Health and smart-wearables. The need for understanding user activity and psychological functions of devices

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Overview

1. Introduction
2. Smart wearables, definition, challenges
3. Interdisciplinary research team (*in progress*)
4. Results: What we have found so far
5. Conclusion
1. Introduction
In Tech, what matters most is how we « interact with » than the device itself

Star Trek

Elysium

Robot and Frank

Real Humans
1. Introduction
From Sci-Fi to current Tech

- Uses and users are to be further investigated
- Important to:
  - study the links between emotions, corporeality, and behavior
  - focus on the needs and expectations of users themselves

Potential of Activity Theory and qualitative methods
2. Smart Wearables

Devices that provide advanced functionality connected to the internet (via smartphone), typically designed to be worn persistently

Activity/fitness trackers (Fitbits, Jawbones) & smartwatches (Samsung Galaxy Gear, Apple-Watch, Garmin)

- Target consumer health
- Count steps, measure blood pressure…
- Help to built a stronger connection between people and healthier habits
- PROMISE better health, better fitness, higher productivity, better sleep… extend life
2. Smart Wearables
Challenging issue (A): Declining rate of use

Activity Tracker Owners vs. Percent of U.S. Population By Age (Endeavour, 2014)

Declining Rate of Sustained Activity Tracker Use Over Ownership
(Endeavour Partners, September 2013)
2. **Smart Wearables** - Challenging issues (B)-(C)
   From raw data to meanings... and contexts

1. How do the users transform the huge amount of data into meaningfull insights? How do they create meaning on the basis of these data in a safe and reliable manner?

2. To understand what is happening within our body, we often need to understand context (e.g. emotions can only be interpreted inside a context). How do the users understand raw data in context? What if the user does not interpret raw data in a « rational way »?

- Interpretation of our corporeality is linked to subjectivity, history and context
- Meaning, needs, expectations leads to specific uses and motivation for use
- Need for research on USE CASES
3. Current research by the Health Psychology team

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Use Cases and Activity Users of Connected Objects of Screening for Indicators of Corporeal States: Application Design, User Activity and Psychological Functions

Santiago-Delefosse, Hauw, Schumarer, Muller, Widmer, Del Rio Carral, Roux

(Submitted SFN -june 2016)

ORIGINALITY of the project

• Interdisciplinary (computer science, sport science, health psychology)
• Study the use in a contextualised and longitudinal way
• Focus on the users’ perspective.
• Computer scientists/developers will follow the evolution, in real time, of the use of different groups

Reach to explain the psychological conditions that allows a real appropriation of the smart wearables (SW) in the follow up of our health and well being.
Current research: methods, main objectives and concepts

POPULATION & METHODS
- Three populations will be targeted: athletes, lay people, and people suffering from chronic illnesses.
- Qualitative, quantitative, longitudinal approach (18 months follow-up)

MAIN OBJECTIVES
- Design software that fits the contexts and needs for specific profiles of use cases, for sporting, wellness/health promotion, and chronic illness management.
- Define the main problems with existing software, and design new algorithms that are better suited to users’ lifestyles.
- Improve health promotion and chronic illness management.
- Identify and prevent “problematic” use cases in the health field (h hypochondriac responses, increased medical consultations, etc.) and prevent potential cost.

Focus on meanings that users-actors create with these devices & the ways in which these meanings organise themselves and transform over time.

Key concepts
activity design, embodiment, Activity Theory, psychological tools, cultural psychology
4. RESULTS: What we have found so far...

**Bibliographical analysis** (Del Rio Carral, Roux, Santiago-Delefosse, 2016a):

- Avoid false debates between technophilia vs. technophobia
- Focus on needs, expectations, *real* uses, meanings for each user
- Follow-up of how expectations and uses evolve, related to the evolution of users’ needs

**Indepth interviews w/lay users and activity analysis** (n=10)

- Different patterns of users and expectations for use: essential to learn more about such patterns and their evolution in time
- These patterns imply different levels of appropriation/internalization of the device

**E.g. Device as:** gadget, magical object, bio-med object, psychological tool

- The complete integration process occurs when the device becomes a *psychological tool* to the user (del Rio Carral, Roux, Bruchez, Santiago-Delefosse, 2016b)
## Preliminary results (Santiago-Delefosse, 2016)
Example of patterns of uses, linked with length of use, expectations, and affects

<table>
<thead>
<tr>
<th>Types of device</th>
<th>Use Duration</th>
<th>Users’ expectations</th>
<th>Users’ Discoveries</th>
<th>Affects linked to use and expectations of users</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Object-Gadget</strong></td>
<td>1-2 months</td>
<td>Gift without new value</td>
<td>Do not feel a valuable contribution</td>
<td>No particular affect Not appeal by device Critical about energy consumption</td>
</tr>
<tr>
<td><strong>Magic-Object</strong></td>
<td>1-3 months</td>
<td>Bought to help Loosing weight Living better...</td>
<td>Do not expect to have to do more (exercise, lowering intake, etc.)</td>
<td>Deception – persecution (when device reminds to do exercise for example)</td>
</tr>
<tr>
<td><strong>Biotechnological Device</strong></td>
<td>Depends on Simplicity of use Utility</td>
<td>Quality of assessment Reliability</td>
<td>Difficult to use (sometimes)-</td>
<td>Look for the simplest and the most reliable device Instrumental relationship</td>
</tr>
<tr>
<td><strong>Psychological tool</strong></td>
<td>2-4 months</td>
<td>Change their inner behavior by helping to find the good « corporeal » sensation</td>
<td>Difficult to use (sometimes)</td>
<td>Satisfaction Keen to try new devices if they can help their inner psychological feeling Impowerment</td>
</tr>
</tbody>
</table>
4. Results: Summary

- Interactions and expectations about devices are a key issue to understand the relationship user-device

- Behaviors do not change without internal meaning supporting the appropriation process (*psychological tool*)

- Meanings arise from various patterns (depending on needs and expectations/context)

- Activity-design is a powerful core of concepts and methods for an multidisciplinary collaboration, including social and psychological science, computer science and medical science
5. CONCLUSION: Future and best practices
be wise and interested in true needs of users

• Move from an exclusive focus on computers/biotech to an understanding of technology as part of a broader scope of human activities

• Focus on « USER CENTERED DESIGN » (User experience and expectations, Usability and usefulness, User empowerment)

• Technology could be adopted in the long run if it is useful and at in the service of human wellbeing and subjectivities

Being wise-tech:
Should imply being at the service of human development and not the opposite
THANK YOU FOR YOUR ATTENTION

A robot may not injure a human being or, through inaction, allow a human being to come to harm.
A robot must obey the orders given it by human beings except where such orders would conflict with the First Law.
A robot must protect its own existence as long as such protection does not conflict with the First or Second Laws.

Asimov, 1942