On the dependability of Internet understood as a medium - A social science perspective

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Systems Usability & Work Design

Introduction

- A social scientist typically takes technology as given – the interest is in the social consequences of implementing technology, e.g. the digital identity

- A Human Factors researcher, however, is interested in
  - understanding the role of artefacts in human conduct and culture, and
  - in the design of technology for the benefit and well-being of people
    - Avoid human **errors** – automation
    - Support the **human element** – design better interfaces and decision aids
    - Develop the **human-technology interaction** – design of joint cognitive system
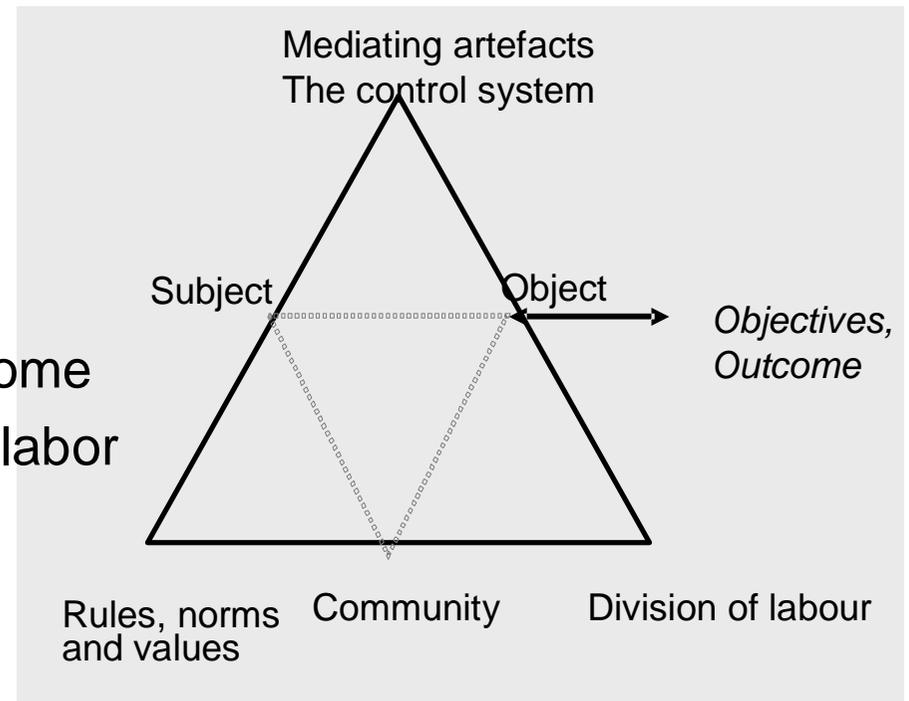
Content of the presentation

∅Technology as a tool and medium

∅Is IP a medium?

∅User perspective to the dependability of IP –
   Availability of IP connectivity

∅Creating network literacy

∅Conclusions with regard to future VTT research

Technology as a tool

- Activity
  - is a system of interactions (S-O-C)
  - is organized according to the Object/Outcome
  - Is mediated by tools, rules and division of labor

- Three functions of tools in action
  - Instrumental – shaping the environment
  - Psychological – control of behavior
  - Communicative – making sense, common awareness

- Connection between activity theory (tool) and media theory (medium) ?
- (Vygotsky 1978, Rückriem 2003, Luke 2000)

Mediating artefacts
The control system

Subject

Object

Objectives,
Outcome

Rules, norms
and values

Community

Division of labour

Technology as a medium

- Communication is thoroughly a technological issue
- The interest in the role of technology has not been overwhelming

- Canada makes an important exception: Harold A. Innis (1894-1952) and Marshall McLuhan (1911-1980):

- Media technology itself shapes social organization and culture (Innis), and human perception and thinking (McLuhan)
  - From the idea that technology is innocent – content and purpose counts => Medium is the message
- Development of culture and practices is slow, e.g. the transformation from speech communication to written communication took hundreds of years
- There must be a communication system that supports the transformation, e.g. the school system (Ruckriem)

