

Sæt jer ret tæt på af hensyn til dialogen



- xx

Brugerfladernes historie: Fra perifere til ikoniske

Anker Helms Jørgensen

Tidl. IT-Universitetet i København

Forord



- Gentagelse 2007?
- Nej: Om at bedrive computerhistorie
- I dag: Historien foldet ud trinvis plus en tolkning
- Anker: Grønskolling på 69 år – koge sig
- I vil komme til at deltage

Del 1: Opvarmning

World Usability Day 2009

*Snippets of
User Interface History*

Quiz

Del 2

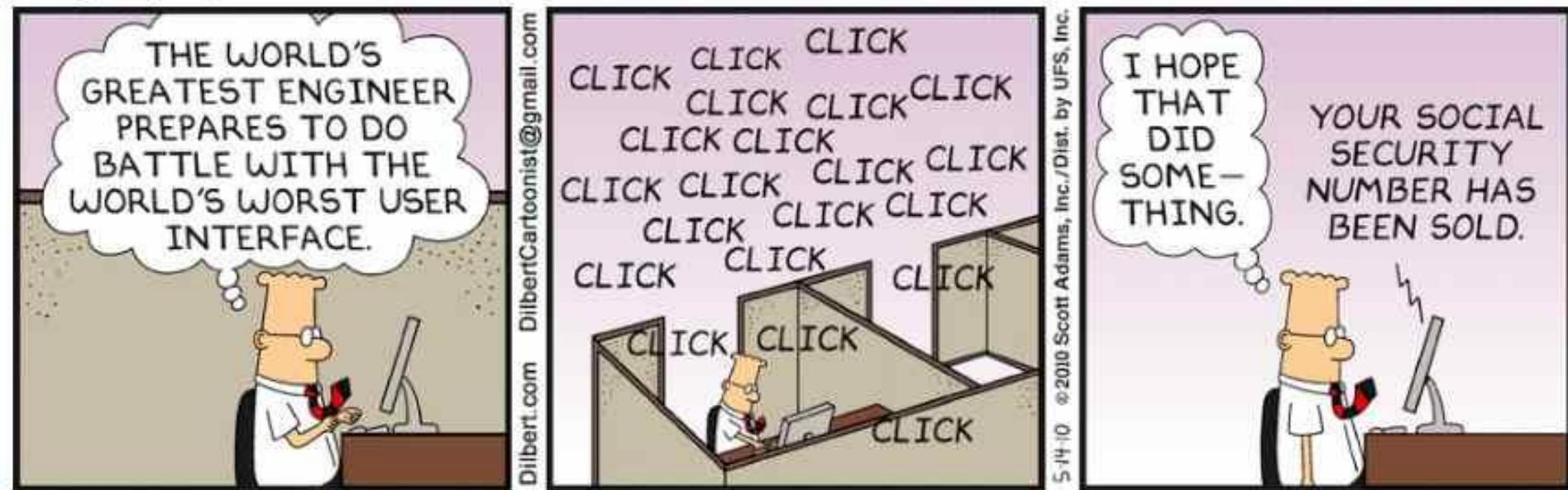
Indledning

Brugerflader: fra perifere til ikoniske

- UX professionen og UX organisationer
 - Jobannoncer
 - Forskning i brugerflader indenfor
 - HCI
 - kulturvidenskab
 - medievidenskab
 - Websites med weird UIs
 - Bøger om UI & Web bloopers
 - Retssager
 - Patenter
 - Reklamer
 - Tegneserier og vittighedstegninger
- Kan man sige, at
brugerfladen er
etableret som et
generelt fænomen
og begreb ?

Intermezzo

Friday May 14, 2010



Formål, tilgang og forløb

- At give jer et indtryk af brugerfladernes historie
- Form
 - Dialog, snak, spørgsmål - cold call
 - Løbende opsamling af pointer
 - Italesætte brud og de lange linier
- Afgrænsning
 - 70 år til 1.5 time
 - Ikke store brugerfladers eller store koryfæers historie, men hvilke facetter, der har været i spil undervejs
 - Fravalg
 - As we may think (Bush 1945)
 - SAGE, PDP 11, IBM 3270
 - Hypercard
 - Xerox Alto, Star, Lisa, Mac, Next

Seks dele

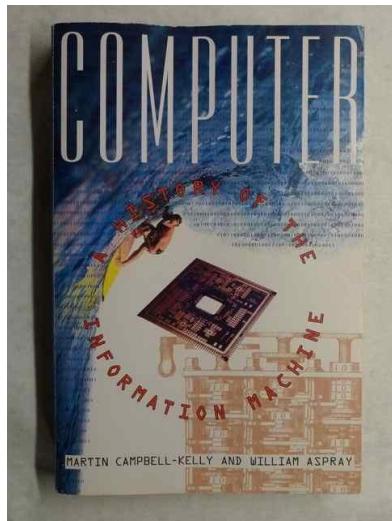
1. Opvarmning
2. Indledning
3. Baggrund og afsæt
4. Nedslag
 - Knapper og kontakter
 - Hulkort - batch
 - Kommandoer
 - Menuer
 - Grafiske brugerflader
 - Web
 - Mobile enheder
5. Er det blevet bedre ?
6. Afrunding

Computerhistorikere om computere og brugerflader

- Om de store navne
 - Doug Engelbart
 - JCR Licklider
 - Ivan Sutherland
 - Vannevar Bush
 - Alan Kay
 - Steve Jobs



Computerhistorikere om brugerflader: Ikke meget



Integrated circuits, 222, 224–27

Intel, 255, 278, 279

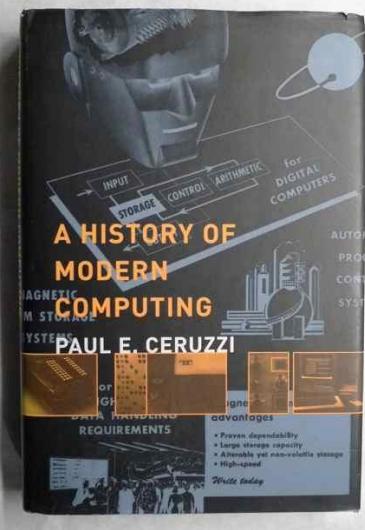
International Chamber

International Comput

USE, 193

Usenet newsgroups, 283, 294–95. *See also Newsgroups*

U.S. House of Representatives, 20. *See also Congress*



Interface Manager, graphical interface, 276. *See also Microsoft Corporation, Windows*

Interface message p

291. *See also Hon*

Internal Revenue S

URL (uniform resource locator), 302

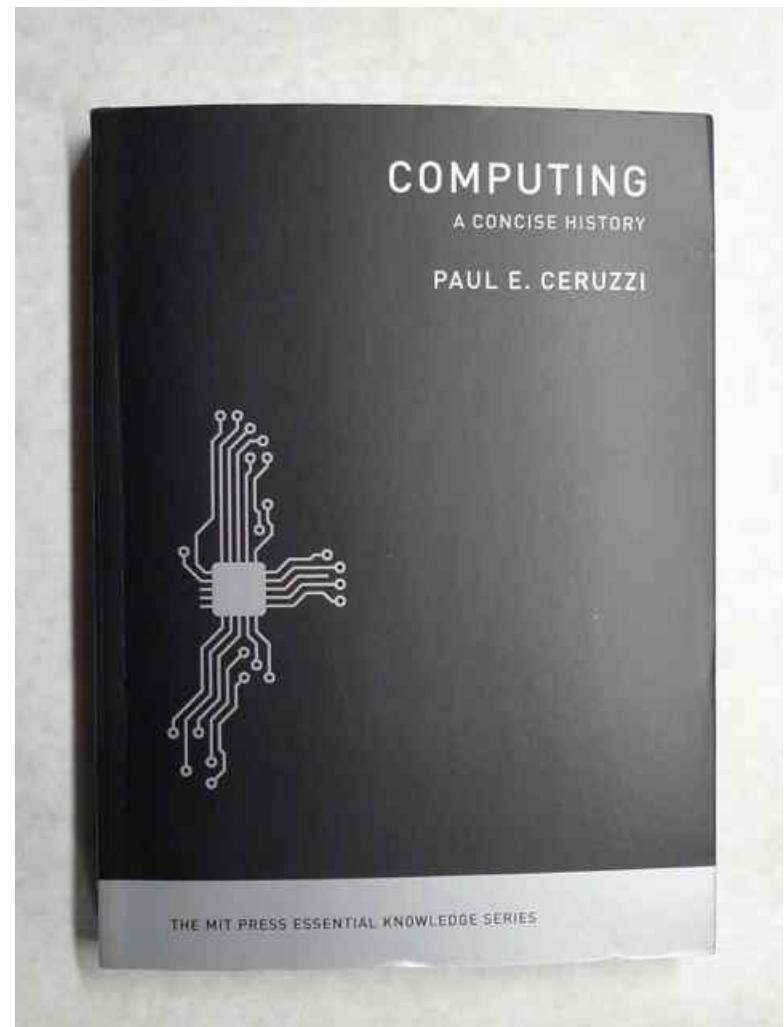
Usenet, 298–299

User groups, 88, 215–216, 230, 264

U.S.S.R., computer developments in,

Computerhistorikere om brugerflader

- *Computing: A concise History*
(Ceruzzi, 2012):
Fire vigtige ”tråde” i
computerudviklingen
 - digitization
 - convergence
 - solid-state electronics
 - human-machine interface



En sammenligning

- Sammenlign en bil fra 1953 med bil fra 2015
- Tidsmaskine – genkende ?

Bil

1953



2015



En sammenligning

- Sammenlign en bil fra 1953 med bil fra 2015
- Tidsmaskine – genkende ?

1953

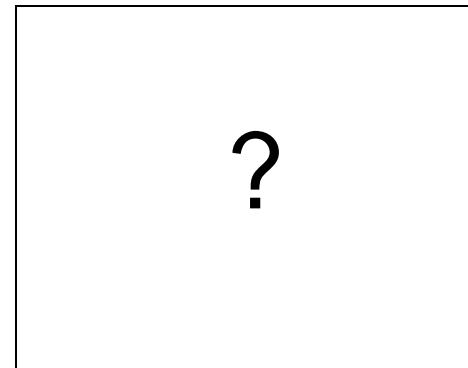


Bil

2015



Com-
puter



Case: Terminologi

- Input / output devices
- Input / output organs
- On-line
- Interaktive systemer
- Dialogsystemer
- Conversational computers
- Time-sharing
- Man-computer information transfer
- Man-computer communication
- Man-computer symbiosis
- Man-computer problem solving

Idag: Interaktion

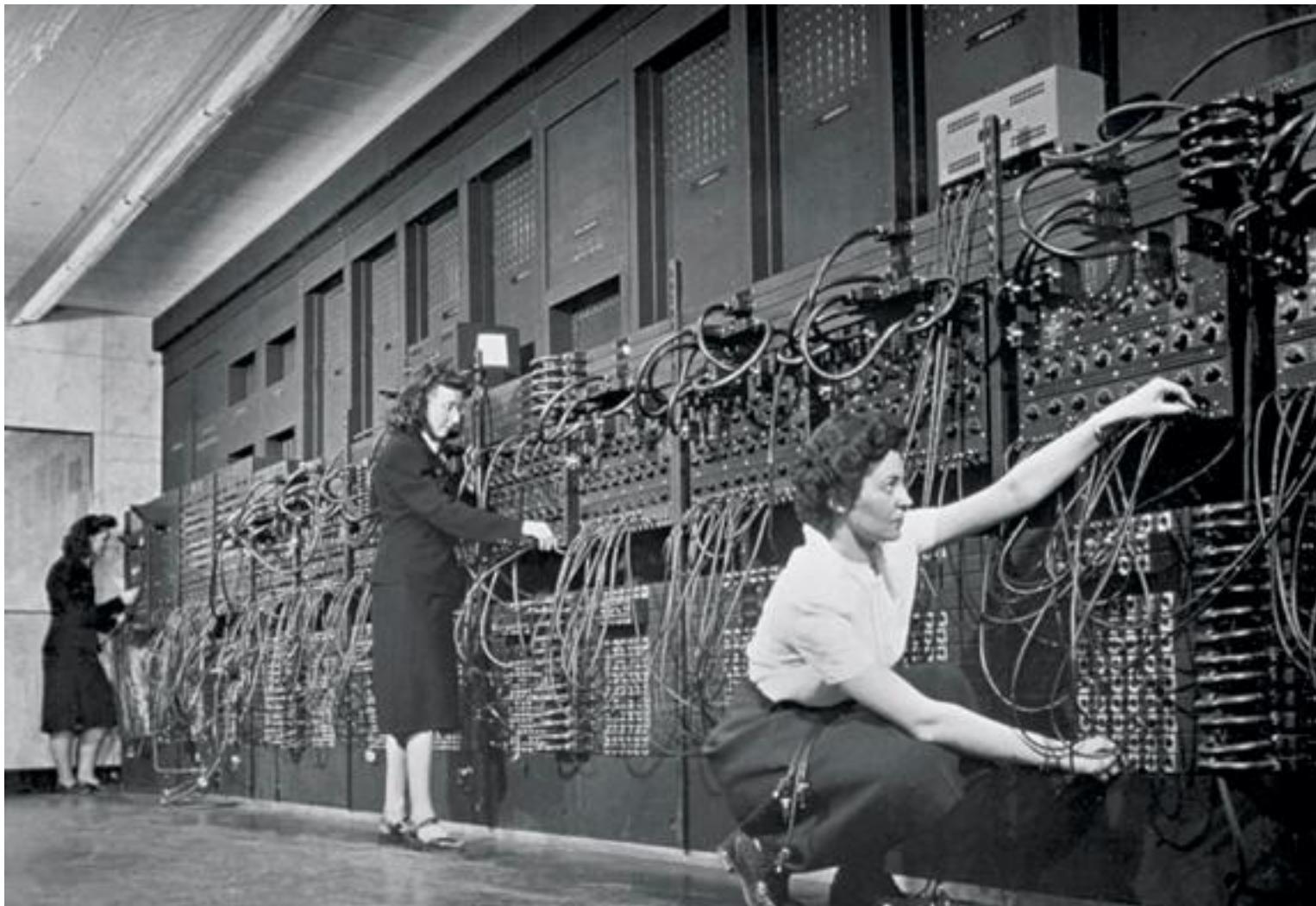
-
1. Opvarmning
 2. Indledning
 3. Baggrund og afsæt
 4. Nedslag
 - Knapper og kontakter
 - Hulkort - batch
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 5. Er det blevet bedre
 6. Afrunding

Nedslag

- Knapper og kontakter
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- Grafiske brugerflader
- Web
- Mobile enheder



Knapper og kontakter



Programmering af ENIAC

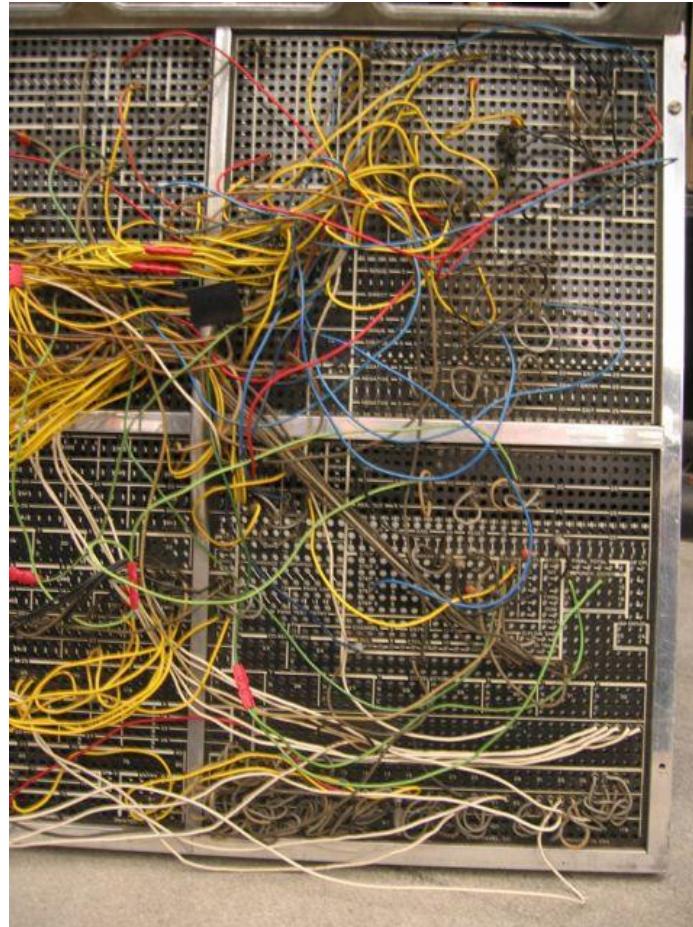
Jean Bartik

"There were no manuals for programming the ENIAC, which included 17,468 vacuum tubes, occupied more than 680 square feet (63 m^2), and weighed 30 tonnes. Bartik and her colleagues pored over its logical and electrical block diagrams."

"Ultimately the women figured out how to set ENIAC's 3000 switches and hundreds of connection cables."

Comm. ACM, 52, 1, Jan 2009, 17.

