

## CHI

### What is the system analyses, explain it and what are the skills required?

- **The systems analyst** assists and guides the project team so the team develops the right system in an effective way.
- Systems analysts must understand how to apply technology in order to solve problems.  
Systems analysts may also serve as **change agents** who identify the organization improvements needed, design systems to implement those changes, and train/motivate others to use the systems.

#### **Systems Analyst Skills**

- Introduces change to the organization and people
- Leads a successful organization change effort
- Understands what to change and knows how to change it
- Must have technical skills, as well as, business skills
- Communicate effectively and give presentations
- Must be able to deal fairly, honestly, and ethically with other project members, managers, and systems users

### What are the various kinds of Specialization in software Project team?

#### **Systems Analyst**

- The systems analyst focuses on the IS issues surrounding the system.
- Develops ideas and suggestions for ways IT can improve business process, helps design new business processes, helps design new business process, designs the new information system, and ensures that all IS standards are maintained.

#### **Business Analyst**

- Focuses on the business issues surrounding the system
- Identifies the business value that the system will create
- Develops ideas for improving the business processes
- Helps design new business processes and policies

#### **Infrastructure Analyst**

- Focuses on technical issues surrounding the ways the system will interact with the organization's technical infrastructure
- Ensures that the new information system conforms to organization standards
- Identifies infrastructure changes

#### **Change Management Analyst**

- A change management analyst focuses on the people and management issues surrounding the system installation.
- Ensures that adequate documentation and support are available to users.
- Provides user training.
- Develops strategies to overcome resistance to change.

#### **Project Manager**

- o Highly experienced systems analyst.
- o Ensures that the project is completed on time and within budget.

- Makes sure the system delivers the expected values to the organization.

## What is system development cycle?

The **SDLC** is composed of four fundamental

### phases: Planning

This phase is the fundamental process of understanding why an information system should be built. The Planning phase will also determine how the project team will go about building the information system.

- The Planning phase is composed of two planning steps.
- During **project initiation**, the system's business value to the organization is identified (How will it lower costs or increase revenues?).
- During **project management**, the project manager creates a work plan, staffs the project, and puts techniques in place to help the project team control and direct the project through the entire SDLC.

### Analysis

- The analysis phase answers the questions of who will use the system, what the system will do, and where and when it will be used.
- During this phase the project team investigates any current system(s), identifies improvement opportunities, and develops a concept for the new system.
- This phase has three analysis steps.
- **Analysis strategy**: This is developed to guide the projects team's efforts. This includes an analysis of the current system.
- **Requirements gathering**: The analysis of this information leads to the development of a concept for a new system. This concept is used to build a set of analysis models.
- **System proposal**: The proposal is presented to the project sponsor and other key individuals who decide whether the project should continue to move forward.
- The system proposal is the initial deliverable that describes what business requirements the new system should meet.
- The deliverable from this phase is both an analysis and a high-level initial design for the new system.

### Design

- In this phases it is decided how the system will operate, in terms of the hardware, software, and network infrastructure; the user interface, forms, and reports that will be used; and the specific programs, databases, and files that will be needed.
- Five Design Steps
- **Design Strategy**: This clarifies whether the system will be developed by the company or outside the company.
- **Architecture Design**: This describes the hardware, software, and network infrastructure that will be used.
- **Database and File Specifications**: These documents define what and where the data will be stored.
- **Program Design**: Defines what programs need to be written and what they will do.

### Implementation

- During this phase, the system is either developed or purchased (in the case of packaged software).
- This phase is usually the longest and most expensive part of the process.
- The phase has three steps.
- **System Construction**: The system is built and tested to make sure it performs as designed.

- o **Installation:** Prepare to support the installed system.
- o **Support Plan:** Includes a post-implementation review.

## What are the various kinds of Feasibility?

1. A Feasibility Analysis is used to provide more detail about the risks associated with the proposed system and includes:

### Technical feasibility.

Technical feasibility is the extent to which the system can be successfully designed, developed, and installed by the IT group.

Essentially, a **technical risk analysis** strives to answer the question: “Can we build it?” Risks can endanger the successful completion of a project. The following should be considered:

1. Users’ and analysts’ should be familiar with the application.
2. Familiarity with the technology
3. Project size
4. Compatibility of the new system with the technology that already exists

### Economic feasibility is also called a cost-benefit analysis.

Economic feasibility is also called a cost-benefit analysis that identifies the financial risk associated with the project.

This attempts to answer the question, “Should we build the system?”

