Lecture 3 – TEAM SKILL 2: UNDERSTANDING USER AND STAKEHOLDER NEEDS
REQUIREMENTS ELICITATION TECHNIQUES - I

Requirement Engineering

Book Pohl, Klaus. *Requirements engineering: fundamentals, principles, and techniques*.

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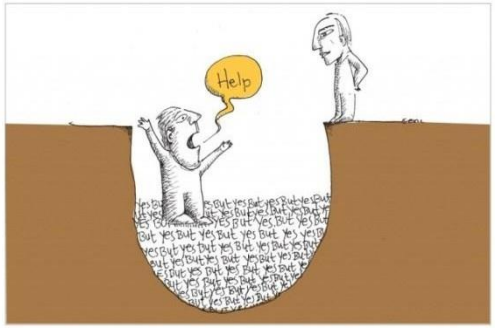
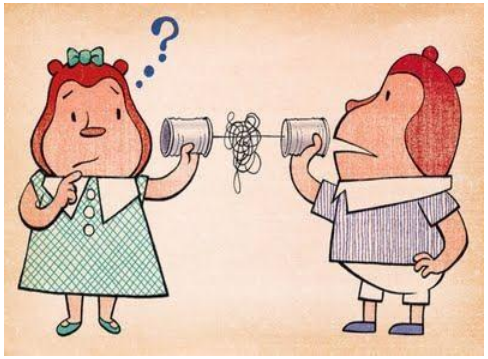
Presentation Outline

- The Challenge of Requirement Elicitation
  - ✓ Yes But Syndrome
  - ✓ Undiscovered Ruins
  - ✓ User and Developer Syndrome
- Requirement Elicitation
- The Requirement Elicitation Process
- Requirement Elicitation Techniques
  - ✓ Interviews
  - ✓ Questionnaires
  - ✓ Background Reading
  - ✓ Introspection
  - ✓ Social Analysis

The Challenge of Requirements Elicitation

- Requirements elicitation is complicated by three endemic syndromes.





- ✓ The **"Yes, But"** syndrome
  - It has been observed that the users' reactions after checking software for the first time are: **"Wow, this is so cool; we can really use this, and so on ….. "Yes, but, hmmmm, now that I see it, what about this . . . ? Wouldn't it be nice if . . . ? And so on . . . "**
- ✓ The **"Undiscovered Ruins"** Syndrome
  - In many ways, the search for requirements is like a search for undiscovered ruins: the more you find, the more you know remain.
- ✓ The **"User and the Developer"** syndrome
  - The third syndrome arises from the **communication gap** between the user and the developer.

Requirements Elicitation Process

- Background Knowledge

- Requirements Gathering

- Requirements Classification

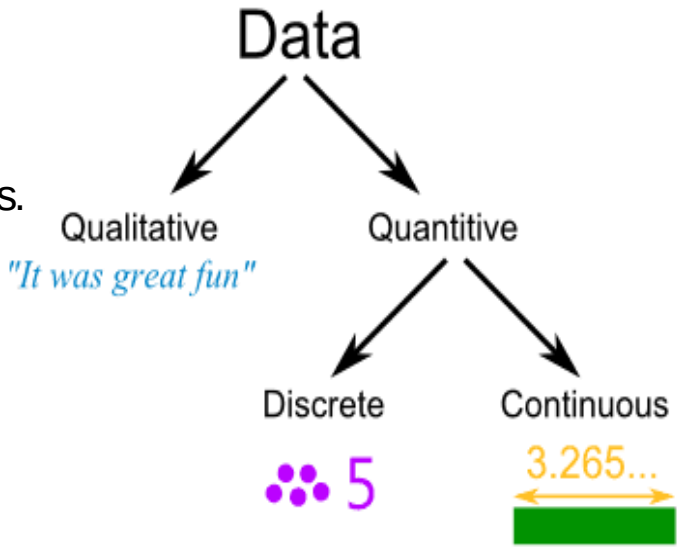
- Requirements Conflict

- Requirements Prioritization

Methods of Collecting Data

Qualitative Data and Quantitative Data

- Qualitative data is data that is mainly words, sounds or images.
- Quantitative data is data that is mainly numbers.



Qualitative Data	Quantitative Data
Overview: • Deals with descriptions. • Data can be observed but not measured. • Colors, textures, smells, tastes, appearance, beauty, etc. • **Qualitative → Quality**	**Overview:** • Deals with numbers. • Data which can be measured. • Length, height, area, volume, weight, speed, time, temperature, humidity, sound levels, cost, members, ages, etc. • **Quantitative → Quantity**

Methods of Collecting Data

Structured and Unstructured Data

- Structured data is organized, unstructured data is relatively disorganized.
- Structured data can be produced by closed questions, unstructured data can be produced by open questions.

