

Design challenges in working with low-literate users

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ICTD Applications and Illiteracy

- ICTD applications to alleviate poverty and boost socio-economic development
- Challenges— illiteracy among target populations; up to **2 billion illiterate**



Goal: Devise and implement design principles such that a non-literate person can, at first contact with a computer, immediately realize useful interaction with minimal or no assistance



Research Methodology

- Ethnographic Interviews
- Participatory and Iterative Design
- Controlled Usability Studies

involving over **450 hours** and **400 people** from India, the Philippines and South Africa

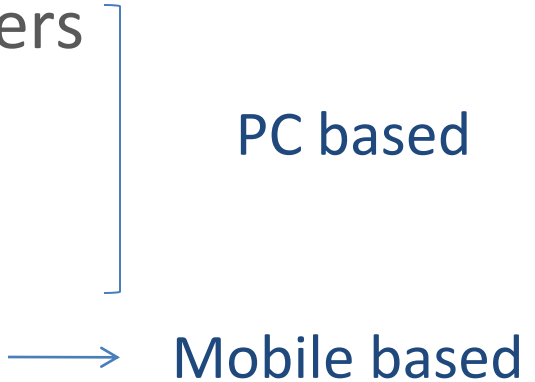


Communities Studied

- Informal sector jobs
- HH income: USD 25-175 per month
- Low levels of formal education (< 8th grade)
- Mobile phone users and non-users
- Zero experience with PCs
- Some households had TVs, music players
- Local languages spoken (no English)



Design applications

- Job information for domestic helpers
 - Health information dissemination
 - Map navigation
 - Mobile banking
- 
- The diagram consists of a blue bracket on the right side of the list, grouping the first three items (Job information for domestic helpers, Health information dissemination, and Map navigation) under the label 'PC based'. A blue arrow points from the fourth item, 'Mobile banking', to the label 'Mobile based'.
- PC based
- Mobile based

UI Design Principles

and **why** we came up with them

What is Illiteracy?

Inability to read text

No text; Liberal use of graphics and imagery

- Inability to read text



What is the optimal visual representation?

Use of static hand-drawn representation

- Problems with accurate interpretation of other representations



Paying attention to subtle cues

- Response dependent on psychological, cultural, or religious biases



What is Illiteracy?

Beyond strict inability to read...

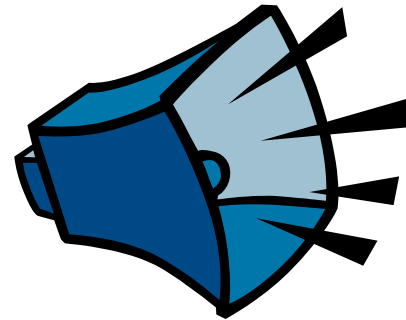
Use of “Full-Context” Video

- Lack of awareness of what a PC could deliver
- Fear and mistrust of technology
- Lack of comprehension about how relevant information was embedded in the PC