### Organizational feasibility.

Organizational feasibility of the system is how well the system ultimately will be accepted by its users and incorporated into the ongoing operations of the organization. There are many organizational factors that can have an impact on the project, and seasoned developers know that organizational feasibility can be the most difficult feasibility dimension to assess.

## What are cost benefits analyses and what is the major step?

- Economic feasibility is also called a cost-benefit analysis that identifies the financial risk associated with the project.
- This attempts to answer the question, “Should we build the system?”

### **Six Steps for Cost-benefit Analysis**

#### **Step 1: Identify Costs and Benefits**

During this step it is important to identify the kinds of costs and benefits the system will have and list them along the left-hand column of a spreadsheet.

The costs and benefits and be broken down in to four categories:

- **Development costs**, Tangible expenses that are incurred during the creation of the system such as: Salaries, Hardware and software expenses, Consultant fees, Training, Office space and equipment
- **Operational costs**, Operational costs are those tangible costs that are required to operate the system and are considered ongoing cost. This will include: Salaries for operation staff, Software licensing fees, Equipment upgrades, Communications charges
- **Tangible benefits**, this includes revenue that the system enables the organization to collect, such as increased sales. The system may enable the organization to avoid certain costs, which may lead to another type of tangible benefit such as, cost savings.
- **Intangibles**, Intangible costs and benefits are more difficult to incorporate into the economic feasibility analysis as they are based on intuition and belief rather than on “hard

numbers.”

#### **Step 2: Assign Values to Costs and Benefits**

Once the types of costs and benefits have been identified, you will need to assign specific dollar values to them. The most effective strategy for estimating costs and benefits is to rely on people who have the best understanding of them. If predicting a specific value for a cost or benefit proves difficult, it may be useful to estimate a range of values for the cost or benefit and then assign a probability estimate to each value. Sometimes it is acceptable to list intangible benefits, such as improved customer service, without assigning a dollar value.

#### **Step 3: Determine Cash Flow**

A formal cost-benefit analysis usually contains costs and benefits over a selected number or years to show cash flow over time. With this cash flow method, the years are listed across the top of the spreadsheet to represent the period for analysis, and numeric values are entered in the appropriate cells with the spreadsheet's body for all years. Often, amounts are augmented by some rate of growth to adjust for inflation or business improvements. Finally, totals are added to determine what the overall benefits will be, and the higher the overall total, the more feasible the solution becomes in terms of its economic feasibility

#### **Step 4: Assess Project's Economic**

The four areas included in Assess Project's Economic Value are:

- Determine Return on Investment (ROI)
- Determine Break-Even Point
- Determine Net Present Value

## CH2

### Explain the models or list them? \*

- o **Project Methodology Options**
- o Waterfall Development
- o Parallel Development
- o V-model (variation of the Waterfall Development)
- o Rapid Application Development (RAD)
- o Iterative Development
- o Agile Development
- o System Prototyping
- o Throwaway Prototyping
- o Extreme Programming

#You should read the book and see Advantages and Disadvantages for each one..

## CH3

### What are the requirements and its type? \*

A statement of what the system must do

A statement of characteristics the system must have

Focus is on business user needs during analysis phase

Requirements will change over time as project moves from analysis to design to implementation

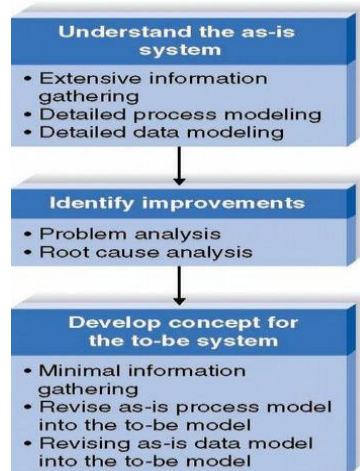
#### Requirement Types:

- **Functional Requirements**
  - A process the system has to perform
  - Information the system must contain
- **Nonfunctional Requirements**
  - Behavioral properties the system must have
    - Operational
    - Performance
    - Security
    - Cultural and political

\*What are the three models of identifying requirement?  
Or explain the components in the diagram?

