Audiovisual Rhetoric: A Pattern Language for Human Computer Interaction
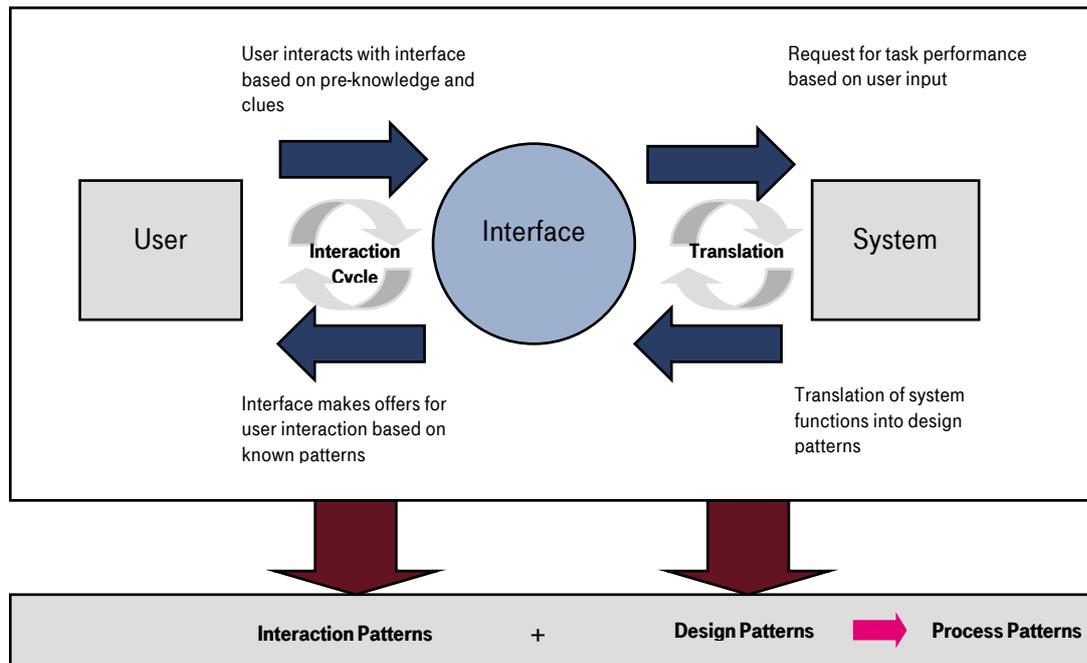
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Abstract
Today, not only the GUI itself, but the interaction between human and computer (HCI) is an important design task for all services and products. For telecommunication services in particular designers have to cope with complex functionality, multimodal input channels and different device properties. But how can we predict the quality perceived by the user? How can we provide systems that satisfy user's expectations? One theoretical framework addressing this problem is audiovisual rhetoric. This is an approach from design research reflecting on media communication in general, not only on verbal aspects but on visual, auditory and interactive parameters. It is a theory to explore the communicative interaction between user, interface and system. The aim is first, to describe the rules and techniques of HCI, second to provide categories for the analysis and third, to design criteria for the evaluation of communicative interaction. Applying this approach to HCI means to describe this interaction as a form of rhetorical communication. In short, we are exploring the *language of HCI.*

Pattern Language
The communication between user, interface and system is based on recurring patterns—this is the primary research statement (see vanWelie, van der Veer, and Eliëns 1999, Hartson 1998). Jenifer Tidwell defines patterns as a description of best practices within a given design domain. "They capture common solutions to design tensions (usually called "forces" in pattern literature)". (Tidwell 2006, XIV) In the HCI communication model (see illustration) these patterns are a mode to transfer system's functionality into interaction offers for the user (*design patterns*). At the same time they are a mode to describe recurring interaction cycles between user and interface (*interaction patterns*). As an emergent layer we can define *process patterns* that characterize recurring sequences of interaction and design patterns. As a result, we can interpret the communicative interaction cycle between user, interface and system in terms of design, interaction and process patterns. This is a new terminological framework for HCI and especially for research on usability.

User interacts with interface based on pre-knowledge and clues

Request for task performance based on user input

User

Interaction Cycle

Interface

Translation

System

Interface makes offers for user interaction based on known patterns

Translation of system functions into design patterns

Interaction Patterns   +   Design Patterns   ➡   Process Patterns

In an ongoing research project we try to describe these recurring patterns for different device classes and to define their application rules. Therefore, we developed a description matrix for the different types of patterns. A *design pattern* reflects on the visual and audiovisual shape of interface elements. It is "a structured textual and graphical description of a proven solution to a recurring design problem" as Jan Borchers states (Borchers 2001, 7) *Interaction patterns* describe the interaction between user and interface depending on different types of application or device. They are categorized in groups like navigation & wayfinding, action & command, forms & controls (see Tidwell 2006) and according to their input components. The *process patterns* are best practice solutions for interaction sequences like download processes, authentication or sending a message. They combine interaction and design patterns to sequence descriptions on a higher abstraction level and can be used to define proven solutions for more complex HCI problems.

In the research project we created a collection of those patterns to set the basis for high quality interaction design in terms of usability. This pattern collection can be understood as a toolbox for interaction designers and system engineers when they want to design a new system and interface based on well established patterns and best practice examples.