Transformations in media technology

(Harold A. Innis, Marshall McLuhan)
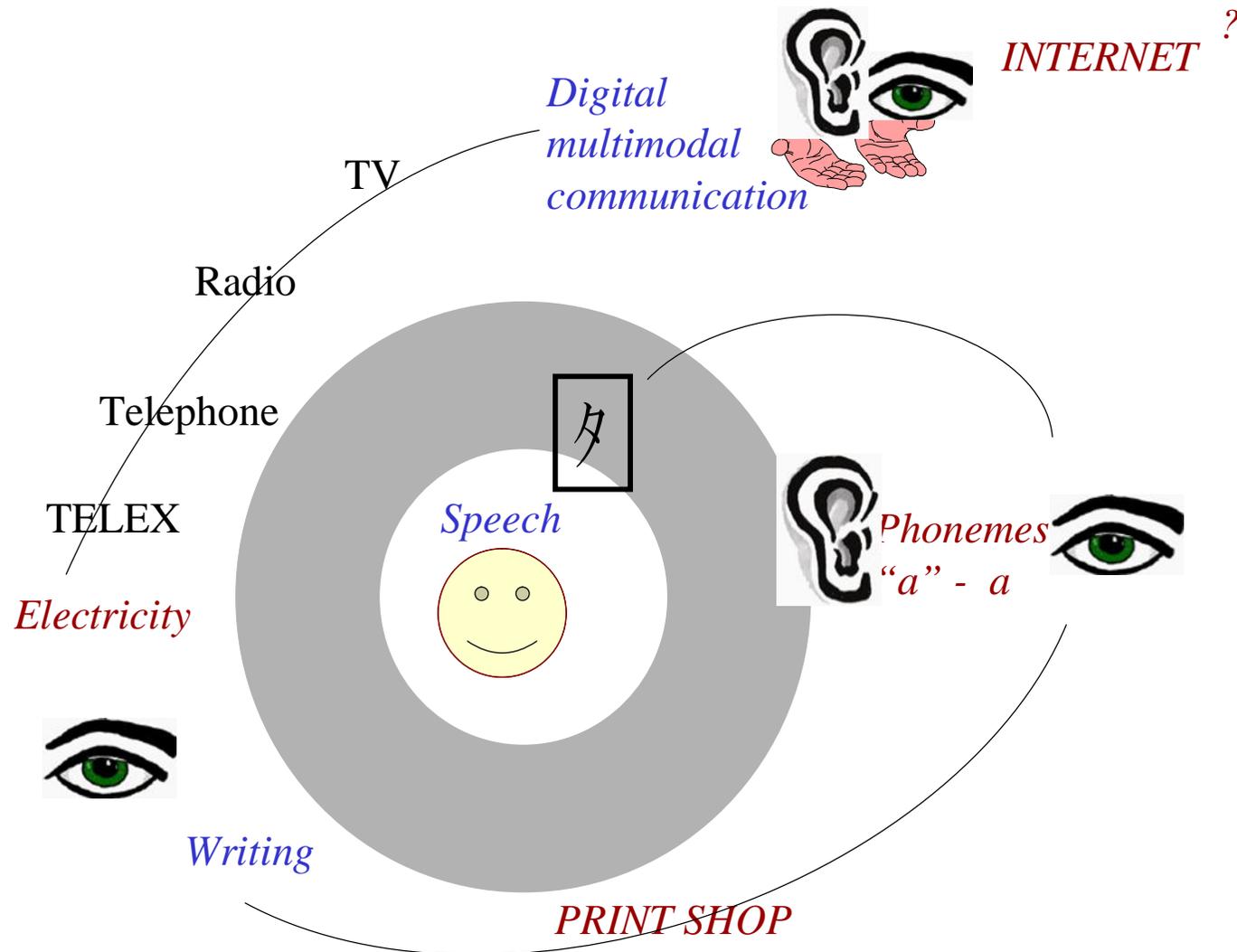
Is IP Network a medium?