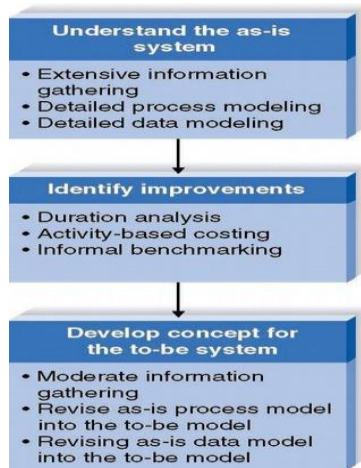
- Three techniques help users discover their needs for the new system:

### Business Process Automation (BPA)



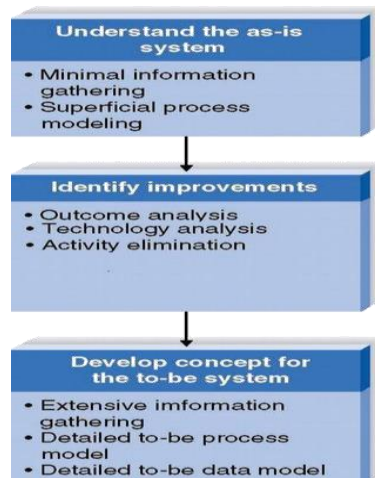
*Goal: Efficiency for users*

### Business Process Improvement (BPI)



*Goal: Efficiency and effectiveness for users*

### Business Process Reengineering (BPR)



*Goal: Radical redesign of business processes*

**\*List the various kind of requiring gathering technique Or Explain every things about them?**

## **REQUIREMENTS-GATHERING TECHNIQUES**

### **Interviews**

- Most commonly used technique
- Basic steps:
  - Selecting Interviewees
  - Designing Interview Questions
  - Preparing for the Interview
  - Conducting the Interview
  - Post-Interview Follow-up

### **Joint Application Development (JAD)**

- A structured group process focused on determining requirements
- Involves project team, users, and management working together
- May reduce scope creep by 50%
- Very useful technique

### **Questionnaires**

- A set of written questions, often sent to a large number of people
- May be paper-based or electronic
- Select participants using samples of the population
- Design the questions for clarity and ease of analysis
- Administer the questionnaire and take steps to get a good response rate
- Questionnaire follow-up report

### **Document Analysis**

- Study of existing material describing the current system
- Forms, reports, policy manuals, organization charts describe the formal system
- Look for the informal system in user additions to forms/report and unused form/report elements
- User changes to existing forms/reports or non-use of existing forms/reports suggest the system needs modification

### **Observation**

- Watch processes being performed
- Users/managers often don't accurately recall everything they do
- Checks validity of information gathered other ways
- Be aware that behaviors change when people are watched
- Be unobtrusive
- Identify peak and lull periods

## CH4

### Use case;

- A **use case** is a set of activities that produce some output result
- Describes how the system reacts to an **event** that **triggers** the system
- Trigger -- event that causes the use case to be executed
- **Event-driven modeling** – everything in the system is a response to some triggering event
- All possible responses to the event are documented
- Use cases are helpful when the situation is complicated

### List the components of use case?

- **Basic information**

- Name, number and brief description
- Trigger – event that causes the use case to being
  - External trigger – some from outside the system
  - Temporal triggers – time-based occurrences
- Viewpoint of the use cases should be consistent

- **Major inputs and outputs**

- Sources and destinations

- **Details**

- Goal is to be all inclusive
- Steps performed and the data inputs and outputs

**\*Small case study and you will give a paragraph to use case without diagram? #you can see the examples from slides and the revision**

Lecture by D. Hala

## CH5

**You can be given DFD diagram and ask to list the data stores, entity and processes? #you can see the examples from slides and the revision Lecture by D. Hala**

### Elements of a DFD

- **Process**

- An activity or function performed for a specific business reason  
Manual or computerized

- **Data flow**

- A single piece of data or a logical collection of data
- Always starts or ends at a process

- **Data Store**



- A collection of data that is stored in some way
- Data flowing out is retrieved from the data store
- Data flowing in updates or is added to the data store

- **External entity**

- A person, organization, or system that is **external** to the system but interacts with it.

## Difference between various levels of DFD ?

### Context Diagram

- First DFD in every business process
- Shows the context into which the business process fits
- Shows the overall business process as just **one** process (process 0)
- Shows all the external entities that receive information from or contribute information to the system

### Level 0 Diagram

- Shows all the major processes that comprise the overall system – the internal components of process 0
- Shows how the major processes are interrelated by data flows
- Shows external entities and the major processes with which they interact
- Adds data stores

### Level 1 Diagrams

- Generally, one level 1 diagram is created for every major process on the level 0 diagram
- Shows all the internal processes that comprise a single process on the level 0 diagram
- Shows how information moves from and to each of these processes
- If a parent process is decomposed into, for example, three child processes, these three child processes wholly and completely make up the parent process

### Level 2 Diagrams

- Shows all processes that comprise a single process on the level 1 diagram
- Shows how information moves from and to each of these processes
- Level 2 diagrams may not be needed for all level 1 processes
- Correctly numbering each process helps the user understand where the process fits into the overall system

## Difference between logical and physical process models ?

- **Logical process models** describe processes without suggesting how they are conducted
- **Physical process models** provide information that is needed to build the system

**Q.1) What is the difference between tangible value and intangible value? Give three examples of each. [6 points]**

**ANSWER**

**NOTE: This is a sample answer. Students' examples may vary.**

*Tangible value* represents the system benefits that are quantifiable and measurable. *Intangible value* represents benefits that are real, but are difficult to quantify and measure.

