

The Human Side of System Architecture

Gerrit Muller

Philips Research
IST-SWA-AME
Prof Holstlaan 4 (WL01)
5656 AA Eindhoven
The Netherlands
gerrit.muller@philips.com
<http://www.extra.research.philips.com/natlab/sysarch/>

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1 Introduction

The system architect is working for and with humans. He is confronted continuously with human aspects. These human aspects sometimes get lost in the hectic world of Product Creation.

The technical origin of most of the design and implementation work lures designers into a technology only viewpoint. It is therefore important to emphasize that the fulfillment of the *human* needs is the final measure of success for any product creation.

A working group [2], consisting of Dieter Hammer (Technical University Eindhoven), Jaap van Rees (Van Rees adviesbureau), Jeroen van Hoven (Erasmus University Rotterdam), Kees van Overveld (Philips Research/TUE), Daan Rijsenbrij (Cap Gemini), Nathalie Masseur (Cap Gemini), and Gerrit Muller (Philips Research)

wants to increase the awareness in the ICT-architecture community of the human aspects.

Especially the ICT world is known for its extremely poor design of human aspects. Examples are programs such as Lotus Notes, and applications based on SAP, and Baan. Numerous examples can be found in the "Interface Hall of Shame" [1].

2 Human Aspects

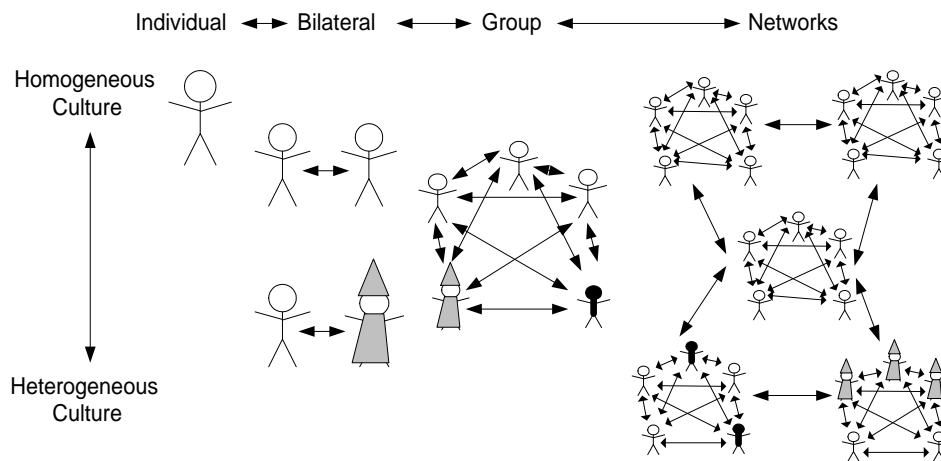


Figure 1: Overview of Human Aspects

The human aspects range from the individual to the multi-cultural society. These aspects are covered by a range of human sciences, such as psychology and sociology. Figure 1 shows this spectrum of human aspects.

2.1 Individual

Psychology focuses on the psyche of the individual. Attributes related to the individual are:

- Identity
- Self perception
- Attitudes, for instance rational or emotional

2.2 Bilateral

The system architect needs a number of basic interpersonal skills to communicate and work effectively with other individuals. Some of these basic skills are:

- Active listening
- Providing feedback
- Empathy, assessing the emotions of the other person
- Showing respect
- Providing direction

Most of these skills are fundamental in group interactions as well. Although the system architect has many interactions in groups, the bilateral contacts in between are instrumental for success.

2.3 Groups

The system architect is participating a significant amount of time in groups, for instance in:

- Meetings
- Teams
- Workshops
- Brainstorms
- Reviews

The interaction in groups is described by "Group Dynamics". Humans have a natural tendency to play games when acting in a group, the so-called *politics*. These games are quite counterproductive. The system architect is the catalyst to be fact and task driven in groups, to discuss the content, rationales and solutions instead of tap-dancing around the difficult issues and personal interests¹.

2.4 Networks

Society is much more complex than a single group. It can be viewed as a network, a recursive set of groups, seemingly randomly related. The system architect must be able to recognize structure in this chaos and to zoom in and out. Sociology is the science which tries to cover this area.

¹Note that personal interests need to be acknowledged and taken into account, as described in the bilateral skills. However acknowledging and taking into account is not the same as fulfilling.