Requirements Elicitation Techniques

- ✓ Interviews
- ✓ Questionnaires
- ✓ Background Reading
- ✓ Introspection
- ✓ Social Analysis
- ✓ Requirements Workshops
- ✓ Brainstorming and Idea Reduction
- ✓ Story Boarding
- ✓ Role Playing
- ✓ Prototyping
- ✓ Requirements Reuse

Interviews [1]

- One of the most important, popular, and most commonly used requirements gathering techniques is the user interview
- A simple, direct technique that can be used in nearly every situation.
- In this method the requirement engineering analyst's discuss with different types of the stakeholders to understand the requirements of the system
- There are two main types of interviews:
  - ✓ **Closed Interviews**
  - ✓ **Open Interviews**

Interviews

Closed Interviews

- In closed interviews the requirements engineer prepares some predefined questions and he tries to get the answers for these questions from the stakeholder's

Open Interviews

- In open interviews the requirements engineer does not prepares any predefined questions and he tries to get the information from the stakeholder's in open discussions

Closed ended Question

- A close-ended question is one that demands mostly a brief yes or no response. [3,4]

Open ended Question

- An open-ended question is one that demands far more than a brief yes or no response. [3,4]

Interviews [1]

- Generally the interviews start wit predefined questions
- However in the process of interview a lot of different considerable things may arise that leads to open discussion
- Interviews are effective for understanding the problem in the existing system and to find the requirements of the stakeholders
- Tomake the interview session effective the requirements engineer and the stakeholders has to perform in the following ways::
  - ✓ Interviewer should be patient enough to listen the stakeholder's views and the requirements, he should be open minded
  - ✓ Stakeholders should be expressive in the interview session, they should express their views in definite context

The Interview Context [1]

- Establishing the user profile
- Assessing the Problem
- Understanding the user environment
- Recap for understanding
- Analyst's inputs on user's problem
- Assessing your Solution
- Assessing the Opportunity
- Assessing Reliability, Performance and Support needs
- Any other requirements
- Wrap up
- Analyst's Summary

Interviews [1]

Pros

- Rich collection of information
- Uncovers opinions, feelings, goals, as well as hard facts
- Can review in detail, and adapt follow-up questions to what the person tells you

Cons

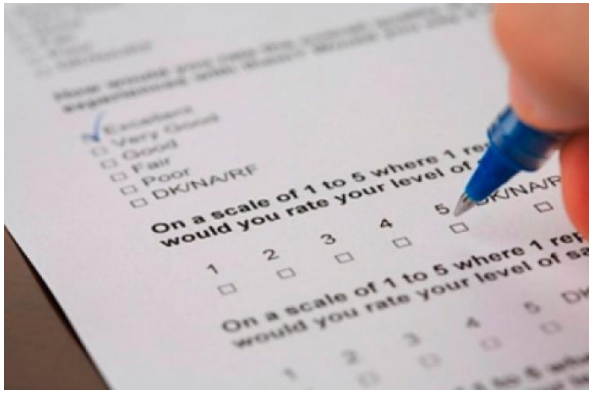
- Large amount of qualitative data can be hard to analyze
- Not as many people from various parts of the company are interviewed, because of cost so there exists high possibility for bias
- Usually many follow ups are required for clarification
- Interviewing is a difficult skill to master

The Interview

DEMO

Questionnaires [1]

- Questionnaires are one of the methods of gathering requirements in less cost and reach a large number of people only in lesser time
- Can be manual (paper form) or electronic (soft form distributed through e-mail)
- The results extracted from the Questionnaires must be clearly analyzed
- The results from the Questionnaires mainly depends on the two factors::
  - ✓ Effectiveness and the design of Questionnaires
  - ✓ Honesty of the respondents



- A well designed and effective questionnaire can be used to decide the actual user requirements, objectives and the constraints

The Designing of Questionnaires

The steps involved in designing and conducting the Questionnaires are::

- The purpose of survey should be clearly defined
- The Sampling group (respondents of the survey) should be decided
- Clearly state Why the respondent was selected for questionnaire
- Provide clear instructions on how to complete the questionnaire
- Avoid asking two questions in one
- Do not ask questions that give clues to answers
- Keep the questionnaire brief and user friendly
- Preparing and developing the questionnaire
- Conducting the questionnaire process
- Gathering and analyzing the results

