Course Title:

System Analysis and Design

BSc.CSIT 5th semester-Tribhuvan University (TU)

Unit-3

Analysis

❑ Introduction to Analysis

- Analysis is the first SDLC phase where we begin to understand pros and cons of a system , understanding the workflow and the needs for the system changes or improvements .This(Analysis) includes the following steps:

i. Understanding the current situation of a system.(Finding problems)

ii. Identify the improvements (Finding opportunities)

iii. Define requirements and concepts of new system.(Directives)

- The analysis team should not take the analysis process for granted because most observers would agree that many of the errors in developed systems are manifest by *inadequate efforts in the analysis and design phases* of the life cycle.
- ***The analysis process is generally divided into two main activities or sub-phases:***

i. Requirement Determination ii.Requirement Structuring

1.Requirements Determination:

- ✓ This is primarily a fact – finding activity or gathering of information through various techniques.
- ✓ In this stage, the functioning of the system is to be understood by the system analyst to design the proposed system.
- ✓ Various methods are used for this and these are known as fact-finding techniques.

❑ *There are seven common fact-finding techniques*

- **Document Review**
- **Research**
- **Observation**
- **Questionnaires**
- **Interviews**
- **Prototyping**
- **Joint requirements planning**

Note:

- Fact-finding is a critical and foundational step in the system analysis and design process. It involves gathering, documenting, and analyzing information about an existing or proposed system to understand its structure, processes, requirements, and constraints.
- The quality and accuracy of the information collected during fact-finding significantly impact the success of the subsequent phases of system analysis and design.

1. Traditional Methods for Determining Requirements(Fact Findings)

- We must collect information about the information systems that are currently being used and how the users would like to improve the current systems and organizational operations with new or replacement information systems or proposed system.

1.Interview:

- Interview is a planned meeting or most common fact-finding technique during which you obtain information form another person.
- You must have the skills needed to plan, conduct, and document interviews successfully.
- Begin the interviewing process, which consists the following seven steps in each interview:

i. Determine the people to interview.

ii. Establish objectives for the interview.

iii. Develop interview questions.

iv. Prepare for the interview.

v. Conduct the interview.

vi. Document the interview.

vii. Evaluate the interview.

Step 1: Determine the People to Interview

- To get an accurate picture, you must select the right people to interview and ask them the right question.
- During the preliminary investigation, you talked mainly to *middle managers or department heads*, during the system analysis phase, you might need to interview people from all levels of the organization.
- It is achieved in two ways, such as

➢ **Personal Interview** – In this method, a person known as an interviewer is required to ask questions face to face to the other person called interviewee.

➢ **Telephonic Interview** – In this method, an interviewer obtains information by contacting people on the telephone to ask the questions or views, verbally.

Step 2: Establish Objectives for the Interview

- After deciding on the people to interview, you must establish objectives for the session.
- You should define which *areas and topics* are to be discussed, and then list the facts findings you want to gather.

Step 3: Develop Interview Questions

- Creating a standard list of interview questions helps to keep you on track and prevent unproductive diversions during interviews.
- The interview should consist of several different kinds of questions:

❖ The questions can be classified into three groups:

i. Open-ended questions

ii. Closed-ended questions

iii. Range-of-response questions.

OPEN-ENDED QUESTIONS

- Open-ended questions *does not limit or restrict the response*.
- Open-ended questions encourage *spontaneous and unstructured responses* or simply we can say Such questions are useful *when you want to understand a larger process* or draw out interviewee's opinion, attitudes, or suggestions.

- Here are some examples of open-ended questions:

- "Which software development methodology or framework you prefer (e.g., Agile, RAD, spiral etc). How have you applied it in your previous roles, and what benefits did you observe?"
- "In your opinion, what is the most significant challenge facing the software industry today, and how do you think it can be addressed?"
- "What programming languages or technologies are you most passionate about, and how have you applied them in your previous roles?"
- Also, you can use an open-ended question by further by asking: is there anything else you can tell me about this topic?

❑ CLOSED-ENDED QUESTIONS

- Closed-ended questions ***limit or restrict the response.*** You use closed-ended questions when you want information that is more specific or when you need to verify facts.

❖ Examples of closed-ended question include the following:

- ✓ How many personal computers do you have in this department?
- ✓ How long have you been in this position?
- ✓ How frequently do you make decisions?
- ✓ Do you review the reports before they are sent out?
- ✓ How many hours of training does an employees receives?
- ✓ How many customers ordered product from the Web site last month?

❑ RANGE–OF-RESPONSE QUESTION.

- Range-of-questions are closed-ended questions that ask the person to evaluate something by providing limited answer to specific responses or on numeric scale or rating.

Examples:

✓ How effective was your training?

--> *Bad, Satisfactory, Good, Best.*

✓ How would you rate the risk factor in your organization ?

-->*low, medium, or high?*

✓ Is your system fails to adapt a new features or changes as per the expectation of users?

-->*Never, sometimes, often usually(regularly/repeatedly), or always?*

Step 4: Prepare for the interview

- After setting the objectives and developing the questions, you must prepare for the interview.
- Careful preparation is essential because an interview is an important meeting and not just a casual chat.
- When you schedule the interview, suggest a specific day and time and let the interviewee know how long you expect the meeting to last.
- It is also a good idea to send an e-mail or place a reminder to call the day before the interview.
- You should send a list of topics to an interviewee several days before the meeting, especially when detailed information is needed, so the person can prepare for the interview.

Step 5: Conduct the Interview

- While conducting an interview, here are the list of points to be remembered.