- The Internet is a *generic* and *independent* technology that supports innumerable services
  - is different from any earlier network that are structured according to the service they provide
- It is the *global connectivity* of the Internet *extends* the human nervous system
- As a consequence the Internet constitutes a *background* for human conduct
  - it shapes peoples' ways of perceiving and acting
  - *people are mostly unaware of this effect*
- The *former media* and their combinations (text, telephone, TV, movies) are (part of) the *content* of the IP medium and realised as various services

- What are the performance shaping features of IP ?
- What are the changes it brings about in perception, action and culture?
- Should people themselves (not only the artists) be aware of these changes?

The laws of media: Four processes that should be accounted when introducing new technology

CASE : Internet

Enhancement

Extension of the human nervous system to a global nervous system

Significance of tactile relationships, resonance?

Reversal

Paralysis

Retrieval

Presence in village

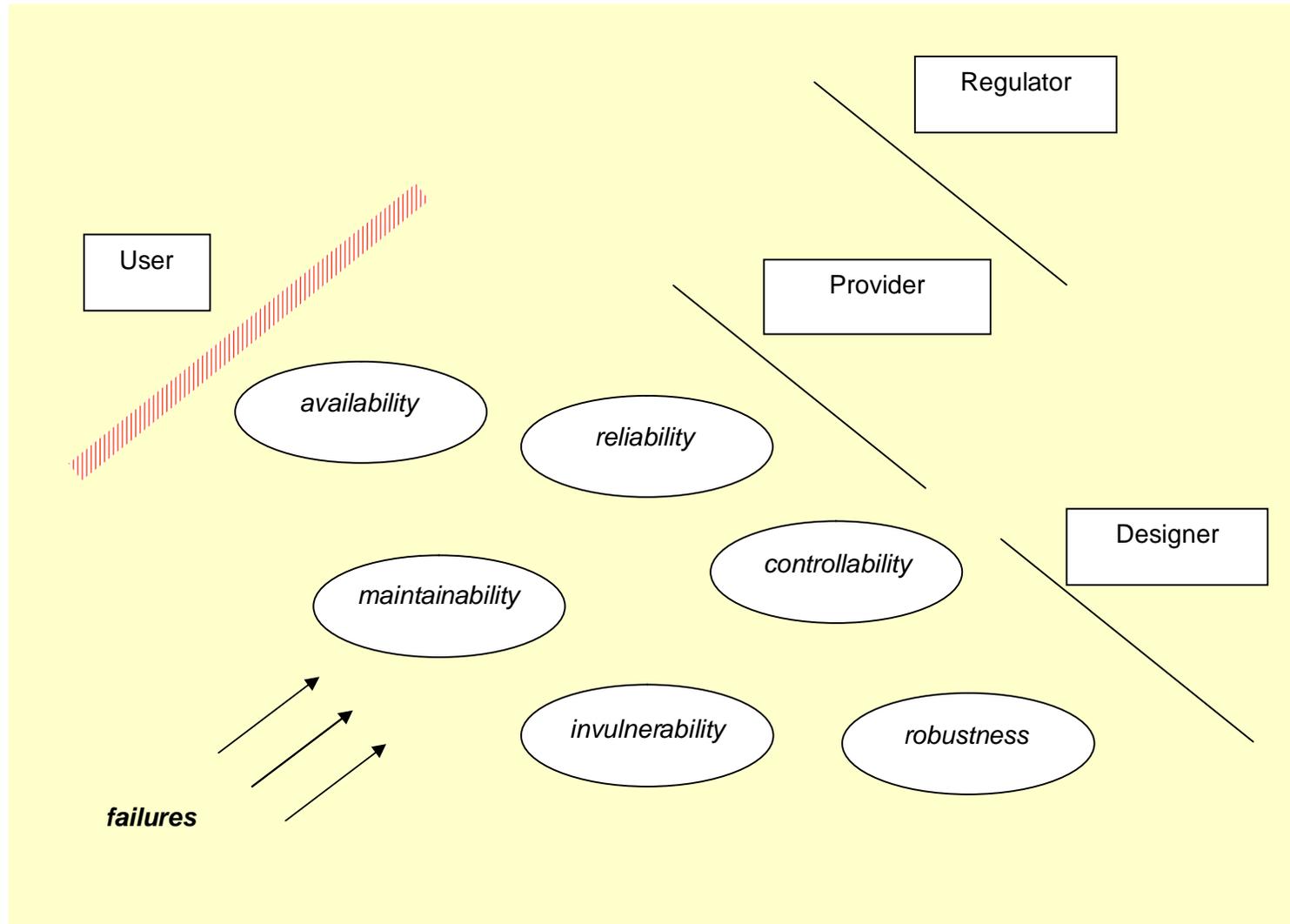Integration of senses

Obsolence

Specificity, differences and hierarchy of media?

Dominance of the visual space?

Conceptual framework of IP dependability

User perspective to IP dependability

- Availability of the IP network is the requirement that is closest to the user – availability is influenced by the further aspects of dependability
- Availability relates to the main affordance (potential for use) of the IP-medium, connectivity
  - without communication a community is dead
  - personal identity also relies on communication

- BUT because the user is interested in the services enabled by the network, availability is typically considered as availability of service with certain quality
