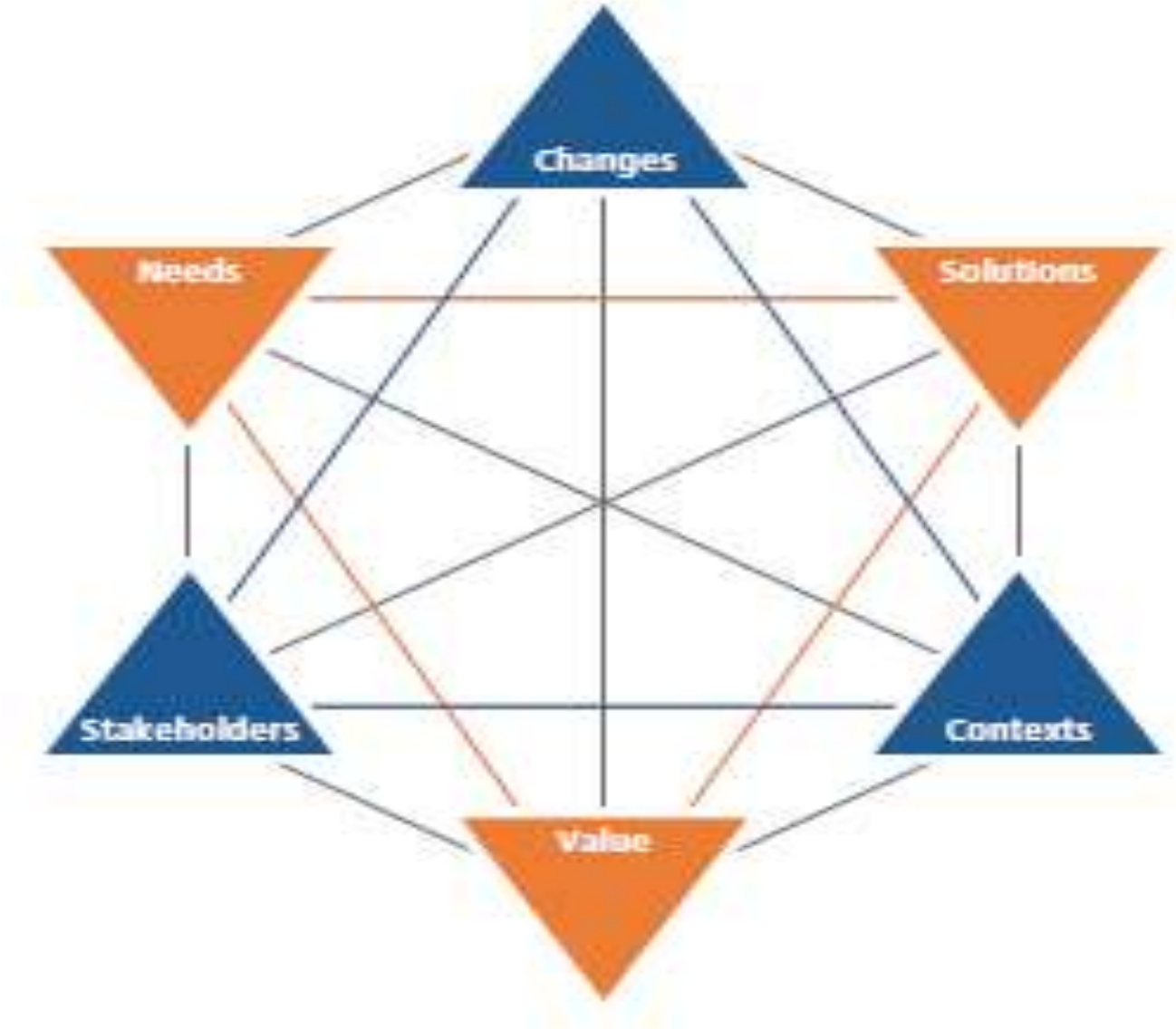


System Analyst & SDLC

- **Systematically repair** and **improve** the information system



The Business Analysis Core Concept Model



The Business Analysis Core Concept Model

Core Concept	Description
Need	- A ***problem*** or ***opportunity*** to be addressed. - ***Needs*** can ***cause changes*** by ***motivating stakeholders*** to ***act***. - ***Changes*** can also cause ***needs*** by enhancing the value delivered by existing solutions.
Change	- The act of ***transformation*** in response to a ***need***. - Change works to ***improve*** the ***performance*** of an enterprise.

