Requirement Analysis

What is Requirement Analysis?

- Process of defining user expectations for a new software being built or modified.
- Also known as ***requirements gathering*** or ***requirements capturing***.
- the needs or conditions to meet for a new or altered product or project
    - By considering conflicting requirements of the various stakeholder
- analyze, documentation, validating and managing system requirements.

Requirement Analysis Process

Requirements Analysis Process

1. Eliciting requirements
2. Analyzing requirements
3. Requirements modeling
4. Review and retrospective

Eliciting requirements In **requirements** engineering, **requirements** elicitation is the practice of researching and discovering the **requirements** of a system from users, customers, and other stakeholders.

Fact Finding methods for requirement discovery

- Background Research
- Sampling of existing documentation, forms, and databases
- Observation of the work environment
- Questionnaires
- Interviews
- Prototyping
- Joint requirements planning (JRP)

Background Research

- Aim is to understand the organization and its business objectives.
- Includes:

– reports

– organization charts

– policy manuals

– job descriptions

– documentation of existing systems

Background Research

Advantages:

– helps to understand the organization before meeting the people who work there

– helps to prepare for other types of fact finding

– documentation of existing system may help to identify requirements for functionality of new system

Disadvantages:

– written documents may be out of date or not match the way the organization really operates

Sampling of Existing Documentation, Forms, and Files

Sampling – the process of collecting a representative sample of documents, forms, and records.

– Organization chart
– Memos and other documents that describe the problem
– Standard operating procedures for current system
– Completed forms
– Manual and computerized screens and reports
– Samples of databases
– Flowcharts and other system documentation

Sampling Techniques

Randomization – a sampling technique characterized by having no predetermined pattern or plan for selecting sample data.

Stratification – a systematic sampling technique that attempts to reduce the variance of the estimates by spreading out the sampling—for example, choosing documents or records by formula—and by avoiding very high or low estimates.

Sampling Documents

Advantages:

– for gathering quantitative data

– for finding out about error rates

Disadvantages:

– not helpful if the system is going to change dramatically

Information gathering techniques

- Interviewing techniques
- Questionnaires

Interviewing

- Interviewing is an important method for collecting data on information system requirements.

- Interviews reveal information about:
    - Interviewee opinions.
    - Interviewee feelings.
    - About the current state of the system.
    - Organizational and personal goals.

Interviewing: Questionnaires types

There are two basic types of interview questions:

- Open-ended.
- Closed.

Open-Ended Questions

- ***Open-ended interview*** questions allow interviewees to respond how they wish, and to what length they wish.

- ***Open-ended questions*** are appropriate when the analyst is interested in breadth and depth of reply

Open-Ended Questions: Example

- What are you planning to buy today at the supermarket?
- How exactly did the fight between the two of you start?
- What is your favorite memory from childhood?
- How will you help the company if you are hired to work for us?
- What do you plan to do immediately following graduation from college?
- What types of decorations do you plan to have for your friend's birthday party?
- What was your high school experience like?
- How did you and your best friend meet?
- What sights do you expect to see on your vacation?

Advantages of Open-Ended Questions

- Allows the interviewer to pick up on the interviewee's vocabulary.
- Reflect education, values, attitudes, and beliefs.
- Provides richness of detail.
- Reveals avenues of further questioning that may have gone untapped.
- Provides more interest for the interviewee.
- Allows more spontaneity.
- Makes phrasing easier for the interviewer.
- Useful if the interviewer is unprepared.
- Puts the interviewee at ease.

Disadvantages of Open-ended Questions

- Possibly losing control of the interview.
- May take too much time for the amount of useful information gained.
- Potentially seeming that the interviewer is unprepared.
- Possibly giving the impression that the interviewer is on a "fishing expedition”

Closed Interview Questions

- Closed interview questions limit the number of possible responses.
- Closed interview questions are appropriate for generating precise, reliable data that is easy to analyze.
- The methodology is efficient, and it requires little skill for interviewers to administer.

Closed Interview Questions : Example

- Are you feeling better today?
- May I use the bathroom?
- Is the prime rib a special tonight?
- Should I date him?
- Will you please do me a favor?
- Have you already completed your homework?
- Is that your final answer?
- Were you planning on becoming a fireman?
- Should I call her and sort things out?
- Is it wrong to want to live on my own at this age?
- Shall we make dinner together tonight?
- Could I possibly be a messier house guest?
- Might I be of service to you ladies this evening?
- Did that man walk by the house before?
- Can I help you with that?
- May I please have a bite of that pie?