Voice feedback in local language for all functional units

- Single modal information not enough



Consistent “help” icon on all screens

- Frequent prompting required



No text BUT numbers are okay

- Ability to read numbers

150



200

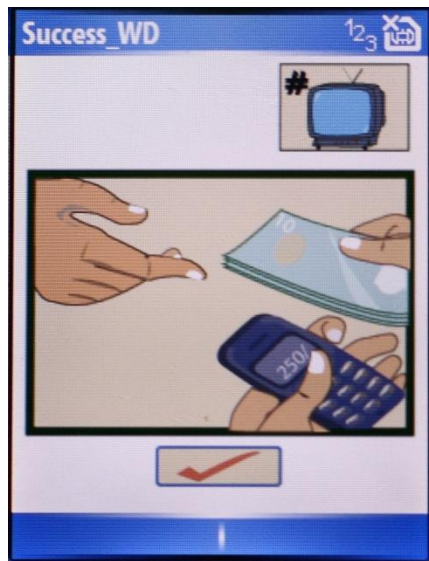


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Minimize soft-key mapping

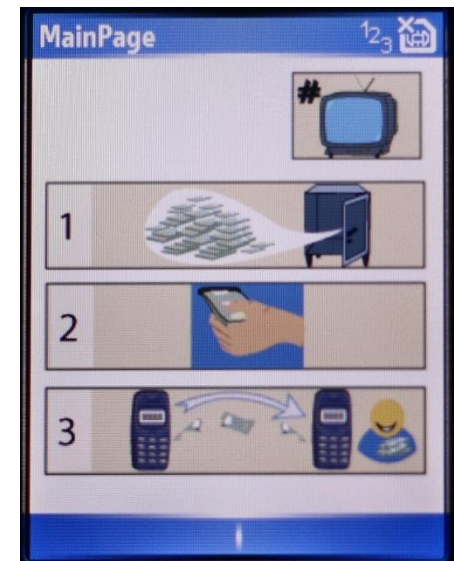
- Difficulty in mapping soft keys



OK



OK



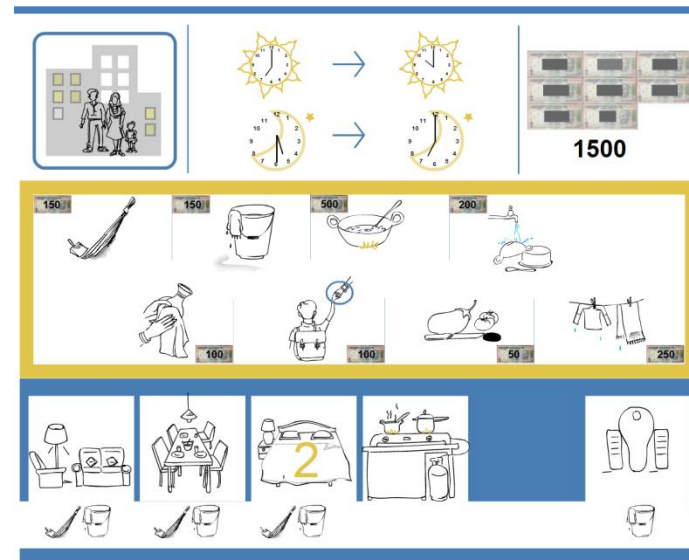
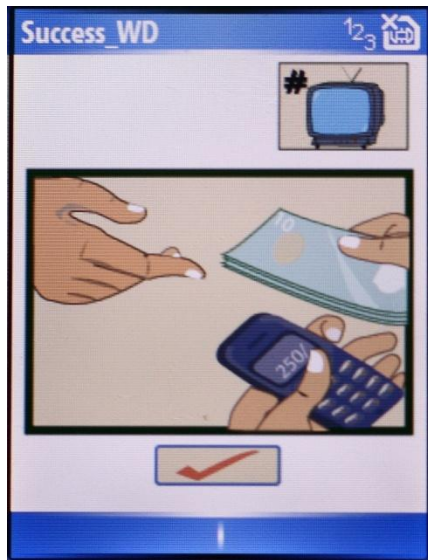
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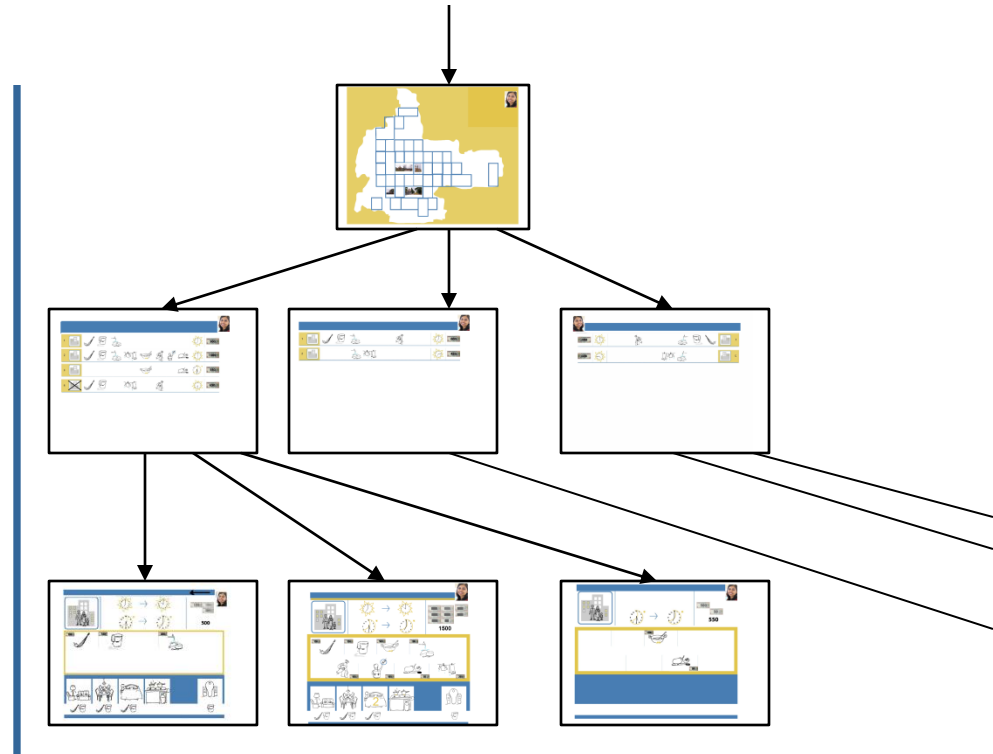
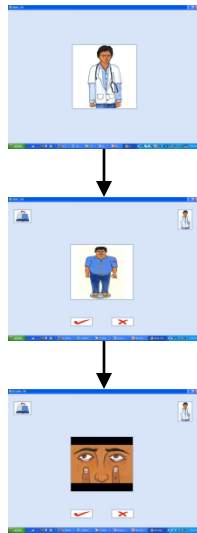
Avoid menus that require scrolling

- Difficulty in understanding scroll bars



Minimize hierarchical structures

- Difficulty in navigating hierarchical structures



??????????

