My approach to participatory and user-centred development

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In COLLA 2014
User-centred approach to design

(Dui, 2006)

<table>
<thead>
<tr>
<th>Overall System Performance</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Well-being</td>
<td></td>
<td></td>
</tr>
<tr>
<td>YES</td>
<td>YES</td>
<td>“True” ergonomics</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Limited Ergonomics (only H &amp; S)</td>
</tr>
<tr>
<td>NO</td>
<td>Bad ergonomics</td>
<td>Bad products and process</td>
</tr>
</tbody>
</table>
## Participatory & user-centred

<table>
<thead>
<tr>
<th>Participatory</th>
<th>User-centred</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>YES</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td></td>
<td>Involving as a expert, maybe as a decision (co-)maker</td>
<td></td>
</tr>
<tr>
<td>YES</td>
<td>“Best one”</td>
<td>possible</td>
</tr>
<tr>
<td>NO</td>
<td>possible</td>
<td>Bad products and process</td>
</tr>
</tbody>
</table>
Wilson and Haines, 2000

INVOLVEMENT IN PROCESS

MOTIVATION TO PARTICIPATE

CONFIDENCE

COMPETENCE - TECHNICAL - SOCIAL

OUTCOMES
• Technology in human and social context

- Technology in isolation, "alone"
  - Individual and organisational participation
  - Individual and organisational user

**people:** 1) Individuals (citizens, users, customers, employees, entrepreneurs, ) and 2) representatives of organisations
Work System (WS), one concept, cf., Carayon & Smith 2000 modified; Väyrynen & Nevala 2010
EN ISO 6385

• According to the above international standard of work systems, optimisation may be evaluated based on usability measures of three categories
  • (1) health and well-being (medical / physiological, psychological, subjective)
  • (2) safety, and
  • (3) performance (the quantity and quality of production)
Performance and preference features

- **Expected benefits**
  - **Utilitarian**
    - (objective product attributes)
  - **Hedonic/Experimental**
    - (Subjective/emotional)
  - **Needs**
  - **Alternative evaluation, purchase, use**

(modified Engel et al., 1990) (Kemp & van Gelderen 1996)
Performance and preference

• satisfaction (ISO 9241 – 11)
• subjectively pleasing (Nielsen 1993),
• appealing (Wiklund & Wilcox 2005),
• convenient and practicable (Merriam-Webster),
• attractive (ISO 9126)
• pleasure (Jordan 2002, 2003)
Performance and preference

- Pleasure, *i.e.*, …felt to be good or desirable; a feeling of happy satisfaction or enjoyment; delight, gratification. Opposed to *pain*… (Oxford English Dictionary)

- “…leads to effective medical diagnosis and treatment, increases the physical and mental **well-being** of patients and caregivers, and leads to commercial success in a crowded marketplace” (Wiklund & Wilcox 2005)
Human-centred design

- **ISO 9241-210:2010**
- Ergonomics of human-system interaction -- Part 210: Human-centred design for interactive systems

- **Humans and Technology:**
- Compatibility physically, psychologically, cognitively, socially, and organisationally
Identify need for human-centred design

New iteration circle

Understand and specify the context of use

Evaluate designs against requirements

OK

The system satisfies the specified user and organisational requirements

Specify the user and organisational requirements

Produce design solutions
by improving existing and creating new work system and its components

• by improving existing and creating new work system and its components
Figure 2. This 3+3 model, in which the three-phase design process is supported by ergonomic knowledge and methods, is an essential part of the PERDA (Väyrynen, Kauto, et al., 1998; Väyrynen, Tornberg, & Kirvesoja, 1999). The rationalistic design is carried out in the processes shown in the center of the figure. The dotted arrows illustrate concurrent engineering potential as well the feedback channel (Tornberg & Väyrynen, 1999). The model is an embedded part of a stakeholder cluster that provides both product needs and possibilities to realize products utilizing technology (Väyrynen, Kauto, et al., 1998).
Macro, society, general broader context...

- regulation
- stakeholders, clusters
- value networks, suppliers, customers
- ecosystems
- open innovation, living labs
- sustainability, social responsibility, ecoefficiency, ecodesign
- universities, R&D
Five Ws and one H

- Why
- Who
- When
- Where
- What
- How
**Why, Who, When, Where, What, How**

- to focus effectively on usability and UX
- to speed implementation
- to be ready to market
- to gain acceptance
- to guarantee quality in use
Why, **Who**, When, Where, What, How

- Co-design group: R&D team of a project or company, with representatives of individual and organisational users, and researchers
- Other users, employees, customers, citizens for specific user-centred and user-driven contributions
- Value network
- Stakeholders
Why, Who, **When**, Where, What, How

- For improvements or innovations
- For ”building” and evaluating
- From very beginning to implementation (and follow-up)
Why, Who, When, **Where**, What, How