Benefits of Closed Interview Questions

- Saving interview time.
- Easily comparing interviews.
- Getting to the point.
- Keeping control of the interview.
- Covering a large area quickly.
- Getting to relevant data.

Disadvantages of Closed Interview Questions

- Boring for the interviewee.
- Failure to obtain rich detailing.
- Missing main ideas.
- Failing to build rapport between interviewer and

Bipolar Questions and Probes

- Bipolar questions are those that may be answered with a ‘yes’ or ‘no’ or ‘agree’ or ‘disagree’.
- Bipolar questions should be used sparingly.

Probing Questions

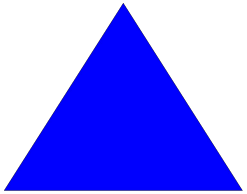
- Probing questions elicit more detail about previous questions.
- The purpose of probing questions is:
    - To get more meaning.
    - To clarify.
    - To draw out and expand on the interviewee's

Question Sequencing

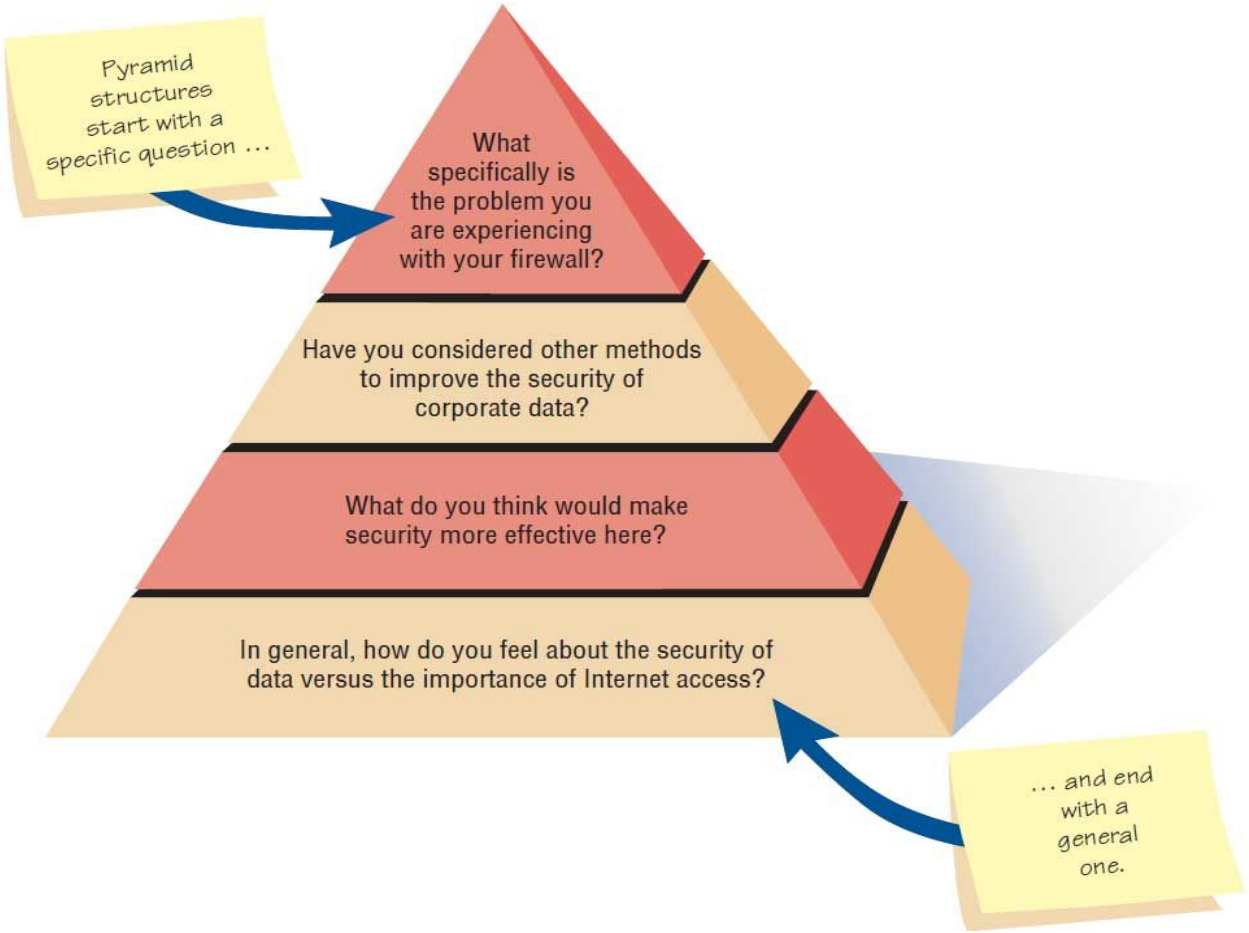
The three basic ways of structuring interviews are :