Examples of tangible benefits might be increased sales, reduced operating costs, and reduced interest costs.

Examples of intangible value might include increased customer satisfaction, improved decision making, improved problem recognition.

**Q.2) Compare and contrast between parallel development and iterative development methodologies in terms of their major elements, benefits and disadvantages? [6 points]**

**ANSWER**

In *Parallel development* generally design of the entire system is performed; then, the project is divided into sub-projects, each of which is designed in detail and implemented. Work on the sub-projects occurs simultaneously in an effort to reduce the time between analysis and delivery of the system. After all sub-projects are complete, the pieces are integrated into the final delivered system. The total time to deliver the system can be reduced using parallel development. The issue in this methodology is in the integration of the sub-projects, since design decisions made in one sub-project may affect other sub-projects if they are not completely independent.

*Iterative development* is characterized by multiple versions of the overall project. The initial version contains the most important and fundamental requirements. This version can be accomplished with a mini-waterfall process. Once the version is complete, feedback is solicited as to the appropriateness of the system. The project then goes into the next version of the project, incorporating feedback that was received. The benefit to this is that an abbreviated version is quickly available for review. The disadvantage to iterative development is that the early versions are abbreviated. Customers must understand that each version will have additional functionality until the final version is delivered.

**Q.3) Three types of questions can be used in an interview: Closed-ended questions, Open-ended questions, and Probing questions. When would each type of question be used? [6 points]**

**ANSWER**

Closed-ended questions are used when the interviewer is looking for specific, precise information.

Open-ended questions are used to gather a broader, rich information set. Open-ended questions can help the interviewer learn why things are the way they are, and also give the interviewee the chance to add ideas or issues that the interviewer did not anticipate.

Probing questions are used whenever the interviewer is not satisfied with his/her understanding of the interviewee's answer, and needs more explanation before moving on to another topic.

**Q.4) What is the purpose of an approval committee in the software development process? Who is usually in this committee? [6 points]**

**ANSWER**

The approval committee generally serves as the decision making body regarding investments in information systems projects. This committee generally has a broad organizational representation and therefore can avoid allocating resources that will serve only narrow organizational interests. The approval committee commonly has project oversight responsibilities as well; monitoring project performance after the project has been accepted.

The composition of the approval committee will vary from organization to organization, but generally consists of high-level managers from throughout the organization. The committee is often chaired by the CIO.

Q.5) Review the [www.seu.edu.sa](http://www.seu.edu.sa) Web site. [4+4 points]

- a) Create a list of business functional requirements that the system meets with.
- b) Create the different kinds of non-functional business requirements that the system meets with.

**ANSWER**

**NOTE: This is a sample answer. Students' examples may vary.**

**a) Examples of Functional Requirements:**

Student

This web site enables each student to:

- add a course, drop course.
- access attendance report.
- access their courses (materials, syllabus , announcements, etc.).
- access their grades.

Instructor

This web site enables instructor to:

- upload attendance, students' marks, etc.
- create, edit and delete course materials.
- create online tests.

Employee:

- This system enables employee to register a student.

**b) Examples of Non-Functional Requirements:**

- Operational: the system should work on any web browser.
- Performance: the system should be available 24/7/365.
- Security: only instructor can upload grades.
- Cultural: the system is available in English and Arabic.

**Q.6) The management of Amazon.com Web site decided to extend its web-based system to include products other than books without a radical change in the applied business processes. Which of the requirements analysis techniques will the analyst follow? How the factors influence the choice of the analysis technique? [8 points]**

**ANSWER**

While the management decided to extend the system with only minor changes because the existing business processes are acceptable and without a need for radical redesign of business processes, then **BPA** or **BPI** is the strategy of choice.

Both of these techniques are narrow in a system scope and they strive to make incremental changes to the as-is system. The proposed extension to the system is with low risk. The technical systems are already in place, and the organization has experience with online commerce and the processes associated with sales projections for the new products. Additionally, the culture of this organization supports this type of expansion.