- In the field
- In living lab
- In a lab
- Within a company or R&D institution
Why, Who, When, Where, **What**, How

- To get a lot of diverse contribution of various product, service, living or work experts and users
- To get results of creativity of all (eg, for scenarios)
- To get desired interaction of user-technology system within context (to achieve high ecological validity)
- To get optimal trade-offs of properties

- By user studies in context (for identifying and listing carefully needs and requirements)
- By usability studies
- By benchmarking and benchlearning
- By a lot of relevant data, knowledge, ideas, scenarios, experimentation, and illustration
Improvements vs. Innovations

- Goffin & Mitchell [2010] present many definitions of innovation. The characteristic feature of most of them is "introducing something new" as far as technology, i.e. products are concerned. Innovations comprise, though, as well processes, services and business processes than products. Svensson & Nilsson [2008] emphasise that innovation is an intentional change, and further, that one form of innovation is a social one. As far as product design and development is concerned it is needed to distinguish conceptual one from detail one. Of course, innovation is much more related to conceptual design or development.

- The "new" is a relative issue – sometimes an innovation is not totally new thing not yet existing at all. In that case it is new "only" in a particular field of businesses or organisations. Then it is more like an improvement, a good practice to be shared with already existing utilisers. One goal of this presentation is to deal with user-centred development by dividing it into the categories of improvements and innovations.
Examples

• Project cases of the author with co-workers

• For improved daily life or working life
In current frictionless communication (FriCo) project (see COLLA 2014)

- Case company-specific implementation of each one’s own conclusive results, participatory workshops, new training, changes in quality and management system
- More emphasis with stakeholders on general implementation of conclusions in final phase of project (national federation of employers, union of academic experts, Finnish Work Environment Fund)
- HSEQ AP (Assessment Procedure)
- Finnish Safety Card Training System

- Big purchasing companies
- Auditing suppliers’ integrated management
- Training of key issues of safety and work environment
- Network collaboration with delivering suppliers and contractors
- Training of key issues of safety and work environment
Video and its analysis system - VIDAR

- As far as innovations, nowadays there is lively discussion about employee-driven ones. Due to their tight links with the users / employees, and hidden innovation potential.
- Experiences in lorry transport R&D
- VIDAR (Forsman et al. 2003) can be said to be an instrument throughout which users can become promoters or even producers of innovation.
- Design science consists of two basic activities, building an artefact / innovation and evaluating it. VIDAR gives help for both the basic activities.
## Example of stakeholders

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Interests and role</th>
</tr>
</thead>
<tbody>
<tr>
<td>National road transport employers’ association</td>
<td>Companies’ general interests</td>
</tr>
<tr>
<td>National workers’ union</td>
<td>Represents united professionals, like lorry drivers</td>
</tr>
<tr>
<td>Organisation of transport and logistics</td>
<td>Represents entrepreneurs, lobbying for haulage sector</td>
</tr>
<tr>
<td>Technology industry, vehicle manufacturers</td>
<td>Represents companies supplying vehicles and systems</td>
</tr>
<tr>
<td>Ministry, social affairs and health</td>
<td>Occupational safety, work environment, wellbeing</td>
</tr>
<tr>
<td>Insurance sector, company</td>
<td>Statutory accident insurance</td>
</tr>
<tr>
<td>National institute of occupational health, ergonomics</td>
<td>Multi-disciplinary research</td>
</tr>
<tr>
<td>Universities at the field</td>
<td>Scientific and applied R&amp;D</td>
</tr>
<tr>
<td>Companies from road transport sector</td>
<td>Utilising technology, skills and knowledge in business</td>
</tr>
<tr>
<td>Companies from mechanical and ICT sectors</td>
<td>Manufacturers (tools, future innovations, design)</td>
</tr>
<tr>
<td>Funding organisations</td>
<td>Development strategies and priorities</td>
</tr>
</tbody>
</table>
Technologies for older citizens – usability of stair of sauna
Technologies for older citizens – videophone with touch screen
Technologies for older citizens – videophone with touch screen

- Public-private partnership
- Individual people
- ICT devices and service providers
Technologies for older citizens – videophone prototype 2001-2002

- Public-private partnership
- Individual people
- ICT devices and service providers
Technologies for older citizens – outdoors mobility aids and services

- Game-assisted user study
- Mechanical and ICT devices and services
- Public-private
- Individual people
Participatory and user-centred approaches for innovations

Innovation Pentathlon (Coffin & Mitchell 2010)

- For new products, services, business models, and processes utilise "5-key factor model":
  - (1) Ideas,
  - (2) Prioritisation,
  - (3) Implementation,
  - (4) INNOVATION STRATEGY,
  - (5) PEOPLE AND ORGANISATION
UTILISE MORE AND MORE SYSTEMATICALLY

• More **user-centred participatory development** is good for your technology, services, and business,

• And for people, too.

• Thank you!