- Pyramid, starting with closed questions and working toward open-ended questions.
- Funnel, starting with open-ended questions and working toward closed questions.
- Diamond, starting with closed, moving toward open-ended, and ending with closed questions.

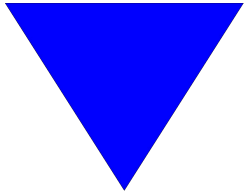
Pyramid Structure



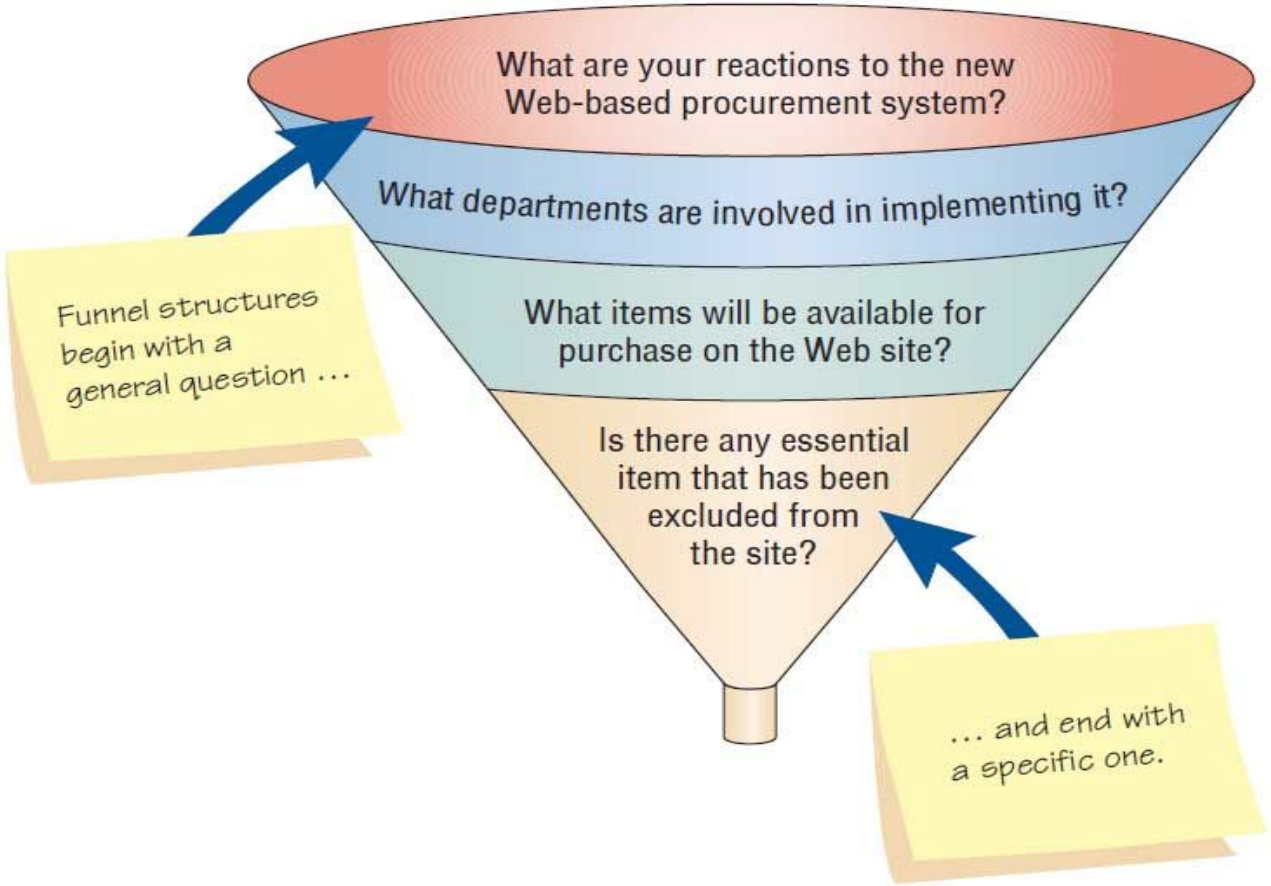
- Begins with very detailed, often closed questions
- Expands by allowing open-ended questions and more generalized responses
- Is useful if interviewees need to be warmed up to the topic or seem reluctant to address th