Case: Plugboard Programming (1958)



Computer ergonomi (Shackel 1959, 1962)

On the prototype, there is no integrated warning system but a number of red lamps on various panels, some of which light to indicate the need for attention to a

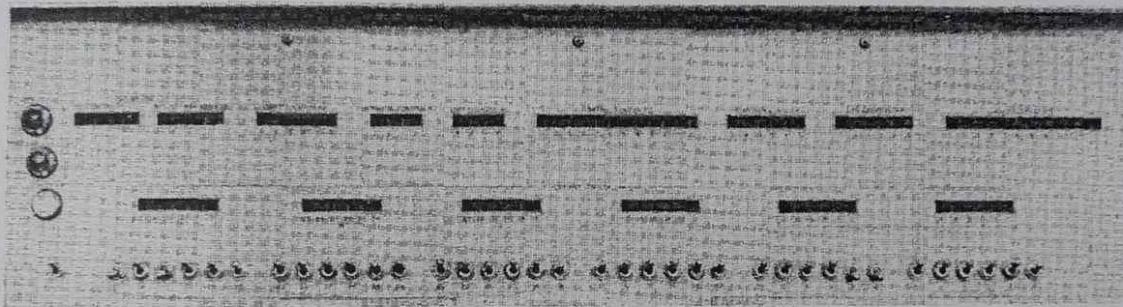


Figure 6 a. Manual input switches, highway and store indicators on prototype

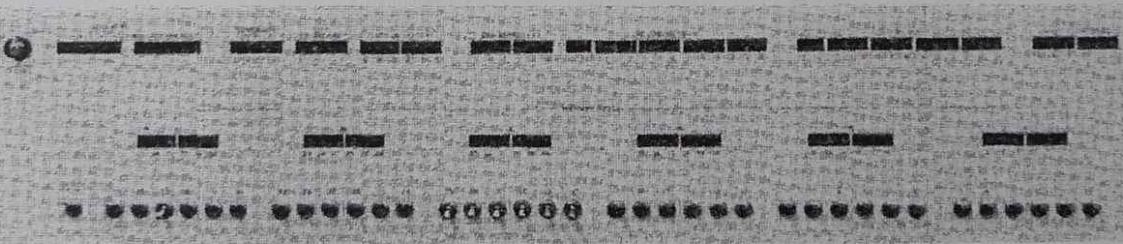


Figure 6 b. Manual input switches, highway and store indicators on 2400.

minor detail sometime within the next five or ten min., and some of which indicate t

1962 Attn 108

Ergonomics, 5, 1, 229-246, 1962.

ERGONOMICS IN THE DESIGN OF A LARGE DIGITAL COMPUTER CONSOLE
By B. SHACKEL
Psychological Research Laboratory
E.M.I. Electronics Ltd., Hayes, Middlesex, England

§ 1. INTRODUCTION

This work of a Psychological Research Team in the Design Group in a large industrial electronics organisation has many facets. As part of the human factors design work, one major project in recent years has involved joining the design team of a general-purpose, digital computer named the EMI DECO 2400. This machine is understood to be the largest electronic computer as present in daily use in Europe. Models are also to be delivered to the British Post Office, the Royal Meteorological Service and National Insurance, and others are being manufactured. Similar human factors work on a computer has been done by Owings (1958), and it is understood to occur at IBM, but no such reports have been published in the literature.

This study was part of the re-design stage for a production series of machines after a first engineering prototype had been designed. The re-design started on 20 September 1960, and had been completed in three months by 31 December. The results are only now visible in a single printed form some six months later, and this is the typical time-scale for complex engineering systems. The scheduling of a prototype followed by a re-design stage was compelled by the engineering complexity, and the reason justified in this instance the human factors work being delayed to this late stage.

In broad outline a digital computer consists of a large data storage or 'memory' section, which contains all the permanent data required for its operation; a control section to control the work to be done; an arithmetic section which does the mathematical operations; a control section to interconnect the various sections as required and to implement the programmed work; and input and output devices to feed in data and feed out results. All these sections are very largely automatic; they will receive a sequence of instructions, and the operator need only see to that of a microsecond; he has to see that the machine is fed correctly with all the required data at the right times, to watch over the life of the machine at work, to prevent it getting into an error state if something goes wrong, and to cure minor ills and call in the specialist to deal with them. As with most man-machine machines, which provide all the required speed as part of their design, not speed but accuracy is the important requirement of the operator at his tasks.

More precisely, it should be emphasised that a general purpose, digital computer does not have one fixed sequence of operation by a multitude of sub-routines and many different functional modes; also, its operating is very largely controlled by the pre-written programme in one of the memory units. The details is, therefore, a complicated multi-stage and considerable man-machine control situation for each time they are required, accompanied by some diagnostic and fault-finding sections. In the absence of a fixed sequence of operation, the components and panels within the console cannot be aligned in a comprehensive sequential layout, and only certain individual panels and sub-units will ever come into play during a particular operating sequence. Therefore, the correct design philosophy must be to present the displays and controls in clear layouts, grouping together those associated in some way, and to locate them and the panels by criteria of relative importance and frequency of use.

The operator's task in the console, therefore, after a general indoctrination, to learn and list the functions of all the various panels and components, and the information to be transmitted between man and machine through them, together with any relevant operating sub-routines. From this information, an order of importance and a frequency of use could be assessed and the ease or difficulty for the man in searching for, acquiring, and transmitting test information to the machine.

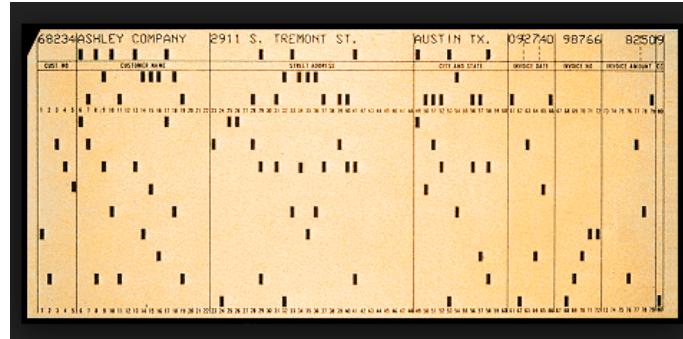
Knapper og kontakter

Hvad kan vi sige om denne form for brugerflade?



Nedslag

- Knapper og kontakter
- Hulkort - batch
- Kommandoer
- Menuer
- Grafiske brugerflader
- Web
- Mobile enheder



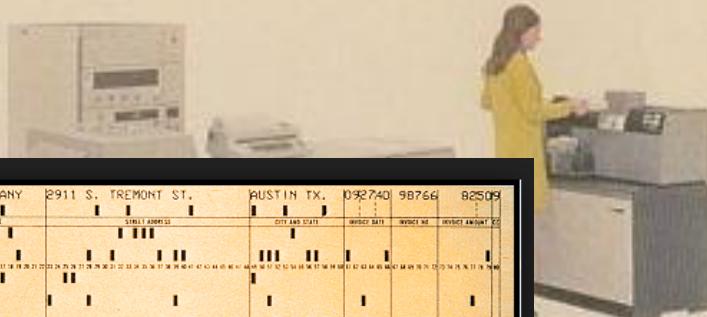
Hulkort – batch IBM 7094 1965



Intermezzo: Reklame

IBM System/3 enhanced with links to larger systems.

New product enhancements greatly increase the input and output capabilities of the IBM System/3 and make possible a broad interchange of data with other systems, including System/370 and System/360. Language enhancements include ANS COBOL for the System/3 Model 10 and FORTRAN IV for Models 6 and 10.

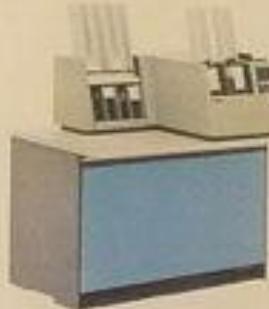


68234 ASHLEY COMPANY	2911 S. TREMONT ST.	RUSTIN TX, 78740	98766	82509
CUST. #	CUSTOMER NAME	STREET ADDRESS	CITY AND STATE	INVOICE DATE
				INVOICE NO. INVOICE AMOUNT

be used in conjunction with
any System/3 through the
communications adapter (DACA).



The 3250 Information Display Station can be attached to the System/3 Model 10 for local and remote inquiry and data entry. It has two levels of storage, which can be exchanged and subsequently loaded by either system.



The 3240 Magnetic Disk Subsystem makes the 36-column tape used in the System/3 also usable with System/32 and System/36.



The 3242 Card Read/Punch allows the use of the familiar 1600 card in place of the 36-column tape in System/3 Model 10 disk drives.



The 3246 Magnetic Tape Subsystem has been redesigned for use with System/3200 and System/360 as well as for System/3 Model 10, thus providing the Model 10 for the best combination of speed, economy and storage capacity of tape.

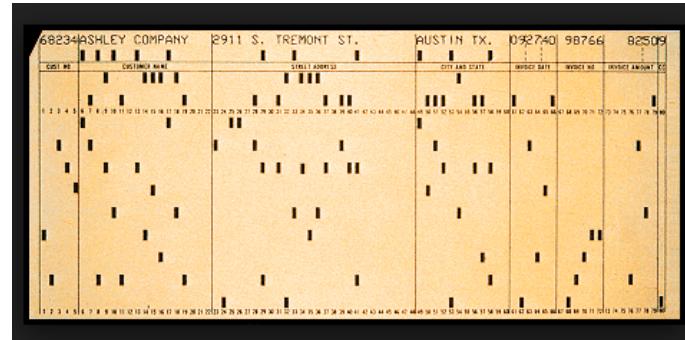


The 3248 Card Data Reader makes the 36-column tape used with System/3 Model 10.

IBM

Hulkort - batch

Hvad kan vi sige om denne form for brugerflade?



Nedslag

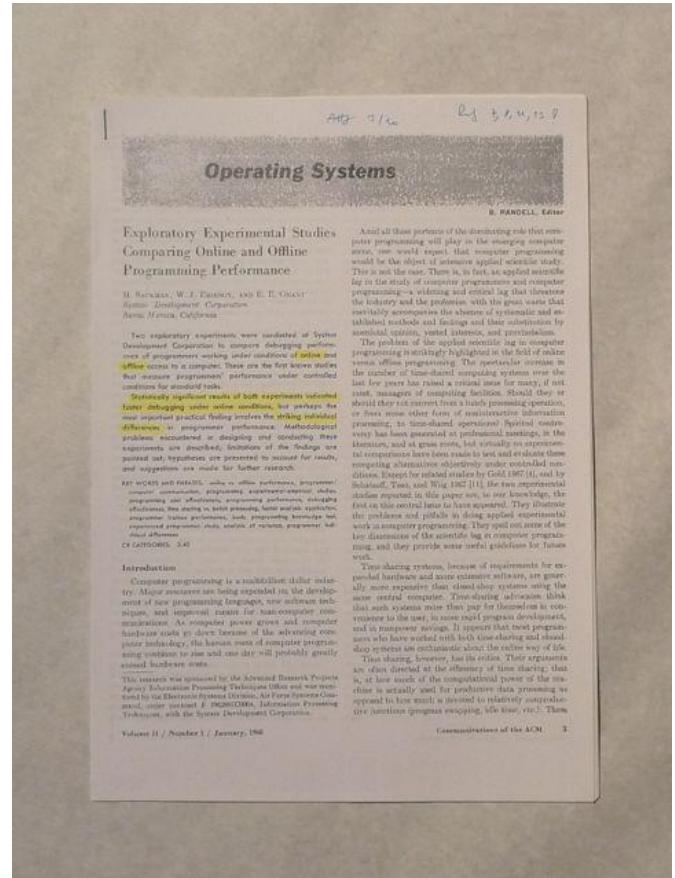
- Knapper og kontakter
- Hulkort - batch
- Kommandoer
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- Mobile enheder

```
C:\>dir
Directory of C:\.

.
..
0 File(s)          0 Bytes.
2 Dir(s)        110,540,800 Bytes free.
```

Batch vs. on-line (Sackman1968)

- Programmer debugging performance batch (off-line) vs online TTY
- Hvad fandt han?



Batch vs. on-line (Sackman1968)

- Han fandt at on-line var bedst
- Han fandt at *individuelle* forskelle var langt større:
10 gange, fra 5 til 28 gange



Art. 71/20
Vol. 5, No. 12, P.

Operating Systems

B. MANSELL, Editor

Exploratory Experimental Studies Comparing Online and Offline Programming Performance

M. SACKMAN, W. J. FORDON, AND E. E. GRANT
*Systems Development Corporation,
Santa Monica, California*

This exploratory experiment was conducted by Systems Development Corporation to compare debugging performance of programmers working under conditions of *online* and *offline* access to a computer. These are the first known studies ever made comparing programming performance under controlled conditions for modified tasks.

Statistically significant results of both experiments validate the hypothesis that online programming requires the striking related differences in programmer performance. Methodological problems encountered in designing and conducting these experiments are discussed, and some recommendations are pointed out. Hypotheses are presented to account for results, and suggestions are made for further research.

KEY WORDS AND PHRASES: online vs. offline performance, programmer performance, computer programming, time sharing, time sharing systems, time sharing vs. batch processing, time analysis, application programs, computer system design, computer system evaluation, experimental programming study, analysis of variance, programmer utilization.

(C) 1968, 240

Introduction

Computer programming is a multidiscipline effort. Innumerable resources are being expended on the development of new programming languages, new software techniques, and improved means for man-computer communication. As computer power grows and resources become more plentiful, the need for more efficient computer technology, the human costs of computer programming continue to rise, and one day will probably greatly exceed hardware.

This work was sponsored by the Advanced Research Projects Agency, Information Processing Technology Office and was monitored by the Electronic Systems Division, Air Force Systems Command, Wright-Patterson Air Force Base, Ohio, Contract AF33(65)-12000, Presorting Techniques, with the Systems Development Corporation.

Communications of the ACM 3

All those portions of the distinction rule that concern programming will play in the emerging computer era, one would expect that computer programming will be no different from other scientific disciplines. This is not the case. There is, in fact, an applied scientific lag in the study of computer programmes and computer programming—lagging and critical lag that threatens the validity of the present results. The reason is that until recently no one has raised a critical issue for many, if not most, managers of computing facilities. Should they or should they not invest in time sharing? Should they or have more other form of constructive information presented to time-shared operators? What constitutes the best way to program? What is the best way to utilize the literature, and so on. Even more, but virtually no experimental comparison has been made to test and evaluate these competing alternatives objectively under controlled conditions. In 1967 [4], and by Schatzoff, Tewks, and Wig 1967 [11], the two experimental studies reported in this paper are, to our knowledge, the first to attempt to make a quantitative comparison of the problems and pitfalls in doing applied experimental work in computer programming. They spell out some of the key dimensions of the scientific lag in computer programming, and they provide a starting point for future work.

The time sharing systems, because of requirements for unequal hardware and more complex software, are generally more expensive than closed loop systems using the same central computer. Thus sharing advocates think that such systems make less pay for their investment in hardware and software, and in turn, less profit in savings. It appears that most programmers who have worked with both time-sharing and closed loop systems feel that the latter is more efficient and effective.

Time sharing, however, has its critics. Their arguments are often directed at the inefficiency of time sharing; that is, at the waste of the computer's time and of the user's time. In a search for productive data processing we appear to have made a hasty, if not wholly appropriate, (unjustified) assumption, viz., time sharing, etc.

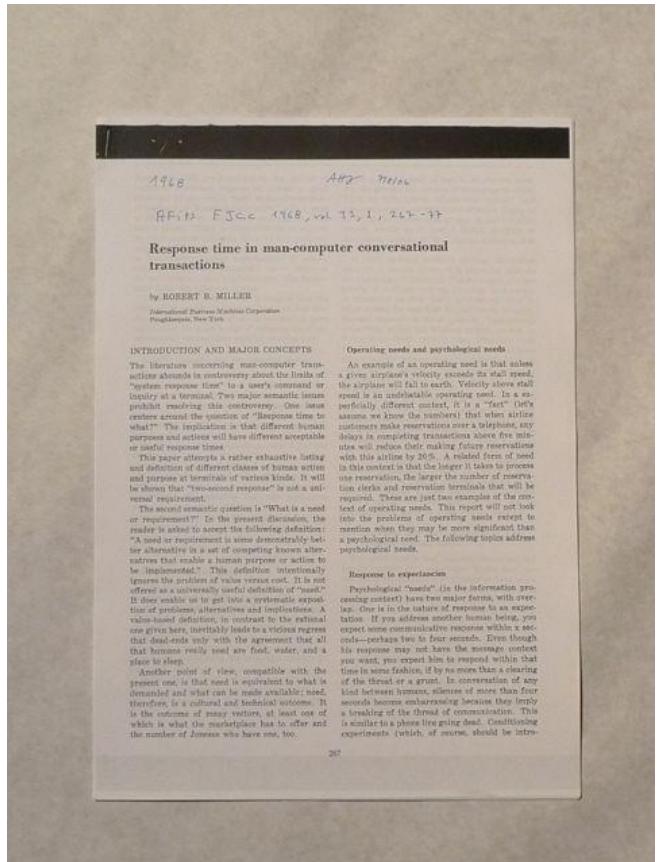
Volume 11 / Number 1 / January 1968

Intermezzo: Response Time (Miller 1968)

Identificerede 17 facetter, bla.

- System, are you listening?
- System, can you work for me?
- System, do you understand me?
- Here I am, what should I do next?

Citeret 679 gange !