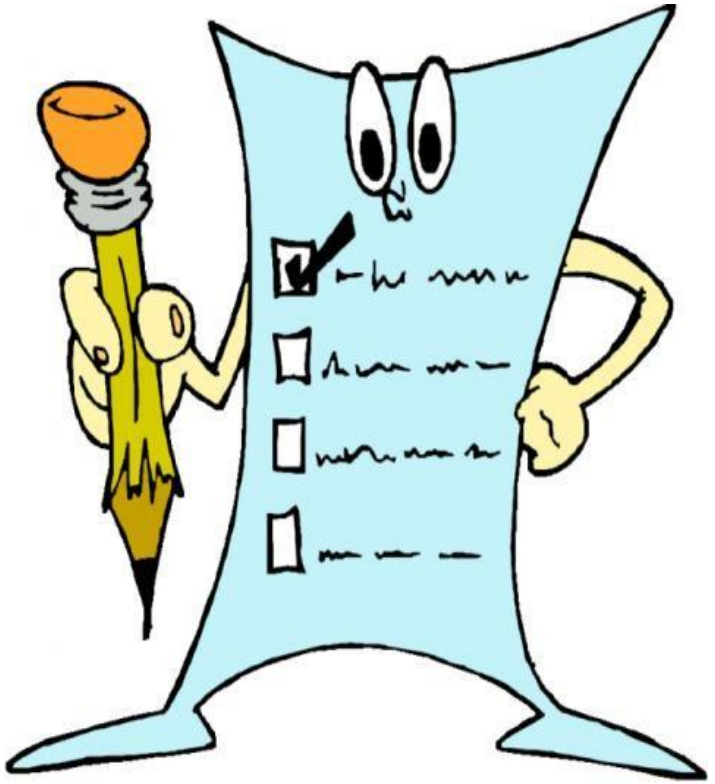
The Designing of Questionnaires

- The Designing of Questionnaire is a multi stage process and should be viewed accordingly
- Assume 30-50% return rate for paper and email questionnaires
- Assume a 5-30% return rate for web-based questionnaires

