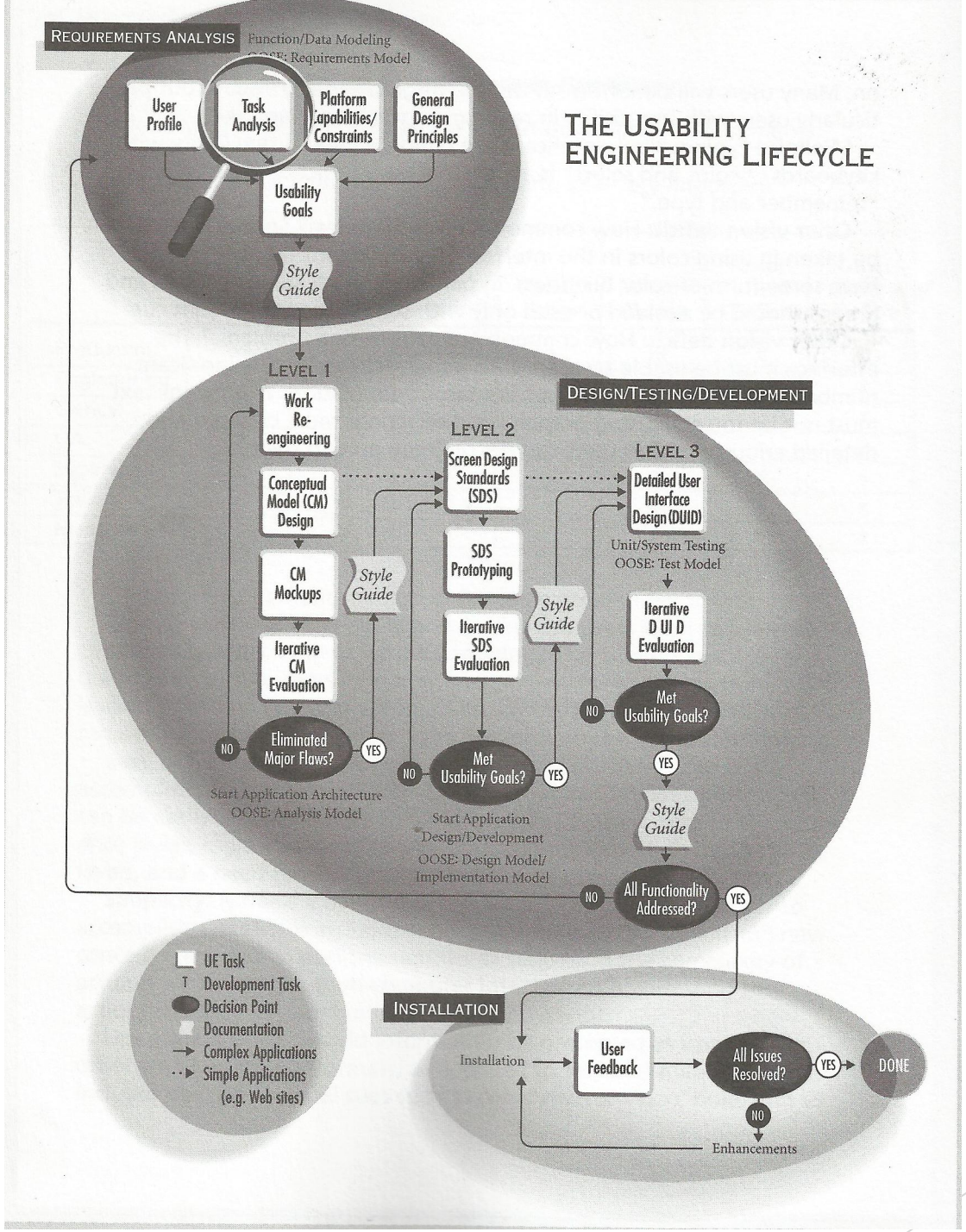
Contextual Task Analysis

A step in Usability Engineering Lifecycle


REQUIREMENTS ANALYSIS
Function/Data Modeling
OOSE: Requirements Model
User Profile
Task Analysis
Platform Capabilities/ Constraints
General Design Principles
Usability Goals
Style Guide
THE USABILITY ENGINEERING LIFECYCLE
DESIGN/TESTING/DEVELOPMENT
LEVEL 1
Work Re-engineering
Conceptual Model (CM) Design
CM Mockups
Iterative CM Evaluation
Style Guide
NO
Eliminated Major Flaws?
YES
Start Application Architecture
OOSE: Analysis Model
LEVEL 2
Screen Design Standards (SDS)
SDS Prototyping
Iterative SDS Evaluation
Style Guide
NO
Met Usability Goals?
YES
Start Application Design/Development
OOSE: Design Model/ Implementation Model
LEVEL 3
Detailed User Interface Design (DUID)
Unit/System Testing
OOSE: Test Model
Iterative D UI D Evaluation
NO
Met Usability Goals?
YES
Style Guide
NO
All Functionality Addressed?
YES
UE Task
Development Task
Decision Point
Documentation
Complex Applications
Simple Applications (e.g. Web sites)
INSTALLATION
Installation
User Feedback
All Issues Resolved?
YES
DONE
NO
Enhancements

Contextual Task Analysis: Task Summary

Task	Purpose	Description	Techniques	Work Products	Integration
Contextual Task Analysis	Obtain a user centered model of work as it is currently performed and extract from this the usability requirements for the product.	Conduct a study of users in their actual work environment performing their real work.	Contextual observations/interviews Other techniques like Affinity diagrams, trajectory mapping, MD scaling, etc.	Work environment analysis Task scenarios Task analysis document Current user work models	Users to study are identified in User Profile. Drives virtually all other tasks except Platform Capabilities/ Constraints.

Contextual Task Analysis

- We start this when we already have a set of functions and features identified and scoped out for automation.
- Hence, specific product has already been identified, defined and scoped.
- The purpose of this task is to obtain user-centered model of work as it is currently performed. How user currently think abut, talk about & do their work in actual work environment.
- Also, to define usability requirements and to point towards ways of meeting those requirements

Traditional Systems Analysis Vs. Contextual Task Analysis

Table 3.1 Traditional systems analysis vs. Contextual Task Analysis

	Traditional Systems Analysis	Contextual Task Analysis
Goal	Input to the design of: software processes and data structures	Input to the design of: the user interface
Output	Function models and data models	Work Environment Analysis, Task Analysis, Task Scenarios, and Current User Task Organization Model
