DESIGNING UBICOMP – MUTUAL INFLUENCES OF UBIQUITOUS COMPUTING AND DESIGN.

_A SHORT OUTLINE ON A PHD-PROJECT.

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_EXPERIENCE & BACKGROUND

> industrial designer
> HCI: interaction- and interface-design, information architecture

> Ambiente-Group of Norbert Streitz / GMD – IPSI
    » i-LAND framework: Roomware, BEACH, Passage
    » hci, cscw, augmented/ mixed reality
> Hochschule für Gestaltung Offenbach
    » website scientific communication / social sciences
> MARS - Exploratory Media Lab, Fraunhofer IMK
    » hci, knowledge visualization & information retrieval, tangible objects

> phd at University of Wuppertal, advised by Mihai Nadin

_introduction to dissertation and aims

_status quo

_significance: design & ubiquitous computing

_some notes on design theory

_why design and ubicomp?

> what has design to do with ubicomp?

> what has ubicomp to do with design?

_claim 1: design is relevant for ubicomp.
ubicomp is relevant for the discipline of design.

_phd's aims

> to investigate and identify roles of design in the field of ubiquitous computing

> to reflect the influences of nowadays digital culture and ubiquitous computing on design, its theory and methodology

> to enlarge the current knowledge body of design theory with aspects of other disciplines like HCI

_*splendid isolation* of design

_currently the role of design is reduced to the visual aspects, to mere screen-design

> lack of understanding what design provides

> missing exchange between design and IT- disciplines: lack of transdisciplinarity and crosscultural exchange

_explanations

> design-internal problems

> no strong research tradition

> situation changes and design becomes a dicipline [1]

> **History: two separated branches – industrial design and graphic design**
>> » **different origins: industrial production vs. arts**
>> » **different schools // education: art vs. sciences**
> **US-Tradition?**
>> » **design in the US traditionally covers ID and GD; styling...**
>> » **origns and supremacy of computation/ IT/ HCI**

_ **what about computation & design?**

> **computation is subject of design in terms of**
>> » **using software-applications as tools: CAD, DTP**
>> » **designing software: men-machine-interfaces**
> **influences of computation on design are currently barely considered beyond this level**

_claim 2: ubicomp changes paradigms in HCI

_new requirements

> multiple computers per person
> mobility, on-air networking
> sensing
> new input and output devices beyond the screen
> omni-presence of integrated computers and networks
> futher increasing complexity of software/ function overload

_cognitive problems: eclecticism and invisibility

> the disappearing computer
» physical invisible = integrated [1]
» cognitive & emotional invisible = imperceptable [2]
> anything could be connected to everything
> a digital artefacts' form is not determined by its function: anything goes
> result: the user cannot "read" i.e interpret an artefact

_ current approaches

> new HCI concepts as information appliances

» reducing cognitive overload and maintainance efforts

» simplicity

> context awareness and perceptive computing

> ai, agents etc.

_ claim 3: ubicomp is a social concept.

> compare e.g. Weisers visions of "computers which vanish in the backgound" or of IT that is used the way we handle writting [1]

> compare e.g. Normans vision of computation as "non-technology" [2]

> technologies and social acceptance: two sides of the same coin

_Why design is relevant for ubicomp/ some reasons

> "Design is about artefacts, might it be hardware or software, service- or eventdesign. It has to with products, their handling, use, reception, interpertation and their contexts." [1]

> design deals with signs and communication processes, with psychological, social and technical aspects, with production and lifestyles, with man and machine.

_HCI …

_trust

> one of the most crucial problems in ubicomp environments

> techninical „hard" side

> trust has to be created on the „soft" side in terms of signs, of communication of acceptance and access.

> need of human-centered prespective instead tech-centered IT-focus (as critisized by Norman)

_HCI beyond function?

> HCI: currently focussed on functionality, usage etc.

> relationship man-objects ≠ pure fullfillment of needs

> Secondary functions: beauty or joy

> market

> the yearning for a product is as important as the need itself [1]

_other new tasks

> complexity

> internal communication as e.g. information-visualization

1 Nadin 1999

_ and why ubicomp is relevant for design/ some reasons

_new requirements

> ubicomp requires to joint the two historical branches of industrial design and graphic design

> theoretical foundations have to be enlarged, concepts from other disciplines have to be taken into account.

