

The Rhetoric of HCI: A communication model for the design and evaluation process

Gesche Joost

Deutsche Telekom Laboratories
Technical University of Berlin
gesche.joost@telekom.de

Abstract

Today, the interaction between human and computer (HCI) is an important design task for all services and products. But how can designers predict the quality perceived by the user when they plan and design a system from scratch? How can designers provide systems that will most likely satisfy user's expectations? One approach is to understand the design process as rhetorical communication that has to address an audience in an appropriate way. It is an interdisciplinary approach from design research and humanities reflecting on the ancient technique of strategic communication that is applied to media communication. The rhetoric of HCI is a theory to explore the communicative interaction between system designer, the system itself, and the user. The aim of this paper is to elicit this transfer with a basic communication model that shows the dependencies and forces between these three parties: designer, system and user.

1. Introduction

Rhetoric is an ancient communication technique that instructs the so called *rhetor* how to communicate successfully in all kinds of situation. The assumption of this paper is that the underlying theoretical framework can be partly adapted to the system design process for HCI. The core strategy of rhetoric is to know

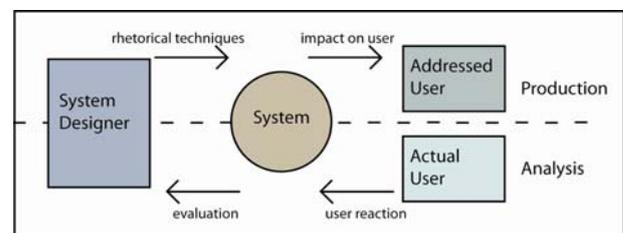
- a) the communication "genre", in HCI the category of application (e.g. game versus calculation tool)
- b) the audience
- c) the context of communication
- d) for HCI additionally the task that has to be solved.

Those parameters resemble up to some extent the Human Interface Guidelines, which e.g. have been provided by Apple [1], and which are also reflected in the Usability Engineering Lifecycle [2]. Furthermore, rhetorical scholarship provides a communication model that describes the dependencies between three parties that are relevant for the production and evaluation process of a system: the *rhetor*, the medium, and the addressed audience. This common model can be transferred to the system design process. The aim is to

describe the different parameters that are relevant for the process, in the production phase as well as during evaluation. The assumption is that with this model on the one hand we provide a common understanding of the process and its stages. On the other hand, the sources of a system's low quality perceived by the user can be located more easily within the model.

2. Rhetoric as a communication model for system design and evaluation

Transferring the communication model to system design, there are the core parties: the system designer, the system itself and the addressed user – as opposed to the *actual* user.



Model of rhetorical communication for system design [3]

This is how the model works:

The production process is described in the upper part of the model: the system designer designs the solution based on rhetorical techniques that address a specific user group in a certain context with certain tasks. What I call *rhetorical techniques* is a collection of different heuristics that are applied at a very early stage in the design process. These heuristics consist on the one hand of user interface design guidelines in general; on the other hand the pattern language for interaction design can also be defined as a rhetorical technique. Recent approaches suggest such a pattern language [4] that provides proven solutions to usability problems in a comprehensive way. From a rhetorical point of view these so called patterns resemble in fact the rhetorical figures. These figures are collected in a system, differentiating them into semantic and syntactic categories. Rhetorical figures can be seen as a toolbox

for the *rhetor* that provides recurring design patterns for different communication requirements. They help the *rhetor* to get an overview on nearly all possible solutions and provide best practice examples that can be adapted to a new communication context. Therefore, there is a strong parallel between the pattern language approach and basic rhetorical theory.

