Vorlesung 14, den 17. Februar 2000

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Donnerstag, den 17. Februar 2000

UNIVERSITÄT DES SAARLANDES

Einführung in die Kognitive Ergonomie

Wintersemester 1999/2000

Methodology

1. A Tool for Analyzing Data from a Usability Lab

Final Review

Demo of ClockPro

Issues Raised by ClockPro

WWW-Seite: http://www.cs.uni-sb.de/users/jameson/eke/

The DRUM Tool for Video Analysis

DRUM Example Screen

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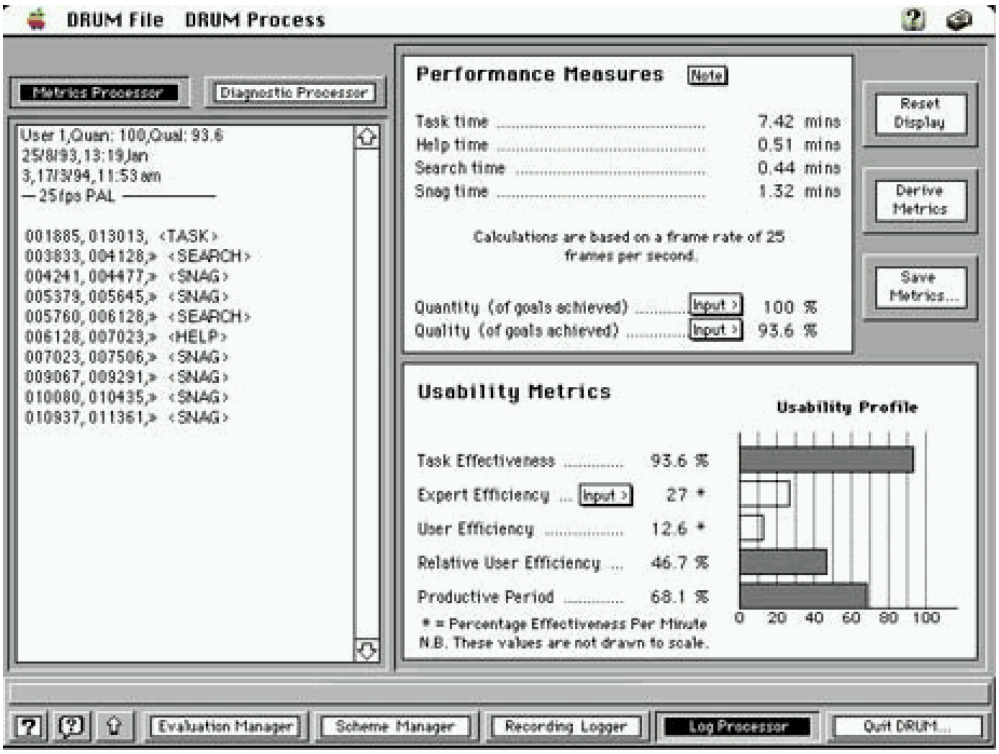

http://prosoma.lu/cgi-bin/show.py?sid=53615&id=2311&page=result

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DRUM Brochure (1)

DRUM - Diagnostic Recorder for Usability Measurement

Usability Services

Information Systems Engineering

- Usability Services
- Techniques for High Integrity
- Scientific Software

DRUM is a software tool which has been developed by close co-operation between Human Factors professionals and software engineers to provide a broad range of support for video-assisted observational studies. It has been in use in commercial organisations since 1992 and has been continuously improved in consultation with NPL's industrial and research clients.

DRUM directly supports the MUSiC Performance Measurement Method for usability evaluation. Evaluation sessions are recorded on video and subsequently analysed with the help of DRUM.

DRUM's role

DRUM provides support for the usability analyst throughout the process of observation-based usability evaluation. DRUM assists in many aspects of the analyst' s work:

- management of data
- task analysis
- video control
- analysis of data

DRUM greatly speeds up the analysis of video recordings and automates some activities entirely, helps the analyst build up a time-stamped log of each evaluation session, and calculates performance measures and metrics.