Impacts	Implementation architecture	Reengineered task organization and task sequence models, Conceptual Model Design, Screen Design Standards, and Detailed User Interface Design
Focus	Technical information processing limitations, data characteristics, and implementation architecture considerations	Human information processing limitations, current work, and current user work models
Objects of Analysis	Data and functions	Users, users' work environment, and users' work goals

Basic steps in Contextual Task Analysis

- Gather background information about the work being automated. (Steps 1-4)
- Collect and analyze data from observations of and interviews with users as they do real work in their actual work environment. (Steps 5-8)
- Construct and validate a model of the users' current task organization. (Steps 9-11)

Contextual Task Analysis: Description

- Observe and interview users doing their actual work to understand and discover their work models. Only then can you present a user interface that supports their work models and tasks.(observe instances of actors & instances of usecases)
- Based on an analysis of your direct observations, construct a model that represents the users' point of view; how they think about, talk about and do their work

Contextual Task Analysis: Key principles mapped from the field of ethnography

- Much behavior in the target culture is tacit(cannot be extracted by direct questioning, therefore extended direct observation of the target culture)
- Only a semi-structured approach is possible because no hypotheses at the start(no understanding of what is important in this culture)
- Observe how artifacts in the culture are used to accomplish real goals(do not map on investigator's use of artifacts)
- Do not distort the target culture's language through mechanical translation into investigator's language. Observe and understand how terms are actually used
- The investigator must learn the language of the culture
- No implicit assumptions that might bias interpretation and to test explicit assumptions in a rigorous way

Contextual Task Analysis: Description (Cont'd)

To truly understand the work of a set of users, go to their workplace, learn the user jargon, and observe and talk with a representative set of users of all key types

BUT

Unlike ethnography, ultimately we will be altering the behavior we study in a Contextual Task Analysis

Contextual Task Analysis: Benefits

- Generate ideas for new products
- Identify key features to include in products
- Design the user interface for products that have already been identified and scoped
- Improve the usability of products already in production Contextual Task Analysis