The Business Analysis Core Concept Model

Core Concept	Description
Solution	- A specific ***way*** of ***satisfying*** one or more ***needs*** in a context. - A solution **satisfies a need** by **resolving a problem** faced by ***stakeholders*** or enabling stakeholders to ***take advantage*** of an opportunity.
Stakeholder	- A ***group*** or ***individual*** with a relationship to the change, the need, or the solution. - Stakeholders are often defined in terms of ***interest in***, ***impact on***, and ***influence over*** the change. - Stakeholders are grouped based on their ***relationship to the needs***, ***changes***, and ***solutions***.

Stakeholder

- A stakeholder is an **individual** or **group** that a business analyst is likely to **interact** with **directly** or **indirectly**.

The generic list of stakeholders includes the following roles:

- customer
- end user
- project manager
- regulator
- supplier
- domain subject matter expert
- implementation subject matter expert
- operational support
- sponsor
- tester

The Business Analysis Core Concept Model

Value	The ***worth***, ***importance***, or ***usefulness*** of something to a stakeholder within a context. Value can be seen as ***potential*** or ***realized returns***, ***gains***, and ***improvements***. It is also possible to have a ***decrease*** in ***value*** in the form of ***losses***, ***risks***, and ***costs***. Value can be ***tangible*** or ***intangible***. A - *Tangible* value is directly ***measurable***. Tangible value often has a significant monetary component. B- *Intangible* value is ***measured indirectly***. Intangible value often has a significant ***motivational component***, such as a ***company's reputation*** or ***employee morale***.

The Business Analysis Core Concept Model

Core Concept	Description
Context	- The ***circumstances that influence***, are ***influenced by***, and provide understanding of the change. - Changes occur within a context. The context is everything relevant to the change that is within the environment. - Context may include attitudes, behaviors, beliefs, **competitors**, culture, **demographics**, goals, **governments**, infrastructure, languages, losses, processes, products, projects, sales, seasons, terminology, technology, **weather**, and any other element meeting the definition.

Computer-Aided Software Engineering (CASE)

CASE Tools

Computer-Aided Software Engineering (CASE)

- CASE tools are used to support a wide variety of SDLC activities.

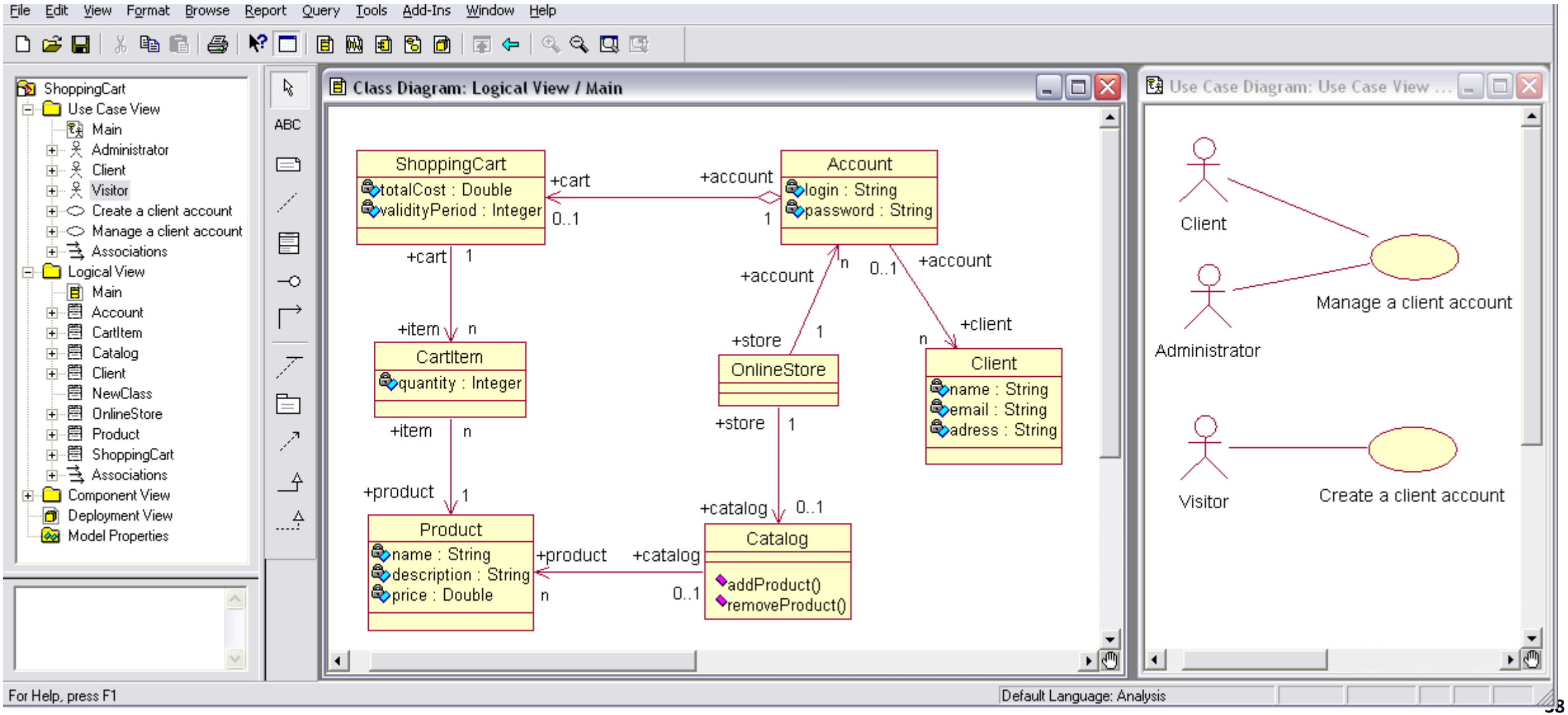
- CASE tools can be used to help in multiple phases of the SDLC: project identification and selection, project initiation and planning, analysis, design, implementation and maintenance.