DRUM delivers evaluation data in a format compatible with spreadsheets and statistical packages, for further analysis and graphical display.

DRUM also assists the generation and delivery of diagnostic feedback concerning usability defects to a product' s designers.

Organising evaluations

The DRUM Evaluation Manager makes it easy to organise data from all stages of usability evaluation. It gives you quick and simple access to evaluation data about:

- users – the people being observed in an evaluation
- tasks – analytic schemes describing the tasks which users perform
- video recordings of evaluation sessions
- logs of user and system activities, created by DRUM
- measures – derived from analysing logged task performance (times, problems, etc.)
- usability metrics – calculated values for individual users and groups
- reports of evaluation findings

DRUM uses text files for data storage, allowing flexible compatibility with word processors, spreadsheets and statistics packages.

DRUM Brochure (2)

Identifying significant events

You may wish to look out for many different kinds of event when studying a video record of an evaluation session. DRUM provides a basic set of event types to support the Performance Measurement Method. With the DRUM Scheme Manager you can define your own event types, and describe the tasks to be performed by users at up to five levels of detail. Each activity is represented on screen as an event button, with associated editable definition and comments.

Analysing video records

The DRUM Recording Logger helps you to build up a time-stamped log marking all the significant events observed on a video. Events are logged with respect to a timecode recorded on the videotape, enabling reliable and efficient access to any part of the video recording at any time. You can add comments to individual logged events.

DRUM gives fully responsive and error-preventative remote-control of the video recorder. As well as the usual video controls, DRUM includes a variable-speed shuttle, and offers automated location and playback of any logged event on the video.

Deriving measures and metrics

The DRUM Log Processor provides automated calculation from any log in the DRUM database of performance measures and performance-based usability metrics, including:

- task time
- snag, help and search times
- effectiveness
- efficiency
- relative efficiency
- productive period

Measures and metrics are presented in tabular and graphical displays. Results for individual users can be grouped, and exported to a spreadsheet or statistics package for further analysis.

Processing analyst-defined events

The DRUM Diagnostic Processor enables you to select any combination of events to generate tables of counts and durations, or comments. The selection mechanism offers great flexibility – allowing events to be selected by type or by time. In addition, any selected subset of the log can be saved as a new log for further processing. Selection templates allow you to define selection criteria to be applied quickly on subsequent logs.

Usability of DRUM

DRUM has an easy to learn graphical user interface, a constantly accessible on-line help system offering context-sensitive and general help, and comprehensive documentation.

What you need to run DRUM – technical information

DRUM requires:

- Apple Macintosh running System 7 or 8
- At least 640 x 480 pixel monitor
- HyperCard 2.1 (or later), allocated at least 2.5 MB RAM

DRUM can at present drive the following video recorders:

- Sony U-Matic VO 7000 and 9000 series, with BKU 701 computer interface
- Sony UVW 1400 series
- Panasonic AG-7350 or AG-7355 with AG-IA232TC adaptor

Other products and services

Additional information leaflets are available for the following:

- Usability Engineering Services
- Usability Services Training Courses
- Usability Context Analysis
- Usability Benefits
- Usability Laboratory Facilities
- Regulations, Standards and Quality
- MUSiC Tools and Methods
- SUMI – Software Usability Measurement Inventory

Usability Services
National Physical Laboratory
Teddington, Middlesex
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TW11 0LW

Tel: 0181-943 7019
Fax: 0181-977 7091
E-mail: usability@npl.co.uk
http://www.npl.co.uk/npl/sections/us/

NPL Helpline 0181-943 6880
Helpline fax 0181-943 6458

Introduction to ClockPro

Overall Design (1)

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ClockPro has three independent pages: Clock, Timer and Alarm.

You can switch these pages by tapping the tabs.

Each independent page can be configured in the Options menu and by tapping icons and digits on the screen.

Tap icons and small digits to show/hide them.

What is displayed on the big digits?

It is your system time on Clock page, last timer lap on Timer page and time to alarm on Alarm page.

Overall Design (2)

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Can I turn off these frames and outlines?

Sure. They are here to help you locate the inactive icons and digits. If you do not like them, go to Options / General menu and choose "none" or "icons" in Outline controls list.

