Contextual Task Analyses

Chapter 03

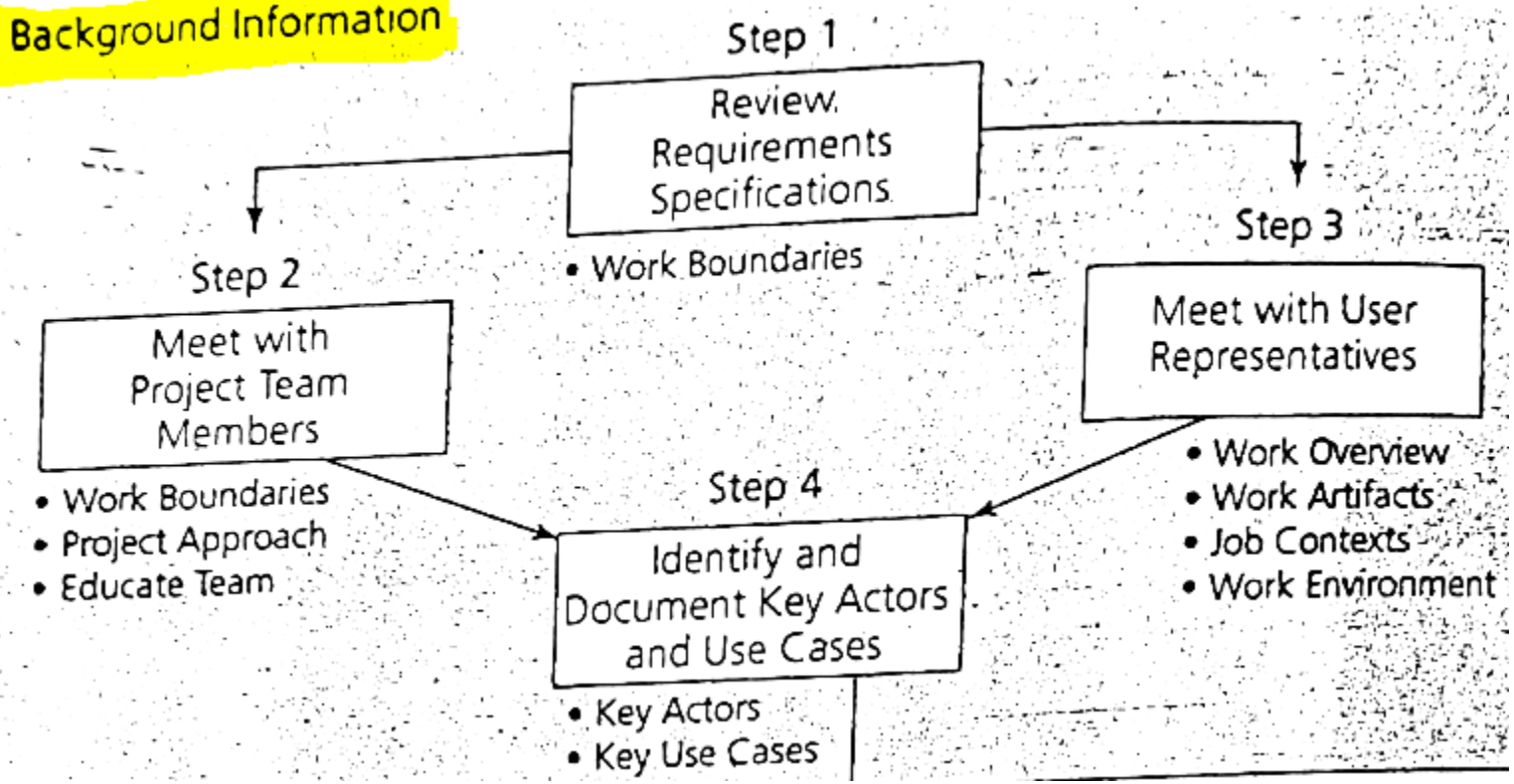
Usability Engineering Life Cycle by
Deborah J. Mayhew

What is contextual task analyses?