**Q1)- What is the relationship between level 0 and level 1 DFD diagrams? Explain. [4 marks]**

Answer: Level 0 DFD's show all the processes (and external entities), while Level 1 DFD's show sub-processes and may not show external entities (for small systems). For example, Process 4 from the Level 0 DFD might be broken into sub-processes 4.1; 4.2; 4.3; 4.4 (etc.)

**Q2)- What does Use Case mean? and what does use case describe? [4 marks]**

Answer: Use case is a formal way of presenting the way that business system interact with it's environment. it's set of activities that produce some output result. Also, it's represent the major process that the system performs and that benefit the actor who interact with the system. it's describe the the main functions of the system and the different kind of users that interact with it.

**Q3)- What does triggers mean in use case, and what are the trigger types? and who's usually be a trigger? [4 marks]**

Answer: Trigger mean the event that cause the use case to executed. Trigger has two main type:

\* External trigger: some from outside the system

\* Temporal trigger: time-based occurrences.

Usually the primary actor is the trigger for the use case

**Q4)- Describe the best way to validate the content of use cases. [4 marks]**

Answer: Role-playing can be useful in confirming the validity of the use case. If the users execute the steps of the use cases using the written steps of the use cases as a "script" for actions to take, they will be able to find errors or confirm the correctness of the use cases.

**Q5)- What is the purpose of an intersection entity? Describe the steps used to create an intersection entity? [4 marks]**

Answer: An intersection entity is created when we need to capture more information about the

relationship between two entities. This often occurs when two entities have a many-to-many relationship. One instance of entity A may be related to many instances of entity B, and one instance of entity B can be related to many instances of entity A. The intersection entity is inserted between entities A and B, and is used to capture information about a specific instance of entity A related to a specific instance of entity B.

B. The steps used to create intersection entity are:

1. Remove the M:N relationship line and insert a new entity between the two existing ones.
2. Add two 1:N relationships to the model.
3. Name the intersection entity.

---

**Q4)- Read the following scenario and answer the questions below.**

“A university library system needs to be built in order to handle the bookkeeping aspects of a library and provide user-browsing facilities. The system allows borrower to search for a book on a particular topic or by a particular author. The borrower should then be able to check if the book is on loan and if so to reserve the book. If a student wants to borrow or return a book, the library staff should enter the student ID to be searched. If student search is successful, the staff will enter the book ID, and if the book is available it can be borrowed. When a student wants to return a book, the staff checks the report data for any pending fine and if no fine is pending the book can be returned.”

- 1) **By using the following use case template, write a use case for “Borrow and return book” requirement. [10 Marks]**

**Ans. Use Case Description**

Use Case Name: <b>Borrow and return book</b>	ID: <b>_1_</b>	Importance Level: <b>High</b>
Primary Actor: <b>Borrower(student)</b>		
Short Description: <b>This describes how to check out, borrow and return books.</b>		
Trigger: <b>Borrower wishes to check out, borrow or return book.</b>		
Type: <b>External/ Temporal</b>		

Major Inputs:		Major Outputs:	
Description	Source	Description	Destination
<u>Book to check out</u>	<u>Borrower</u>	<u>Borrowed book info change</u>	<u>Borrowed</u>
<u>Borrower ID</u>	<u>Borrower</u>	<u>book file</u>	
<u>Validation information</u>	<u>Valid Borrower file</u>	<u>Returned book info change</u>	<u>Book holdings</u>
<u>Overdue book info</u>	<u>Overdue file</u>	<u>Overdue status</u>	<u>Overdue file</u>
<u>Fine due info</u>	<u>Fines file</u>	_____	_____
<u>Returned book</u>	<u>Borrower</u>	_____	_____
<u>Borrowed book info</u>	<u>Borrowed book file</u>	_____	_____
		_____	_____

Major Steps Performed	Information for Steps
<p>1. Borrower presents book(s) to check out. ID is checked for validity against valid borrower file. Overdue books and fines are checked. If OK book is lent to borrower.</p>	<p>Book to check out</p> <p>Borrower ID</p> <p>Validation information</p> <p>Overdue books info</p> <p>Fines due info</p> <p>Borrowed book info</p>
<p>2. Borrower returns book. Book is removed from borrowed file and returned to holdings. If overdue, book is removed from overdue file.</p>	<p>Returned book</p> <p>Borrowed book info</p> <p>Borrowed book info change</p> <p>Returned book info change</p> <p>Overdue file status</p>



2) Draw the level-0 data flow diagram for the Borrowing books system. [1]