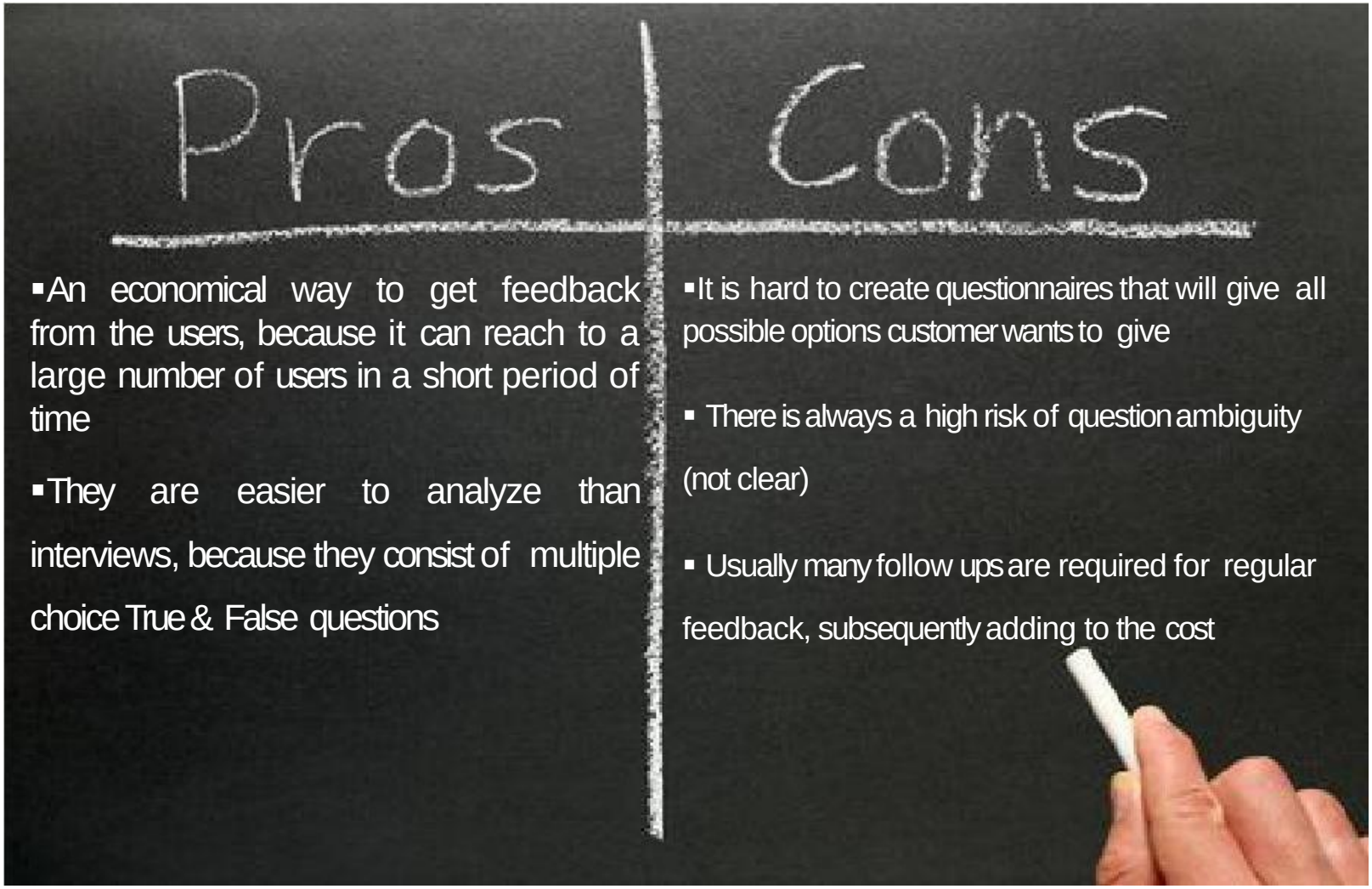
The Arrangement of Questionnaires

The steps in arranging a Questionnaire are::

- The questions should be arranged well, so that general questions are followed by the particular questions
- Arrange the questions such that easy questions come first
- The questions relevant to the main subject should be given high priority



Questionnaires



Background Reading

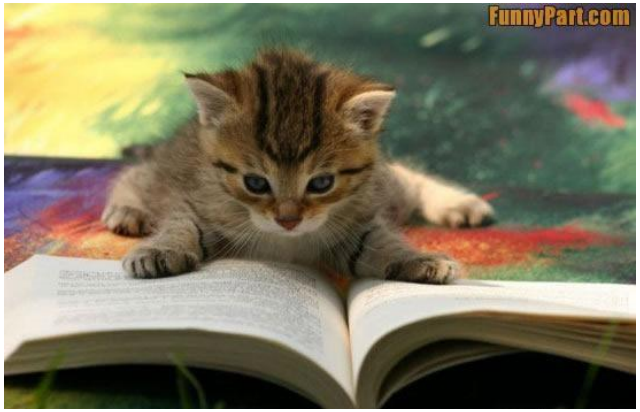
- **Background Reading** is used to gather information about the organization, which is helpful to gain an understanding of the organization's structure, its working, and the existing system

- **Background Reading technique** is not solely used for eliciting requirements because you can not get the real user needs by just studying the existing documents