Kommandoer

```
C:\>dir
Directory of C:\.
.
<DIR>                04-04-2005  8:47
..
<DIR>                04-04-2005  7:59
    0 File(s)          0 Bytes.
    2 Dir(s)         110,540,800 Bytes free.

C:\>md test

C:\>dir
Directory of C:\.
.
<DIR>                04-04-2005  8:47
..
<DIR>                04-04-2005  7:59
TEST                 <DIR>                04-04-2005  8:47
    0 File(s)          0 Bytes.
    3 Dir(s)         110,540,800 Bytes free.

C:\>cd test

C:\TEST>cd ..

C:\>exit
```

Kommandoer: Eksempel på linie-orienteret editor

The quick brown fx jumped over the lazy dog

Kommandoer: Eksempel på linie-orienteret editor

The quick brown fx jumped over the lazy dog

> replace “fx” “fox”

Kommandoer: Eksempel på linie-orienteret editor

The quick brown fx jumped over the lazy dog

> replace “fx” “fox”

The quick brown fox jumped over the lazy dog

Kommandoer: Eksempel på linie-orienteret editor

The quick brown fx jumped over the lazy dog

> replace “fx” “fox”

The quick brown fox jumped over the lazy dog

> replace “ed” “s”

Kommandoer: Eksempel på linie-orienteret editor

The quick brown fx jumped over the lazy dog

> replace “fx” “fox”

The quick brown fox jumped over the lazy dog

> replace “ed” “s”

The quick brown fox jumps over the lazy dog

Kommandoer: Eksempel på linie-orienteret editor

The quick brown fx jumped over the lazy dog

> replace “fx” “fox”

The quick brown fox jumped over the lazy dog

> replace “ed” “s”

The quick brown fox jumps over the lazy dog

MS DOS: MD_[disk:]\[path\] DIRECTORY

Intermezzo: TTY terminal med papir



Intermezzo: Reklame 1985

C - CA 1985

7 gode grunde til at få 20 systemudviklere til at skifte job.

Dele af Systemutviklingsgruppen:

- Hans Høeg & Frederikke Hansen: "Jeg har brug for udviklere, der er vist i stand til at overholde vores høje standarder."
- Børge G. Petersen: "Systemudvikling er en vigtig del af vores virksomhed. Vi har en stor behov for teknologisk udvikling og nye løsninger."
- Ørjan Knudsen: "EDB-AID er et godt eksempel på, hvordan teknologi kan bidrage til en bedre virkning i vores erhvervsliv."
- Hans E. Hansen: "Jeg sætter pris på, at HandelsBankens systemer er meget brugervenlige."

Personer.
Du kan føle at være tilmeldt op og følge den helte din. Eller mod et personligt udviklingsproje i spændende rytme. Og sende glæden vidt i sådant, også hvornår det er midt undervejs med os.

Jobbet.
Du kommer til at arbejde med dem der vænder tilbage til at være banebærer på et nytt HandelsBankens Datastøtte-system. Enestående serviceorienterede.

Det er en forskel, hvis du har erfaring, du var vant til at leve først. Til genudvikling, når andre kan se næsten. Det resulterer altså den endelige succes!

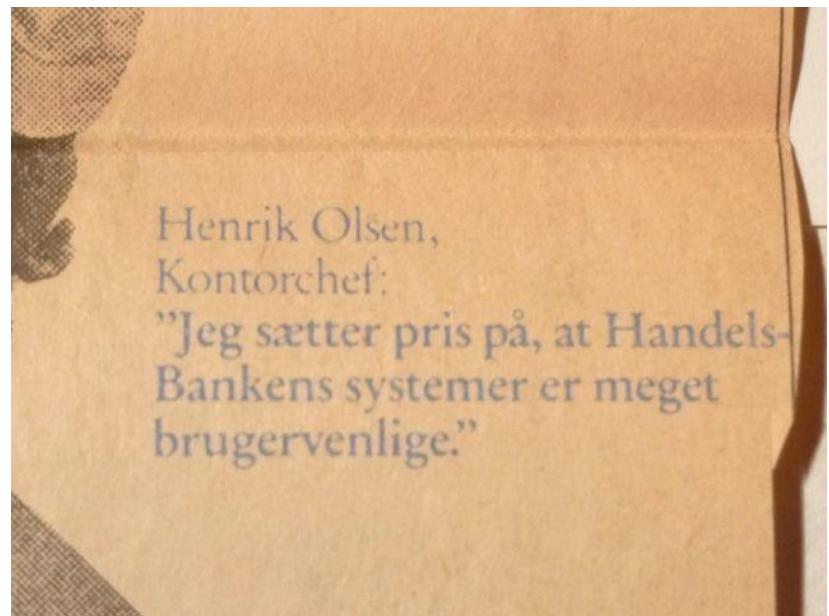
Der er gode muligheder for personlig udvikling, da vi er et stort selskab.

Få rum til videregående på telefon 070 45 86 00 hos systemudvikleren Hans Hansen, vedt. lokal 2133, chefdirektører. P.t. Elvæg, lokal 2990 eller hos chefudvikligerne Per Lunde, lokal 2967.

Dækker også kontoret ud og besøger os og hør mere om vores planer og ønsker. Ring også til os på denne adresse.

HandelsBanken A/S, Ringstedgade 12, 1997 København K. Adresser og telefonnumre findes også under 'Systemudvikling' i EDB-AID, ligetil med information om Husk's nye kapitel: 'Nystrukturering'.

HandelsBanken



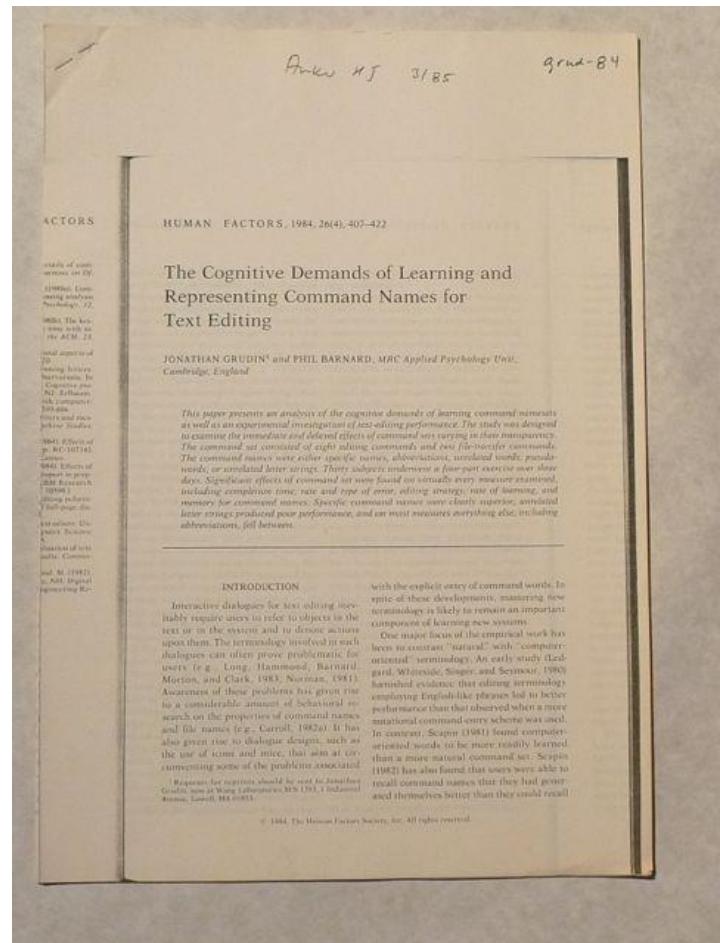
Intermezzo



Kommandoer (Grudin & Barnard 1984)

Forsøg med fem sæt
kommandoer til en enkel editor,
her sletning:

- Specifik delete
- Forkortelse dlt
- Urelatered ord parole
- Pseudo-ord ragole
- Konsonanter fnm



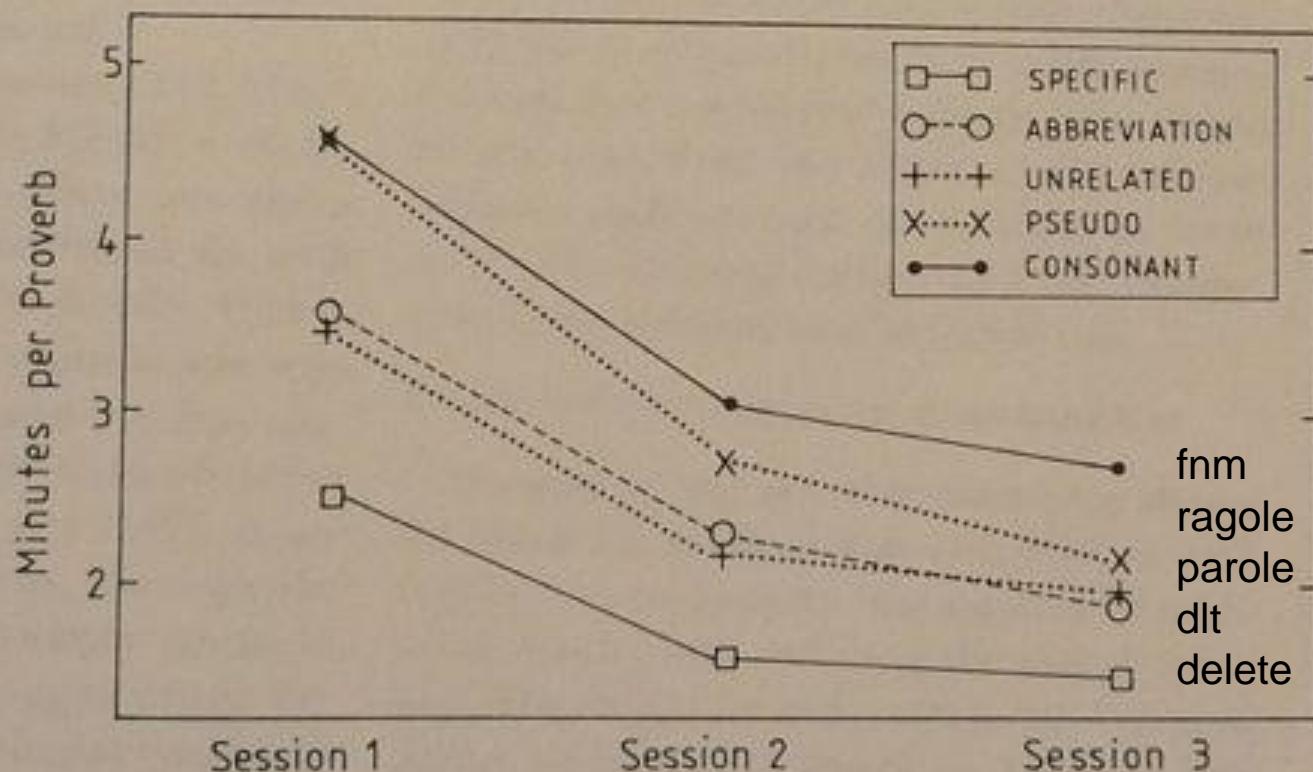


Figure 2. Mean times taken to complete the processing of each proverb for the three editing sessions.

Kommandoer

Hvad kan vi sige om denne form for brugerflade?

```
C:\>dir
Directory of C:\.

.
..
0 File(s)          0 Bytes.
2 Dir(s)         110,540,800 Bytes free.
```

Nedslag

- Knapper og kontakter
- Hulkort - batch
- Kommandoer
- Menuer
- Grafiske brugerflader
- Web
- Mobile enheder

0	ISPF PARMS	- Specify terminal and user parameters
1	BROWSE	- Display source data and output listings
2	EDIT	- Create or change source data

Menuer

```
----- CICS PRODUCTS PRIMARY OPTION MENU -----
0 ISPF PARMS      - Specify terminal and user parameters      USERID   - MKEEN
1 BROWSE          - Display source data and output listings    TIME     - 14.20
2 EDIT            - Create or change source data             TERMINAL - 3278
3 UTILITIES       - Perform utility functions                  PF KEYS  - 12
6 COMMAND         - Enter TSO command or CLIST
D DATA MNGT       - Data Management Functions
I ICPS            - Interactive Problem Control System
R RACF            - Invoke RACF Dialog
S SDSF            - System Display and Search Facility
M ISPF            - ISPF PRIMARY OPTION MENU (standard options set)
U CICSUTILS       - CICS PRODUCT UTILITIES (include DB2I option)
O OMVS            - OpenEdition ISPF interface.
X EXIT            - Terminate ISPF using log and list defaults
```

Enter END command to terminate ISPF.

OPTION ==> _

F1=HELP	F2=SPLIT	F3=END	F4=RETURN	F5=RFIND	F6=RCHANGE
F7=UP	F8=DOWN	F9=SWAP	F10=LEFT	F11=RIGHT	F12=RETRIEVE

Menuer

JOURNAL SYSTEM - VERSION 2.0

FUNKTION: --

DATO: -----

----- JOURNALISERING -----

SO SAGSOPRETTELSE
BI BREVOPRETTELSE - INDGÆNDE
BU BREVOPRETTELSE - UDGAENDE
NO NOTATOPRETTELSE

RT SAGS- ELLER BREVRETTELSE
SA SAGSINDHOLD
OJ OMJOURNALISERING
SA6 ELLER BREV/MOTAT

----- SØGNING -----

----- UDSKRIFTER -----

SS SAGSSØGNING
BS BREVSØGNING

PL POSTLISTE

----- DIVERSE -----

AF ANDRE JOURNALFUNKTIONER - OVERSIGT

Menuer

SCREEN DEFINITION PROCESSOR - LEVEL: 1R2 KES-002



TAB TO APPROPRIATE FUNCTION

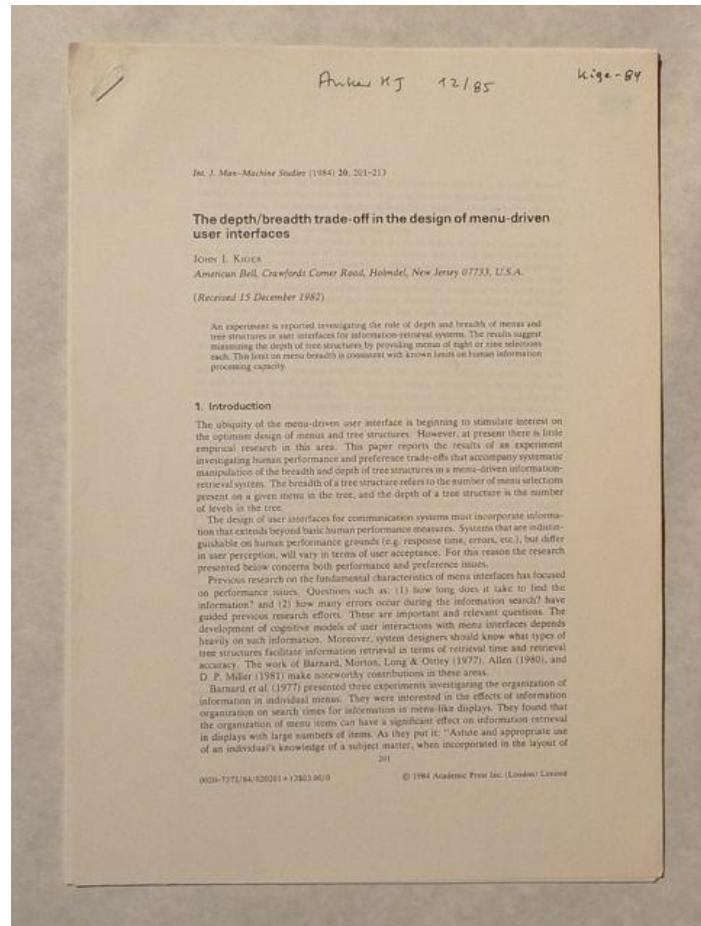
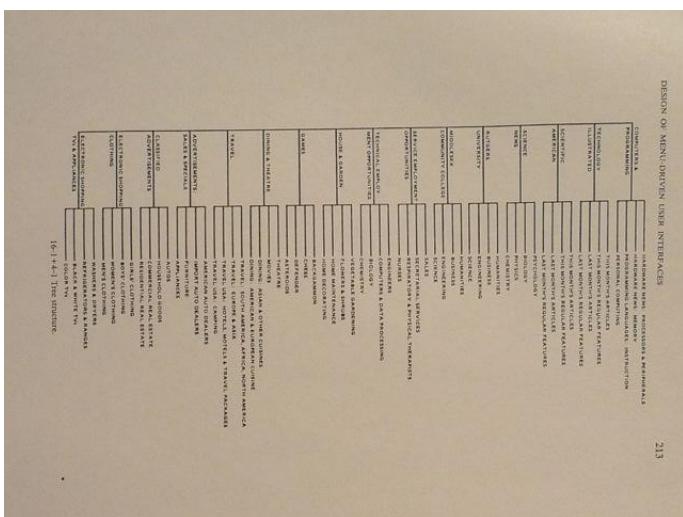
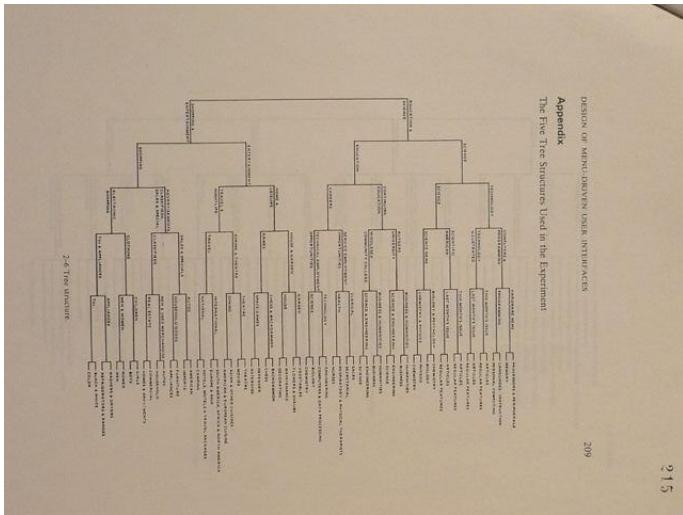
- ▶ INSERT SCREEN
- ▶ UPDATE SCREEN
- ▶ COPY SCREEN
- ▶ GENERATE W/S



- ▶ DELETE SCREEN
- ▶ DISPLAY SCREEN
- ▶ PRINT SCREEN
- ▶ TERMINATE SDP

Tryk TAB-FWD til den ønskede funktion
og herefter INIT.