Pyramid structures start with a specific question …
What specifically is the problem you are experiencing with your firewall?
Have you considered other methods to improve the security of corporate data?
What do you think would make security more effective here?
In general, how do you feel about the security of data versus the importance of Internet access?
… and end with a general one.

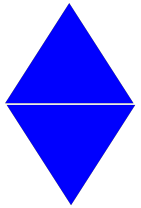
Funnel Structure



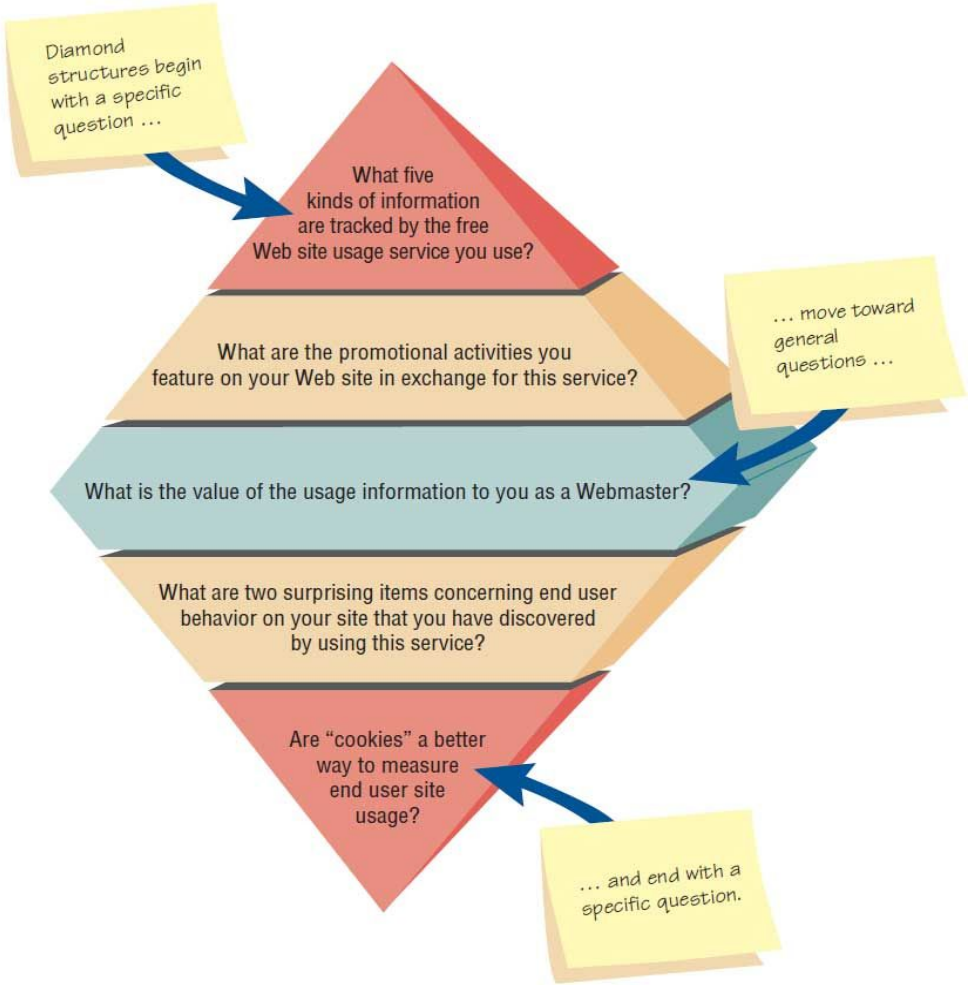
- Begins with generalized, open-ended questions
- Concludes by narrowing the possible responses using closed questions
- Provides an easy, non threatening way to begin an interview
- Is useful when the interviewee feels emotionally about the topic


What are your reactions to the new Web-based procurement system?
What departments are involved in implementing it?
What items will be available for purchase on the Web site?
Is there any essential item that has been excluded from the site?
Funnel structures begin with a general question ...
... and end with a specific one.