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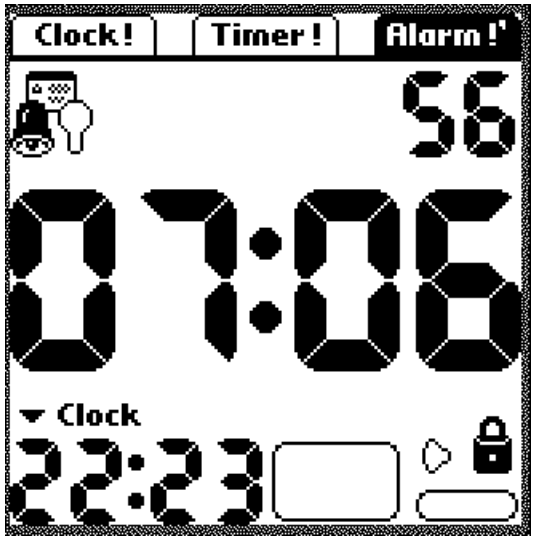
Alarm Page (1)

Why are the numbers on Alarm page counting backwards?

The big digits on Alarm page show how much time until alarm goes off.

In ClockPro, the alarm is set to some time ('Set Alarm to' rectangle in Alarm settings) even if you do not have any notification on (sound, info screen, backlight).

This allows you to see how much time left you have until meeting, how much more your flight will last etc. without the need to hear the sound when the alarm goes off.



Alarm Page (2)

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What are the three upper left hand icons?

They control the notification for each page. ... On the Alarm page they determine what happens when alarm comes off.

There are three types of notification:

Bell icon: Sound notification. You can choose what sound you want to hear ....

(Light bulb icon: Backlight blinking....).

(Screen icon: Screen with written information ....)

Other icons

Speaker: Turns on audible ticking (once every second) for each page.

Lock: Disables auto-off while in ClockPro

(Auto-off: The device turns itself off automatically after a certain interval)

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Setting the Alarm (1)

Double tap the Alarm tab to get to alarm setting dialog.

Choose a time format.

HH:MM ss: Big digits on main screen show hours and minutes, small digits show seconds (can be hidden)

MM:SS hh: Big digits on main screen show minutes and seconds, small digits show hours (can be hidden)

Setting the Alarm (2)

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Then tap the 'Set Alarm to' rectangle and set the desired time.

Tap upper or lower part of each digit to increase or decrease its value.

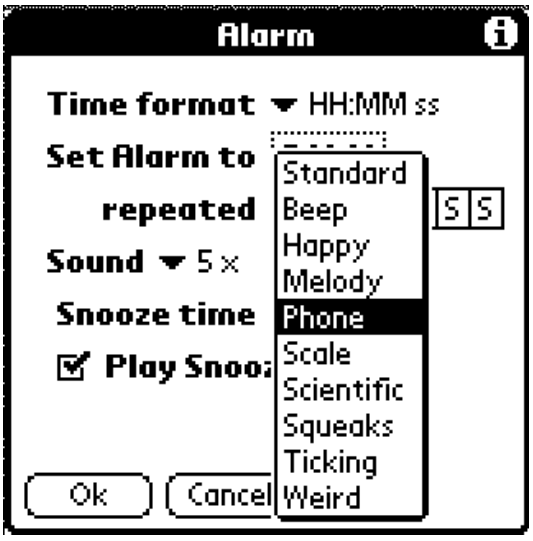
Choose the days of the week on the 'repeated' bar.

The alarm will only go off on the selected days

317 Setting the Alarm (3)

Sound: Choose a sound and set how many times you want the sound to be repeated. You can stop any playing sound/light and snooze or discard an alarm by pressing the hardware buttons.

To turn alarm sound / light / screen on or off you have to choose the appropriate icons on the main Alarm screen.



Setting the Alarm (4) 318

Snooze time: Set a time period for snooze. If you do not press any button during the alarm sound, the alarm will be snoozed automatically.

Setting the snooze time to zero will disable the auto snooze feature. You can also snooze by pressing PageUp/Down hardware button or you can discard an alarm by pressing one of the 4 application hardware buttons.