Case: Menuer dybde vs. bredde (Kiger 1984)



The ubiquity of the menu-driven user interface is beginning to stimulate interest on the optimum design of menus and tree structures. However, at present there is little empirical research in this area. This paper reports the results of an experiment investigating human performance and preference trade-offs that accompany systematic manipulation of the breadth and depth of tree structures in a menu-driven information-retrieval system. The breadth of a tree structure refers to the number of menu selections present on a given menu in the tree, and the depth of a tree structure is the number of levels in the tree.

The design of user interfaces for communication systems must incorporate information that extends beyond basic human performance measures. Systems that are indistinguishable on human performance grounds (e.g. response time, error rate), but differ in user perception, will vary in terms of user acceptance. For this reason the research presented below covers both performance and preference issues.

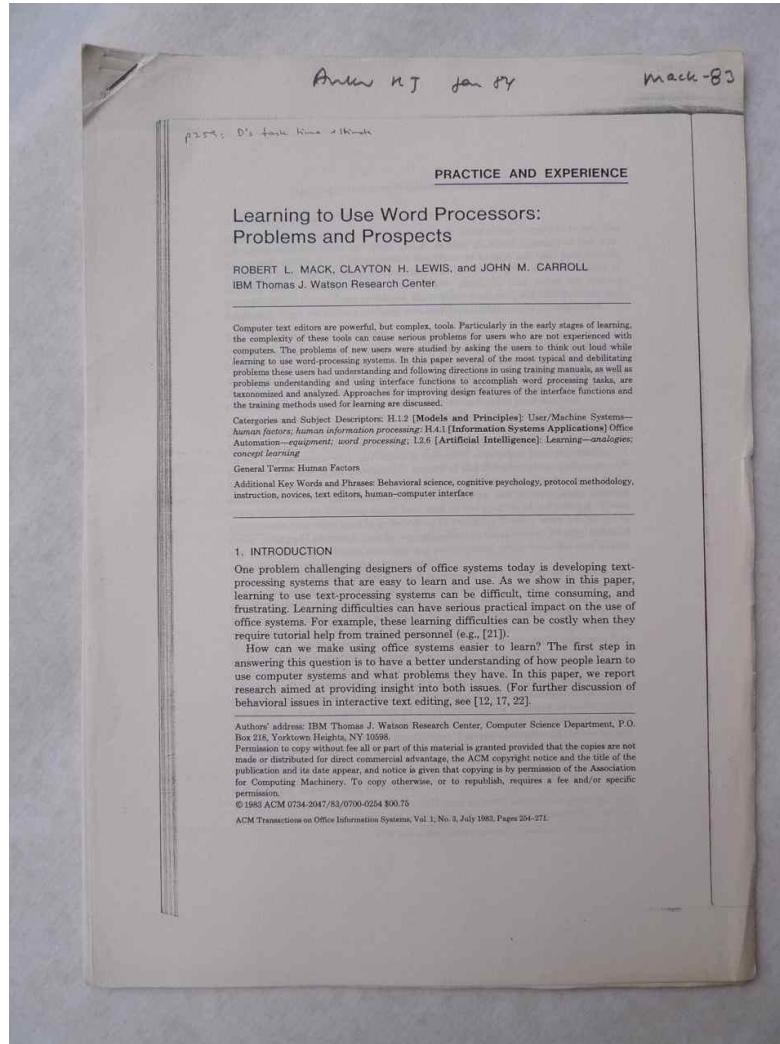
Previous research on the fundamental characteristics of menu interfaces has focused on performance issues. Questions such as: (1) how long does it take to find the information? and (2) how many errors occur during the information search? have guided previous research efforts. These are important and relevant questions. The development of cognitive models of user interactions with menu structures has focused heavily on such measures. Most systems users should know what types of tree structures facilitate information retrieval in terms of retrieval time and retrieval accuracy (see work of Barnard, Morris, Long & Orlitzky (1977), Allen (1980), and D. P. Miller (1981) make noteworthy contributions in these areas).

Barnard et al. (1977) presented three experiments investigating the organization of information in individual menus. They were interested in the effects of information organization on search times for information in menus. Their results indicated that the organization of menu items can have a significant effect on information retrieval in displays with large numbers of items. As they put it: "Ajuste and appropriate use of an individual's knowledge of a subject matter, when incorporated in the layout of

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Intermezzo: HCIs hvide mus (Mack 1983)



Intermezzo: HCIs hvide mus (Mack 1983)

required for, learning. These expectations should result in a more supportive environment for learning, since the learners know they face a challenging learning task and should not blame themselves for problems.

3.2 Learners Lack Basic Knowledge

Computer-naive learners lack general knowledge about how computers work, as well as specific knowledge of text-editing systems. They fail to readily understand basic ideas and jargon, they entertain implausible possibilities, and they have trouble identifying what is relevant to solving or understanding problems.

One participant, for example, wondered what the cursor was after several hours of using the system. Another wondered “who” the printer was. Yet a third wondered if she was the printer. These examples of learners’ “innocence” about basic concepts in using computers are reminiscent of Bott’s study [4] of problems college students had learning to use a line editor: for example, many of his learners thought that a “command” was something the computer wanted them to do!

Participants also lacked familiarity with technical jargon. They had trouble with terms such as “parameter” (or “perimeter” as one learner put it), “queue,” “reversed video,” “background,” “pagination,” and “default.” Learners often invoked misleading associations; for example, “default” can have a negative (legal) connotation.

Participants’ lack of knowledge about text processing can make it hard for them to interpret what happens accurately. One participant, who finally succeeded in executing an operation after several attempts, wondered if her earlier failures were somehow due to her having hit the ENTER key incorrectly. To an experienced user this is a nonsensical possibility: how can one hit a key incorrectly? But new users simply do not know enough to rule out interpretations that

Intermezzo: HCIs hvide mus (Mack 1983)

Table II. Summary of Major Results

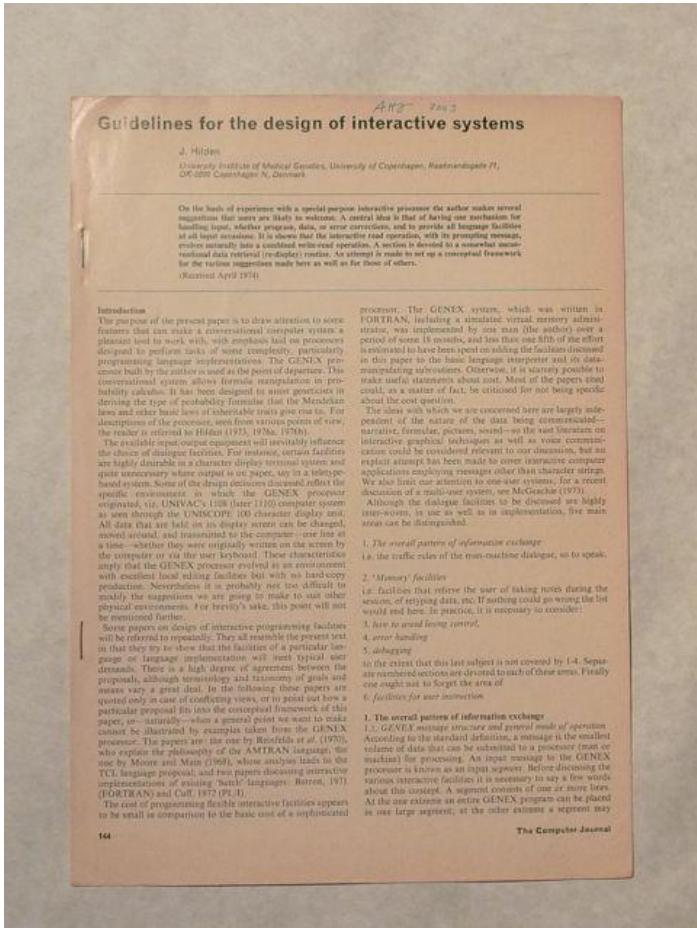
- | | |
|--|--|
| (1) Learning Is Difficult | Learners experience frustration and blame themselves
Learning takes longer than expected, and learners have trouble applying what they know after training |
| (2) Learners Lack Basic Knowledge | Learners are naive about how computers work (e.g., do not understand computer jargon)
Learners do not know what is relevant to understanding and solving problems |
| (3) Learners Make Ad Hoc Interpretations | Learners try to construct interpretations for what they do or for what happens to them
Learners' interpretations can prevent them from seeing that they have a problem |
| (4) Learners Generalize from What They Know | Learners assume that some aspects of text editors will work like typewriting (especially functions that simply move the typing point on a typewriter)
Learners assume that text-editing operations will work consistently |
| (5) Learners Have Trouble Following Directions | Learners do not always read or follow directions
Learners do not always understand or correctly follow directions even when they do try |
| (6) Problems Interact | Learners have trouble understanding that one problem can create another |
| (7) Interface Features May Not Be Obvious | Learners can be confused by prerequisites and side effects of procedures
Learners can be confused by feedback messages and the outcome of procedures |
| (8) Help Facilities Do Not Always Help | Learners do not always know what to ask for
Help information is not always focused on the learner's specific problem |

put it: "It makes me feel stupid." Others who had come to value the particular program had admitted that they had considered

Intermezzo: Guidelines (Hilden 1976)

Erfaringsbaseret viden

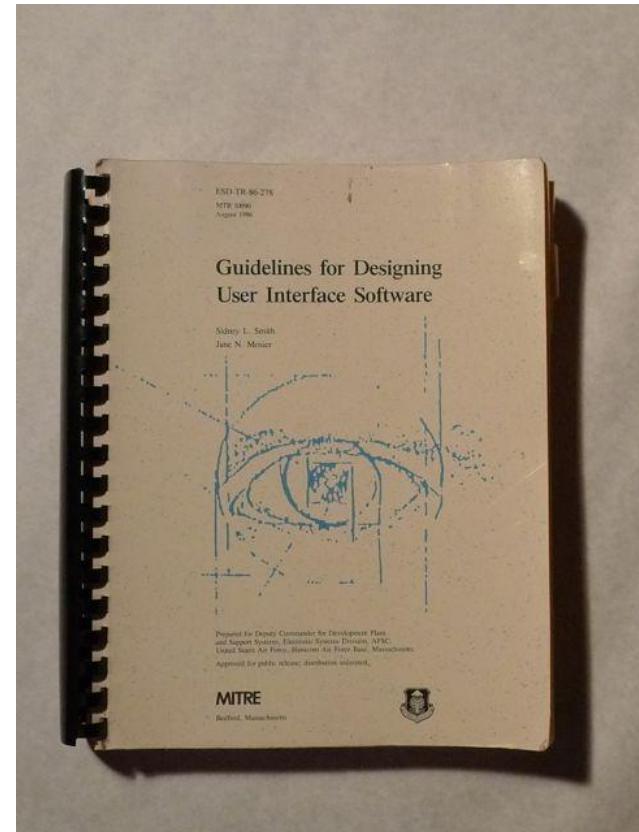
- How to avoid losing control
- Error handling
- Debugging



Intermezzo: Guideline-samling (Smith & Mosier 1986)

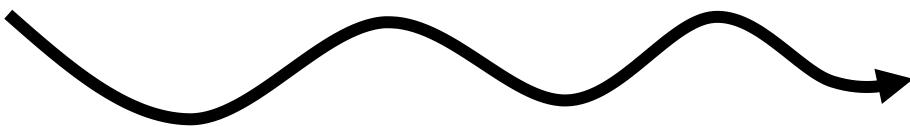
Tredie og sidste samling af 944 guidelines for design af brugerflader

- Data entry (80 sider)
- Data display (120 sider)
- Sequence control (80 sider)
- User guidance (46 sider)
- Data transmission (34 sider)
- Data protection (30 sider)

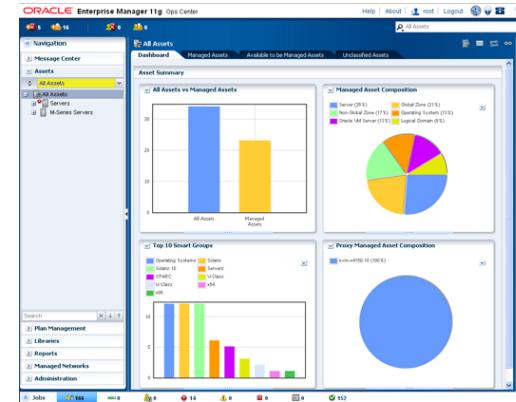


Undersøgelser: Svært at bruge

Intermezzo: Viden om proces og produkt



Proces



Produkt

Intermezzo: Tre designprincipper (Gould & Lewis 1985)

RESEARCH CONTRIBUTIONS

Human Aspects
of Computing
Henry Ledgard
Editor

Designing for Usability: Key Principles and What Designers Think

JOHN D. GOULD and CLAYTON LEWIS

ABSTRACT: This article is both theoretical and empirical. Theoretically, it describes three principles of system design which we believe must be followed to produce a useful and easy to use computer system. These principles are: early and continual focus on users' empirical measurement of usage; and iterative design whereby the system is simulated, prototype, and reals is modified, tested, modified again, tested again, and the cycle is repeated again and again. This approach is contrasted to other principled design approaches, for example, get it right the first time, reliance on design guidelines. Empirically, the article presents data which show that our design principles are not always intuitive to designers; identifies the arguments which designers often offer for not using these principles—and answers them; and provides an example in which our principles have been used successfully.

Any system designed for people to use should be easy to learn (and remember), useful, that is, contain functions people really need in their work, and be easy and pleasant to use. This article is written for people who have the responsibility and/or interest in creating computer systems (or any other systems) with these characteristics. In the first section of this article we briefly mention three principles for system design which we believe can be used to attain these goals. Our principles may seem intuitive, but system designers do not generally recommend them, as results of surveys reported in Section 2 show. The recommendations of actual designers suggest that they may sometimes think they are doing what we recommend when in fact they are not. In Section 3 we contrast some of their responses with what we have in mind to provide a fuller and clearer description of our principles. In Section 4 we consider why designers might not actually be using our design

principles. In Section 5 we elaborate on the three principles, showing how they form the basis for a general methodology of design. In Section 6 we describe a successful example of using our recommended methodology in actual system design, IBM's Audio Distribution System (ADS), and the advantages that accrued as a result.

1. THE PRINCIPLES

We recommend three principles of design.

Early Focus on Users and Tasks

First, designers must understand who the users will be. This understanding is arrived at in part by directly studying their cognitive, behavioral, anthropometric, and attitudinal characteristics, and in part by studying the nature of the work expected to be accomplished.

Empirical Measurement

Second, early in the development process, intended users should actually use simulations and prototypes to carry out real work, and their performance and reactions should be observed, recorded, and analyzed.

Iterative Design

Third, when problems are found in user testing, as they will be, they must be fixed. This means design must be iterative. There must be a cycle of design, test and measure, and redesign, repeated as often as necessary.