- During the interview, ask question in the order in which you prepared them, and give the interviewee sufficient time to provide thoughtful answers.
- Establishing a good rapport(relation) with the interviewee is important, especially if this is your first meeting.
- If the other person feels comfortable at ease, you probably will receive more complete and candid(clear) answers.
- Your primary responsibility during an interview is to listen carefully to the answers.
- Analysts sometimes hear only what they expect to hear. You must concentrate on what is said and notice any non verbal communication(i.e body Language, Facial expression ,Eye contact, Hand Gestures) that takes place. This process is called ***engaged listening.***
- After asking questions, allow the person enough time to think about the question and arrive at an answer.
- When you finish asking your questions, summarize the main points covered in the interview and.conclude the interview, thank the person and encourage him or her to contact you with any question or additional comments.

Step 6: Document the Interview

- While preparing the documents, we have to follow the certain guidelines.
- The documentation or note taking should be *detailed and kept to a minimum.*
- You should avoid writing everything that is said. Too much writing distracts the other person and makes it harder to establish a good rapport(relation).
- After conducting the interview, you must record the information quickly and evaluate the information.
- You, therefore, should use your notes to record the facts immediately so you will not forget them. *Tape recorders* are effective tools for an interview; however, many people feel uncomfortable when recorders are present.
- After the interview, send a memo/letter to the interviewee expressing your appreciation for his or her time and cooperation.
- In the memo, you should note the date, time, location, purpose of the interview, and the main points you discussed so the interviewee has a written summary and can offer additions or corrections.

Step 7: Evaluate the Interview

- In addition to recording the facts obtained in an interview, *try to identify any possible biases.*
- For instance, an interviewer may reject a candidate based on the simple fact that the interviewee didn't have a *'good handshake', didn't make enough eye contact, or because they kept their arms crossed during the interview.*

❑ **Conclusion:** This kind of unconscious bias in interviewing often leads to bad hiring decisions. As such, it has a negative impact on the efforts made by the interviewer.

Other Fact-Finding Techniques

- System analysts may use other fact-finding techniques, including :
- Document Review
- Research and Site visits
- Observation of the work environment
- Questionnaires
- Such techniques are used before interviewing begins to obtain a good overview and to help develop better interview questions.

1. Document Review

- Document review is the best way to analyze the existing system is to collect facts from *existing documentation* rather *than from human sources*.Documents review is a fact finding technique that finds or discover the following facts including,

- ✓ Issues/problem with the existing system,
- ✓ Policies, rules, and organizational directions ,
- ✓ Opportunities to meet new needs,
- ✓ Titles and names of key individuals in the existing system.
- ✓ Data, rules for processing data.etc.

❖ **There are various kinds of documents to collect facts from existing documents. These include**:

- ✓ Various types of flowcharts and diagrams,
- ✓ Program documentation and user training manuals.
- ✓ E-mails, customer complaints, suggestion box notes and reports that indicates the problem area,
- ✓ Analyze the samples of completed computerized forms and reports.
- ✓ hence, Document review is the best way to analyze the existing system is to collect facts from existing documentation rather than from human sources.
- ✓ Document review can help you understand how the current system is supposed to work.

Note:

- Remember that system documentation sometimes is out of date, Forms can change or be discontinued, and documented procedures often are modified or eliminated or Information may be incomplete or inaccurate.
- Hence, You should obtain copies of actual forms and operating documents currently in used.

3. Observation

- Another fact finding technique is observation. This is a method of gathering information by noticing and observing the *people, events, and objects*.
- The analyst visits the organization to observe the working of current system and understands the requirements of the system.
- In this technique, system analyst participates in the organization, studies the flow of documents, analyze the existing system, and interacts with the users.
- By using this technique, system analyst can know how employees spend their days.
- Directly see what people do rather than relying on what they say they do.
- Through observation, you might discover that neither the system documentation nor the interview statements are accurate.
- Here, analysts ask the users what they like and what they don't, and requirement is specified which is required for the system build – up.
- Observation also says that observe workers at selected time to see how data are handled in real time and what information people need to do their jobs.

Advantages

- It is a direct method for gleaning(gathering) information.
- It is useful in situation where authenticity of data collected is in question.
- It produces more accurate and reliable data.
- The analyst can know and gather reliable information personally.
- Clearer view for the analyst to know what exactly is happening to the system.
- A rather less time consuming and inexpensive methods of analyzing the system.

Disadvantages:

1. Might cause tension or uncomfort for the employees and giving out false data to the analyst.

2. Workers might not show how they normally violate the system under the analyst's observation ,also causing to give out faulty information for the analyst.

3.People usually feel uncomfortable when being watched to their work.

- While a person performs a task, behaviors, events, and activities are observed and recorded. When observing, one should be as inconspicuous(unnoticeable or Unknown) as possible.
- The test persons should ideally feel unobserved or at least comfortable.
- During the observation , document each single action. Highlight problems and the unusual things.
- It is an exploratory method record the behavior, events and activities of the person.

4.Research

- Research is another important fact-finding technique.
- Your research can include fact-findings from the *Internet, IT magazines, and reference books, technical material, and news about industry trends* and developments are good sources of information that can make available the vast quantity of information on how others have solved similar problems/issues plus whether or not any software packages exist to resolve or even partially solve your current problem.
- In addition, you can attend professional meetings, seminars, and discussions with other IT professionals, which can be very helpful in problem solving.

5. Questionnaires and Surveys

- A questionnaire is another fabulous fact-finding method that consists of a set of questions for the purpose of gathering information from respondents through survey or statistical study.
- The questions can be open-ended (allowing for free-text responses) or closed-ended (offering predefined response options, like multiple-choice)
- In project where it is desirable to obtain input from a large number of people, a questionnaire can be valuable tool.
- A questionnaire, also called a survey, is a document containing a number of standard questions that can be sent to many individuals.
- Questionnaires can be used to obtain information about a wide range of topics, including organizational workloads, volumes of transaction handled, job duties, difficulties/challenges, and opinions of how the job could be performed better or more efficiently.
- When designing a questionnaire, the most important rule of all is to make sure that your questions collect the right data.