2.5 Heterogeneous Cultures

The increased economic scope and the increase in communication world wide result in more multi-cultural interactions. The scope change from local or national to international happens in all dimensions:

- markets/products
- supplier chain
- origin of employees

That means that at all levels the system architect should be aware of multi-cultural aspects. This starts at the individual level, since once identity is partially determined by the cultural background.

2.6 Interaction with Customers

In the interaction with customers the system architect needs the insight in the spectrum of human aspects. One of the basic skills of a system architect is observation. This observation should range from the individual characteristics of this specific customer to the multi-cultural group dynamics taking place at the customer home-base.

3 Human Stakeholders

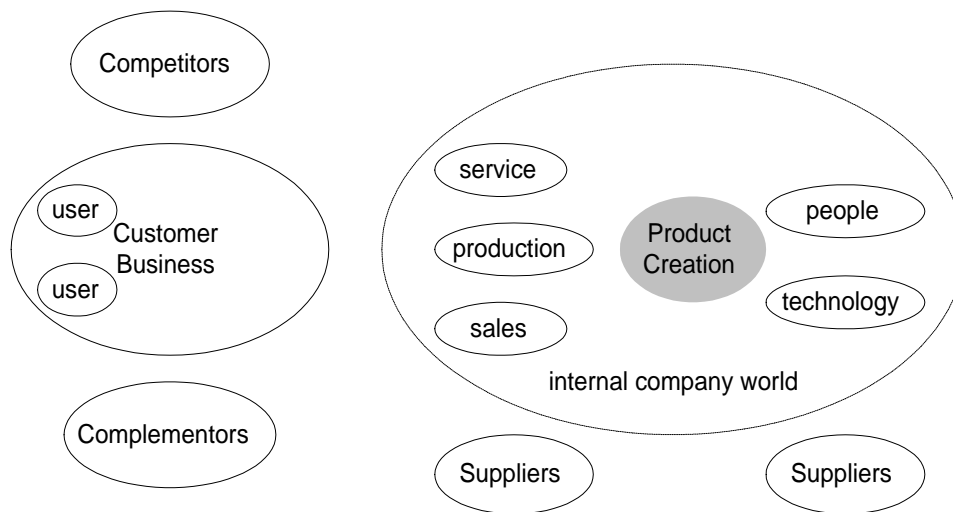


Figure 2: Context of the Product Creation, indicating the involved stakeholders

The Product Creation has many stakeholders, see figure 2. Every stakeholder is in reality a large collection of human individuals.

Note that in most processes ² an abstraction of the stakeholder is used, such as *customer, consumer, user, employee* etcetera, while the needs of these abstractions are captured in other abstractions, such as requirements and specifications.

For instance a specification might indicate that a product is targeted at elderly citizens, which is much more abstract than the 85 year old mister Smith who cannot find his remote control which is so small that it always disappears.

The system architect has to do with external and internal stakeholders. Quite often it is impossible to know all of them personal, which forces him to work more indirect and to apply abstraction. For instance Sales and Marketing Managers meet much more customers and often represent them during the requirement capturing. The system architect should at least meet a few "life" customers. Again a balancing act is expected from the system architect with respect to the attention for external and internal stakeholders.

4 From Product Creation Perspective

This article focuses on the human side from the system architecture perspective. All other players in the Product Creation should also be aware of this human context.

The system architect should not "protect" the other project members from this human outer world. Project managers, Designers etcetera must have sufficient insight in this human context to avoid solutions which are unkind for humans.

Many of the horrible designs from human point of view can be traced back to designers which lack the insight in the human context. Quite often they are simply blind for this non technological factors.

It is also the task of the system architect to educate the people surrounding him in the human aspects. This is the only scaleable way of working.

5 Acknowledgements

The trigger to write this article is the work of a work-group consisting of: Dieter Hammer (Technical University Eindhoven), Jaap van Rees (Van Rees adviesbureau), Jeroen van Hoven (Erasmus University Rotterdam), Kees van Overveld (Philips Research/TUE), Daan Rijsenbrij (Cap Gemini), Nathalie Masseur (Cap Gemini), and myself from Philips Research. The contributions of the members stimulated me to write this article.

²A perfect example is this article itself, which abstracts the human again in several ways

References

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History

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