Abstract
The architect plays an essential role in making solutions, which fit with the human measure. During the long product creation chain the human measure is easily lost. The role of the architect is to integrate understanding of the customer world with know-how of the solution (technology) world. The architect quickly iterates many stakeholder viewpoints to achieve a satisfying solutions from many, seemingly conflicting, viewpoints.

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1 Introduction

This article is written as part of a collective effort to write a book about "ICT and the Human Measure". It will become one chapter of this book, describing "the role of the architect". For that reason the problem statement is short and illustrative only.

2 Illustration of the problem

Many products have characteristics which are determined by technology push rather than user need. Take for instance most video recorders, which are often way too difficult to program for ordinary (non-technical) people. This is illustrated by figure 1.

![Figure 1: Did you ever program a VCR?](image)

One cause of this problem is the long chain of activities which results in a product, as shown in figure 2. This long chain of activities also involves many people with different roles, as shown in the figure. The figure shows the product creation cycle, where the user is at the end of the process, and the product is at the beginning.

![Figure 2: Product Creation Cycle](image)
different stakeholders, ranging from potential customers, and product managers to development engineers and production personnel.

Figure 3: Bridging the gap between Human Experience and Engineering

A lot of the stakeholders "live" in the engineering world, which addresses a lot technology concerns. The other end of the stakeholder chain, the human users, live in the real world, with many human concerns, such as emotions, feelings, perceptions et cetera. Figure 3 visualizes the gap between those stakeholders.

Both figures 2 and 3 already hint at the crucial role played by the architect by architecting the solution.
3 What is architecting?

Architecting in product creation spans from understanding the why, via describing the what to guiding the how, as shown in figure [4] Or in even more popular terms: do the right things and do the things right.

Architecting is a job which is done by all members of the product creation team, however the architect is responsible for the consistency and balance of why, what and how.

A useful top level decomposition of an architecture is provided by the so-called "CAFCR" model, as shown in figure [5]. The customer objectives view and the application view provide the why from the customer. The functional view describes the what of the product, which includes (despite the name) also the non functional requirements. The how of the product is described in the conceptual and realization view, where the conceptual view is changing less in time than the fast changing realization (Moore’s law!).

The job of the architect is to integrate these views in a consistent and balanced way. Architects do this job by frequent viewpoint hopping, looking at the problem from many different viewpoints, sampling the problem and solution space in order to build up an understanding of the business. Top down (objective driven, based on intention and context understanding) in combination with bottom up (constraint aware, identifying opportunities, know how based).

The how of the product is created by many specialists. The how is guided by the architecture. At least 5 views are required for guidance:

- functional decomposition
- construction decomposition
- allocation of functions to construction elements
- infrastructure
- integrating concepts

Figure [6] visualizes these 5 how views.
**What** does Customer need in Product and **Why**?

![Diagram](image)

**Product How**

**Customer What**

Customer objectives

Application

Functional

Conceptual

Realization

context understanding

intention

objective driven

constraint awareness

knowledge based

opportunities

Figure 5: Five viewpoints for an architecture. The task of the architect is to integrate all these viewpoints, in order to get a valuable, usable and feasible product.

**What** does Customer need in Product and **Why**?

![Diagram](image)

**Product How**

**Customer What**

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Figure 6: Guiding **how** by providing five how-viewpoints
4 The architect

![Diagram](image)

Figure 7: The architect integrating all specialist teamplayers

The architecting function is ideally performed by every teammember. However the primary responsibility for the balance and consistency of requirements, specification and design is owned by the architect. Figure 7 shows the architect meddling with the work performed by all teammembers, in order to obtain the balance and maintain the consistency.

![Bar chart](chart)

Figure 8: Required architect know-how per view, typical for current architects and the preferred profile.

The role of the architect is to (proactively) integrate the work of all the specialists. This role requires sufficient know-how in the five views, see figure 8. Most current architects have a dominant technical view on the world and should acquire more know-how from the customer world.

This broad profile of the architect does not evolve automatically. Potential architects grow by stepwise broadening their scope, see figure 9. The intermediate roles are quite important in complex systems, it prevents the need for an impossible broad and heavy superarchitect.
Figure 9: The architect maintains technical roots

References


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