❑ **Here are some additional ideas to keep in mind when designing your questionnaire:**

- Keep the questionnaire brief and user-friendly.
- Provide clear instruction that will answer all anticipated questions.

- Arrange the questions in logical order, going from simple to more complex topics.
- Avoid misunderstanding; use simple terms and wording.
- Try not to lead the response or use questions that give clues to expected answers.
- Limit the use of questions that can have negative impact.
- A questionnaire can be traditional paper form, or you can create a fill-in form and collect data on the internet or a company intranet.
- There are two types of questions that can be asked in a questionnaire, namely

i. Free-format and

→Free-format questions offer the respondent greater freedom inputting answers.

ii. **fixed-format.**

→Fixed-format questions require specific responses from individuals, and for the given question, the respondent must choose from the available answers.

❑ Contemporary Methods for Determining Requirements

- Here, there are various techniques to collect information about the current system, the organization area requesting the new system and what the new system be like.
- ***The contemporary methods for determining system requirements can be divided into two parts: JAD and the prototyping model.***

II. Using the Prototyping model

- The prototyping model suggests that before developing the actual software, a working prototype of the system should be built. A prototype is a partially developed product which has limited functional capabilities, low reliability and inefficient performance.
- The model starts with an initial requirement gathering phase. A quick design is carried out and the prototype model is built using several shortcuts. The shortcuts might evolve using inefficient, inaccurate dummy systems.
- The prototype product usually turns out to be a very crude version of the actual system. A function may produce the desired result by using a table lookup rather than performing the actual computation.

Contd. ….

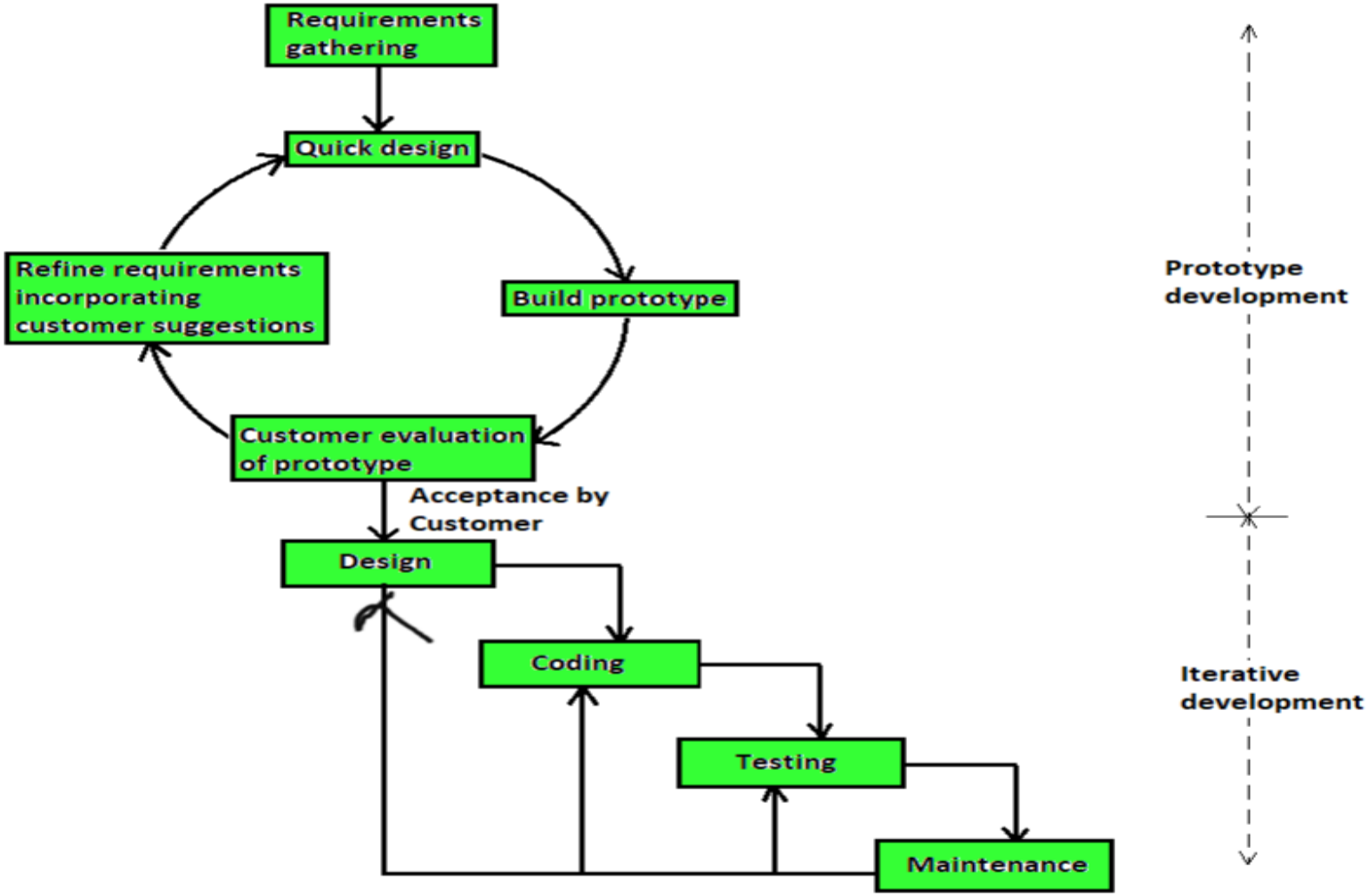


Fig:The Prototyping Model

❑ Radical Methods for Determining Requirements

- Analysts use system requirements determination to understand the current problems and support entities, as well as to determine what is needed and desired in future systems.
- The overall process by which current methods are replaced with radically new methods, is generally referred as **business process re-engineering (BPR)**.
- Even if the term **BPR** may seem dated to some, process orientation remains a testing legacy of the **BPR** movement.
- ***BPR consists of the following processes:***

✓ **Identifying processes to re – engineer.**

✓ **Disruptive Technologies.**

Contd. ….