- We ask: Should the users distinguish between the network and the services in order to comprehend the affordances of the internet?

Our hypothesis: Awareness of network while focusing on service

- Influences peoples' capability and level of exploiting the Internet possibilities:

  a) Merging network services => adoption of the role of a consumer, forming an audience   OR

  b) Network as a generic medium => active usage and authorship, forming a public (Viherä, Cubbit, Dewey, Bolter)

- Promotes a realistic perception of the quality of service (QofS) and ability to utilise the diversity of the network to improve the QofS

- Promotes awareness of the state and functioning of the network - prevents from false blaming of the net or miss-diagnosing of loss of the net and eventual paralysis

- Forms the basis for "network literacy"

Creating network literacy (1)

1. Forming a personal sense and perspective for the usage of the network (research results and experiences of acquisition computer literacy)

2. Developing new practices and competencies to grasp/prehend the IP connectivity
   - Cope with complexity and uncertainties: IP-media provides a new *catalogue function*, finding innumerable perspectives to the environment and the world
   - Cope with simultaneity and instantaneousity (Luke, Castels): reference to past and future, personal lifespan
   - Cope with global presence: embodiment, and locality is needed for creativity and identity, ability to act (Bachealard, Bolter, Harré)
   - Cope with interactions; responsibilities, habits, norms, values

Creating network literacy (2)

3. Trust in the medium
- Medium is external part of the human – lack of trust in oneself when using own creations
- Understanding the constraints for its use

