

CUTA:

***A Simple,
Practical,
Low-Cost
Approach to
Task Analysis***

The main goal of a user interface is to support the user's tasks. In order to ensure that a user interface appropriately supports tasks, a designer must understand how people actually work. Task analysis is a method of determining this.

Many task analysis techniques exist, but few are simple to understand and use. Most are based on abstract concepts (such as formulas or diagrams) and require substantial documentation that users will neither read nor understand. Another problem appears to be involving users in the traditional task analysis process.



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Suggested in this article is a simple technique called Collaborative Users' Task Analysis (CUTA). CUTA is based on the work of Muller et al. [4,5,6], who discuss participatory design in task analysis using the Collaborative Analysis of Requirements and Design (CARD) technique.

CUTA Approach

CUTA (from the French *Analyse Collaborative des Tâches des Utilisateurs* (ACTU)), is a collaborative task analysis technique based on activity-oriented cards. It is strongly inspired by CARD, graphic facilitation, [2] storyboarding, and comments from undergraduate students and IS professionals who learned different task analysis techniques such as CARD, graphic facilitation, scenario, and organizational process diagram (OPD).

Because of its nontechnical and concrete aspects, CUTA, like CARD, removes communication obstacles between IS experts and users. In fact, using CUTA requires no specific skills.

Concepts

CUTA is based on cards, each showing a picture of a user performing a specific activity with a specific object (e.g., a man filing a document in a filing cabinet). Each card also has specific areas in which to describe the activity,

its duration, and its frequency. A CUTA user simply fills out the card-like form (Figure 1).

Like CARD, cards in CUTA are color coded to identify activities. Activities are divided into three categories: (1) non-technology driven (e.g., writing a letter with a pen), (2) technology driven (e.g., faxing a memo to someone), and (3) non-object based (e.g., speaking to someone, having a meeting).

Unlike CARD, however, the characters that appear on cards using CUTA are not anonymous: they are identified by gender (two cards—one for a male character, one for a female character—are usually used for each activity) and distinct appearance. As col-

leagues and I have observed in workplaces, using characters on cards permits users to identify themselves with the work that is analyzed. This helps them to more concretely describe the tasks being performed.

Therefore, instead of saying, "The person is looking for a document in the file cabinet," a user says, "Janet is looking for a document in the file cabinet." This method seems to help users more clearly state their work and their relationships with other people.

Cards are tailored to a particular workplace. A card exists for every object and situation encountered in the workplace. Cards describing office activities, for example, would depict a character using a computer, a character looking for someone's address in a Rolodex™, or people involved in a meeting. Categorizing a task domain this way is not new—many people, either instinctively or not, use this method. [7] In CUTA, this is merely intended for creating standard kits of cards.

The procedure for customizing CUTA cards to a particular workplace involves three simple steps:

1. Identify all the objects that are part of the workplace environment (such as photocopier, fax machine, telephone, Rolodex™ and so forth)

2. Associate each object with a character, for instance, a man making a phone call or a woman sending a fax and so forth

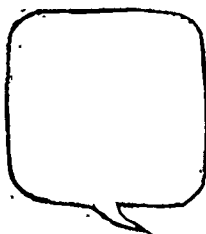



Figure 1.
Sample CUTA Card.

Activity  <p>Sam looks for background reports to write his agenda for the meeting.</p>	
Duration 5 Min.	Frequency 1

3. Identify work situations that do not require an object, such as a casual meeting.

Aside from the cards describing a task domain are what I call "wild cards": a card showing a character looking at his wristwatch (temporal action), or two people attending an informal meeting, or a character thinking.

The thinking character card has proved its efficiency during CUTA sessions: users discovered new activities in their tasks that could not even be documented in procedure manuals. During one CUTA session, a user placed the card with the thinking character into the activity flow of managing business meetings (invitation, attendance, follow-up). Users simply joked about the difficulty to locate meeting rooms in their building and labeled the thinking character card with the description "the participant is lost trying to locate the meeting room." This led the user interface designers to add a map of the building to help participants find their way to the meeting room.

Blank cards are also available to account for unforeseen situations.