Contextual Task Analysis: Roles and Resources

- **Task Leader:** A Usability Engineer
- **Other resources:** A User Interface Designer and all project team members should participate in all aspects of this task

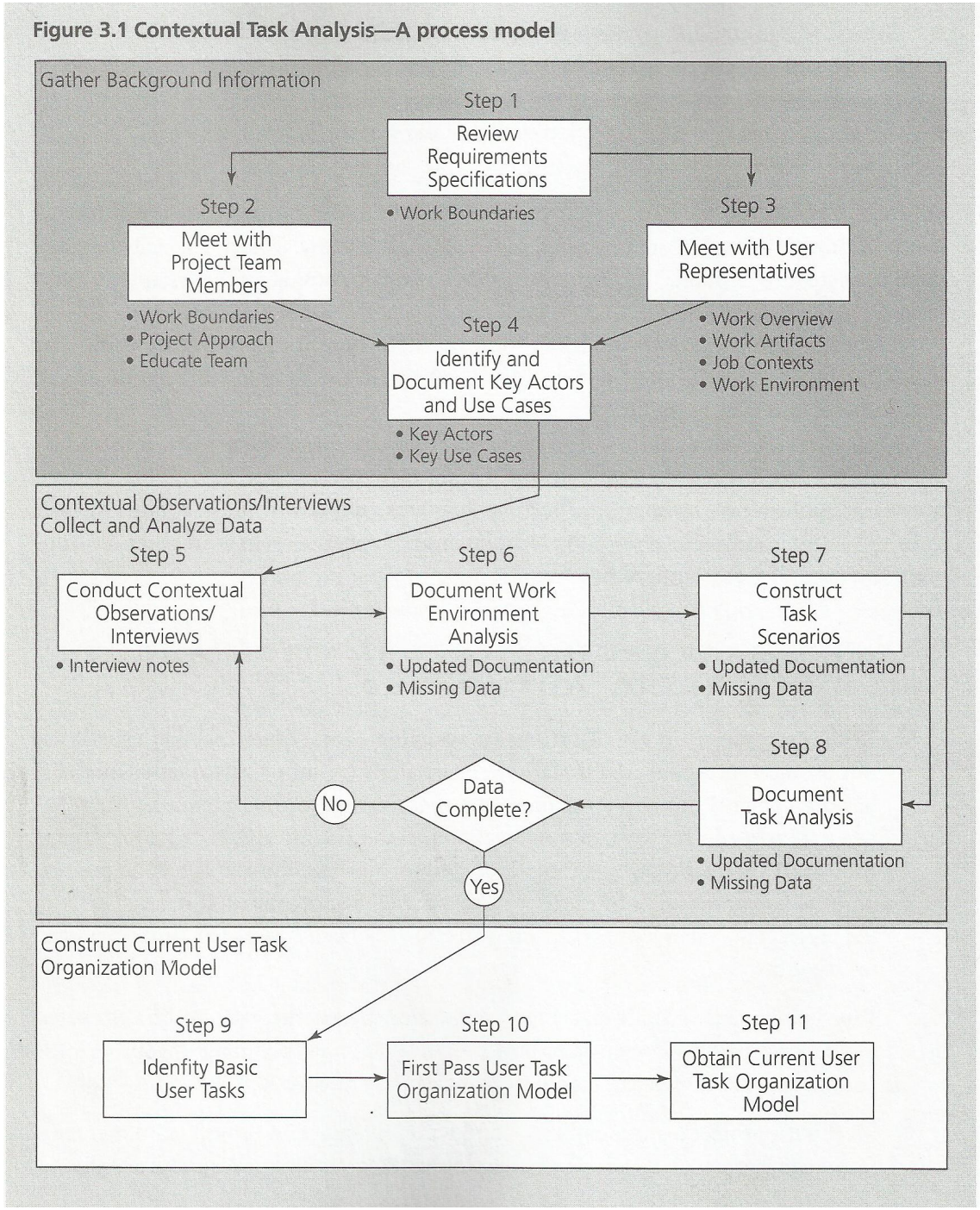
Integration with other tasks

- The User Profile task feeds directly into Contextual Task Analysis by identifying categories of users (Actors) whose tasks must be studied.
- Contextual Task Analysis feeds directly into the Usability Goal Setting task by helping to identify different primary goals for different task types (Use Cases) and by identifying bottlenecks and weaknesses in current work processes that can be improved through good user interface design.
- Contextual Task Analysis feeds directly into the Work Reengineering task. Current user work models are "reengineered" only as much as necessary to exploit the power of automation and contribute to explicit business goals. Current user knowledge and experience are exploited as much as possible to facilitate usability.
- Contextual Task Analysis will be documented in the product Style Guide.
- Ultimately, this task will have a direct impact on all design tasks, the selection of usability testing and evaluation issues, and the design of usability testing materials.

Sample Technique: A step-by-step procedure

- Gather background information about the work being automated. (Steps 1-4)
- Collect and analyze data from observations of and interviews with users as they do real work in their actual work environment. (Steps 5-8)
- Construct and validate a model of the users' current task organization. (Steps 9-11)

Figure 3.1 Contextual Task Analysis—A process model



Steps 1-4: Gather Background Information About the Work Being Automated

- **Review Requirements specification (if available)**

  Get overview of user task to be carried out.

- **Meet with project team members**

  Conduct interview with project teams(managers, developers, analyst etc) to get overview of tasks being automated.

- **Meet with user representatives**

  Conduct interviews with user representatives(user managers, user group leaders, subject matter experts etc.). Combining knowledge acquired from this step with information gained from user profiles provides base for contextual interview.

- **Identify and Document key Actors and Use Cases**

  Pick subset of users(primary actors) & key usecases(performed by primary actors ,focused on main functionality) for contextual task analysis

Step 5: Collect and Analyze Data from Contextual Observations/Interviews

- Conduct contextual observations/interviews
- Your main goals are:
  - 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
    - User's work models
    - Problems, bottlenecks, errors and other opportunities for improvement