- An integrated and standard database called a *repository* is the common method for providing product and tool integration.
- **Example products:** Oracle Designer, Rational Rose, Eclipse

CASE Tools (cont.)

- ***Diagramming tools*** enable **system process**, **data**, and **control structures** to be represented **graphically**.
- ***Computer display*** and ***report generators*** help prototype **how systems "look and feel."**
- ***Analysis tools*** **automatically** check for **incomplete**, **inconsistent**, or **incorrect** specifications in **diagrams**, **forms**, and **reports**.
- A ***central repository*** enables the integrated storage of specifications, diagrams, reports, and project management information.
- ***Documentation generators*** produce **technical** and **user documentation** in standard formats.
- ***Code generators*** enable the automatic generation of program and database definition code directly from the design documents, diagrams, forms, and reports.

CASE Tools (cont.)



Sources of Application Software

Sources of Application Software

IT Services Firms

Cloud Computing

Google Apps
Salesforce.com (CRM)

Microsoft
Oracle

Packaged Software Providers

Open Source

Linux OS
MySQL database system
Firefox web browser
SourceForge.net

Accounting, HR, Manufacturing, Supply Chain (Shared Database)

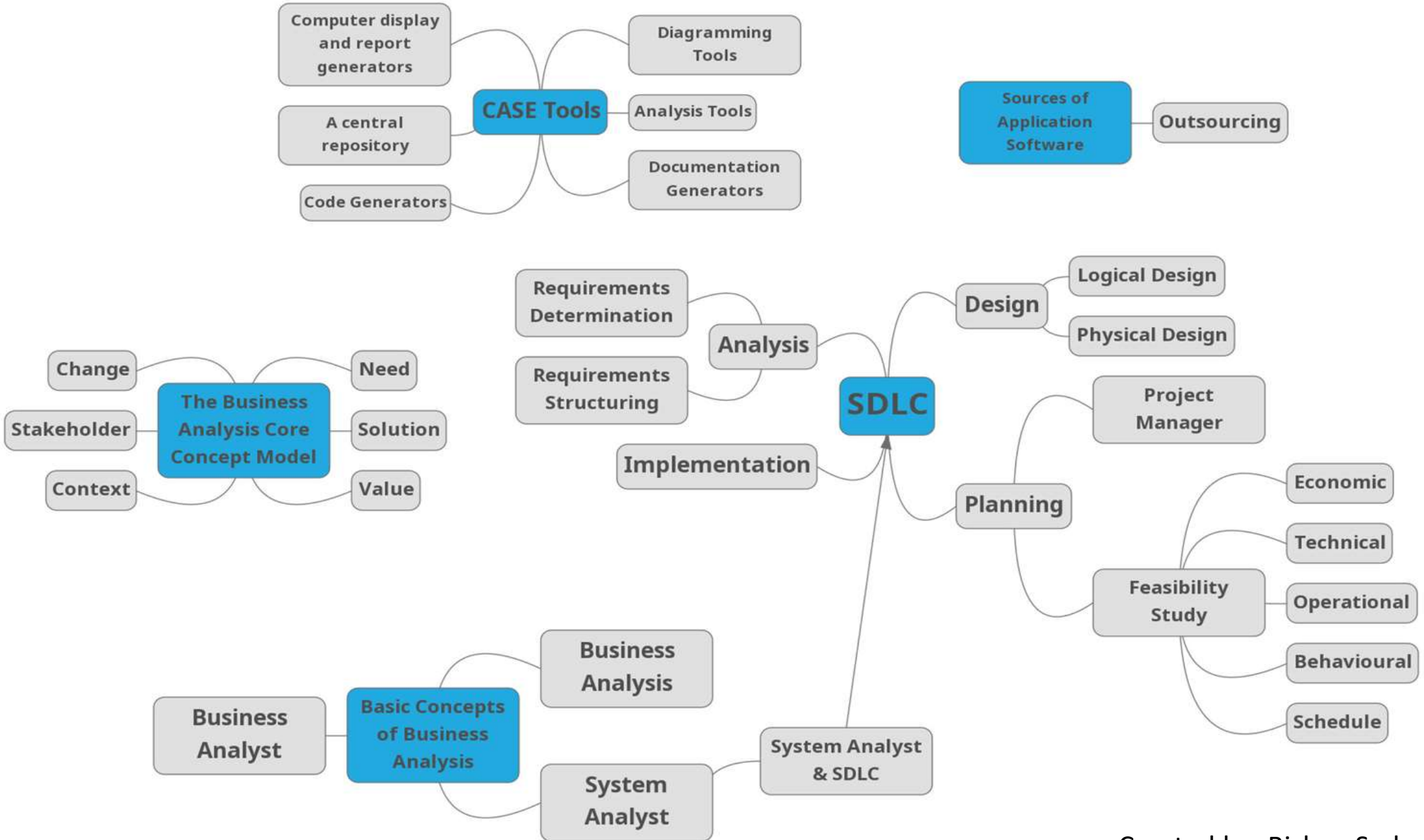
ERP Providers

In-House

Outsourcing

- ***Turning over responsibility*** of some or all of an ***organization's information systems*** applications and operations to an ***outside firm***.