- Contextual Task Analysis is on projects in which a specific product has already been identified, defined and scoped.
- To obtain a user-centered model of work as it is currently performed
- Here you need to understand how users currently think about, talk about and do their work in their actual work environment.
- Basic Steps are
  - Gather background information
  - Collect and analyze data from observations/interviews
  - Construct and validate a model of the users' current task organization

Contextual Task Analysis Process Model

1. Gather Background Information



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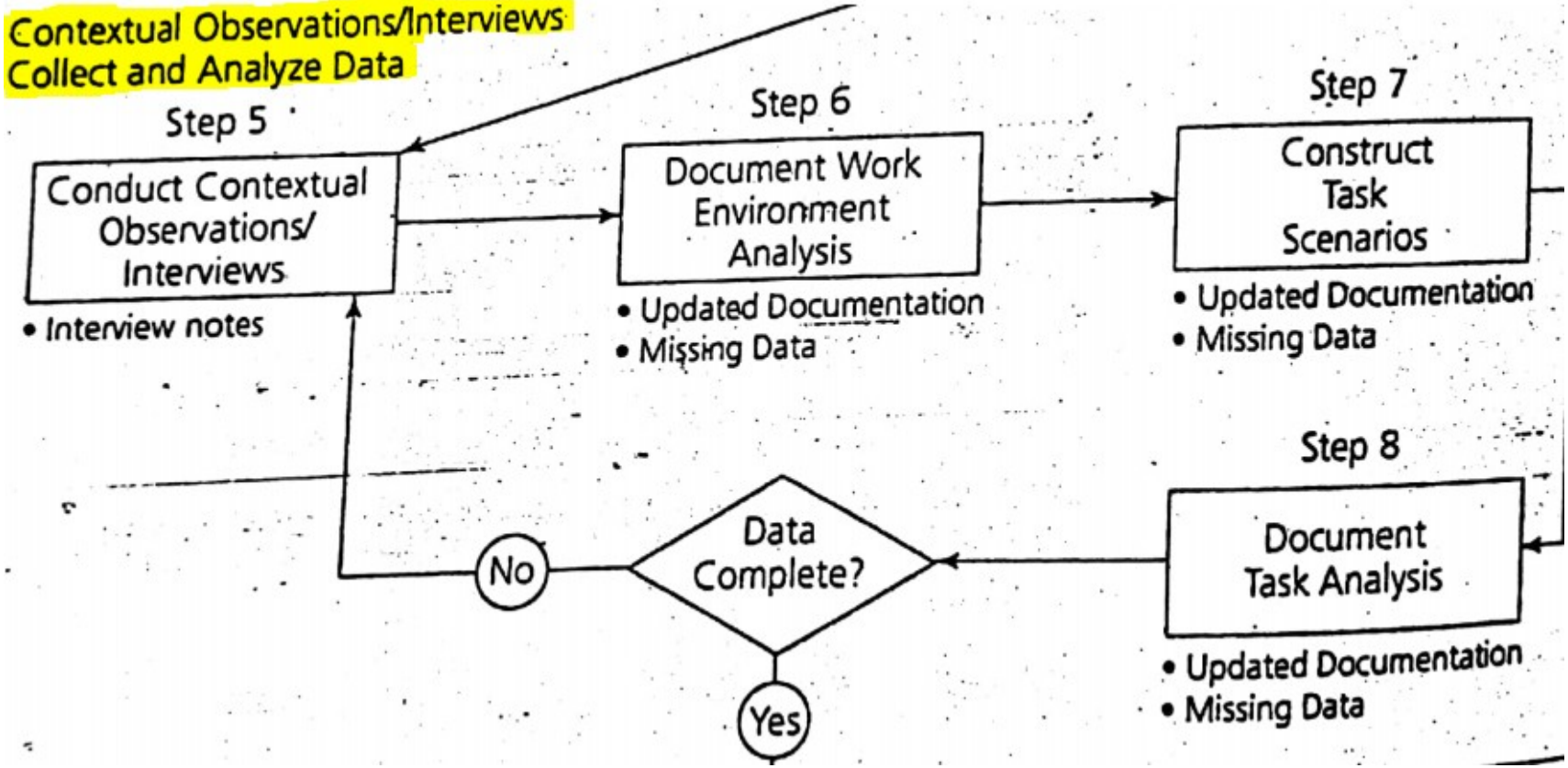
2. Contextual Observations/Interviews Collect and Analyze Data