Technique

Conducting a CUTA session is quite simple. Form a group of no more than six people with at least three users, one IS analyst (or a IU designer), and one facilitator. Give each participant a set of identical CUTA cards. The goal of the session is for users, collectively, to describe the task flow by ordering the cards on a shared workspace (such as a large table or a wall). Without manipulating the CUTA cards, the role of the IS analyst (or the IU designer) and the facilitator is to ask questions and to help users describe their work.

The facilitator should start the session by explaining the goal (i.e., understanding how users actually work in order to build an appropriate user interface) and the steps involved (see the following paragraphs). Participants should be given a time limit for taking part in the CUTA session: four to five hours is usually enough for a specific work domain (for example, sales representation in a computer retailer company). Telling participants in advance the steps involved and the time limit helps them focus on the job to be done and reassures them

of how long it will take. (Special consideration is given to time since most CUTA sessions are held outside normal work hours.)

A CUTA session involves three steps.

1. Participants pick all the necessary cards, without trying to order them, and put them on the center of a table (a conference table is appropriate). This step is surely one of the most animated since all the participants are picking activity cards simultaneously, telling each other which activity suits each card selected, and filling in the descriptions.

2. Participants place the cards in sequence on the table. To indicate that there is more than one way to do an activity, the cards can be spread out side by side.

3. After grouping the different activity cards for a given task, participants move them to a poster taped to the wall. Post-It™ Tape is useful so that participants can freely move the cards once they are on the poster. Participants then, complete each card, specifying the duration and frequency of the activity. If needed, participants can create custom cards. Finally, participants validate their final analysis by choosing a volunteer (or the facilitator) to read aloud the task flow.

Figure 2 is an example of the final product of a CUTA session.

Discussion

CUTA and CARD offer the same benefits.

- Using CUTA is fun, so people seem to better communicate and interact with each other.

Task: Setting up a meeting- Invitation

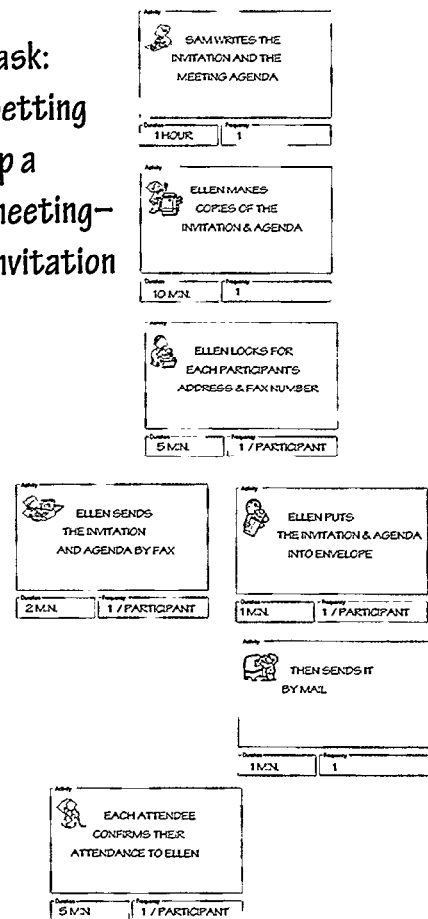


Figure 2.
Task Analysis Using
CUTA

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- CUTA uses concrete representation of objects and tasks, as opposed to abstract diagrams using boxes and circles. In fact, studies have established that the more users work with familiar objects and concepts, the better they will communicate their needs and their way of doing things. [3]
- Like CARD, CUTA addresses task flow analysis through low-tech, card-like artifacts, so the focus is on user actions rather than on computer artifacts.
- Everything the users need to communicate is explicit on the table or the wall, ensuring better communication.
- CUTA encourages new ideas; CUTA session participants referred to the CUTA cards as idea triggers that helped them describe their work.
- People tend to identify with the characters on the cards, allowing them to better explain their role within the task domain.
- CUTA requires almost no preparation or complex technical setup.

