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Smart phone as a medium to access medical information: a field study of military physicians

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Agenda

- Research background
- Research purpose and design
- Results: Military physicians' evaluation of the mobile medical information system
- Conclusions

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Research background – Support mobile technology in military medicine


- Need for the military and military medicine to keep building up more mobile and agile Defence force
- Specifics of military medicine
 - Rough field conditions, emergency and crisis situations, field hospital
 - Troops are mobile
 - Civilian medicine+ military readiness
- Applications of mobile technology in the military medicine (US Military)
 - BMIS-T: based on Microsoft Windows Mobile

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Research background: smart phone and the mobile medical databases

- The mobile medical information system, used in this research, is designed by Duodecim Publication Ltd. It is a set of medical information and knowledge databases
- **Databases:** EBMG; Cochrane abstract; Pharmaca F.; Drug interaction; Drug price update; ICD-10; Lab guide; Acute care guide; Dictionary; Health care related addresses & contact information
- XML databases, operates on Symbian, Palm OS, WinCE
- the system is stand-alone



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Research purpose

- The study presented here is part of a larger study aiming at investigating the suitability of a mobile medical information system for military physicians in the Finnish Defence Forces.
- One purpose of the study is to investigate the advantages and disadvantages of using "off-the-shelf" technology in providing support to medical professionals in armed forces.
- The focus of the field study presented here is the usability of the selected device (Nokia Communicator) in delivering the mobile medical application and the benefits for military doctors.

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Research design – Field study

- Sep. 6, 2005, 31 physicians were given a phone (Nokia Communicator 9210) equipped with the mobile medical database;
- Dec.10, two researchers visited a military training camp to conduct interviews of military physicians and to observe them in their daily routines and their operating environment
- The researchers visited two different attachments of military doctors during a military exercise: one at the battalion level medical station and one on the front line
- 7 semi-structured interviews were conducted




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Research design

Interview questions focused partly on the properties & the features of the device:

- *screen properties*: lighting, size, readability of the information (text size, font), and use in different weather and daylight conditions
- *keyboard properties*: size, layout (easiness to input text, use with gloves), and use in different weather and daylight conditions
- *phone cover*: robustness and durability
- *phone storage and portability*: how is the phone handled? Is the phone easy to carry with? Where and how is it kept?
- *battery life*



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Results

- 6 male, 1 female
- Nokia 9210 Communicator was a new device to most of them
- The female subject used her own Nokia 9300 Communicator
- Familiar with the national Internet portal: Terveysportti

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Results: Learning to use the device

- Learning to use did not seem to be a problem
 - Learned to use the device and the databases within the first week they received the devices;
 - The core concept of the databases was known from the Internet portal;
 - The Nokia user interface was known from the use of previous Nokia phones;
 - The use of the device did not differ from the use of a normal computer.

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Screen properties

- The screen size was suitable;
- The shape of the screen, "horizontally oriented vs. vertically oriented"
- Screen readability and font size did not pose any problem;
- When using the device in the dark, the screen has to be bended to bring light onto the keyboard; this affects readability and makes the use of the device unpractical.

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Keyboard properties

- Text input did not pose any major problems, input of special signs was tedious,
- Nearly impossible to input text with gloves in cold weather conditions,
- The need for a backlit keyboard was expressed.

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Phone robustness and durability

- Robust in stationary conditions (a field hospital);
- Cold, humidity, or crawling in the field would break down the device, especially "humidity"..

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Size of the device, phone storage and portability

- Leather case to keep the device,
- A smaller device would be welcomed, but not at the expense of the screen size,
- Device was carried the device in the front pocket of their uniform

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Battery life

- Battery life was a problem, insufficient in
 - War-like situations
 - Outdoor operations with cold weather conditions
 - The work pace can be very hectic, the user forget to charge the battery, or leave the phone running, consuming the battery.

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Conclusion

Smart phone as a medium to access medical knowledge and information is welcomed by the study group, BUT

- The size of the screen
- Screen layout
- Use of the device in the dark is impractical
- Special protecting case
- Special power saving settings

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Conclusion

- Future research:
 - a comparison study of different mobile devices in their suitability of delivering mobile e-health services in military field conditions.
 - improve the system suitability for military field condition.

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