Diamond Structure



- A diamond-shaped structure begins in a very specific way
- Then more general issues are examined
- Concludes with specific questions
- Combines the strength of both the pyramid and funnel structures
- Takes longer than the other structures


Diamond structures begin with a specific question …
What five kinds of information are tracked by the free Web site usage service you use?
What are the promotional activities you feature on your Web site in exchange for this service?
… move toward general questions …
What is the value of the usage information to you as a Webmaster?
What are two surprising items concerning end user behavior on your site that you have discovered by using this service?
Are "cookies" a better way to measure end user site usage?
… and end with a specific question.

Measurement Scales

- The two different forms of measurement scales are :
  - Nominal.
  - Interval.

Nominal Scales

- Nominal scales are used to classify things into categories.
- It is the weakest form of measurement.
- Data may be totaled.

What type of software do you use the most?
1 = Word Processor
2 = Spreadsheet
3 = Database
4 = An Email Program

Interval Scales

- An interval scale is used when the intervals are equal.
- There is no absolute zero.
- Examples of interval scales include the Fahrenheit or centigrade scale.

How useful is the support given by the Technical Support Group?

NOT USEFUL AT ALL				EXTREMELY USEFUL
1	2	3	4	5

Validity and Reliability

Questionnaires must be valid and reliable.

- Reliability of scales refers to consistency in response--getting the same results if the same questionnaire was administered again under the same conditions.
- Validity is the degree to which the question measures what the analyst intends to measure.

Problems with Scales

There are three problems associated with poorly constructed scales:

- Leniency.
- Central tendency.
- Halo effect.

Leniency

- Caused by easy raters.
- Solution is to move the “average” category to the left or right of center.

Central Tendency

Central tendency occurs when respondents rate everything as average.

- Improve by making the differences smaller at the two ends.
- Adjust the strength of the descriptors.
- Create a scale with more points.

Halo Effect

- When the impression formed in one question carries into the next question
- Solution is to place one trait and several items on each page.

Designing the Questionnaire

Good response rates can be achieved with consistent control of questionnaire.

- Allow ample white space.
- Allow ample space to write or type in responses.
- Make it easy for respondents to clearly mark their answers.
- Be consistent in style.

Order of Questions

- Place most important questions first.
- Cluster items of similar content together.
- Introduce less controversial questions first.

Web Form Questionnaires

- Controls (fields) used on Web forms:
- Single line text box.
- Scrolling text box, used for one or more paragraphs of text.
- Check box for yes-no or true-false answers.
- Radio button for mutually exclusive yes-no or true-false answers.
- Drop-down menu for selection from a list.
- Submit or Clear buttons.

Methods of Administering the Questionnaire

Methods of administering the questionnaire include:

- Convening all concerned respondents together at one time.
- Personally administering the questionnaire.
- Allowing respondents to self-administer the questionnaire.
- Mailing questionnaires.
- Administering over the Web or via email.

Electronically Submitting Questionnaires

Administering a questionnaire electronically has the following benefits:

- Reduced costs.
- Collecting and storing the results electronically.

Discovery Prototyping

● The act of building a small-scale, representative or working model of the users’ requirements in order to discover or verify those requirements.

Joint Application Design (JAD)

- Joint Application Design (JAD) can replace a series of interviews with the user community
- JAD is a technique that allows the analyst to accomplish requirements analysis and design the user interface with the users in a group setting

When to Use JAD

- JAD may be used when
  - Users are restless and want something new
  - The organizational culture supports joint problem-solving behaviors
  - Analysts forecast an increase in the number of ideas using JAD
  - Personnel may be absent from their jobs for the length of time required

JAD Personnel

- JAD involves
  - Analysts
  - Users
  - Executives
  - Observers
  - A scribe
  - A session leader

Benefits of JAD

- The potential benefits of using JAD are
  - Time is saved, compared with traditional interviewing
  - Rapid development of systems
  - Improved user ownership of the system
  - Creative idea production is improved