2. WHAT SYSTEM DESIGNERS AND PROGRAMMERS ACTUALLY SAY

We began recommending these principles in the 1970's. Often the reaction is that they are obvious. Nevertheless, they are not usually employed in system design. Why? We wondered whether or not these principles were really obvious, or whether or not they just

1. THE PRINCIPLES

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Intermezzo: Begrebet usability (Shackel 1981)

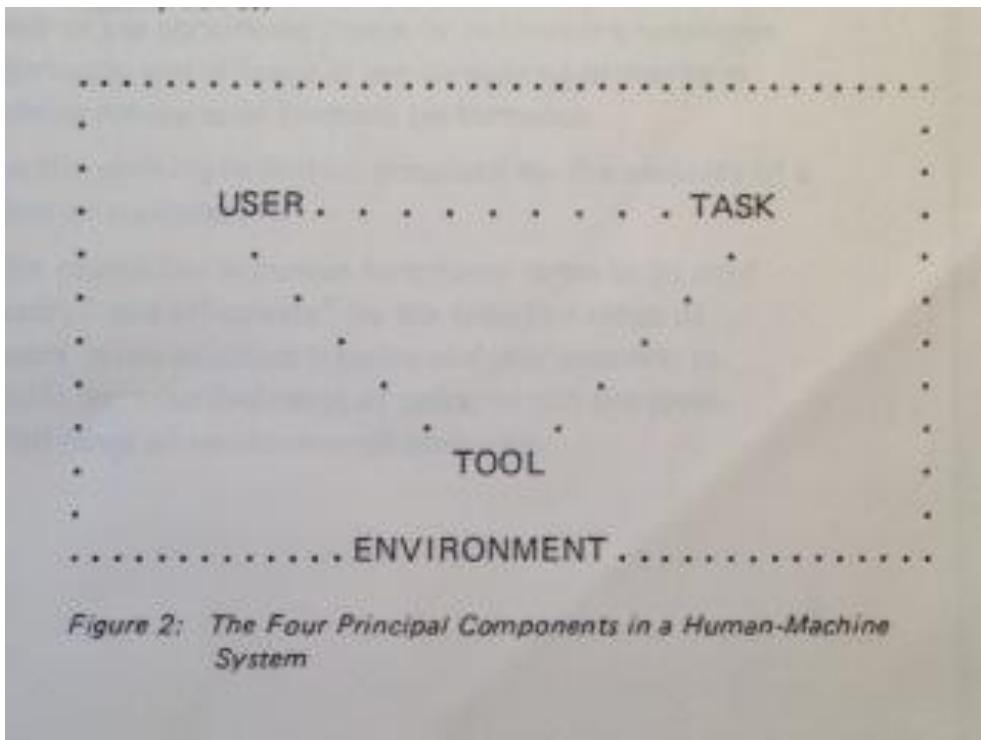
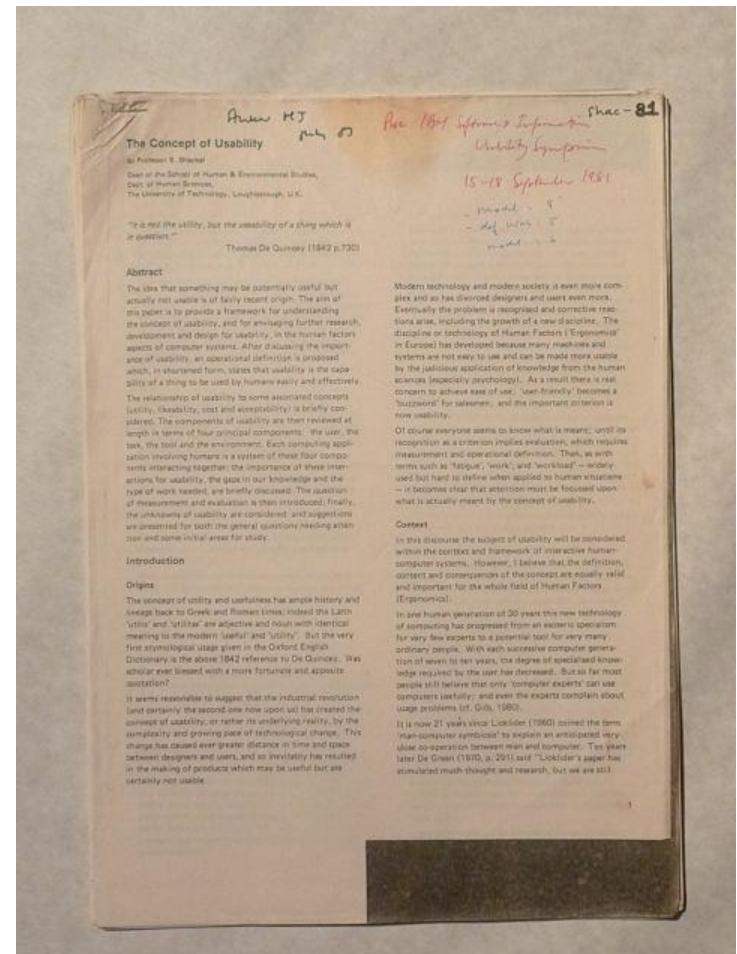


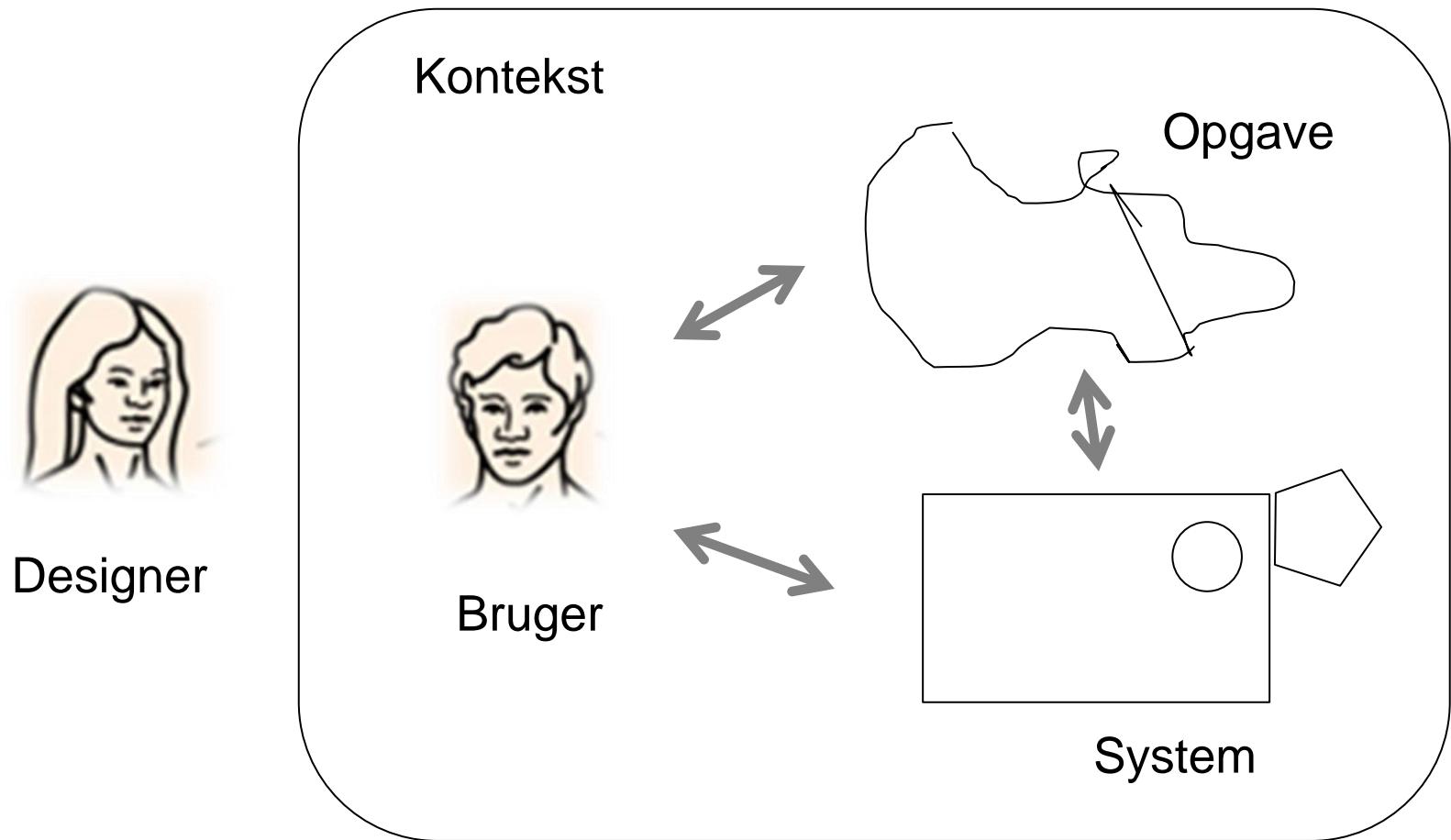
Figure 2: The Four Principal Components in a Human-Machine System

Thus the working definition proposed for the usability of a system or equipment is: —

the capability in human functional terms to be used easily* and effectively* by the specified range of users, given specified training and user support, to fulfil the specified range of tasks, within the specified range of environmental scenarios.



Intermezzo: Begrebet usability



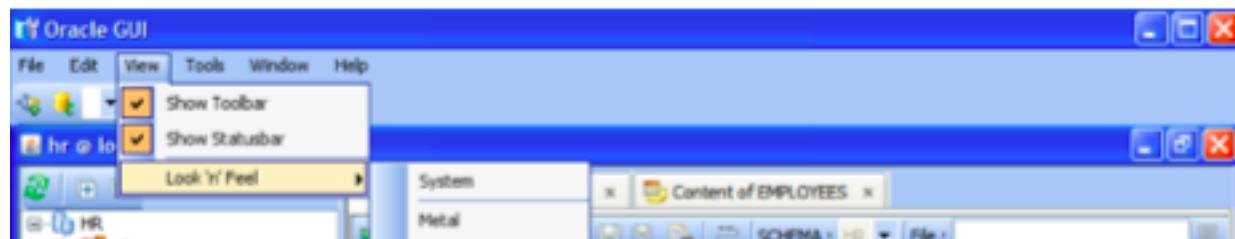
Menuer

Hvad kan vi sige om denne form for brugerflade?

- 0 ISPF PARMS - Specify terminal and user parameters
- 1 BROWSE - Display source data and output listings
- 2 EDIT - Create or change source data

Nedslag

- Knapper og kontakter
- Hulkort - batch
- Kommandoer
- Menuer
- Grafiske brugerflader
- Web
- Mobile enheder



Grafiske brugerflader

The screenshot shows the Oracle SQL Developer graphical user interface. On the left, there is a tree view of the HR schema, including tables like COUNTRIES, DEPARTMENTS, EMPLOYEES, JOBS, JOB_HISTORY, LOCATIONS, and REGIONS. A context menu is open over the EMPLOYEES table, with options like 'Show Toolbar' and 'Show Statusbar' checked. In the center, a tab titled 'Content of EMPLOYEES' shows the results of a query. The results table has columns: EMPLOYEE_ID, FIRST_NAME, LAST_NAME, EMAIL, PHONE_NUMBER, HIRE_DATE, JOB_ID, SALARY, COMMISSION_PCT, MANAGER_ID, and DEPARTMENT_ID. The data includes rows for employees like Sabuj Das, Neena Kochhar, Lex Dan Haan, Alexander Hunold, Bruce Ernst, David Austin, Valli Pataballa, Diana Lorentz, Nancy Greenberg, Daniel Faviet, John Chen, Ismael Sciarra, and Jose Manuel Urman. At the bottom, there is an 'INS' button.

EMPLOYEE_ID	FIRST_NAME	LAST_NAME	EMAIL	PHONE_NUMBER	HIRE_DATE	JOB_ID	SALARY	COMMISSION_PCT	MANAGER_ID	DEPARTMENT_ID
100	Sabuj	Das	sabuj.das@...	515.123.4567	Jun 17, 1987	AD_PRES				
101	Neena	Kochhar	INKOCHHAR	515.123.4568	Sep 21, 1989	AD_VP				
102	Lex	Dan Haan	LDEHAAN	515.123.4569	Jan 13, 1993	AD_VP				
103	Alexander	Hunold	AHUNOLD@...	590.423.4567	Jan 3, 1990	IT_PROG				
104	Bruce	Ernst	BERNST	590.423.4568	May 21, 1991	IT_PROG				
105	David	Austin	DAUSTIN	590.423.4569	Jun 25, 1997	IT_PROG				
106	Valli	Pataballa	VPATABAL	590.423.4560	Feb 5, 1998	IT_PROG				
107	Diana	Lorentz	DLORENTZ	590.423.5567	Feb 7, 1999	IT_PROG				
108	Nancy	Greenberg	NGREENBE	515.124.4569	Aug 17, 1994	FI_MGR				
109	Daniel	Faviet	DFAVIET	515.124.4169	Aug 16, 1994	FI_ACCOUNT				
110	John	Chen	JCHEN	515.124.4269	Sep 28, 1997	FI_ACCOUNT				
111	Ismael	Sciarra	ISCIARRA	515.124.4369	Sep 30, 1997	FI_ACCOUNT				
112	Jose Manuel	Urman	JMURMAN	515.124.4469	Mar 7, 1998	FI_ACCOUNT				

Xerox Star HF experiments (Bewley 1983)

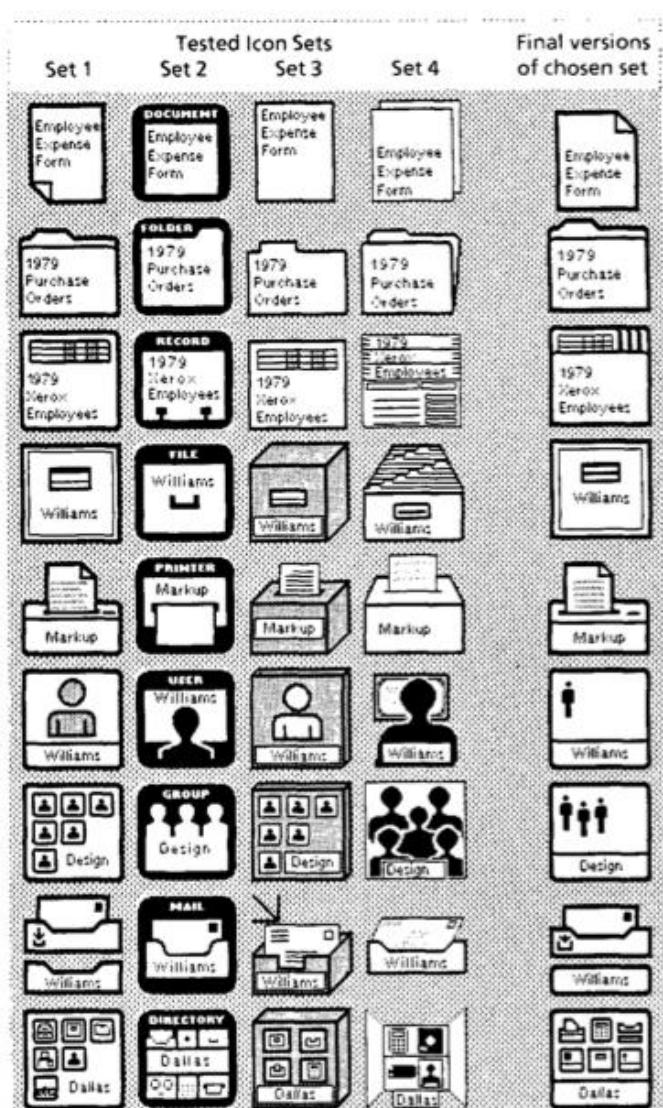
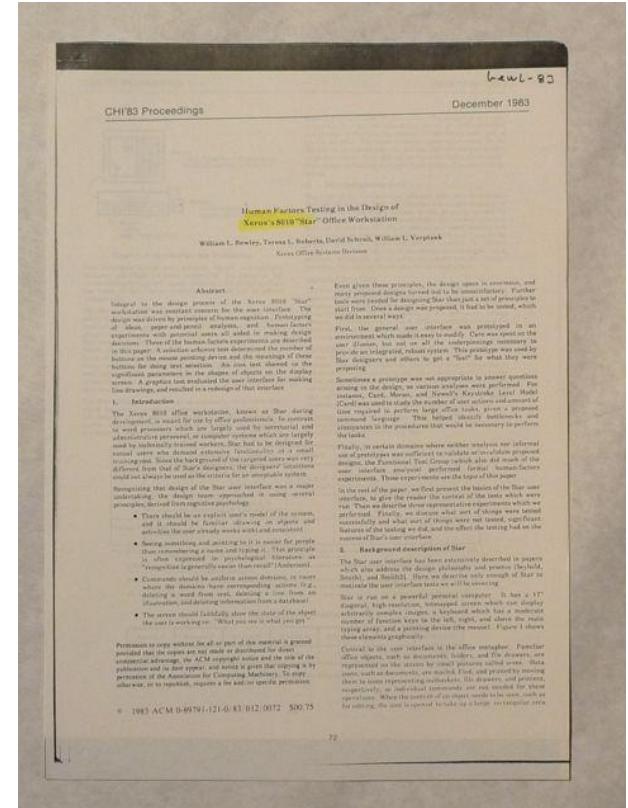


Figure 4. Four sets of icon designs were tested (only nine of the seventeen in each set are shown here). Set 1 was chosen and modified as shown at the right.