- ✓ **Identifying processes to re – engineer:** The first step in any BPR effort relates to understand what processes to change. The key business processes are the structured, measured set of activities designed to produce a specific output for a particular customer or the target market.
- ✓ **Disruptive Technologies:** Once the key business processes and activities have been identified, information technologies must be applied to radically improve business processes.
- Disruptive technologies are those technologies that enable the breaking of long – held business rules that exhibit organization from making the radical business changes.

2.Contemporary/Modern Methods for Determining Requirements

- Even though we called *interviews*, *questionnaires*, *observation, and document analysis* traditional methods for determining a system's requirements, all of these methods are still used by analysts to collect important information.
- Today, however, additional techniques are available to collect information about the existing system or proposed system called contemporary /modern methods for determining requirements.
- In this section, you learn about two modern information-gathering techniques for analysis: **joint application design (JAD)** and **prototyping.**
- These techniques can support effective information collection and structuring while reducing the amount of time required for analysis.

1.Joint Application Design(JAD)

- JAD, which stands for Joint Application Development, is a collaborative workshop-based approach used in system analysis and design to gather and document requirements for software or system development.
- JAD sessions bring together stakeholders, including users, business analysts, developers, and other relevant parties, to ensure that everyone's perspectives and needs are considered through a succession of collaborative workshops called *JAD sessions* involved in the analysis of a current system.
- JAD is also called as systems development method to collect business requirements while developing new/proposed information systems for a company.
- In that respect, JAD is similar to a group interview; a JAD, however, defines its own processes and structure of roles of stakeholders in a JAD session, during which system analyst controls the sequence of questions and answered by the users.
- The goal of JAD sessions is to accelerate the requirements gathering and analysis process, improve communication, and increase the likelihood of a successful project outcome.

1.Joint Application Design(JAD)

- Meeting with all these important people for over a week of intense sessions allows you the opportunity to resolve conflicts and developed a desired system.
- A JAD may last anywhere from four hours to an entire week and may consist of several JAD sessions.
- JAD promotes a spirit of partnership and collaboration, so requirements can be documented faster and more accurately than with traditional requirements gathering approaches.
- In summary, JAD sessions are a powerful tool in system analysis and design, facilitating collaborative requirements gathering and analysis. They help ensure that the resulting systems meet the needs and expectations of all stakeholders, leading to more successful projects.

#Phases of JAD

A JAD session is conducted in mainly three phases. They are:

1. Preparation:

- **Identification of Participants**: The first step is to identify and invite relevant stakeholders. This may include *end-users, managers, business analysts, and technical experts.*
- **Agenda Planning**: Define the objectives, goals, and topics to be discussed during the JAD session. This may include specific requirements, business processes, and design considerations.
- **Scheduling**: Set a date and time for the JAD session, making sure all participants can attend.

2. Conducting the JAD Session:

- **Introduction**: The session begins with an introduction by the facilitator, explaining the purpose and goals of the session.
- **Icebreaking Activities**: To build rapport and create a comfortable atmosphere, icebreakers or team-building activities may be conducted. Icebreaking activities are designed to break the initial tension and create a more relaxed and open atmosphere during meetings, workshops, or team-building sessions. They encourage participants to get to know each other, build rapport, and feel more comfortable, which can improve communication and collaboration.

- ***Problem Definition:*** Participants discuss the problem or the need for the system, focusing on what issues need to be addressed. For example, in a healthcare system, participants may identify the need for improved patient record management.
- ***Requirements Elicitation:*** Requirement elicitation is a crucial step in system analysis and design, and it involves extracting, documenting, and validating the requirements necessary for the successful development of a system or software application. The specific techniques and methods used will depend on the project's nature and the preferences of the project team and stakeholders.
- ***Use Cases and Scenarios:*** Use cases and scenarios are important concepts in system analysis and design, particularly in the context of software development. They are used to define and illustrate how a system or software application interacts with its users, external systems, and other elements.

❑ *Example of a Use Case:*

- Consider an online banking system. One of the use cases for this system might be "Transfer Funds." The "Transfer Funds" use case describes how a user interacts with the system to transfer money from one account to another. The use case would include:
- **Actor**: The user initiating the fund transfer.
- **Preconditions**: Any conditions that must be met before the fund transfer can occur, such as the user being logged in.
- **Main Flow**: The main sequence of steps, including user actions and system responses, required to complete the transfer.
- **Alternative Flows**: Possible variations or exceptions to the main flow, such as insufficient funds or technical errors.
- **Post conditions**: The expected state of the system after the fund transfer is completed successfully.

❖ *Prototyping:*

- Prototyping is a technique used in the field of software development and other areas of product design and engineering to create a simplified and preliminary version of a system, product, or software application.
- The purpose of prototyping is to visualize and test the design, functionality, and features of the final product early in the development process. This helps stakeholders, including developers and end-users, gain a better understanding of the project's requirements and make necessary adjustments before investing in full-scale development.

❖ *Brainstorming and Discussion:*

- These activities encourage open and creative thinking among stakeholders, helping to address complex problems and make informed decisions.
- These activities can lead to more effective and efficient decision-making and a clearer path for system analysis and design.

❖Documentation:

→At the end, all the records and documents copies are given to all associated members and they approve it as per the idea and discussion made during JAD sessions.