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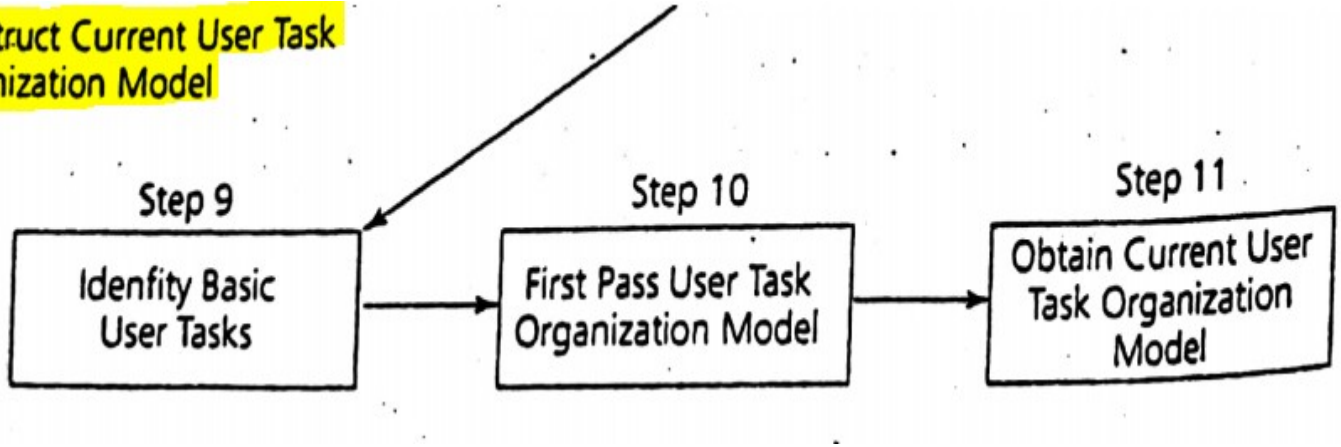
3. Construct Current User Task Organization Model



Stage 1.

Gather Background information

1. Review Requirement Specification

or Software Requirement Specification (SRS)

- A Software Requirements Specification (SRS) is a document that describes the nature of a project, software or application.
- In simple words, SRS document is a manual of a project provided it is prepared before you kick-start a project/application.
- SRS Document includes
  - purpose, scope, functional and nonfunctional requirements
  - software and hardware requirements

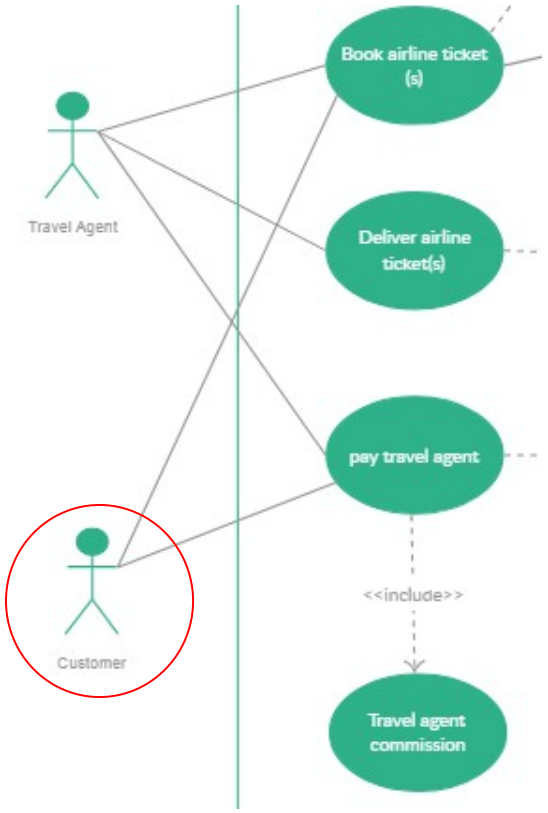
Reference: https://krazytech.com/projects/sample-software-requirements-specificationsrs-report-airline-database

2. Meet with project Team members

- Conduct interview with project team members to get high level view of the jobs/tasks being automated/produce.
- A good starting point to understand what the application needs to offer.
- Win their confidences and assure their cooperation
- This will provide context for step 5

3. Meet with user representatives.

- Conduct interview with user representatives (Indirect user)
  - i.e Travel agency customers would be indirect Users of a travel agent's online reservation system.
- Spend some time with user representatives getting a list of the main artifacts or objects, involved in the task under study.
- This will give you high-level of overview of the "What" and "How" of the work task.



4. Identify and Document key Actors and Use cases.

- Based on the User Profile and previous three steps identify the complete set of **Actors** (major user category) and **Use Cases** (Major types of user tasks)

Stage 2.

Contextual observations/interviews, Collect and Analyze data

5. Conduct contextual observation/interviews

- This step is absolutely central to contextual task analyses.
- Here, you go out and observe and talk with actual intended end users in their real work environment while they do real work.
- Based on analyses of your direct observation, construct a model that represent the work from users' point of view.

What information you need to determine?

- Identify the main work artifacts or objects.
- Collect Task Scenarios, or instances of Use Cases.
- Gain insight into the actual user and business goals underlying Use Cases.
- Gain insight into users' work models.
- Learn the users' language (their terminology and jargon).
- Gather statistics about Use Cases, for example, relative frequency, range and average time to complete, number and types of errors.
- Gain insight into problems, bottlenecks, errors, and other opportunities for improvement in the current work process (whether manual or automated).
- Gather data about the work environment.

