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FIT on the Top of an Organizer - A New Technique for Multi-Purpose Event Recording

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FIT on the Top of an Organizer
A New Technique for Multi-Purpose Event Recording[1]

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Introduction

One of the most cost consuming tasks in systems analysis is the recording of data. Concerning to work process analysis, the objectives hereby are to observe, identify and register events, for example: tasks, postures, movements, gestures, episodes of communication or co-operation as well as environmental factors. To economise this, handheld computer tools in the size of an electronic organiser can be use for onsite and online observations. For their application the user has to learn by heart the meaning of function keys, menu abbreviations or codes and has to spent an high amount of training time to reach an acceptable flexibility in programming or configuration the whole system for different observation tasks.

To improve this, a new concept has to:
- reduce the gap between the event recorder interface and the observer's mental model,
- provide online flexibility without reprogramming,
- guarantee the ease of adaptability for different applications.

The FIT-System (Flexible Interface Technique) can fulfil these demands and is presented in this paper.

Method

The FIT-System hardware components are a handheld computer device and a template (figure 1).

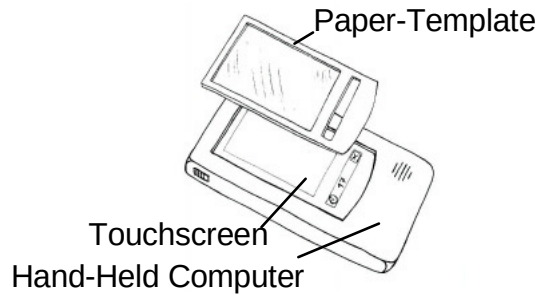

Figure 1: FIT-System components

The template has a paper part, which covers the touch screen of the handheld device. The use of the FIT-System can describe in three steps: *Template design, Event recording* and *Data analysis.*

Demonstration

The observation task are the hand movements of a car driver. His right hand can touch his legs, the steering wheel, the gear-stick, the hand-brake, the radio, the heating or his left arm (figure 2).

Figure 2: Situation to observe the tasks of a car driver

Step 1: *Template design* By using text, symbols, sketches and with the help of colours, the observer can create manual and without computer interactions a drawing on the paper template according to their ideas and representation of the analysis (figure 3).

Figure 3: A template to record the hand movements

[1] *Proc.8th Int. Conference on Human-Computer Interaction* (Munich, Germany, August 22-27, 1999), p.117-118

Step 2: Event recording The observer is sitting in the car, observes the driver and identifies online the events, recording them by typing on the related template symbols. The co-ordinates of the typed point and the actual time code are stored in the handheld device memory. Certain data files can be managed to record different data sets, i.e. different observations, and to transfer these data records later to a personal computer (figure 4).

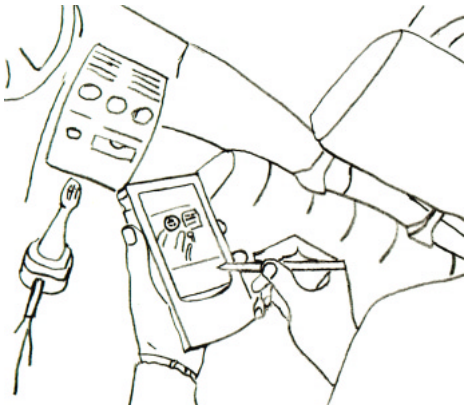

Figure 4: FIT-System event recording in process

Step 3: *Data analysis* Transmitted to the personal computer (PC), the recorded data can be defined according to the template design. Polygons can be drawn with the PC mouse pointer to encircle and define the data points. A Set of polygons is a filter for all recorded data of one template (figure 5).

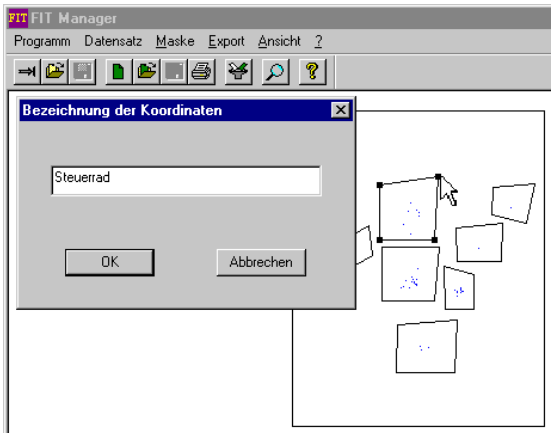

Figure 5: Definition of the recorded data

Result is a table of the defined events and time codes as a basis for a routine in a standard spreadsheet program which offers elementary statistics as well as graphs and diagrams (table 1 and figure 6).

Table 1: Part of assigned event recording data

event	time
Gear-stick	00:00:00
Leg	00:00:19
Steering wheel	00:00:26

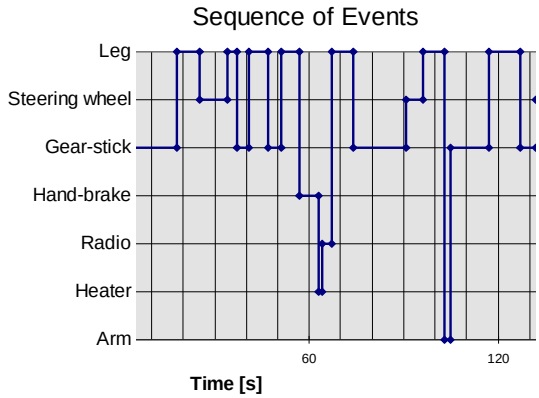

Figure 6: Part of the Diagram: Sequence of events

Conclusion and Discussion

An human factors engineer in one of the FIT-System's usability test conclude: „The FIT-System is easy to use, flexible for different tasks and users and for a lot of different analysis. As it is so small, it can be taken everywhere, it's for working on the move...As the needed final output becomes clearer during the task, one only has to change the template according to the changes of the mental model during the process of data-recording. Using the own mental model is a potential opportunity for using it automatically, blind."

The reasons for the ease of use and flexibility are the separation of the user interface from the handheld device and the latter assignment of the data. The observer can 'fit' his ideas of event recording on his template, to guarantee a short cognitive distance between his mental model and the use of the event recorder. Interface design or redesign can be done even on site on the job, because of the latter assignment of the recorded data sets. Overall the user can spend more attention to the observed situation. Naturally this has a positive impact to the performance not only for single, but also for parallel task recording using the paper-template and pencil technique on top of common and simple handheld organizers (Held and Krueger 1998, Held 1999).

References

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