Drawbacks of Using JAD

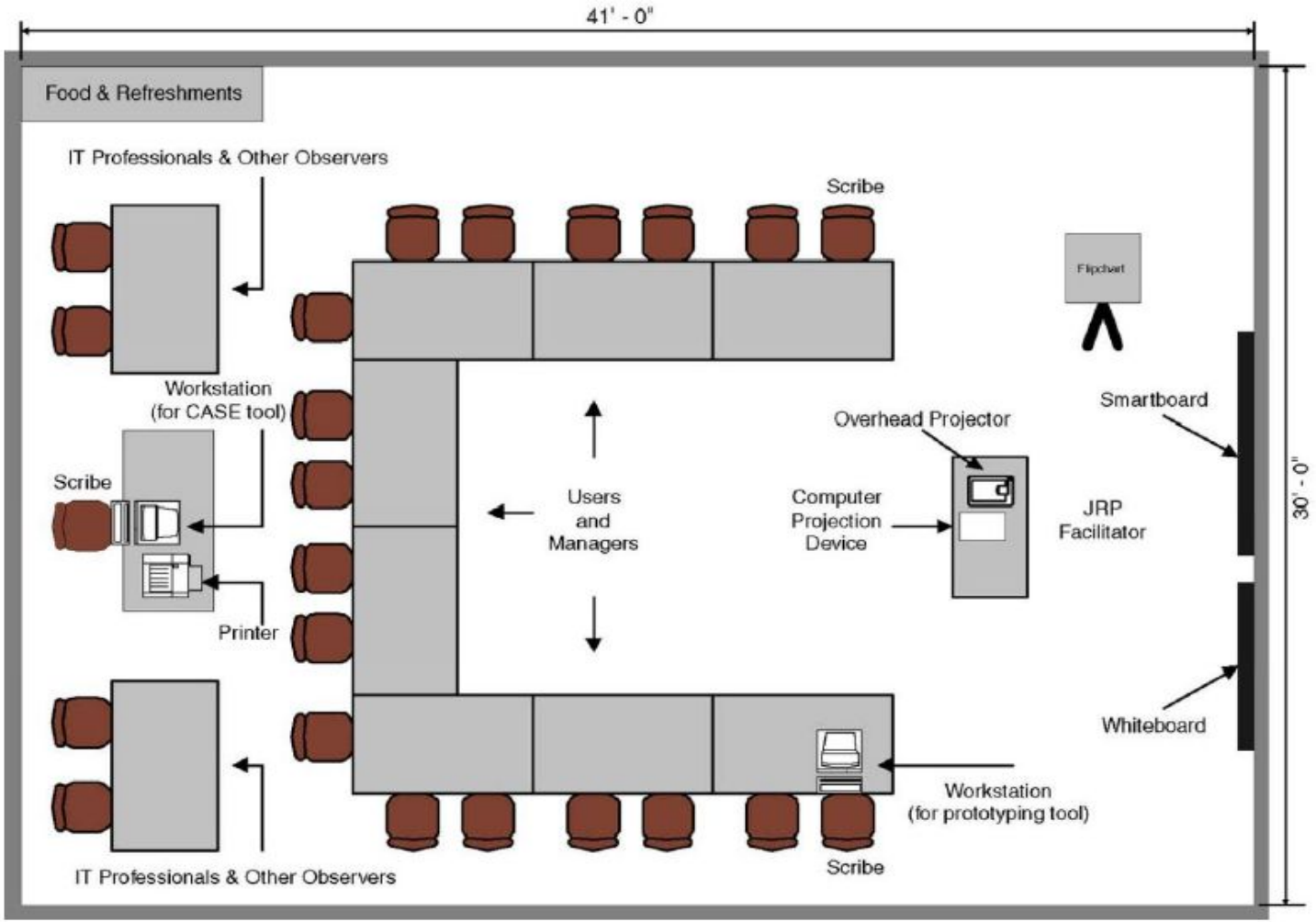
- Potential drawbacks of using JAD are
  - JAD requires a large block of time be available for all session participants
  - If preparation is incomplete, the session may not go very well
  - If the follow-up report is incomplete, the session may not be successful
  - The organizational skills and culture may not be conducive to a JAD session

Joint Requirements Planning

Joint requirements planning (JRP) – a process whereby highly structured group meetings are conducted for the purpose of analyzing problems and defining requirements.

– JRP is a subset of a more comprehensive joint application development or JAD technique that encompasses the entire systems development process.

• JRP Participants-
– Sponsor
– Facilitator
– Users and Managers
– Scribes
– IT Staff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Food & Refreshments
IT Professionals & Other Observers
Scribe
Flipchart
Workstation
(for CASE tool)
Overhead Projector
Smartboard
Scribe
Users
and
Managers
Computer
Projection
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Thank you