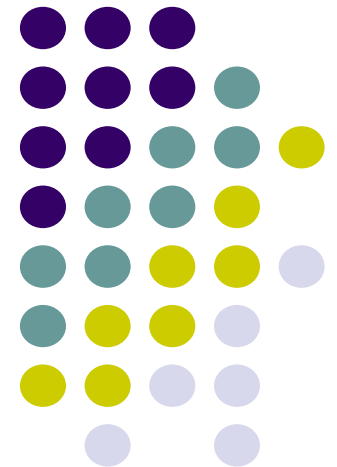


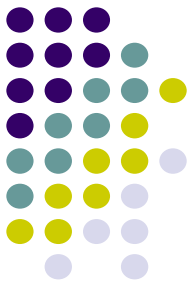
Usability Evaluation of Mobile Phone Applications

Harsha BN and Shrinivas
NOKIA India

“Today, switching from one phone to another, or from one carrier to another, requires learning new menus and screen designs. The differences -- maddening as they are -- rarely add any value to the user experience.”

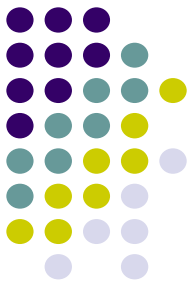
-Business Week





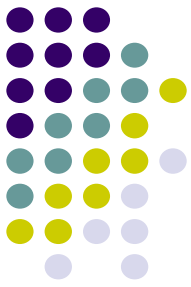
Agenda

- Usability Evaluation of mainstream HCI
- Market Dynamics of Mobile phone applications
- Mobile Context-Real Challenge
- PC Context vs. Mobile Context
- Recruiting the participants- Know the mobile users
- Mobile application usability attributes-Three Layer Usability
- Conclusion



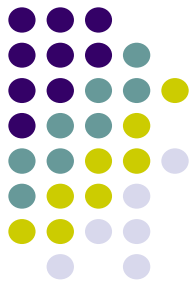
Is Your User happy?

- User Experience is key element for market success.
- **Enhanced user experience will drive the Market-**
Over half of the phones are currently sold to the people already have a phone
- **Market is Competitive**
Winning companies put user experience at the center of their strategy
- Usability evaluation has proven to be invaluable tool for assessing the usability of the product



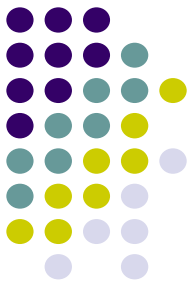
Usability evaluation of Mainstream HCI

- Many methods and techniques evolved for Usability evaluation of Mainstream HCI.
- Has many tried and true approaches to mainstream HCI
- Has empirically documented experience with their use.
- Designer knows the exact target user or can reasonably well defined
- Can these evaluation methods be used for mobile phones?



Market Dynamics for Mobile phone applications

- Mobile phone applications spanning from Phone book applications to more advanced applications like Location based services
- Global mobile subscription expected to 2 billion by 2008
- Investment in Mobile phone applications are rising exponentially
- Many features in mobiles are unnoticed or unused as bulk of users are naïve
- Myriads of applications are developed by companies ranging from start-ups to mobile barons.
- Market success is the only way of survival



Mobile context –Real challenge

Physical context

- ❖ Uncertain mobility of user (home, office, travel, farm)
- ❖ Environment of mobile usage (cold, dark, rain etc..)
- ❖ Demography of a individual.(Ex:Plumber, labor, old man, CEO, College student)

Social context

- ❖ privacy
- ❖ individuality
- ❖ Conformity

Mental context

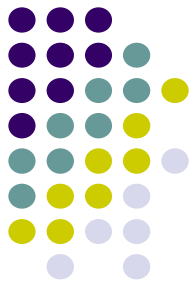
- ❖ how well he/she knows mobile they are using.
- ❖ Users of these products do not expect to operate a computer system

Mobile infrastructure

- ❖ limited bandwidth
- ❖ low network coverage
- ❖ Lack of seamless mobility
- ❖ Platform & menu structure

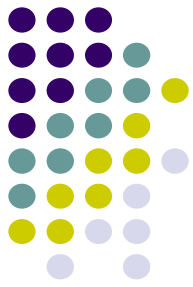
Mobile Ergonomic context

- ❖ Limited I/O
- ❖ Display size
- ❖ Low resolution



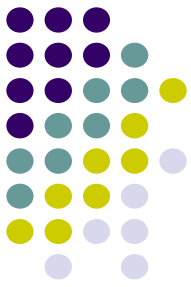
PC Context vs. Mobile Context.