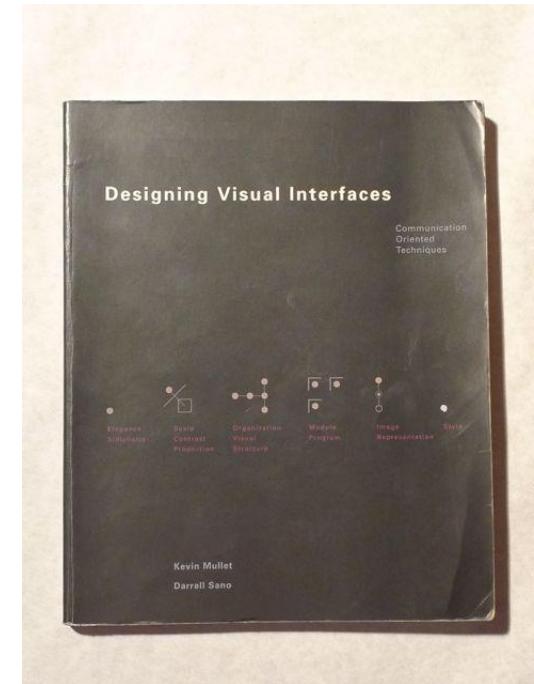
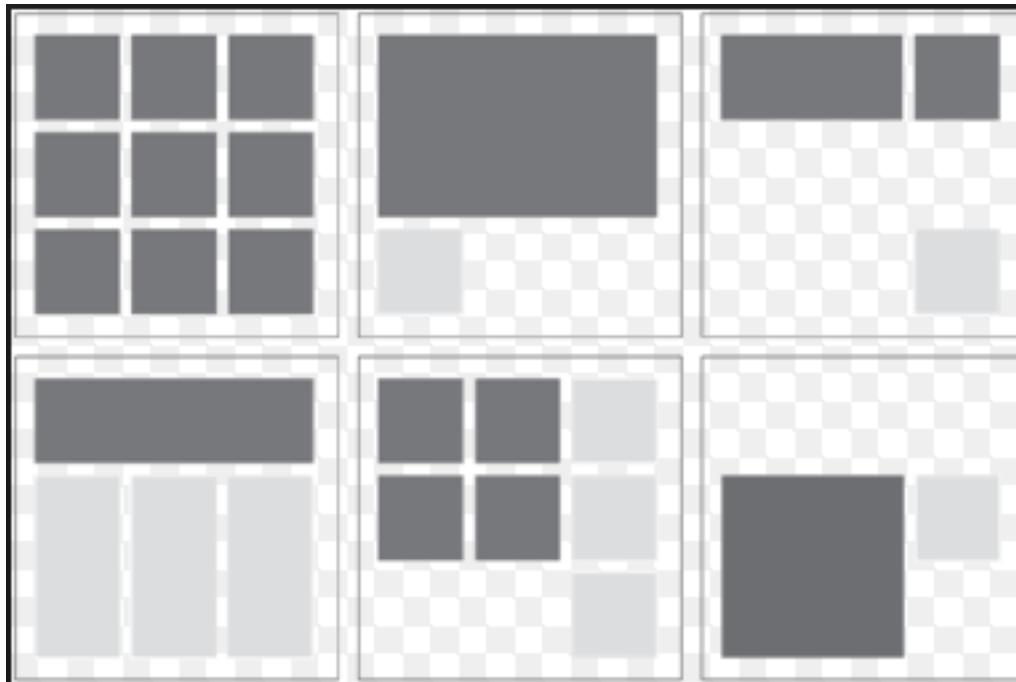
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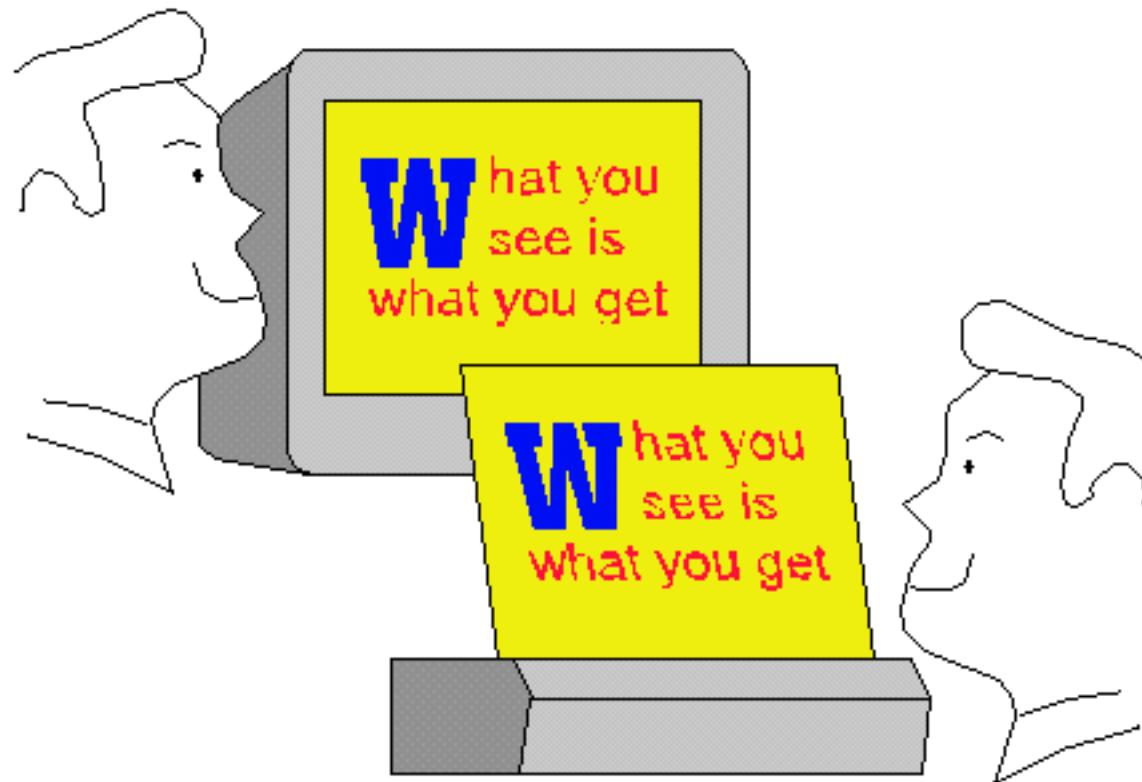
God GUI grafik (Mullet & Sano 1995)

Grid



Intermezzo: WYSIWYG

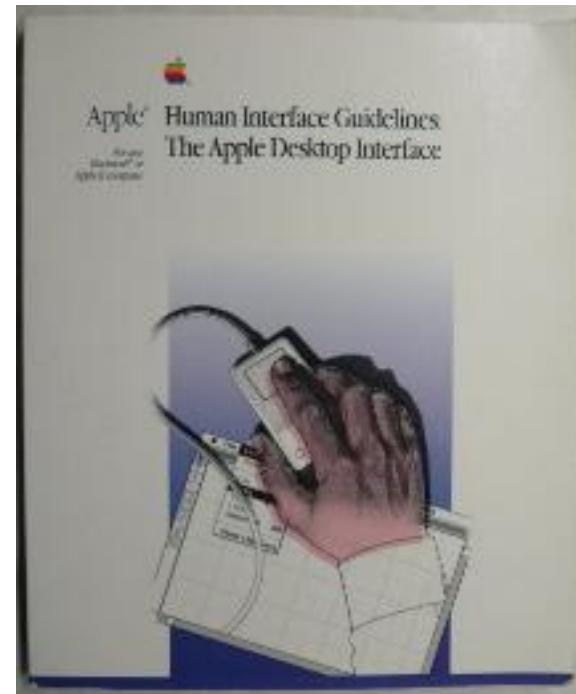
WYSIWYG: What you see is what you get



Intermezzo: Standarder for GUI'er



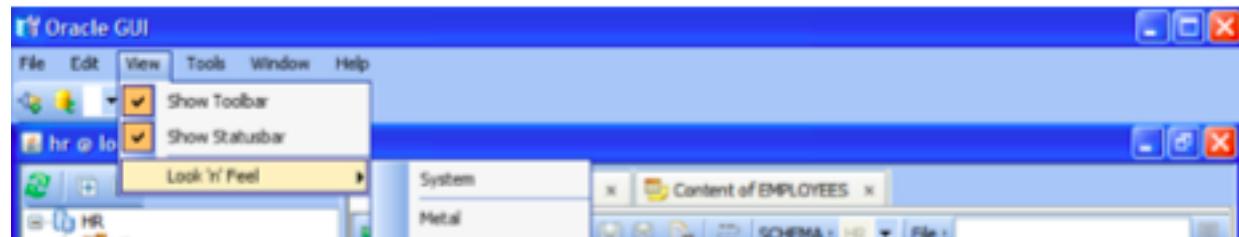
IBM Common User Access



Apple Interface Guidelines

Grafiske brugerflader

Hvad kan vi sige om denne form for brugerflade?



Nedslag

- Knapper og kontakter
- Hulkort - batch
- Kommandoer
- Menuer
- Grafiske brugerflader
- Web
- Mobile enheder



Web brugerflader Forfra



Web brugerflader

The screenshot shows the Evernote homepage with a green background. At the top left is the Evernote logo and navigation links: PRODUCTS ▾, BLOGS ▾, THE TRUNK, and a sign-in section with links to Web Sign In, Create Account, and Go Premium. A 'Reset Password' button is also visible.

Remember everything.

Capture anything.
Save your ideas, things you like, things you hear, and things you see.

Access anywhere.
Evernote works with nearly every computer, phone and mobile device out there.

Find things fast.
Search by keyword, tag or even printed and handwritten text inside images.

GET EVERNOTE—IT'S FREE ▶

Evernote ▶ **Skitch** ▶ **Pensultimate** ▶ **Web Clipper** ▶ **Evernote Hello** ▶ **Evernote Food** ▶ **Evernote Clearly** ▶ **Evernote Peek** ▶

Web brugerflader



Don Norman om HTML (2000)

"HTML has set back the user interface by a decade. HTML is a batch processing mechanism, poorly suited for interaction. HTML is a publishing mechanism."

Ekspllosion i muligheder

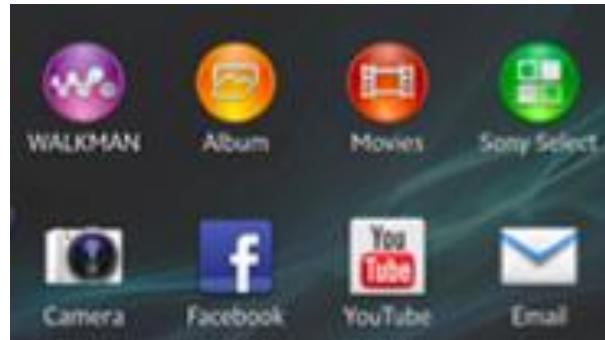
Web

Hvad kan vi sige om denne form for brugerflade?

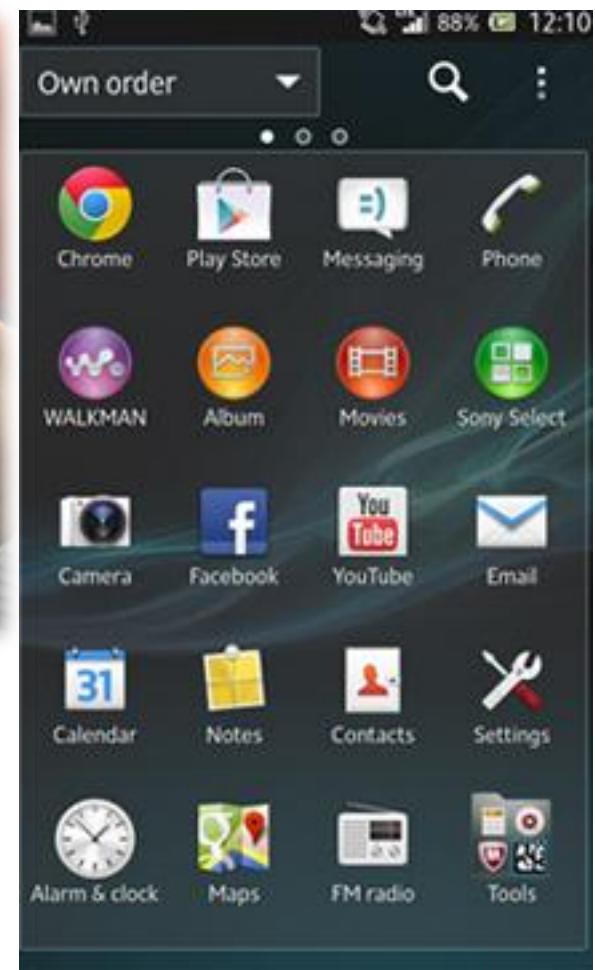


Nedslag

- Knapper og kontakter
- Hulkort - batch
- Kommandoer
- Menuer
- Grafiske brugerflader
- Web
- Mobile enheder



Mobile enheder

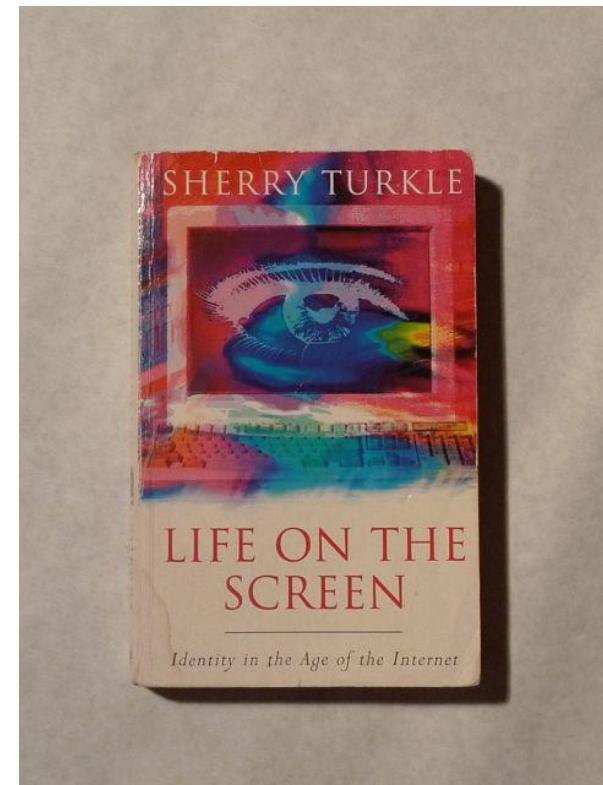


- Ekspllosion i muligheder
 - GPS
 - Kompas
 - Lommelygte
 - BeMyEyes

Intermezzo: Life on the screen (Turkle 1995)

Om de psykologiske virkninger af vores liv med computere:

"I feel pressure from a machine that itself seems to be perfect and leaves no one and no other thing but me to blame." (29)

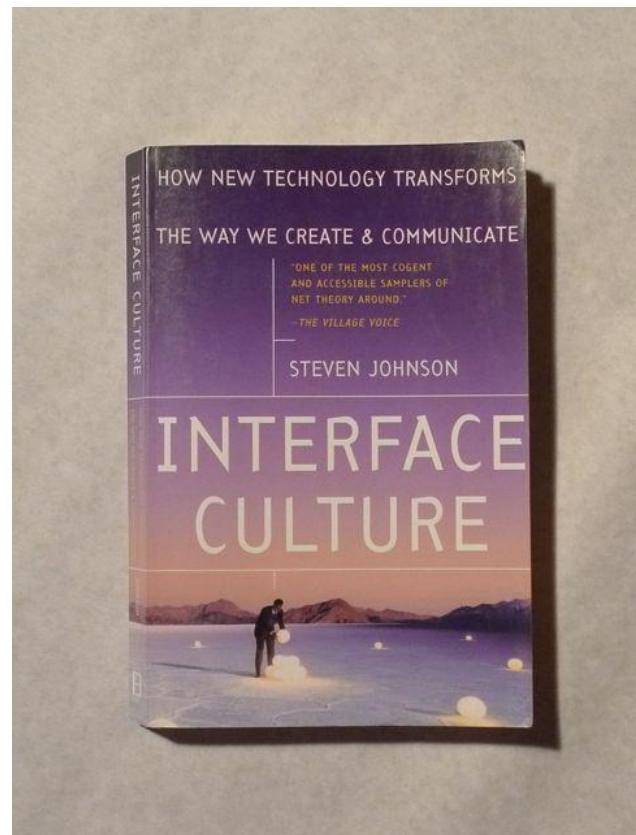


Intermezzo: Interface Culture (Johnson 1997)

"Doug Engelbart gave us the first machine worth living in." (24)

"For the first time a machine was imagined not as an attachment to our bodies, but as an environment, a space to be explored." (24)

"The interface came into the world under the cloak of efficiency, and it is now emerging as a genuine art form." (242)



Intermezzo: Computer Personalities (Moon, Nass 1996)

- Eksperiment om ærlighed ved computerbrug i Californien
- Indgive en forsikringsanmeldelse med tre conditions
 - Computer i rummet ved siden af
 - Computer et andet sted i CA
 - Computer i New York
- Klar sammenhæng mellem hvor meget deltagerne "smurte" på

Int. J. Human-Computer Studies (1995) 43, 223-239

Can computer personalities be human personalities?

CLIFFORD NASS, YOUNGME MOON, B. J. FOGG, BYRON REEVES AND D. CHRISTOPHER DRYER

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(Received 22 November 1994 and accepted 15 June 1995)

The claim that computer personalities can be human personalities was tested by demonstrating that (1) computer personalities can be easily created using a minimal set of cues, and (2) that people will respond to these personalities in the same way they would respond to similar human personalities. The present study focused on the "similarity-attraction hypothesis," which predicts that people will prefer to interact with others who are similar in personality. In a 2×2 , balanced, between-subjects experiment ($n = 48$), dominant and submissive subjects were randomly matched with a computer that was endowed with the properties associated with dominance or submissiveness. Subjects recognized the computer's personality type, distinct from friendliness and competence. In addition, subjects not only preferred the similar computer, but they were more satisfied with the interaction. The findings demonstrate that personality does not require richly defined agents, sophisticated pictorial representations, natural language processing, or artificial intelligence. Rather, even the most superficial manipulations are sufficient to exhibit personality, with powerful effects.

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It has become a commonplace idea that believable agents must have personalities. Yet, attempts to create personalities of agents virtually never draw on the enormous psychological literature on personality. This is ironic, because psychologists have been defining personality, and identifying how particular people will respond to various personality types, for many decades.

The present study turns to the vast personality literature in the field of psychology to conceptualize personality. The goal is to find the minimum set of cues necessary to present a computer-based personality, and to determine whether these cues are sufficient to produce powerful effects. Specifically, using a laboratory experiment, we seek to demonstrate that if a computer is endowed with a set of personality markers, users will be able to identify that personality, and respond to it in a manner predicted by social-psychological theories.

In other words, this research approaches personality from a psychological, rather than technological, perspective. The idea that the creation of personality requires richly defined agents, sophisticated pictorial representations, natural language processing, and artificial intelligence is a prevalent one in the field of human-computer interaction. In contrast, this research demonstrates that personality can be created using a simple, text-based system with scripted responses.

This approach is based on the "Computers Are Social Actors" or "CASA" paradigm (Nass, Steuer, Tauber & Reeder 1993; Nass, Steuer & Tauber, 1994a). The CASA studies have demonstrated that the social rules guiding human-human interaction apply equally to human-computer interaction. For example, Nass,

Mobile enheder

Hvad kan vi sige om denne form for brugerflade?