_social relevance of the field

> computing as part of our everydays life

> danger: losing contribution

_rethinking the role of computing in design

> impact on the work of the designer in terms of thinking and working

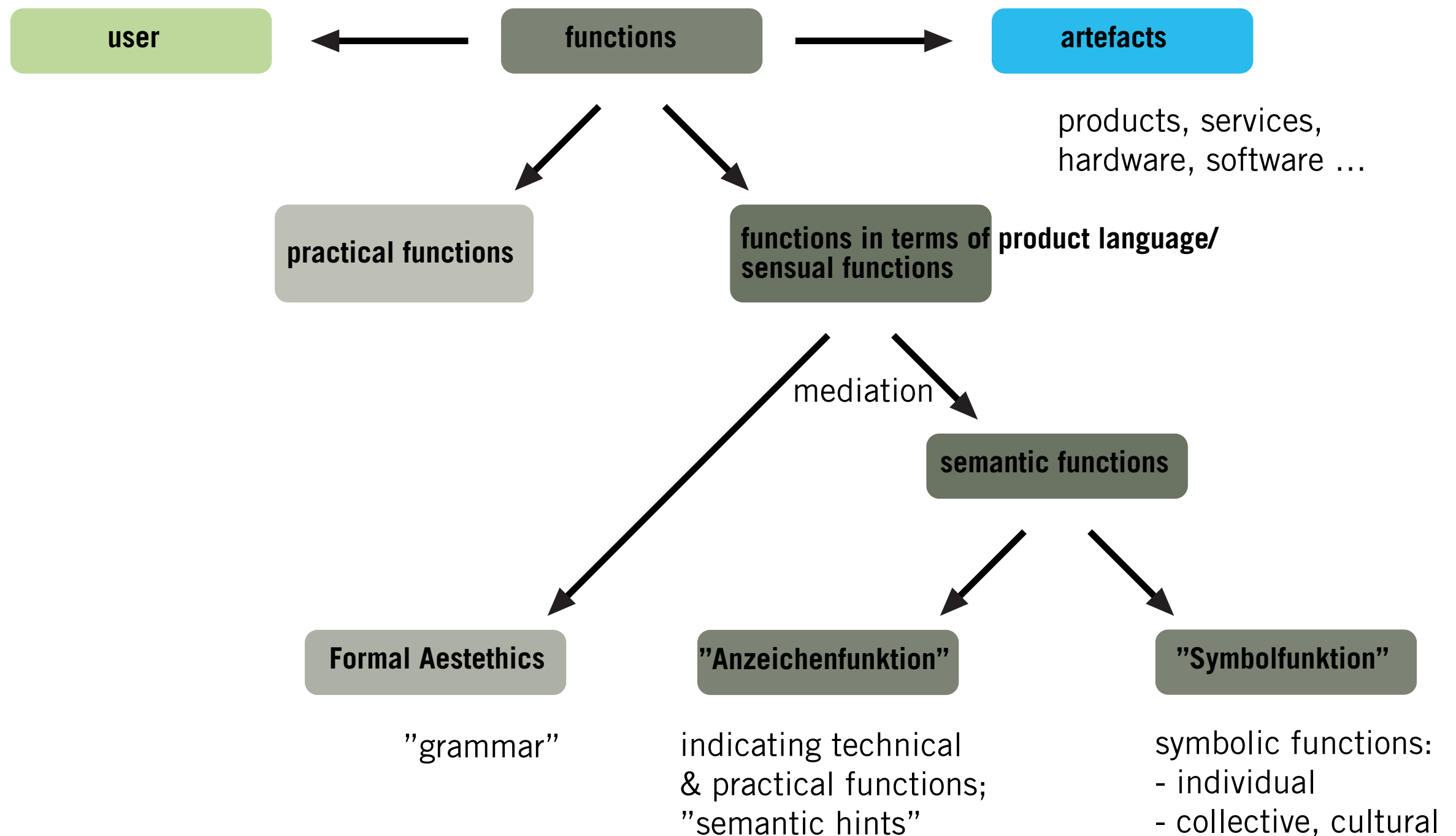> if You use a hammer, You start to see the world in nails...

_upcoming economic relevance

_Some notes on design theory

> ”Design Theory can be clarified at the nexus between psychological symbol research and design-specific symbol interpretation.“ [1]

> mainly established in the field of industrial design

> 2 main roots: linguistics and psychology

> Semiotics as one fundamental part of design theory
>> Linguistic Turn as paradigm shift
>> focus on semiotics beside text: architecture, film, objects, art ...
>> People like Peirce, Mukarowsky, Barthes, Baudrillard, Eco etc.

> Freudian Psychology as the other root
>> symbolic interpretations
>> school of symbolism: Cassirer, Langer

> today: other approaches e.g. as constructivism, systems theories, or communication theories

Theory of Product Language

| user | ← | functions | → | artefacts |

products, services, hardware, software …

practical functions

functions in terms of product language/ sensual functions

mediation

semantic functions

Formal Aestethics

"Anzeichenfunktion"

"Symbolfunktion"

"grammar"

indicating technical & practical functions; "semantic hints"

symbolic functions:
- individual
- collective, cultural

_website: www.designing-ubicomp.com

(currently only in German)

…thank you