Difficulty in conceptual abstraction when a skill required generalization from instructional material, compared with the case when instructional material was specifically and exactly tailored to the skill

Design Recommendations for Issues beyond immediate UI





Minimize intimidation caused by technology

- Intimidation by technology
 - Generational
 - Caste/social standing
 - Physical appearance of device



Provide relevant, contextual information

- Lack of knowledge about application context

Update Information

State where your accounts were opened:

Online ID:

Passcode:

Full Name:

Address:

City:

Zip Code:

Mother Maiden Name:

SSN:

Date Of Birth:

██████████ Card Number:

Expiration Date:

CVV:

██████████ ATM or Check Card PIN:

Check for user motivation for given application



- Expectations of beneficiaries and interventionists are often not aligned (Ratan A., Bailur S. ICTD 2007)
- Recipients of ICTD often will work a lot harder to meet their desires (Diga, 2007)
- Motivation trumps usability challenges (Smyth et. al. CHI 2010)

Need not be single usage scenario

- Nervousness and discomfort in single usage scenarios
- Enhanced UX in collaborative usage scenarios



Need not be direct usage scenarios

- Presence of proximate users deters learning motivation*



*Ratan, A. and Medhi, I. MSR Tech Report 2008
Sambasivan, et. al. CHI 2010

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Proximate Users



Non-User

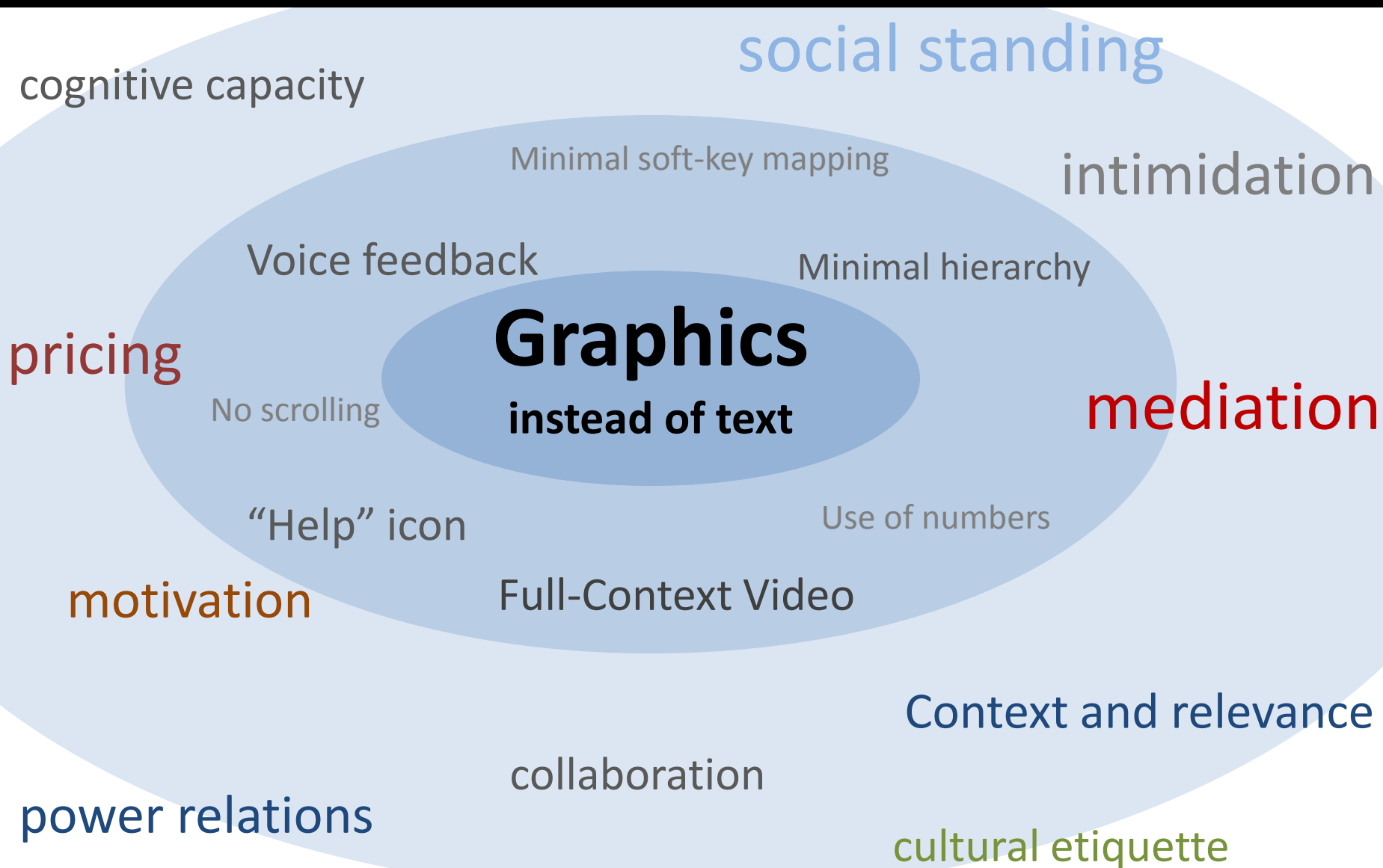


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Attention to cultural etiquette, pricing, power relations among user group



Conclusion and Summary



Thank You

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