Addressing the user and evaluating the interaction process
But audiovisual rhetoric goes beyond a collection of patterns and processes. One important question is how can a designer apply those patterns in order to address the user in an effective way? The ancient theory of rhetoric distinguishes three different levels of how to address the user:

- On an informative level: "low style" communication, which is rational and objective, to inform and instruct the user without emotional impact ("docere")
- On an entertaining level: "middle style" communication, which has a soft emotional impact for attracting and entertaining the user ("delectare"), operating with sympathy and fun
- On a highly affective level: "high style" communication, with strong emotional impact, to move the audience emotionally and to persuade them ("movere")

These three levels describe the different options how an interface can be used to grab the user's attention. In what context which level of addressing is appropriate is defined in a precise evaluation setting that rhetoric provided already in the ancient world for verbal talks. Today, we can imagine examples of their application for digital media: for an official government website the pure informative style will be a good choice, for a promotion DVD for a new product some entertainment should be included, and for a game application the high affective level might be appropriate. For an infotainment application, e.g. software for educational use, a combination of these levels can be the right combination – depending on the application's subject.

To estimate the user acceptance, we can derive criteria to evaluate interface design from ancient rhetorical scholarship (see Joost 2006):

- "Outer aptum": Appropriateness for addressed user, task and context
- "Inner aptum": Consistency of communication, e.g. interaction logics
- "Perspicuitas": Explicitness, clarity, intelligibleness for the addressee, correctness of expression
- "Ordine": Intelligible and clear structure of the communication system
- "Decorum": Appropriate use of rhetorical patterns

These criteria are not physically measurable but they rely much more on the designer's experience and estimation. To guarantee a good usability and acceptance by the user these rhetorical criteria have to be combined with established usability evaluation criteria like Norman (1988) suggested.
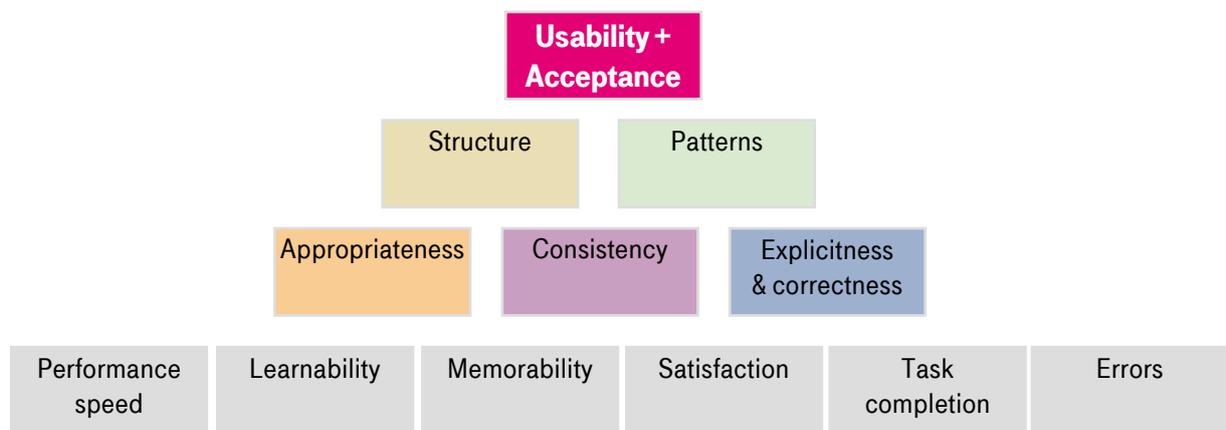
This pyramid (see illustration above) shoes criteria to plan and evaluate efficient and attractive communication with system interfaces. Therefore, they are helpful measures for designers and system engineers in the production and evaluation process. They enhance the standard usability criteria in a significant way because they focus on the appropriate addressing of the user—depending on the subject, context and emotional factors.

In the paper, it will be analyzed how the knowledge of audiovisual rhetoric can help to predict and evaluate the quality of HCI. It will also be shown how the pattern framework can be used to design qualitative system interactions. The aim of the paper is to demonstrate that audiovisual rhetoric creates a knowledge base for HCI that is crucial to enhance the usability of interfaces, because this knowledge adapted from communication theory gives a broad

understanding of the interrelations between user, interface and system. Knowing the recurring patterns and their application rules, knowing efficient ways how to address the user, knowing typical gaps in the interaction process means a significant advantage for the interface design process. With this knowledge, usability design is no longer a question of trial and error, but it can be described as the correct and efficient application of a language with specific rules and patterns.

Literature:

Borchers, J. (2001): A pattern approach to interaction design, Wiley.

Hartson, H. R. (1998): Human-computer interaction: Interdisciplinary roots and trends, The Journal of Systems and Software, vol 43, pp. 103-118.

Joost, G. (2006): Audio-visuelle Rhetorik und Informationsdesign, in: Eibl, M.et al (ed.): Knowledge Media Design – Grundlagen und Perspektiven einer neuen Gestaltungsdisziplin, Oldenbourg Wissenschaftsverlag, S. 211–224.

Norman, D. (1988), The Design of Everyday Things, Basic Books.

Tidwell, J. (2006): Designing User Interfaces, O'Reilly.

vanWelie, M., van der Veer, G. C., and Eliëns, A. (1999): Breaking down Usability, Proceedings of Interact '99, Edinburgh, Scotland.

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