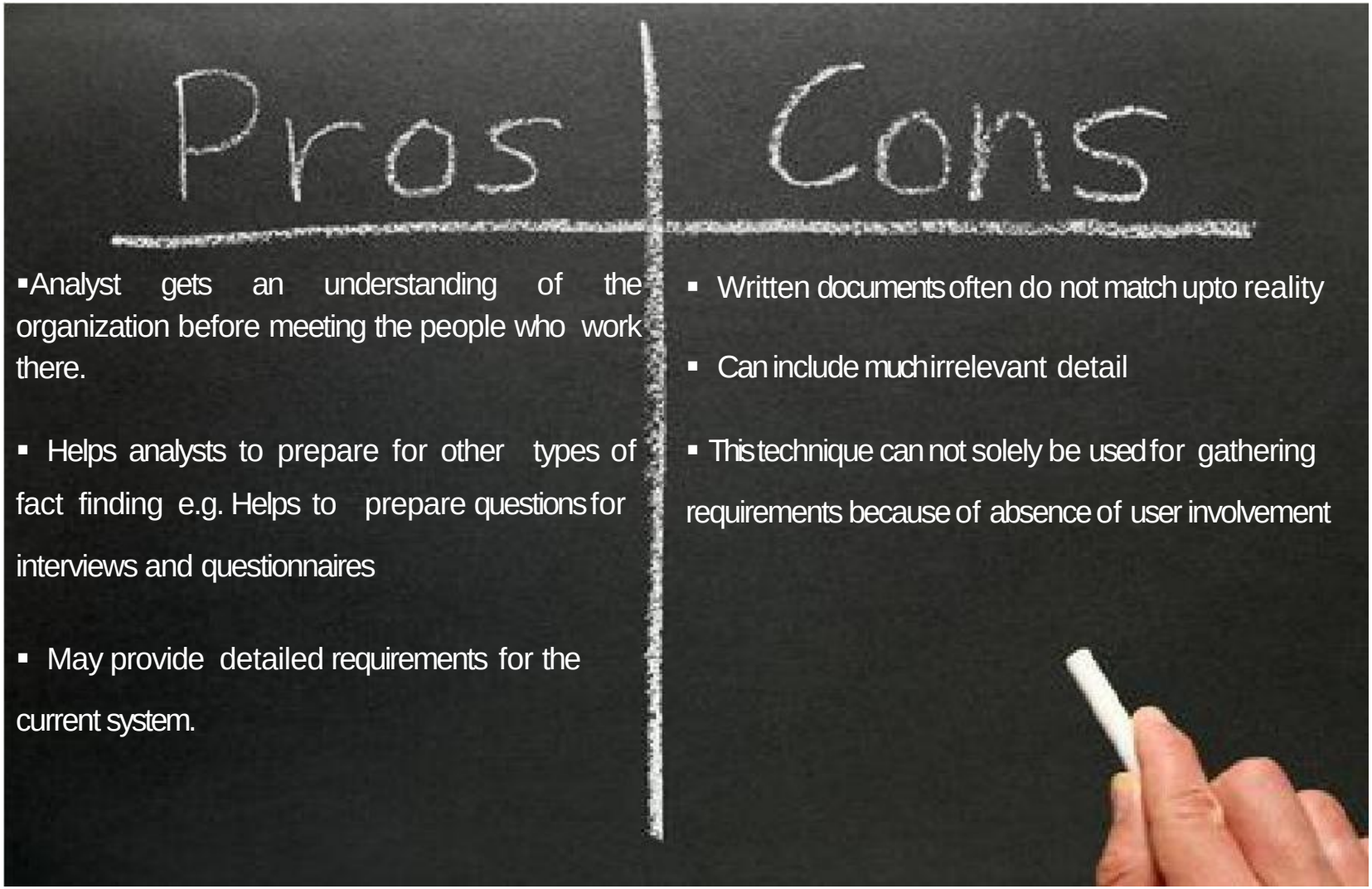
- It is used as a complementary approach with other techniques

- **Sources of information:**
  - ✓ company reports, organization charts, policy manuals,
    job descriptions, reports, documentation of existing systems, etc.

- **Appropriate for**
  - ✓ when you are not familiar with the organization being investigated.



Background Reading



Introspection

- **In Introspection technique** Requirements analyst "imagines" what kind of system is required for doing the required job, or by using available equipment etc

- Introspection is the first and the most obvious method for trying to understand what properties a system should have in order to succeed.

Introspection

Appropriate for

- when users are not available, don't want to answer your questions or shows lack of feedback or input then **Requirement engineer's** can use this technique to imagine the things which he assumes that the user would require

Introspection

Pros

- Introspection is an easier technique to apply

Cons

Introspection can be very inaccurate at times because Requirement Analyst imagines what is required rather than asking from the user what he requires

This technique is unlikely to reflect the stakeholder's goals and actual user experiences

Social Analysis

- Social Analysis is also known as Observation
- Observation is a process of collecting requirements by observing the people doing their normal work
- This method is used to find the additional requirements needed by the user, when the user is unable to explain their expected requirements
- This Social Analysis can be of the following types::
  - ✓ Passive Observation
  - ✓ Active Observation
  - ✓ Explanatory Observation

Social Analysis

Passive Observation

- This social analysis is carried out without the direct involvement of the observer in the society
- The observation of the peoples work is carried out by recording using videotapes, video cameras and surveillance cameras
- The documentation of the problem and requirements are prepared from the recorded data

Social Analysis

Active Observation

- This social analysis is carried out with the direct involvement of the observer in the society
- The observers encourages people to work with the existing product to perform the operations on the product
- The observer provides the domain knowledge to the user and makes the report of the requirements of the people by observing their day to day work with the product

Social Analysis

Explanatory Observation

- In this type of observation the user talks loudly, explaining what they are doing while using the product

- The observer takes notes using the explanation given by the user

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