3. Analysis and Post-Session Activities:

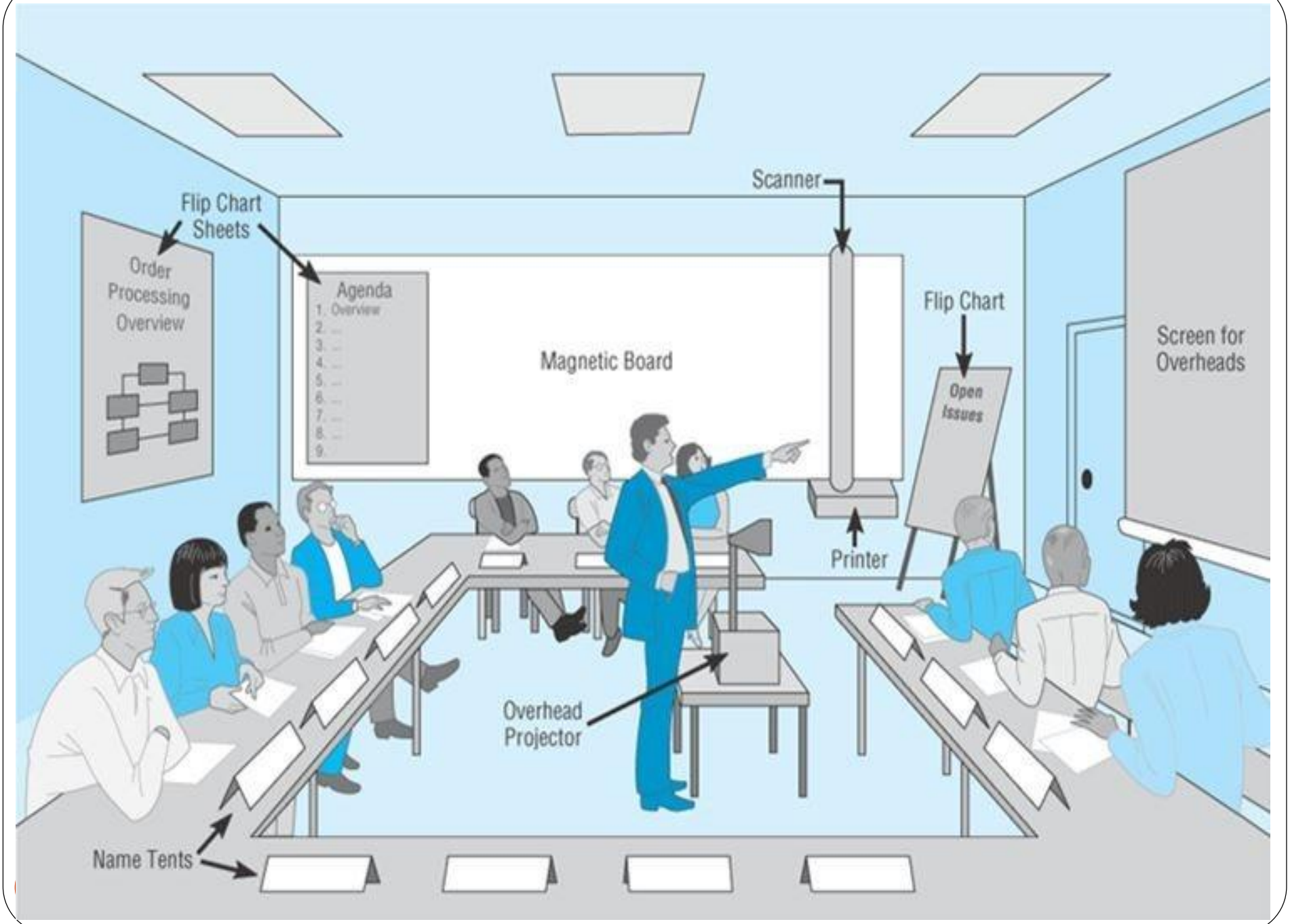
- These activities ensure that the gathered requirements are accurate, complete, and approved, setting the stage for successful system development.

❑ Benefits of JAD:

- **Faster Requirements Gathering**: JAD sessions expedite the process of collecting requirements.
- **Reduced Miscommunication**: Direct collaboration between stakeholders minimizes misunderstandings and misinterpretations.
- **Enhanced User Involvement**: Users' insights and needs are given priority, resulting in systems that better meet their requirements.
- **Improved Team Collaboration**: JAD sessions foster teamwork and shared understanding among team members.

❑ Challenges:

- JAD sessions can be time-consuming, requiring careful planning and management.
- It can be difficult to coordinate schedules for all relevant stakeholders.
- The success of JAD depends on effective facilitation, which requires skilled individuals.


Flip Chart Sheets
Order Processing Overview
Agenda
1. Overview
2. ...
3. ...
4. ...
5. ...
6. ...
7. ...
8. ...
9.
Magnetic Board
Scanner
Flip Chart
Open Issues
Printer
Screen for Overheads
Overhead Projector
Name Tents