Play Snooze sound: Check this box if you want to hear the confirmation sound whenever the alarm is snoozed automatically or manually by pressing the PageUp/Down buttons.

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Setting the Alarm (5)

Press ’Ok’ button and check out you have the bell icon active on Alarm page.

Auto preset: To prevent forgetting to turn on some way of chime/ timer/alarm notification choose what you want to preset automatically whenever you change any chime/timer/alarm related settings.

When the Alarm Goes Off

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How do I shut off the sounds?

Just press any hardware button (PageUp/Down or 4 application buttons) while the sound is playing.

If the sound playing is produced by Alarm (not by Clock chiming or Timer expiration) you can choose whether you want to shut off the sound and snooze the alarm at the same time (then press PageUp/Down buttons) or whether you just want to shut off the alarm without snooze (then press one of the 4 application buttons).

Comments by ClockPro's Designer

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Setting the Alarm

Using previous experience?

$\mathcal{U}$ needs to learn what steps to perform when setting an alarm

I would hope that $\mathcal{U}$'s experience in setting normal alarm clocks would help here

Method for setting time

I'm quite proud of my method for changing the digits while setting the alarm (by simply tapping on the top or bottom of a digit)

Almost all other systems have more complex methods for setting a time

E.g., you select a digit and then push on an upward or downward arrow icon to increase or decrease it

I frankly think that every system should adopt my method instead of other pen input methods like these

Of course, one could also consider completely different methods for inputing the time information

Errors (1)

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Specific known error

One user $\mathcal{U}$ told me about the following error that he made while setting an alarm

It was Monday evening, and he had already used the alarm page on Monday afternoon; so Monday was selected on the "Repeated" bar

$\mathcal{U}$ set an alarm for Tuesday morning, 5:20 am

He forgot to check Tuesday instead of Monday on the "Repeated" bar

So the alarm was actually set to go off at 5:20 am the next Monday, so $\mathcal{U}$ overslept

Of course I'd like to improve the design to prevent this type of error

Note that $\mathcal{S}$ already gives a warning if an alarm is set but *no* day has been selected

But $\mathcal{S}$ can't give a warning if the wrong day is selected, since $\mathcal{S}$ can't know which day $\mathcal{U}$ intends the alarm to go off on

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Errors (2)

Overlooking the snooze sound?

When the alarm has gone off, it may be important that $\mathcal{U}$ notice whether the alarm will be snoozed (i.e., be repeated after a few minutes)

That's why I added the special "snooze" sound, which is heard when after the alarm has gone off (if the alarm will be snoozed)

But I wonder what happens if $\mathcal{U}$ isn't specifically listening to hear if the snooze sound will appear

Other possible errors?

I also wonder if there are any other types of error that users might tend to make, which I could prevent with a better design

Automatic Processing; Real Alarm Clocks 324

Automatic processing

I hope that $\mathcal{U}$'s processing with ClockPro can become *automatic* after $\mathcal{U}$ has gained experience with the system

I wonder what parts of the operation of $\mathcal{S}$ are likely to become automatic

More like a real alarm clock?

Some people have asked why I didn't make ClockPro look and work more like a normal physical alarm clock (for example, the digital ones that a lot of people are familiar with)

I never really tried to imitate a normal clock

Should I try to do so more in the next version?

325 Taking Human Limitations Into Account

Visual perception

I think I've done a good job of taking into account the limitations of human visual perception

For example, even people who normally wear glasses say they can read the big digits when they wake up in the middle of the night to check the time

I don't think that ClockPro needs any improvement in this respect

Working memory

Also, I've tried to minimize the burden on $\mathcal{U}$'s working memory

But I wonder if I could do an even better job at this

Screen Design and Direct Manipulation 326

Screen design

In both the main pages and the alarm-setting screen, I've tried to observe the basic principles of good screen design

Frankly, I think I've done pretty well, and I wouldn't know what to improve

Direct manipulation

I tried to make ClockPro a *direct manipulation* system in every respect

I wonder if I could go even further in this direction