- The task analysis is self-documented.
- CUTA is fast and effective. During a CUTA session with sales representatives from a computer retailer company, the group was able to describe all of its activities in one evening between 6:00 and 11:00 p.m. Participants said that they could not have done this in such a short period of time using a conventional approach. Speed is a key factor, especially when dealing with busy professionals.

As with any participatory design approach, it is important for the participants to possess good communication skills and to master their respective work domains.

After completing a CUTA session, you can use any intelligent diagram making software to produce the final version of your work. That format is more suitable than posters with cards taped on them for distribution and storage purposes.

CUTA and Other Task Analysis Techniques

Comparing CUTA with other approaches to task analysis involves two steps: (1) comparing CUTA with traditional approaches to task analysis and, (2) comparing CUTA with similar techniques based on the participation of users and on the use of more concrete formalisms.

Table 1 presents a comparison of task analysis techniques.

Concrete methodologies, combined with a participatory approach, give faster results than any traditional methodology. In fact, for one project, an IS analyst who had tried for two weeks to collect individually the proper information for making a data flow diagram found that more was accomplished in one evening using CUTA.

Comparing CUTA with other concrete techniques, we can say that:

- As opposed to CARD, the characters on the cards represent users and thus are not anonymous: they have gender and different appearances. As colleagues and I have observed in workplaces, having real characters on cards permits users to identify themselves with the work being analyzed.

Comparison of Task Analysis Techniques

Concrete methodologies	Abstract methodologies
User-oriented	System engineer-oriented
CARD	Hierarchic Task Model
CUTA	Data Flow Diagram
Scenarios, (essential) use cases	Organization Processes Diagram
Based on graphic representations (clip art, colors, etc.) and/or on dialogs	Based on IS engineer formalisms (boxes, circles, etc.)
Require minimal training	Require that IS experts and users learn a formalism
Mostly collaborative	Mostly controlled by IS experts
Collective requirement analysis	Individual requirement analysis
Auto-documented	Need lots of written documentation
Represent concrete objects, what people do, think, or wish	Represent tasks with abstract objects
Tasks are described visually	Do not take into account the context of realization

This helps them describe more concretely the tasks being performed.

- CUTA associates each object with a character using it. In fact, this was the first modification made to the CARD technique (in which objects are sometimes not associated with a character). People who learned CARD and worked with it in a real-world context told us that it was difficult for them to link people cards with the appropriate object cards, thus preventing them from properly describing the task flow.
- Using CUTA requires no drawing skills, unlike the storyboarding and graphic facilitation techniques. Cards exist for almost every situation that can be encountered in a specific workplace. Few people have the ability to properly draw objects and persons; users of various pictive approaches have always stated this problem. They find graphical-oriented techniques efficient for communicating with users but also hard to master.

CUTA and User Interface Design

By the concrete nature of its approach, CUTA gives the user interface designer certain guidelines, namely:

- The flow of CUTA cards indicates the order in which menus, menu items, and screen items should appear.
- The activity depicted on a card is usually described in the users' vocabulary, thus providing a sample list of the words they use at work.
- The object being used in an activity may give an idea of the metaphor to create; for instance, having a character using a calendar may indicate the need to implement a calendar metaphor.
- CUTA allows you to determine if the user interface efficiently and effectively supports the users' tasks.

Conclusion

It is not surprising that CUTA, CARD, and other concrete approaches are effective from both the user interface designer's and the user's points of view.

First, these techniques use concrete objects

instead of abstract ones. Second, many cues appear in those diagrams—words, symbols, pictures, colors—facilitating the recognition, comprehension, and memorization of information. Third, CUTA is fun, inexpensive, and easy to understand and use. Fourth, CUTA helps users discover new task perspectives and perform task analysis in much less time than most other conventional approaches.

However, CUTA is more appropriate for collaborative tasks (i.e., involving many participants) than for other kinds of tasks (i.e., involving only one or two people such as in a telephone information service). For these other tasks, I suggest investigating other approaches such as scenarios, use cases, and hierarchic task model [1].

Finally, CUTA is auto-documented: there is not much place for misinterpretation. CUTA may not be as elaborate as other traditional approaches and techniques, but it is one of the most inexpensive ways to perform quality task analysis and to understand how users work. @



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