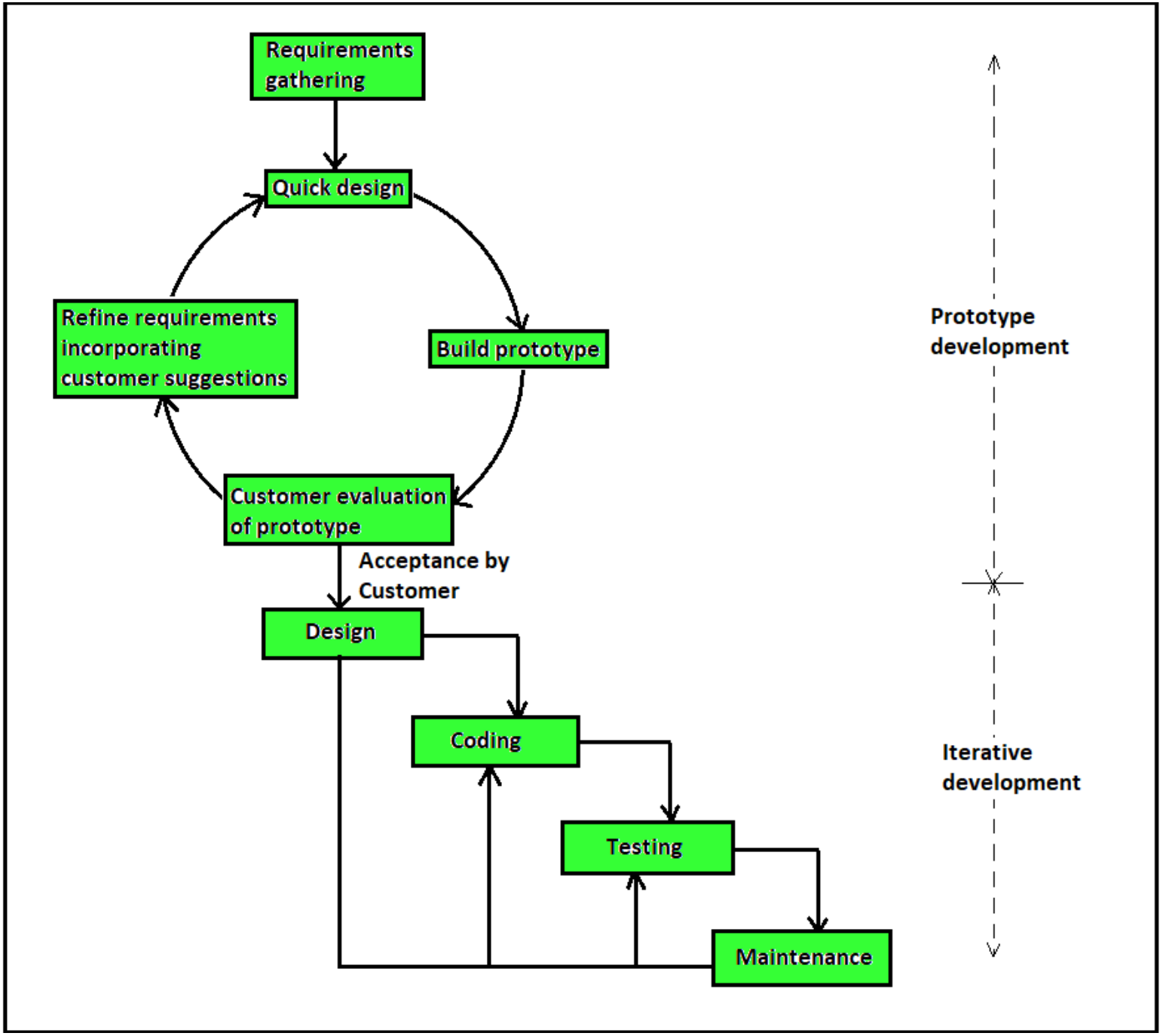
1.Prototyping Model(throwaway model)

→Prototype model is a software development model in which a prototype (i.e an early sample of the final product) is built and evaluated. And then rework is done on it as per client requirements, until a final acceptance product is achieved.

→A prototype is a working model of software with some limited functionality.

→A prototype always holds the exact logic used in the actual software application because the prototype is a dummy or toy model.

→ It helps to get valuable feedback from the customer and help software designer and developers to understand about what exactly is expected from the product under development.


Requirements gathering
Quick design
Build prototype
Customer evaluation of prototype
Refine requirements incorporating customer suggestions
Acceptance by Customer
Design
Coding
Testing
Maintenance
Prototype development
Iterative development

When to use Prototype Model?

→When client requirements are not clear.

→When client can communicate without delays because developers have to show the prototype so often to the client for review or customer evaluation. .(i.e there should be a strong communication between client and the system to make a prototype of a product.)

Advantages:

1. Client feedback is received quickly which speeds up the development process.
2. Developed prototype can be used later for any similar projects.
3. Software Designers and developers understand about what exactly the client is expected from the product.
4. Missing functionality and errors can be detect earlier.

Disadvantages:

1.Increase in cost of development.

2. Prototyping may be a slower and time taking process.

3. Poor documentation due to the changes in the requirement.

4. Regular meeting are vital to keep the project on time.

The following is a list of typical JAD participants:

1. JAD session leader / Facilitator

- The JAD leader organize and schedule JAD activities and runs the JAD workshop. i.e This individual is responsible for creating, managing and executing the JAD activities, minimize disagreements, maintaining focus and unbiased approach.
- The JAD leader sets the agenda and sees that it is met or not?
- He or she remains neutral on issues and does not contribute ideas or opinions, but rather concentrates on keeping the group on the agenda, resolving conflicts and disagreements, and soliciting(ask for/request) all ideas to improve the system.
- Responsible for Lead groups and keep sessions on track.

2. Users

- The key users of the system under consideration are vital participants in a JAD workshop.
- They are the only ones who clearly understand and know the operations ,nature and functionalities of a system on a daily basis.

3.Managers

- Managers of the work groups who provide insight into new organizational directions, motivations for and organizational impacts of systems, and support for requirements determination during the JAD sessions.