AN ARRESTING CONTEXTUAL TASK ANALYSIS

As an example of what can be missed by not doing a Contextual Task Analysis, I was performing such an analysis in a metropolitan police department. Police officers used a system of standardized paper forms to inventory confiscated property. I observed infrequent users of the forms struggling with them (there were many complex forms and many unwritten rules about how to fill them out), and I later observed how frequent users handled them. The frequent users tended to ignore the forms initially and take free-form notes describing the property they had to document in a format very different from that required on the forms. They then transcribed their own notes onto the forms as required. It was clear from this observation (and from follow-up interviews with the frequent users) that the forms were not designed in a way that supported the users' task, and a lot of what I learned about how frequent users worked around the forms went into designing better on-line forms. A traditional systems analysis would typically not involve studying users actually using paper forms in their actual work, but would have instead taken the paper forms themselves as a description of the work to be automated. Problems with the forms would have been missed entirely and perpetuated in the on-line version of the task.

There are always a great many things that users simply will not think to report during an off-site interview or "focus group." They only emerge during contextual observations/interviews of people doing real work in their workplace. Such things can have major implications for product user interface design.

Stationhouse Contextual observation/interview Data collection

Actors	Trigger	Use Case (Tasks)	Task Scenario Sequence	Errors, Problems and Comments
Police Officer	Arrest	Fill out property forms associated with an arrest	**1**.Respond to 911 call **2**.Pick up perpetrators and take property (knife, bag etc) **3**.Report to station commander at police station **4**.Write up property summary	**-**Police office may do this type of task only four times per day **-**Use case may take 2 to 6 hrs to complete

6. Document work environment analyses

This step include description of

- Physical work environment
  - open/close working area, lightning, heat, noise level etc.
- Sociocultural work environment
  - Team work, motivation and inter-user support

- Drawing specific implication of user interface design based on these environments

Example: Stationhouse Physical work environment

- In general police station are fairly old, the interior is gloomy, dismal and rundown. Wall color tend to be dark and neutral. The walls are plastered with miscellaneous notices and reminders.
- Implications of User Interface
  - Human performance degrades under stressful conditions, poor lightning.
  - This means that the user interface must provide lots of cognitive, perceptual and motor support.
  - Light colors should be used and pleasant graphics increase performance

Sociocultural work Environment

- Almost all the upper-level staff in this organization have worked up through the ranks.
- Natural hostility and distrust between police offices and prisoners
- Lack of trust and support
- Implications of User interface:
  - Should be as self-explanatory as possible
  - Ease of use, Ease of learning

7. Construct Task Scenarios.

- Task Scenario is an instance of a Use Case
  - A step by step description of an actual, detail procedure that a user followed to accomplish some task.
  - It captures the sequences of steps required to get a task done.
- i.e. For a travel agent the general use case is to make a set of reservations for a customer's trip
  - Task Scenario(exact sequences of steps) might involve: Making airline, rental car and hotel reservation for a family and trying to accommodate specific requests for such things as preferred airline and hotel.

8. Document Task Analysis

- Write/update a document containing Task Scenarios and other descriptions of insights gained from the contextual observations or interviews.
- It might include
  - Purpose and structure of this Document
  - Identification of tasks and users
  - Task scenarios
  - Analysis of current task
    - Task Complexity, Error Rates, Breakdown in the process etc.
- Example: Page 112 in chapter 3, Deborah J.Mayhew

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In this section, we make general observations from our contextual observations/interviews regarding the user tasks being automated, highlighting problem areas, bottlenecks, and opportunities for improvement, where the design of the user interface can have an impact.

Broad range of task complexity: The complexity of the property processing task can vary significantly. One police officer told us she once had to complete twelve separate property forms for a single incident; another time she saw an officer come into the police station with fifteen large bags of narcotics and related materials associated with a single incident, all of which had to be logged on property forms. By contrast, we watched another police officer come in with no prisoners and a single piece of property to process: a spent shell from a handgun. Certain property types, such as automobiles, guns, and cash, always entail quite a few complex forms, while others involve only simple paperwork.

The user interface must keep simple transactions simple but make complex transactions possible.

High degree of interrupts during tasks: The property processing tasks are subject to a high level of interruptions. In the case of the police officer, the source of interruptions may be prisoners, other police officers in the arrest room, other aspects of processing an arrest besides property, or having to leave the arrest room to gather data for the property forms, for example, to check an auto for information that needs to be included on the property form.

Stage 3:

Construct the user task organization model

Construct the user tasks organization model

- In this stage Three steps are involved
  - Identify the basic user tasks
  - Take a first pass at a Current User Task Organization Model of those tasks
  - Obtain a Current user Task Organization Model of those tasks directly from users

Reference

- The Usability Engineering Lifecycle by Deborah J.Mayhew, Chapter 03

End of the Lecture