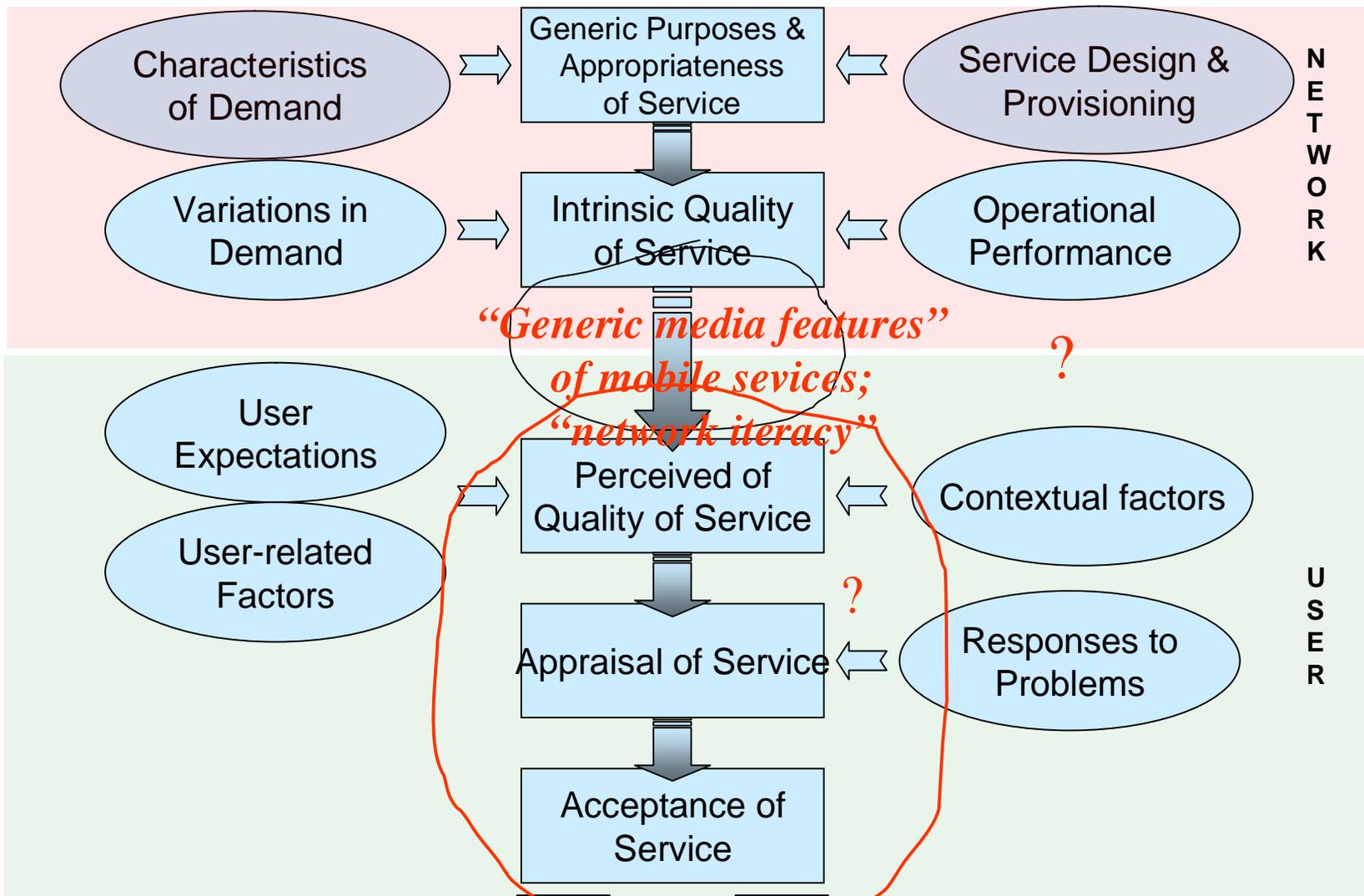4. Awareness of the different forms of governance of the network
- Different scenarios have been sketched
  - Audience / Public
  - Consumer/ Author

5. Involvement in a communication system
- Meaningful usage of the medium develops in activity systems, what are these?

Conclusions: The future research strategy

- Research tasks:
  - Defining the concept and content of network literacy
  - Developing methods to study peoples' conceptions of IP and IP-based services and practices in using them
  - Understanding interactions between technical aspects of dependability and user appraisals of the IP-medium

- Research approach:
  - Field studies in specified activity/communication systems (representing three forms of "smart environments": smart production, living and service environments)
  - Synthesising activity and work research, media research and systems analysis

Characteristics of Demand → Generic Purposes & Appropriateness of Service ← Service Design & Provisioning

Variations in Demand → Intrinsic Quality of Service ← Operational Performance

NETWORK

"Generic media features of mobile sevices; "network iteracy" ?

User Expectations

User-related Factors

Perceived of Quality of Service ← Contextual factors

Appraisal of Service ← Responses to Problems ?

Acceptance of Service

USER

Norros & Laarni 2006

Learning & Attitude Change

Development of Service

15