2.1 Affecting the user

Additionally, the system designer can use techniques from rhetorical scholarship for addressing the user in an affective way: the “low style” communication with no emotional impact and pure, informative characteristics; the “medium style” involving soft emotions to attract and entertain the user; and the “high style” communication with strong emotional impact to move the user affectively. [5] These three levels describe the different options how communication can be used to grab the user’s attention and to attract him/her on an emotional level. In what context which level of addressing is appropriate is defined in a precise evaluation setting that rhetoric defined already for verbal talks. [6] Today, we can imagine examples of their application for digital media: for a software application for calculating business processes the pure informative style will be a good choice, but for a promotion DVD for a new service addressing young people some entertainment should be included. However, for a game application used by teenagers who are quite familiar with the PC the high affective level will be appropriate, dealing with action and strong user involvement. For an infotainment application, e.g. software for educational use at school or university, a combination of these levels can be the right choice – depending on the application’s subject. Those three different levels of addressing the user in an appropriate way are a generic rule of rhetorical communication that a designer mostly applies intuitively. But they are nevertheless important guidelines for the design process because they emphasize the role of the user. He/she is the key factor of the design process and due to his/her needs and requirements the whole system has to be aligned. This is a basic rule of rhetorical communication that Aristotle already mentioned: the audience gives the direction of all decisions that are made within the communication process. [7] Therefore, the right addressing is crucial to the whole process.

2.2 Rhetorical criteria for evaluation

Some basic requirements from rhetorical scholarship can supplement the individual requirements that are derived from the specific analysis of user group and application. [8] Namely there are:

- the “*inner*” and “*outer aptum*”, defining the appropriateness towards the logic of system usage on the one hand, and on the other hand the appropriateness towards the communication setting in general;
- *perspicuitas* reflecting the clarity, explicitness and correctness of communication;
- *ordine* describing the correct and logic interaction structure;
- *decorum* elaborating on the balance between addressed user, context and selected communication style.

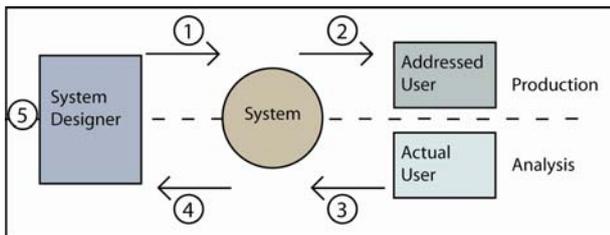
All in all, the system designer has a set of heuristics for the early stage of the design process that he/she has to use and combine. The aim is to provide a high system quality perceived by the user and therefore the heuristics have to be proven to be relevant within the specific set of requirements.

2.3 Evaluation of the process

The next step in the model is that the actual system design has a certain impact on the user, e.g. it attracts him/her with specific interaction offers or with the right “look & feel” of the product. At this stage we see the outcome of the applied heuristics and of the design decision that were made. This leads to the lower part of the diagram: it shows the analytical feedback that starts with the actual user interacting with the system. In rhetorical scholarship the *rhetor* gets direct feedback from his/her audience, thus he can estimate whether his/her strategy is successful and can refine it on the fly. For HCI normally there is no direct feedback by the actual user and as a consequence, usability testing has to be applied. At this point, the user reaction can be measured with different usability testing methods that were developed in recent years to get user’s feedback on the offered interaction options and the overall system design [9]. The results of testing are then evaluated and communicated to the system designer who initiated the process. The evaluation of the user testing is the base for the next iteration of the design process. On this base, the system designer can refine his/her assumptions concerning the addressed user groups, its tasks and requirements as defined in the User Centered Design Process [10].

3. How the communication model can help to locate the sources of low system quality

So far, the basic model of rhetorical communication shows the interdependencies of the three parties and the connection between production and analysis. The question that follows is: how can it be used within the process to locate the sources of a low quality of a system? Which step in the iterative process went wrong and what are the consequences for the system quality? If the sources can be defined precisely, the problems can be solved much easier. This is an advantage for the system design process. The idea is now to define the sources of quality problems within the model in order to show the relations and dependencies between the parameters.



Model of rhetorical communication for finding the sources of quality problems

This diagram suggests that sources of quality problems can be allocated in the communication model. The numbers in the diagram show different positions within the process where those problems mostly occur. From this allocation a sample lists of problems can be derived that differentiates typical quality problems due to their position within the process.

