Inter-usability and intelligent communication:

Usability aspects in a multi-device personal attentive system

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What is inter-usability?

• Ambient Intelligent systems often consist of multiple, interconnected devices. Therefore, in designing the user interaction of such systems, one should ensure a **seamless user experience across devices** (inter-usability).
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Our 2 challenges

- Inter-usability
- Intelligent communication

Properties, concepts & elements important for a successful AmII
Our 2 challenges

• **Inter-usability:**
  Designing the *interaction with multiple devices* in such a way that the user experiences the system as a *coherent whole* and full use is made of the capabilities of each device.

• **Intelligent communication**
Our 2 challenges

- **Inter-usability:**
  Designing the *interaction with multiple devices* in such a way that the user experiences the system as a *coherent whole* and full use is made of the capabilities of each device.

- **Intelligent communication:**
  The user interaction does not only entail usage of the system’s devices in a reactive sense, but also *proactive communication* of the system with the user via multiple devices. Moreover, this communication deals with a sensitive subject; the system provides feedback on the user’s unhealthy lifestyle. This communication needs to have the *right content*, it needs to be delivered on the *right device*, in the right *modality* and at the *right time*.
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Inter-usability

Contributions to the field
Inter-usability

‘Guidelines’

It should be clear to the user

– What the **capabilities** of each device are and what functionalities are available on each device

– What **data** is available on each device

– What the **role** is of each device in the overarching system

– Whether there is **functional modularity** in the system: is there a subset of devices that can still provide some limited service when specific devices are unavailable, and if so, what is this subset and what can it do?

– What the behavior of the system will be: how **predictable** is the behavior of the system on a certain device, is it comparable to other services on the same device, or to similar services on another device?
Inter-usability

*Metrics for inter-usability*

- Capability
- Functional modularity
- Roles
- Predictability
- Availability of data
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Intelligent communication

Contributions to the field
Intelligent communication

Step 1. Translation
Data gathered by devices should be translated into a common data format

Step 2. Reasoning
Data should be transformed to useful knowledge about the user through some form of reasoning

Step 3. Use
Knowledge should be used as a basis for generating messages with the right content, to be sent to the right device, at the right time.
Intelligent communication

Gathering knowledge – user modeling
Intelligent communication

**Reasoning – update rules**

Latitude & Longitude => Current Address

Current Address == Home Address => At Home

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Intelligent communication

Use – intervention rules

At Home & TV on => Progress overview on tv in modality video

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Intelligent communication

*Use – intervention rules*

How do we get it?  Which knowledge do we need?  Start here: which messages & when? (domain expert)

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Summary

• **Inter-usability**: *extend guidelines and metrics* for usability with guidelines and metrics for capability, availability of data, roles, functional modularity and predictability w.r.t. other services on the device.

• **Intelligent communication**: method where *domain & usability experts* are involved from the beginning, *simplifying communication* across disciplines.
Conclusion

Next steps

• Detailed, concrete guidelines
• **Use** the guidelines & metrics
• **Use** the method for designing intelligent communication

• **Pay attention to the user!**
  
  ➢ *Improve cross-disciplinary communication*