  - Learn the user's language (their terminology and jargon)
  - Gather statistics about Use Cases(average time to complete, number and types of errors)
  - Gather data about work environment

Remember Steps 5-8 are iterative

- Do not be perfectionist about the technique or process itself!
- Schedule time periodically to reflect on the process
- Share the “learnings” with the rest of the organization

Step 5: Collect and Analyze Data from Contextual Observations/Interviews (Cont'd)

- Training observers/interviewers
- Selecting users
- Scheduling contextual observations/interviews
- Starting contextual observations/interviews
- Conducting contextual observations/interviews (optimal num of interviewers 2,apprenticeship- user is the master)
- Types of data to capture (how long you have worked at this location? When , Where , how)
- Data capture techniques(notes, copies of work products, video ,audio & pictures)
- Ending the observations/interviews (show appreciation,
- Greasing the wheels(facilitate user involvement, no barriers between team & user, motivate stakeholders, product development partnership, educate users about design process)
- Public relations

Steps 6-8

- Step 6: Document the work environment analysis
  - The physical work environment(open/close work area ,light ,heat & noise levels, distractions & interruptions)
  - The sociocultural work environment(morale, motivation, team work , attitudes towards automation
  - The job contexts(frequency & importance of tasks, physical & sociocultural aspect unique to job.
- Step 7: Construct Task Scenarios (two to five key task scenarios or instances of use cases for each major user. Write abstractly but in user terms, no reference to existing or future computer systems)
- Step 8: Document the Task Analysis
  - Purpose and structure of this Document
  - Identification of Tasks and Users
  - Task Scenarios
  - Analysis of Current Tasks

Steps 9-11: Construct the Current User Task Organizational Model

- Step 9: Identify basic user tasks

  whole team goes through all the collected data and construct a single list of all discrete work tasks that forms user's over all job

  Example of basic user tasks in property tracking in a metropolitan police department:

  1.Enter incoming property from a new incident in property log.

  2.Document property from a new incident on proper forms.

  3.Get station commander's approval in property documentation.

- Step 10: Take a first pass at Current User Task Organizational Model (grouping things together both logically & in terms of work flow)
- Step 11: Obtain a Current User Task Organizational Model (Task sorting exercise , hierarchy of low level tasks,

Reference

- Chapters 3, “The Usability Engineering Lifecycle” by Deborah J. Mayhew