Position 1 and 2:

- Design guidelines are applied that are not appropriate to user, system or task requirements.
- An interface design solution suggested by the pattern language is not applicable due to software or hardware constraints.
- The system designer violates basic usability principles.
- The user and task analysis fails and leads to false requirements for the system design.
-

Position 2 and 3:

- The addressed user is not congruent to the actual user due to false assumptions.
- The context of use is different from the one primarily assumed.
- The main set of tasks is different from the one primarily assumed.
- The actual impact of the system design solutions differs from the estimated impact due to performance weaknesses.
-

Position 3 and 4:

- The applied usability testing methods are not appropriate to system and usage requirements.
- The evaluation of testing results is weak.
- The system prototype does not mirror the actual system design due to performance reasons.
- The general user acceptance was distorted by the test design.
-

Position 4 and 5:

- The overall results of the analysis phase are not interpreted well enough.
- The refinement of assumptions and applied techniques fails due to a lack of usability design knowledge.
- The system design and usability iteration cannot run due to a lack of financial or other resources.
-

This sample list describes common problems within the design and evaluation process and of course many further problems can be added to the list. Categorizing them like suggested here means that it is now possible to define at what stage in the process the main problem occurred and how it affected the process from that point on. A false assumption at the earliest stage (position 1 and 2), concerning e.g. the addressed user group and its requirements, will lead to severe problems throughout the whole process. If the results of the analysis process are not interpreted well enough at a later stage (position 4 and 5), the problem deriving can be solved much easier because the designer can always use a fallback-strategy to an earlier stage and restart at that point.

4 Conclusions

This paper suggests that the rhetorical communication model can be transferred to HCI design process. With this transfer the involved parties can be described in a systematic manner and the parameters that affect the success of the process can be allocated.

It was demonstrated that rhetoric creates a knowledge base for HCI that is crucial for understanding the system design and evaluation as an iterative process. It is important to understand that the timeframe for those iterations is not only connected to a single usability engineering lifecycle, but it reflects on the long term evolution of rules and techniques within the rhetorical system. The knowledge adapted from communication theory gives a broad understanding of the interrelations between design, system, and user. 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 system design process.

5 References

- [1] See [<http://developer.apple.com/documentation/UserExperience/Conceptual/OSXHIGuidelines/index.html>].
- [2] Nielsen, J. (1993): Usability Engineering, Academic Press.
- [3] This model was originally developed for rhetorical communication in film by Gesche Joost and Arne Scheuermann, 2005. See [<http://www.arnescheuermann.de/filmdesignrhetorik.html>].
- [4] See vanWelie, M., van der Veer, G. C., and Eliëns, A. (1999): Breaking down Usability, Proceedings of Interact '99, Edinburgh, Scotland; Borchers, J. (2001): A pattern approach to interaction design, Wiley; Tidwell, J. (2006): Designing User Interfaces, O'Reilly.
- [5] 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.
- [6] Ueding, G., Steinbrink, B. (Ed.) (2005): Grundriss der Rhetorik. 5. Edition. Metzler
- [7] Aristoteles (1995): Rhetorik, UTB p. 20f (=1358a).
- [8] Those criteria resemble partly Grice's "Cooperative Principle and the Conversational Maxims" from 1975. See Grice, H. P. (1975): Logic and conversation. In P. Cole & J. Morgan (Eds.): Syntax and semantics (Vol. 3, pp. 41-58), Academic Press.
- [9] See a good overview over recent developments in testing methods [<http://www.useit.com/>] and [<http://www.otal.umd.edu/guse/testing.html#sect2>]
- [10] This iteration is also defined in the User Centered Design Process. See ISO 13 407 at [<http://www.ucc.ie/hfrg/emmus/methods/iso.html>]. See also: Norman, D. (1988): The design of everyday things, Doubleday.