- Reasons to outsource
  - Cost-effective
  - Free up internal resources
  - Reduce time to market
  - Increase process efficiencies
  - System development is a non-core activity for the organization


Computer display and report generators
Diagramming Tools
CASE Tools
Analysis Tools
A central repository
Documentation Generators
Code Generators
Sources of Application Software
Outsourcing
Requirements Determination
Logical Design
Design
Physical Design
Analysis
Change
Need
Requirements Structuring
SDLC
Project Manager
The Business Analysis Core Concept Model
Stakeholder
Solution
Implementation
Context
Value
Planning
Economic
Technical
Feasibility Study
Operational
Behavioural
Schedule
Business Analysis
Business Analyst
Basic Concepts of Business Analysis
System Analyst & SDLC
System Analyst

Sources

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- BABOK, A Guide to the Business Analysis Body Of Knowledge, International Institute of Business Analysis IIBA.


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👇

- Info Sessions.
- On-Spot First Interviews.

مين يقدر يحضر الجزء ده من الحدث؟ 🤔
بالنسبة إلي ايام التوظيف المفتوحة (الأربعاء والخميس)، عشان تقدر تشارك فيها لازم تنورنا في ايام المعرض التوظيفي (الثلاث ايام الأولي علي حسب كليتك) وتحجز دورك مع الشركات الموجودة المهتمة بالكلية الخاصة بيك ، وده من خلال المنظمين الموجودين في جناح مركز التوظيف الموجود عند منطقة المسرح.

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