4. Sponsor

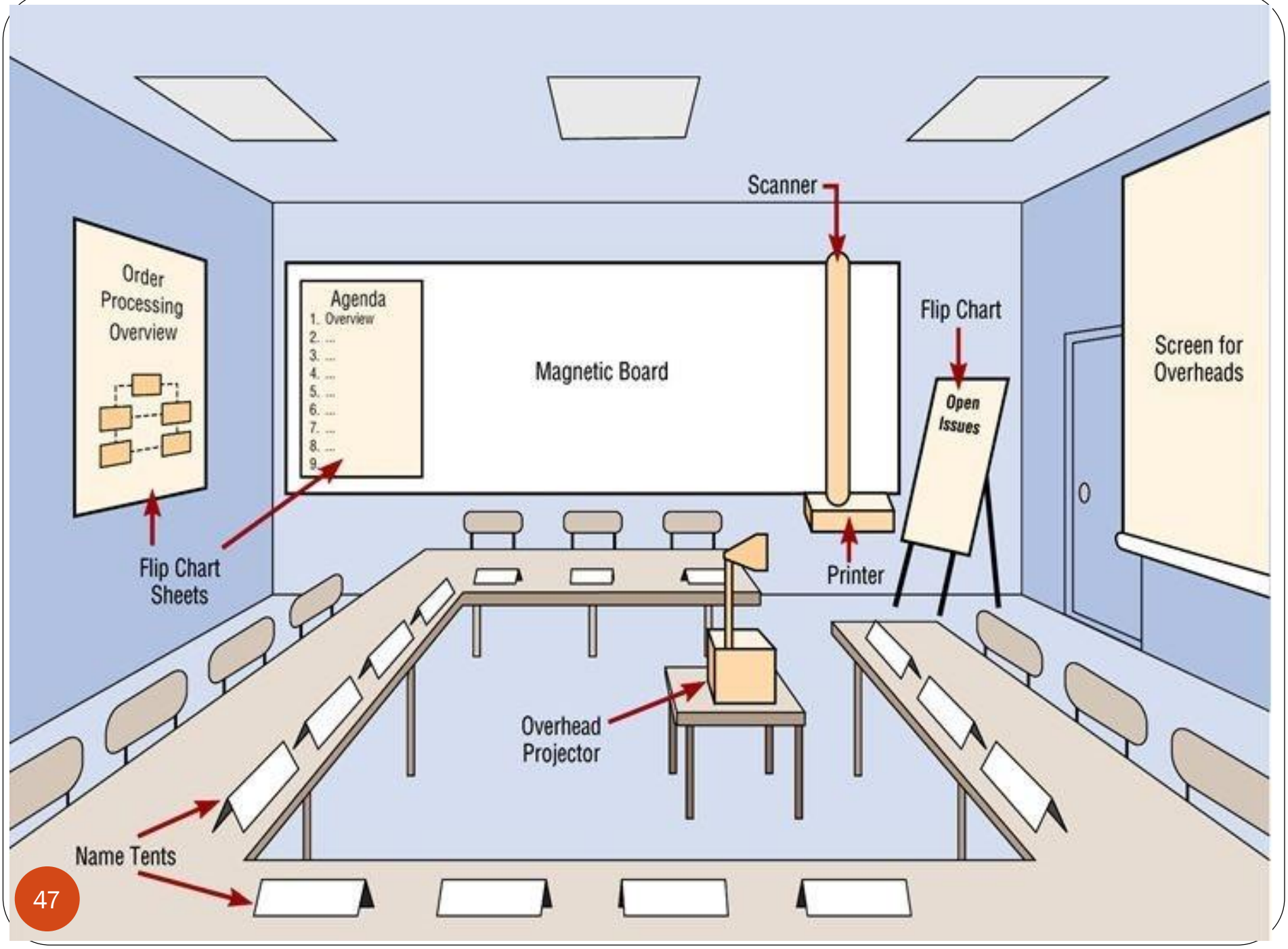
- As a major undertaking, because of its expense, a JAD must be sponsored by someone at a relatively high level in the company such as a vice president or chief executive officer. If the sponsor attends any sessions, it is usually only at the beginning or the end.

5.Scribe(Recorder)

- The scribe takes notes during the JAD sessions, usually on a personal computer or laptop.
- This person is responsible for documenting JAD process and JAD sessions precisely and effectively.

7. IS staff(IT Representatives)

- Besides systems analysts, other IS staff, such as programmers, database analysts, IS planners, and data-center personnel, may attend the session.
- Their purpose is to learn from the discussion and possibly to contribute their ideas on the technical feasibility of proposed ideas or on the technical limitations of current systems.
- IT Representative gives technical advice and helps JAD team develop logical models to build a prototype


Scanner
Order Processing Overview
Agenda
1. Overview
2. ...
3. ...
4. ...
5. ...
6. ...
7. ...
8. ...
9. ...
Magnetic Board
Flip Chart
Open Issues
Screen for Overheads
Flip Chart Sheets
Printer
Overhead Projector
Name Tents

- JAD sessions are usually held in special-purpose rooms where participants sit around horseshoe-shaped tables.
- These rooms are typically equipped with whiteboards (possibly electronic, with a printer to make copies of what is written on the board). Other audio visual tools may be used such as (Projector, tape/video recorder) ,whiteboard, flip charts, and display boards/screens.
- Flip-chart paper is typically used for keeping track of issues that cannot be resolved during the JAD,.
- Computers may be used to create and display form or report designs or to diagram existing or replacement systems.
- In general, however, most JADs do not benefit much from computer support. The end result of a completed JAD is a set of documents that detail the workings of the current system and the features of a replacement system.

#Advantages and disadvantages of JAD

Advantages

- JAD allows you to resolve difficulties more simply and produce better, error-free software through a collaborative platform.
- The joint collaboration between the company and the clients lowers all risks.
- JAD reduces costs and time needed for project development.
- Well-defined requirements improve system quality.
- Due to the close communication, progress is faster.
- JAD encourages the team to push each other to work faster and deliver on time.

Disadvantages

- Different opinions within the team make it difficult to align goals and maintain focus.
- Depending on the size of the project, JAD may require a significant time commitment.

Radical Methods

for Determining System Requirements

- Bussiness Process Reengineering(BRP)

1.Bussiness Process Re-engineering(BPR)

- Business Process Reengineering (BPR) is **a business management strategy to recreate a core business process to improve** in critical aspects like quality, output, cost, service, and speed.

Companies use Business Process Reengineering because:

- ✓ Most of the Nepalese business organizations are facing problems every day in terms of sales and the qualitative production. Because the rate of new business organization is increasing rapidly day by day with new mission and strategies for the succession but the level of consumption and patterns are remaining same approximately.
- ✓ Less productive actions are involved.
- ✓ Process duplication and spending more time on less important task.
- ✓ Product development cycle times were too slow/time consuming.
- ✓ Errors were too high because of the lack of expertise.
- As a result, enterprises were ill equipped(failed) to succeed in a time of rapidly changing technologies, rising customer expectations and global competition.