Intermezzo: Brugerfladen er et menneske

Hiroshi

Ishiguros

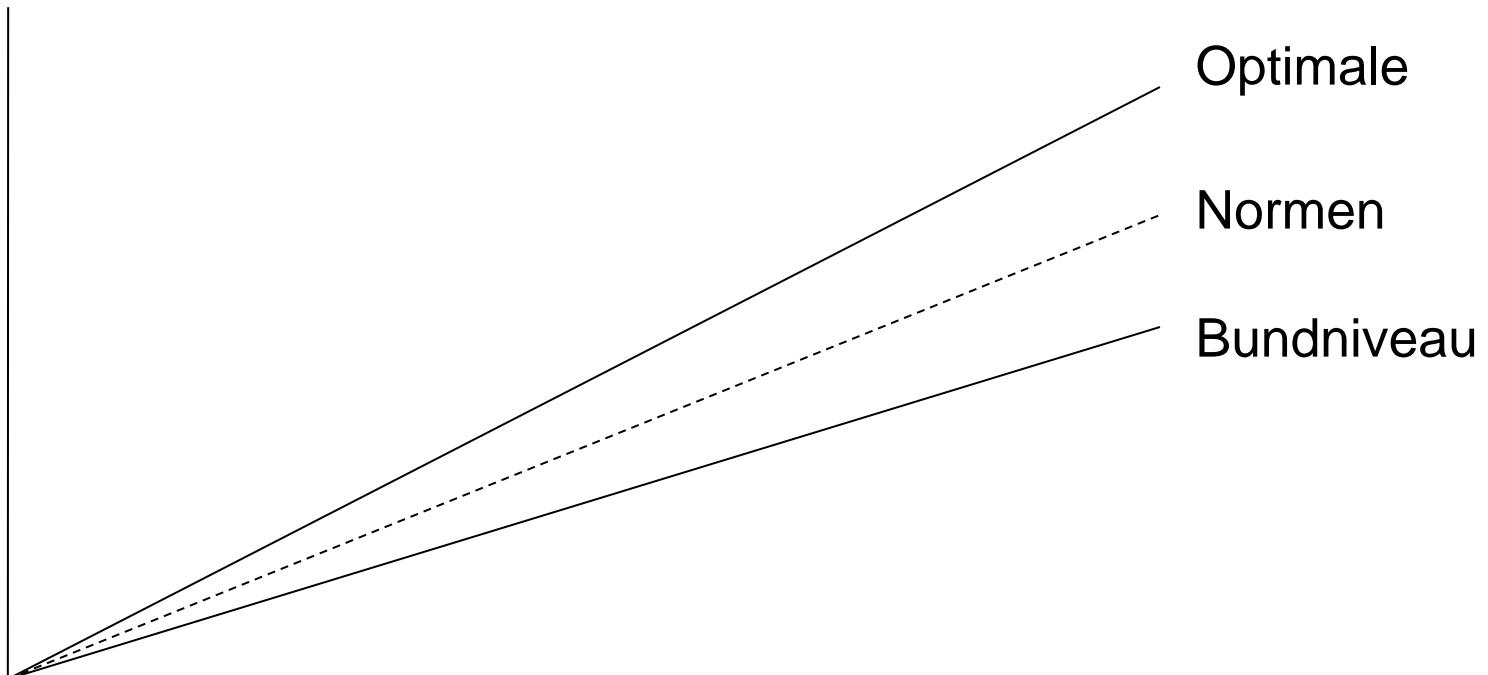
robot



-
1. Opvarmning
 2. Indledning
 3. Baggrund og afsæt
 4. Nedslag
 - Knapper og kontakter
 - Hulkort - batch
 - Kommandoer
 - Menuer
 - Grafiske brugerflader
 - Web
 - Mobile enheder
 5. Er det blevet bedre?
 6. Afrunding

Er det blevet bedre ?

- Er der sket en forbedring?
- Er der stadig plads til forbedringer?



Forbedringer ?

Rigsrevisionen: **Offentlige løsninger til selvbetjening er elendige**



Virksomheder spilder alt for meget tid på at finde rundt i det offentliges digitale selvbetjeningsløsninger, viser ny beretning fra Rigsrevisionen.

AU HENRIK BASCH

data. Ved tilsættelse af et selvbetjeningstegn har Rigsrevisionen fundet, at det tilsætter 11 procent af brugere, der ikke har brug for at ramme kontoret fremtid. Det er en stor

tal. Dette tilsættende teknologi gør også, at de digitale selvbetjeningsløsninger ikke er gode nok til at vokse sig ud i brugernes behov, et resultat af den teknologiske arbejdsmiljø, der ikke er tilstrækkeligt god til at tilvejebringe alle brugere. Det er et teknologisk problem, der ikke kan løses ved at tilføje flere teknologier.

Allé blev medvirkende teknologiske virksomheder har da også henvist til de velfungerende resultater fra Rigsrevisionens test af de nye, brugervennlige løsninger i deres respektive løsninger.

Digitaliseringsteknologien er desuden på vej mod en færdig løsning i de digitale løsninger. Det vil blive tilgængeligt fra desember. *

Test af ni løsninger

Rigsrevisionen har sammen med digitale selvbetjeningsvirksomheder fra tre forskellige offentlige myndigheder:

Esbjergs bygdekontor

Forsvaret og Helseforetakene

Eksempel: 3. december

LÆS OM

DET STEMMER VI OM	3
JA ELLER NEJ?	4
TILVALGSORDNINGEN	6
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ASYL OG INDVANDRING	10
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FREHTIDIGE RETSAKTER	15

HVAD BETYDER

MELLEMSTATSLIG SAMARBEJDE

I EU har der i mellemtidet været etableret et EU-regime med godkendelse og vedtagelse af medlemslandenes signe parlamentarier – i Danmarks tilfælde Folketinget – og af regeringer stat guvernørerne i medlemslandenes egne lande i mellemstatligt samarbejde over alt med medlemslandene være enige om nye EU-regler, hvilket bliver vedtaget. Senest i løbet af tre dage i 2009 har det ikke været muligt at vedtage denne type af retsakter på grund af manglende opmøde fra anliggende lande.

OVERSTATSLIG SAMARBEJDE

Overstatlig samarbejde betyder, at EU's medlemslande sammen med Europa-Parlamentet kan lave regler, der har direkte virkning i de enkelte medlemslande. Europe-Kommisionen kan også på denne måde lave regler og træffe afgørelser, der har direkte virkning i de enkelte medlemslande.

SUVERÆNITETSMØDVELSE?

Grensværen giver mulighed for, at Danmark i nærmere bestandt omgang ved sig ikke overstyre befalser, der tilkommer statsministermyndigheder til mellemstatlige myndigheder som f.eks. EU. Danmark har overtaget sædvanen befalser EU i på visse områder. Tals. Xen Aspasia har stortid virket for denne type af retsakter på overstådet for mange og andre anliggender.

DRIFTSRET FOR RETTIGE OG INDRÆ ANSIGTENE?

Området for rettige og andre anliggender omfatter de dele af EU-samarbejdet, der hanterer omstridt (hovedsagelig tømmeret og handel over grænser), driftsret, politisamarbejde, Schengen-samarbejde (grænseovertrækket og alrum) samt asyl og indvandring.

RETSAKTER

En retsakt er en folkesædelsprægning for en lov, en regel eller en beslutning. Den findes forskellige former for EU-retsakter: forordninger, direktiver og afgørelser.

DET STEMMER VI OM

Den 3. december 2015 skal danskerne stemme om, hvorvidt det nuværende retsforbehold skal omdannes til en tilvalgsordning.

Den 3. december 2015 skal vi til folkeafstemning i Danmark. Vi skal tage stilling til, om vi vil omdanne det danske retsforbehold til en tilvalgsordning.

Danmark har haft et retsforbehold siden 1993. Retsforbeholderet betyder, at Danmark kun deltager i EU's samarbejde om rettige og andre anliggender på såkaldt mellemstatligt niveau. Siden 1993 er samarbejdet om rettige og andre anliggender gradvist flyttet fra mellemstatligt til overstortsligt niveau.

Derfor deltager Danmark ikke i ny EU-lovgivning om blandt andet strafferenet og politisamarbejde. I foråret 2016 forventes EU at vedtage en ny forordning om Europol, som Danmark derfor ikke kan deltage i.

Partierne Venstre, Det Konservative Folkeparti, Socialdemokraterne, Radikale Venstre og Socialatisk Folkeparti står bag et fælles forslag om, at vi omdanner retsforbeholderet til en tilvalgsordning. Vi vil fortsat have et retsforbehold, men med tilvalgsordningen kan Danmark fremover selv vælge, hvilke dele af EU's samarbejde om rettige og andre anliggender vi vil deltage i.

Der skal vedtages et lovforslag i Folketinget for at omdanne retsforbeholderet til tilvalgsordningen. Lovforslaget indebærer, at vi afgiver suverænitet. Det er grundet til, at vi skal til folkeafstemning.

Denne pjæce giver en introduktion til tilvalgsordningen, og hvilid den vil betyde for Danmark. Du kan finde mere information på www.3december.dk.

Eksempel: Google søgning

The screenshot shows a Google search results page. The search query in the bar is "replace tooth teeth \"henry ledgard\"". The results are categorized by type: Internet, Billeder, Videoer, Mere, and Søgeværktøjer. Below the categories, it says "Ca. 399 resultater (0,52 sekunder)". The first result is a PDF titled "The Natural Language of Interactive Systems" from citeseerx.ist.psu.edu, dated 1980, by Henry Ledgard. It includes a snippet of text about replacing TOOTH. The second result is a link to Amazon.com for Henry F. Ledgard's books, biography, and blog. The third result is a link to RateMyProfessors.com for Henry Ledgard at the University of Toledo.

replace tooth teeth "henry ledgard"

Internet Billeder Videoer Mere Søgeværktøjer

Ca. 399 resultater (0,52 sekunder)

[\[PDF\] The Natural Language of Interactive Systems](#)
citeseerx.ist.psu.edu/viewdoc/download?doi... ▾ Oversæt denne side
etter H Ledgard - 1980 - Citeret af 153 - Relaterede artikler
Henry Ledgard. University of TRUTH will replace TOOTH, and not the other way around. Current line moves ahead to last line in text containing TOOTH.

[Amazon.com: Henry F. Ledgard: Books, Biography, Blog ...](#)
www.amazon.com/Henry-F.../e/B001HQ4U8O ▾ Oversæt denne side
Results 1 - 12 of 20 - PASCAL with Style: Programming Proverbs (Hayden computer programming series) by Henry Ledgard (Jul 1981) ...

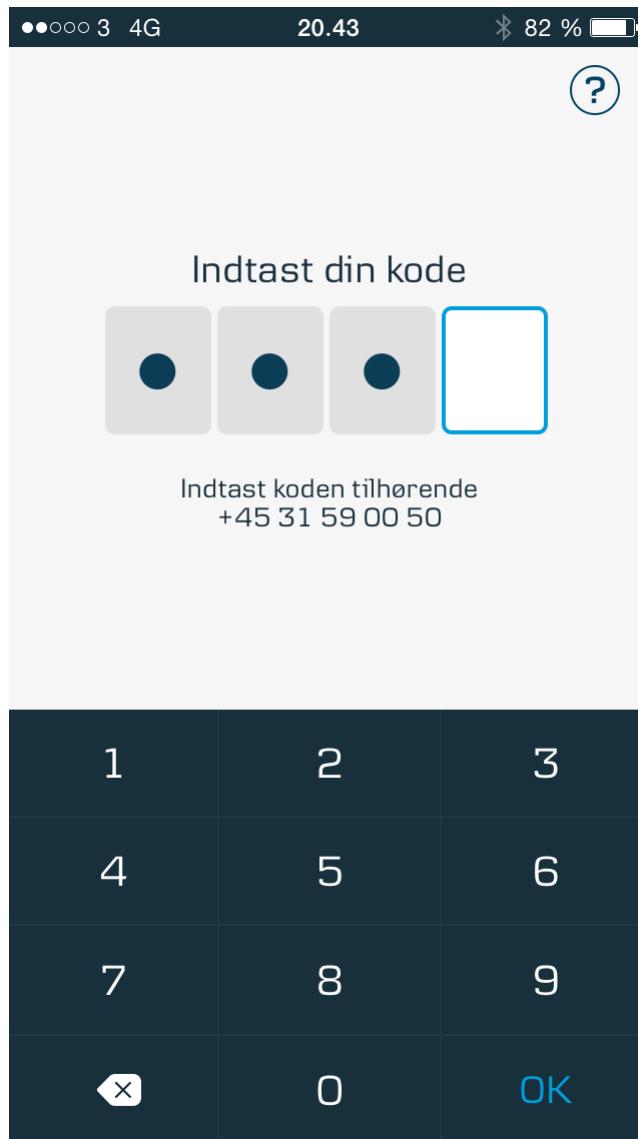
[Henry Ledgard - RateMyProfessors.com](#)
www.ratemyprofessors.com>ShowRatings.jsp?tid... ▾ Oversæt denne side
Rating and reviews for Professor Henry Ledgard from University of Toledo ... he sees the problem and it should be an easy fix and walks away without helping.

Mobile Pay

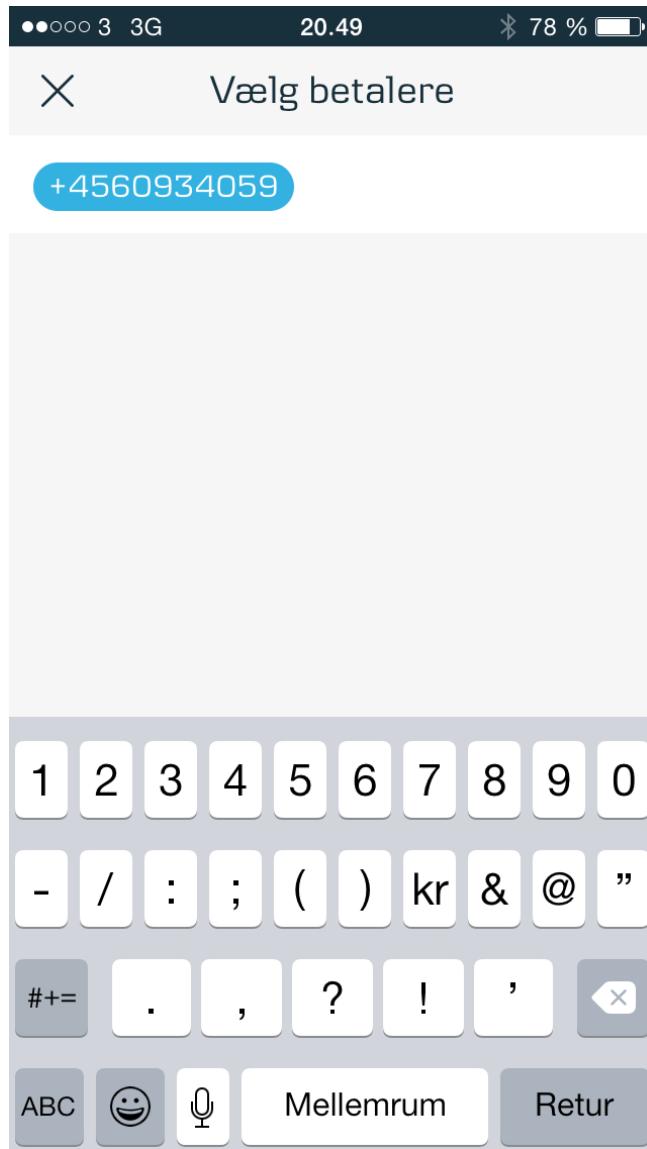
Consistency: Et fundamentalt usability-princip