- ❖ PC likely to be stationary (temporarily or permanently)
- ❖ Using the PC is likely to be the primary task
- ❖ The PC is in the network or out
- ❖ Using PC is likely to be a primary task.
- ❖ Platform for PC are stable and limited
- ❖ Communication any time anywhere.
- ❖ Several simultaneous tasks ongoing
- ❖ Network coverage and communication bandwidth vary
- ❖ Need to remain connected versus need to be discrete.
- ❖ Too many proprietary platforms.



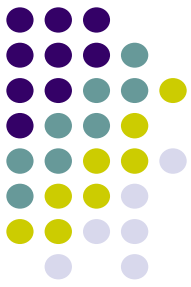
Mobile Usage context in Usability Evaluation

- Traditional methods does not consider or measure the influence of context
- Usability of the product is characterized not only by the feature but also by its context of use.
- Methods used to study mobile use and usability need to be context centered
- Usability test in real environment can help ensure that a mobile application can work properly and help user to achieve their goals in real environment
- A mobile application tested in controlled laboratory environment may not work as well as it does in real environment due to changing and unpredictable network condition and other environmental factors
- Make sense to test usability in the Real environment, BUT...



Mobile Context Continued..

- Mobile Usage context is hard to emulate.
- Complicate to establish realistic environments that capture the richness of the mobile context.
- Difficult to apply established methods such as *coaching method, thinking aloud and Question asking protocol*.
- Challenging for data collection
- So both the methods have pros and cons.



So What should be approach?

- Hybrid method is preferred
- Emulators - to emulate network and low memory conditions in laboratory.
- Test applications
- Usability attributes such as effectiveness, efficiency, learnability of the menu can be conducted in Laboratory
- Field Evaluation- to evaluate Features which are hard to emulate in Lab.

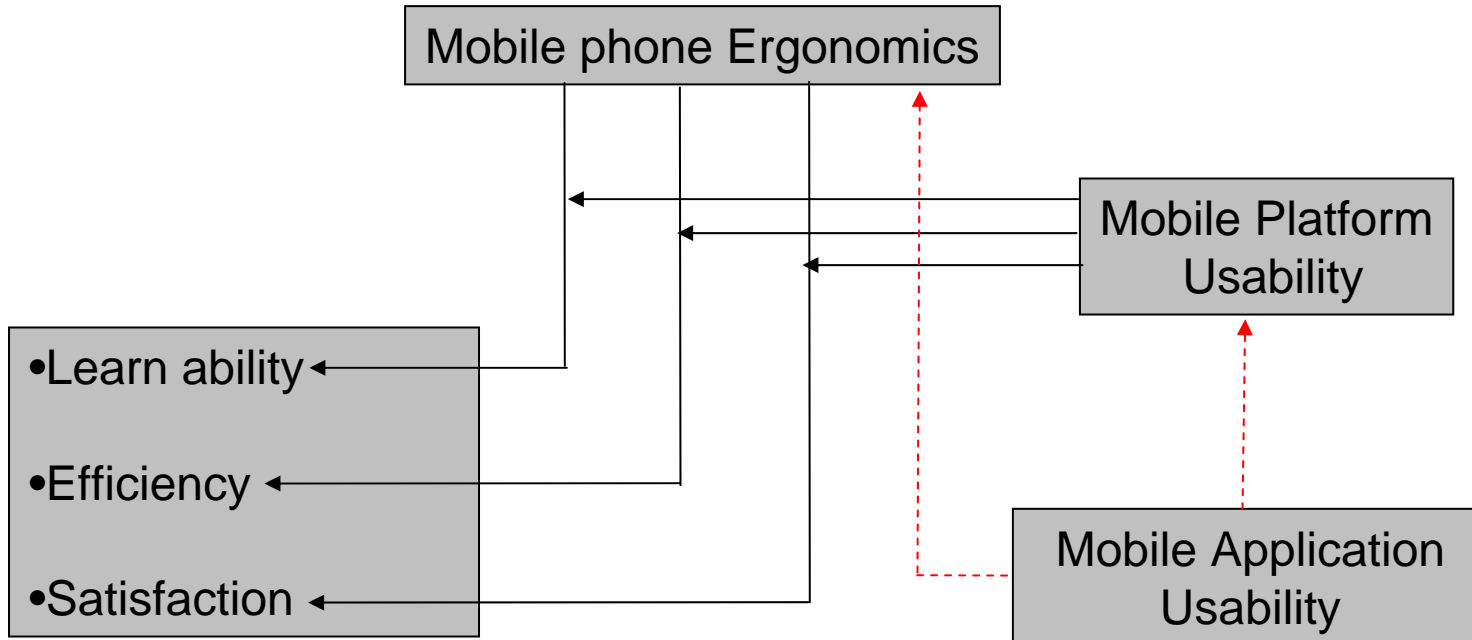
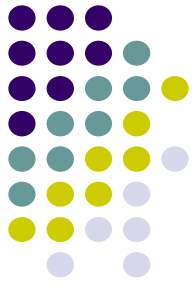