Purpose of using BRP:

- **To Reduce costs and process redundancy :** Business Process Reengineering reduces costs and process redundancies *by eliminating unproductive activities (eliminate tasks that do not improve performance) and the employees* who perform them.

- **To Redesign core processes to enable improvement in quality**:

✓ First you should aware with the existing core processes of your business system and improves quality by establishing clear reengineering processes and enhancing the performance based on prompt feedback.

✓ Making changes to the process gets more and more difficult as your business grows but in reality, you cannot improve processes without making changes. Thus Processes have to be reengineered carefully.

- **To Stay in the business competition:** Applying Business Process Reengineering to your business can sustain to the long term, compete with your existing competitors and can fulfill your own needs and stakeholder's expectation but Business organization should aware with the innovative idea, market trend analysis and frequent patterns to stay in the competition, then only can sustain for long term and meet their objectives with the satisfaction of stakeholders.

- **To Refocus on customer needs**: Business organization should realize that "getting closer to the customer" is crucial to growth. Consumers have more choices than ever before, empowered by online and mobile channels that provide more ways to buy, give and get recommendations, and talk back to companies. Today's customer won't hesitate to walk away from an established company relationship that doesn't meet their needs. This holds true for nearly all industries today.

- **To Reorganize a cross-functional teams;** A cross-functional team is **a group of people with a variety of expertise who come together to achieve a common goal**. It typically includes employees from all levels of an organization in response to an increasingly global and competitive environment, the flexibility to adapt to changing market needs and develop innovative cross-functional team is the key to success.

Below are the 5 Business Process Re-engineering Steps:

1. Address the current state of your business processes

- To keep **business process reengineering** fair, transparent, and efficient, stakeholders need to get a better understanding of the key steps involved in it. Although the process can differ from one organization to another , gather data from all resources–both software tools and stakeholders.
- Understand how the process is performing currently.

2. Analyze and find any process gaps or disconnects

- Identify all the errors and delays that restrict a free flow of the process. A well-conducted gap analysis identifies problems in the current processes and examines possible solutions to those processes.
- The Process Gap Analysis is conducted by project managers, continuous improvement facilitators, and operational leaders.
- Hence, Develop focused action plans to close gaps and improve processes that help you meet your process goals.

3. Look for improvement opportunities

- Business process improvement (BPI) is an approach that identifies areas where the business could improve, redesigning the existing business processes to increase effectiveness and optimize performance. For the modern organization, undergoing a business process improvement is an ongoing necessity.
- Every business has hundreds of processes, they usually fall into one of these categories – operational, management, supporting.

1.Operational activities are those that repeat every day, such as administrative, advertising, and sales activities.

2.Management activities concentrate on human resources management, financials management, monitoring etc.

3.Supporting activities are the remaining undertakings such as recruitment, accounting, and IT support.

Finally, All above mentioned tasks and activities require regular evaluation to determine if there are inefficiencies or room for improvement. When opportunities for improvement are identified, that's where BPI comes in.

4. Design a future-state process map

- Create a new process that solves all the problems you have identified.
- Don't be afraid/hesitate to design a totally new process that is sure to work well.

5. Implement and Monitoring

- Inform every stakeholder of the new process and educate them about how the new process works.
- **E**nsure success through constant monitoring.

A real-life example of BPR

- Many companies like Ford Motors, GTE(General Telephone and Electronics **Corporation**), and Bell Atlantic tried out to reshuffle their operations. The reengineering process they adopted made a substantial(adequate) difference to them, dramatically cutting down their expenses and making them more effective against increasing competition.

The story

- An American telecom company that had several departments to address customer support regarding technical snags(difficulties), billing, new connection requests, service termination, etc.
- Every time a customer had an issue, they were required to call the respective department to get their complaints resolved.
- The telecom representatives reviewed the situation and concluded that it needed drastic measures to simplify things–a one-stop solution for all customer queries. It decided to merge the various departments into one, minimize multiple handoffs(delivery) and form a nerve center of customer support to handle all issues from a single platform.
- A few months later, they set up a customer care center in Atlanta and started training their clerks(employees) as 'frontend technical experts' to do the new, comprehensive job.
- The company equipped the team with new software that allowed the support team to instantly access the customer database and handle almost all kinds of requests from the same platform.
- Now, if a customer called for billing query, a new service request confirmed without having to call another number. While they were still on the phone, they could also make use of the *push-button phone menu to connect directly with another department* to make a query or input feedback about the call quality.

BPR team member roles

- The radical change advocated by BPR required serious commitment from a company's top executives. Such a team might look like this:

- **Team leader:** A senior executive who has envisioned and authorized the overall reengineering effort. The team leader is responsible for appointing the *process owner.*
- **Process owner:** A senior-level manager in charge of a specific business process. The process owner is responsible for assembling a team to reengineer the process they oversee.
- **Steering committee:** A group of senior managers who have championed the concept of reengineering within the organization *and set specific goals* for improving performance. The steering committee, which is led by the team leader, is responsible for arbitrating disputes(negotiation of conflicts) and helping process owners make decisions about competing priorities.
- **Reengineering team:** A group of operational level employees who involves in the process that is being reengineered. The reengineering team is responsible for analyzing the existing process and overseeing its redesign.
- **Reengineering czar.** A data **czar**, also known as a Chief Data Officer, providing specific services and facilities to the project that we need . The czar's responsibility is to be a facilitator and develop the techniques and tools the organization uses to reengineer workflow.

#Structuring System Process Requirements:

1. Data flow diagram(DFD)
2. Decision Tree
3. Decision Table
4. Pseudocode

#.Structuring System Data Requirements:

- Introduction;
- Conceptual Data Modeling(E-R Modeling)