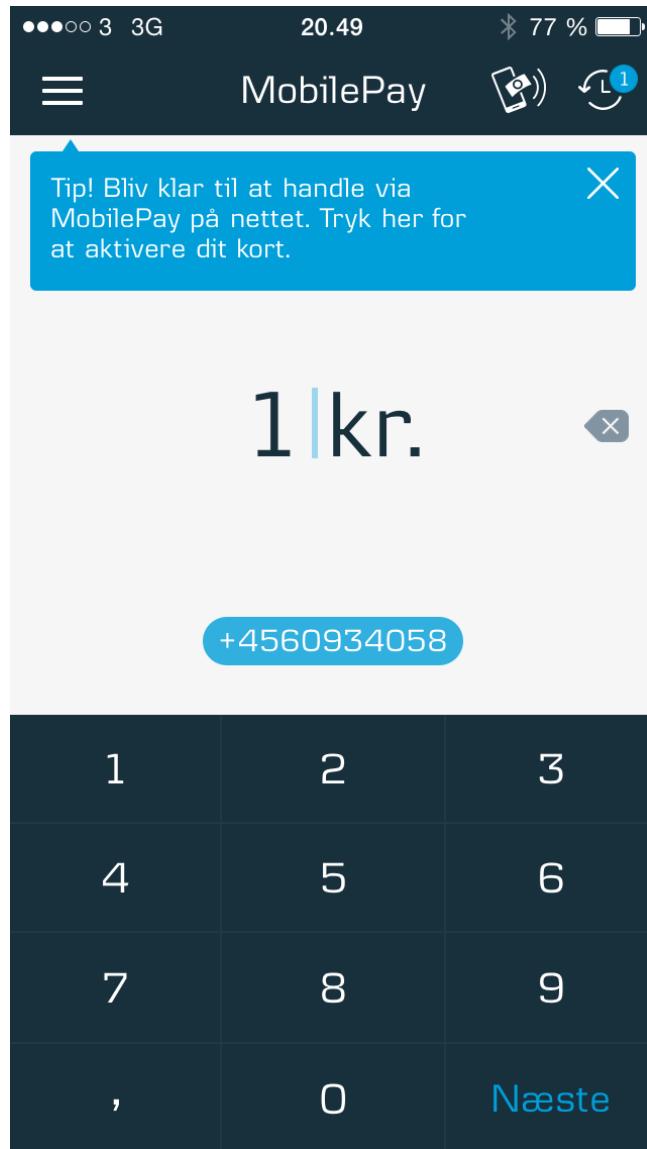
Mobile Pay



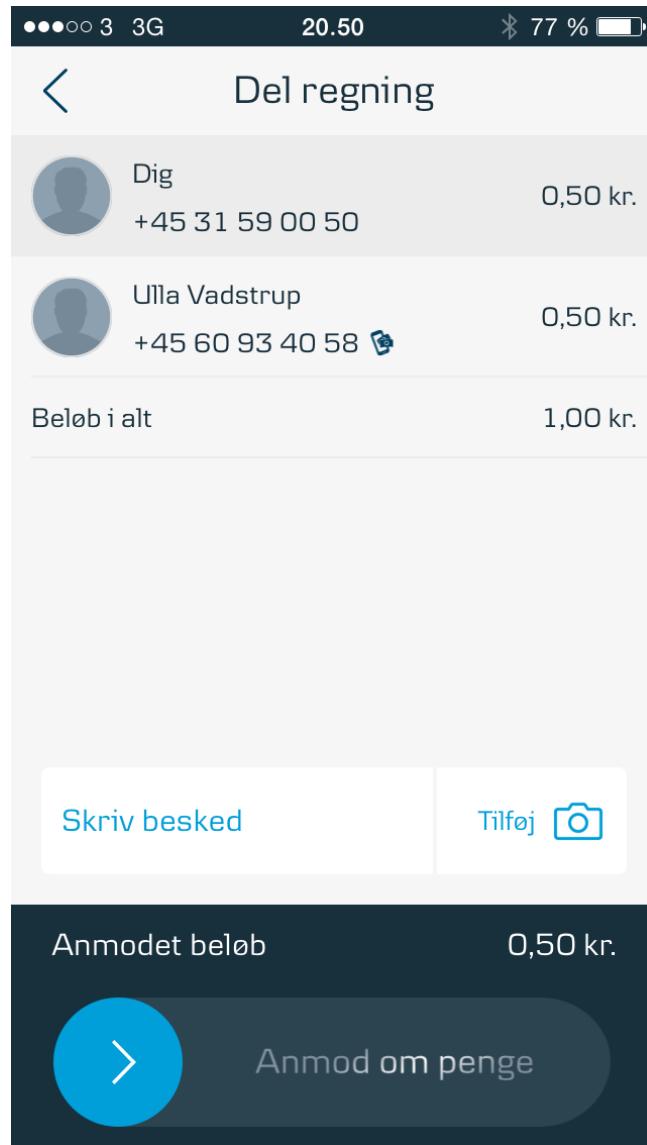
Mobile Pay



Mobile Pay

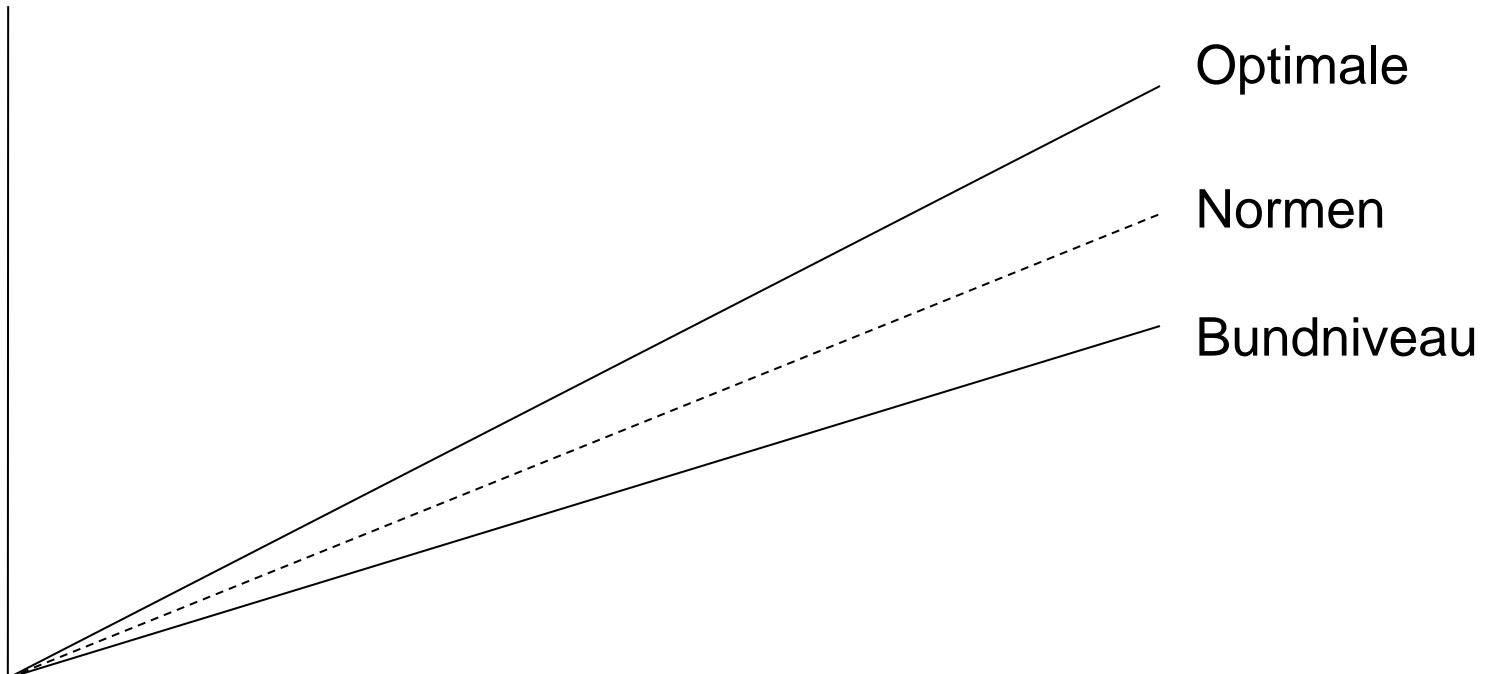


Mobile Pay



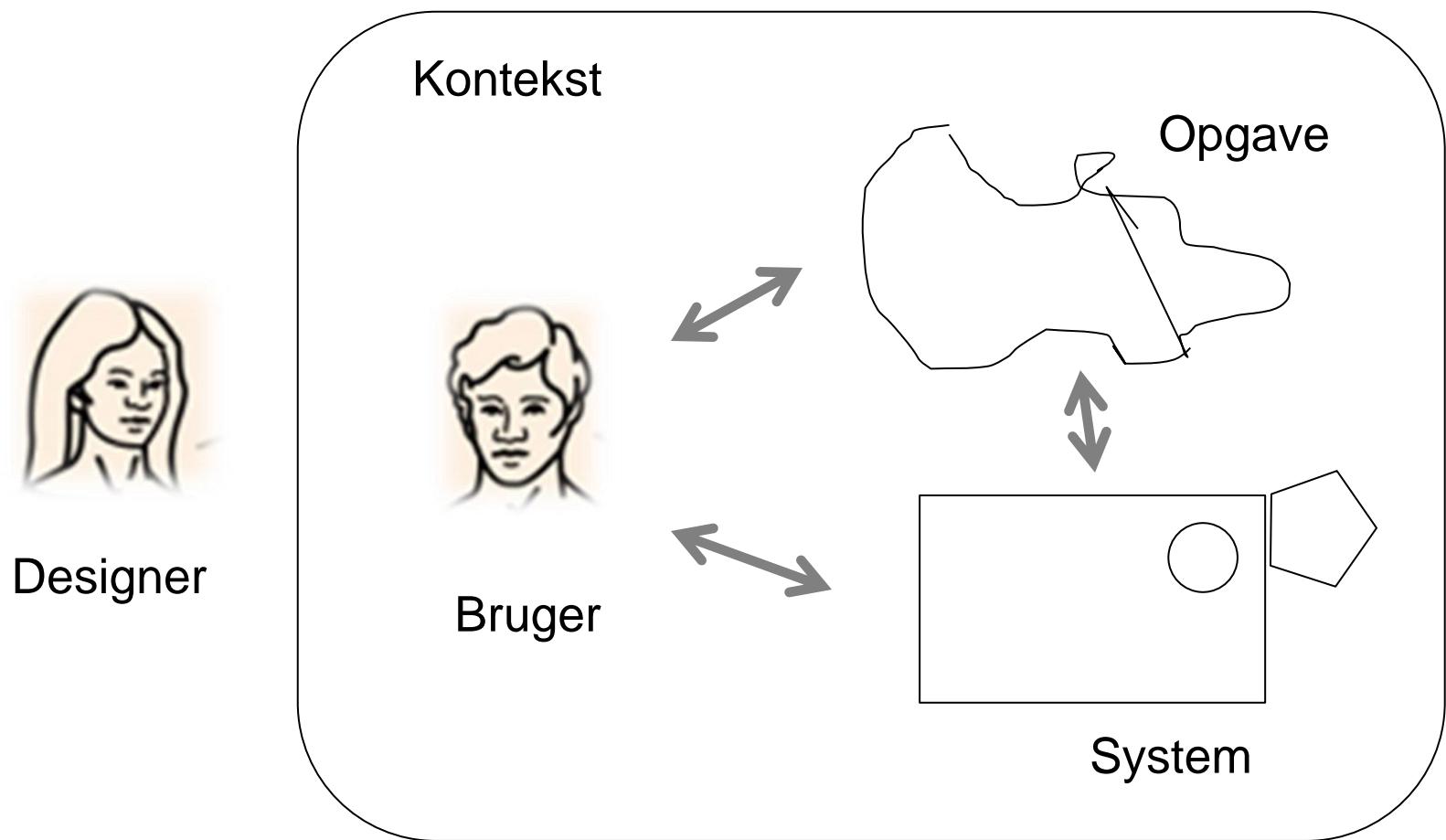
Forbedringer ?

- Er der sket en forbedring? JA!
- Er der stadig plads til forbedringer? JA!

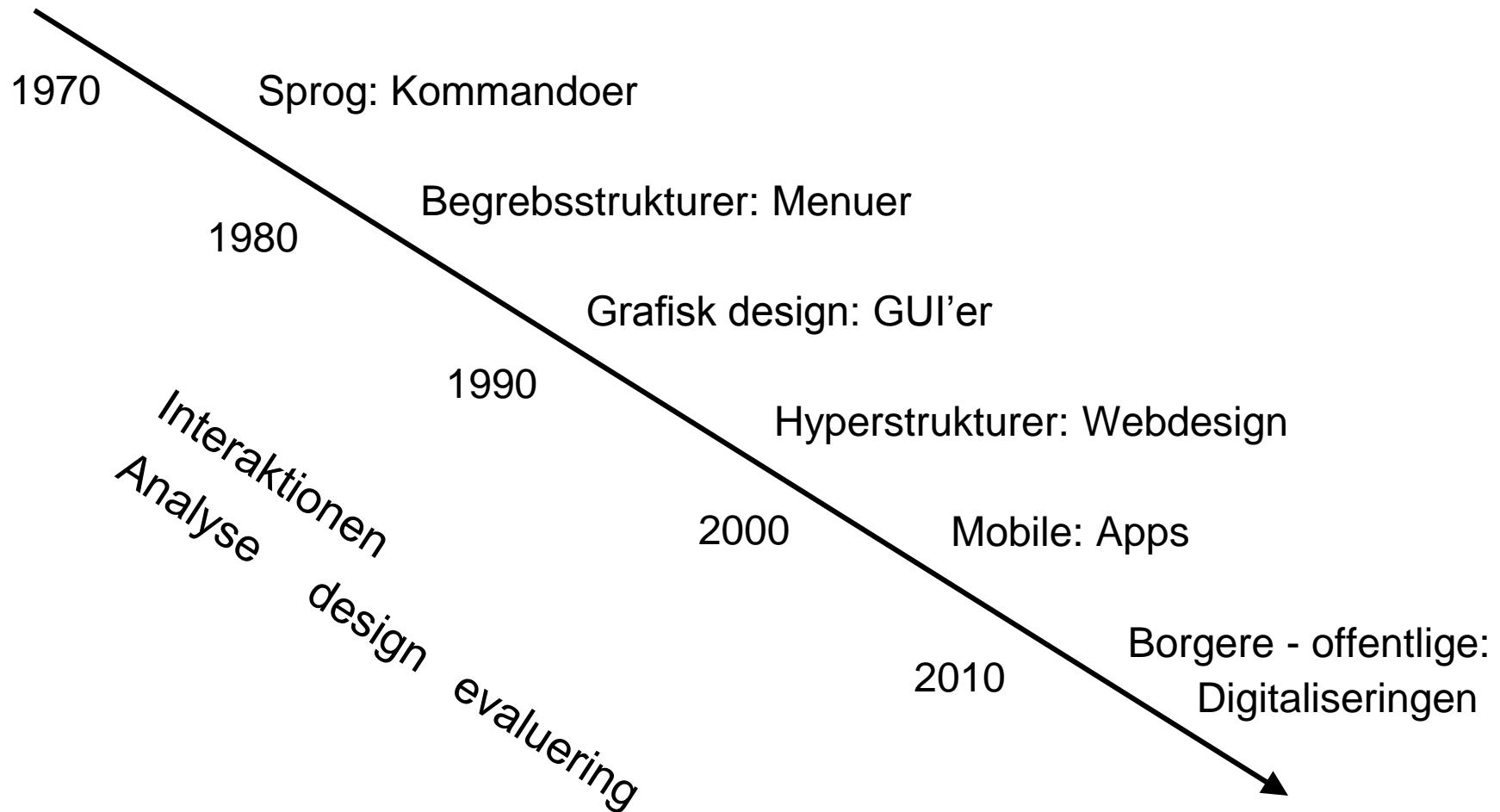


-
1. Opvarmning
 2. Indledning
 3. Baggrund og afsæt
 4. Nedslag
 - Knapper og kontakter
 - Hulkort - batch
 - Kommandoer
 - Menuer
 - Grafiske brugerflader
 - Web
 - Mobile enheder
 5. Er det blevet bedre?
 6. Afrunding

Ekspllosion på alle fronter



Ekspllosion i kompetancer



Faser

- Historical Continuity of Interface Design (Grudin 1992)
Interface as
 - hardware 1950s
 - software 1960-70s
 - terminal 1970-90s
 - dialogue 1980s
 - work setting 1990s
 - ? 2000s
 - ? 2010s
- Three and a half decade of HCI (Cockton 2004)
 - system-centered 1970s
 - user-centered 1980s
 - context-centered 1990s
 - ??-centered 2000s
 - ??-centered 2010s

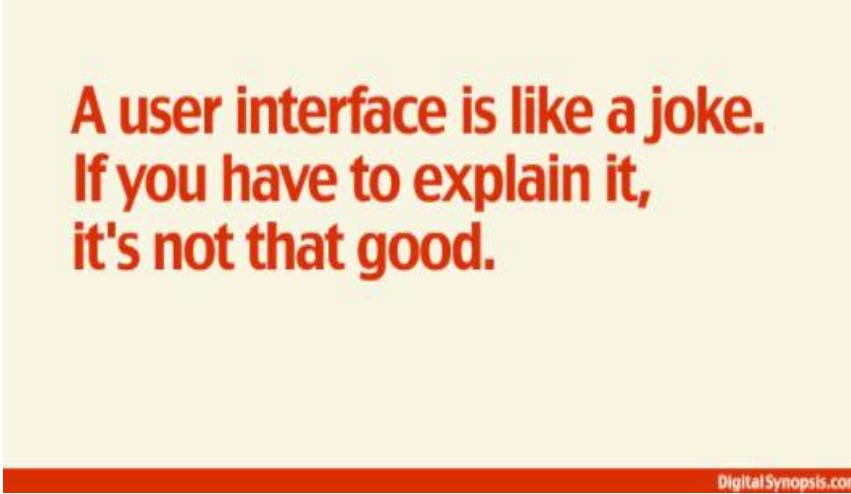
Brugerfladens udvikling: Integration og færre barrierer

- *Sted.* I batch: aflevere eet sted vs. afhente et andet sted
- *Medie.* I batch: hulkort/strimmel vs. leporello lister
- *Tid.* I batch: Aflevering på et tidspunkt vs. hente (langt) senere
- *Responsetid:* Langt mindre og langt mindre variabel
- *Hukommelse:* Genkaldelse vs. genkendelse
- *Grafik:* Langt mere naturtro repræsentationer
- *Interaktionen:* Direkte Manipulation vs. sprogligt mellemled
- *Feedback:* Langt mere direkte og sanselig, sansning og handling smelter sammen
- *Standarder:* Lære langt mindre
- *Opgaven:* Favner navigation og computer

Mit bud på en essens

- Computeren
 - Forsvinder: vaskemaskine, telefon, drone vs. server & mainframe
 - Fra kalkulator til medie
 - Fra specialist-værktøj til hvermands eje
 - Fra gigantisk til lille bitte i størrelse
 - Fra lille bitte til gigantisk mht. potentiale & funktionalitet
- Brugerfladen er etableret som et generelt fænomen og begreb
 - Fra perifer til ikonisk
 - Computeren forsvinder og brugerfladen dominerer
- Historien gentager sig
 - Digitaliseringen i DK
 - 3270 og HTML protokollerne: sidevis validering (Jan Clausen)
 - Symbolske adresser i assembler og Excel (Søren Lauesen)

Slut: Vittigheder om brugerflader?



A user interface is like a joke.
If you have to explain it,
it's not that good.

DigitalSynopsis.com

Og så er det I ikke skal sige:

"Er du rar lige at forklare den!"

Intermezzo: Standarder

SLUT