Recruiting the participants – Know mobile user.

- Effective participant recruiting is crucial to collect reliable data during usability testing of mobile phone application
- Attributes to consider
 - Age group
 - Mobile phone users with earlier experience of different manufacturer
 - Job characteristic
 - Cultural group
 - Mobile phone segmentation

Mobile application Usability attributes

- Three Layer Usability



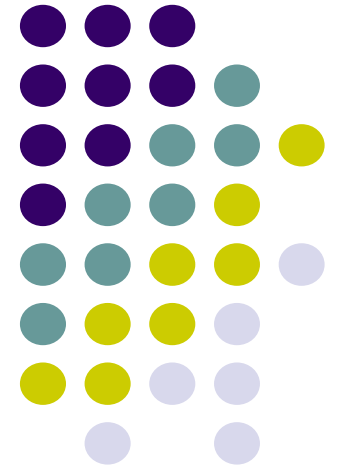


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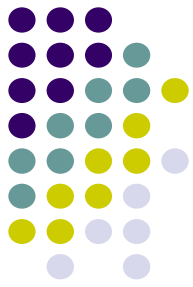
- Desired display feature
- Consistency
- Flexibility and efficiency of software
- Desired help text
- Usability of keypad
- Menu Structure
- Text Labels
- Easy control of battery
- Learnability
- Satisfaction
- Easy to clean up troubles
- Hands free

Conclusion

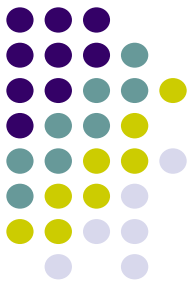
“Unique features of mobile phones, limited bandwidth, unreliability of networks, changing mobile context and target users, makes the mobile phone usability evaluation challenging process. Though existing mainstream HCI usability evaluation methods can be used, but cannot completely rely on them. Therefore this area needs profound research.”



Reference



- [1] Dongsong Zhang and Boonlit Adipat, **Challenges, Methodologies, and Issues in the Usability Testing of Mobile Applications**, International Journal of Human-Computer Interaction, ed. , Vol. 18, No. 3, Pages 293-308 (doi:10.1207/s15327590ijhc1803_3): 2005.
- [2] L. Gorlenko and R. Merrick, **No wires attached: Usability challenges in the connected mobile world**, <http://www.research.ibm.com/journal/sj/424/gorlenko.html>, volume 22. no.4 ed. , 2003.
- [3] Jesper Kjeldskov and Jan Stage, **New Techniques for Usability Evaluation of Mobile Systems**, Department of Computer Science,Aalborg University, Denmark: 2002
- [4] Jesper Kjeldskov and Mikael B. Skov, **New Creating Realistic Laboratory Settings:Comparative Studies of Three Think-Aloud Usability Evaluations of a Mobile System**, Department of Computer Science, Aalborg University,Denamrk
- [5] Ann Arbor, **Challenges in Participant Recruiting for Usability Testing**, Department of Computer Science, Aalborg University,Denamrk: IPCC 98 Proceedings,the annual conference of the IEEE Professional,Communication Society. ©1998 IEEE., 1998
- [6] Harri Kiljander, **Evolution and Usability of Mobile Phone Interaction Styles**, Dissertation for the degree of Doctor of Science in Technology ed. , Helsinki University of Technology : 2004.
- [7] Jesper Kjeldskov and Connor Graham, **A Review of Mobile HCI Research Methods**, Department of Information Systems University of Melbourne
- [8] Anne Kaikkonen, Titti Kallio, Aki Kekäläinen, Anu Kankainen and Mihael Cankar, **Usability Testing of Mobile Applications: A Comparison between Laboratory and Field Testing**, Issue 1, Vol. 1, pp. 4-16 ed. , November 2005.



Thank You

Questions?