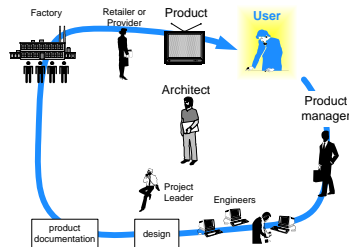# Architect and Human Measure; the integration role

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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.

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.
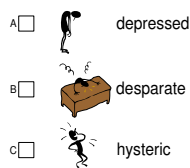
2   Illustration of the problem

Figure 1: Did you ever program a VCR?

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.
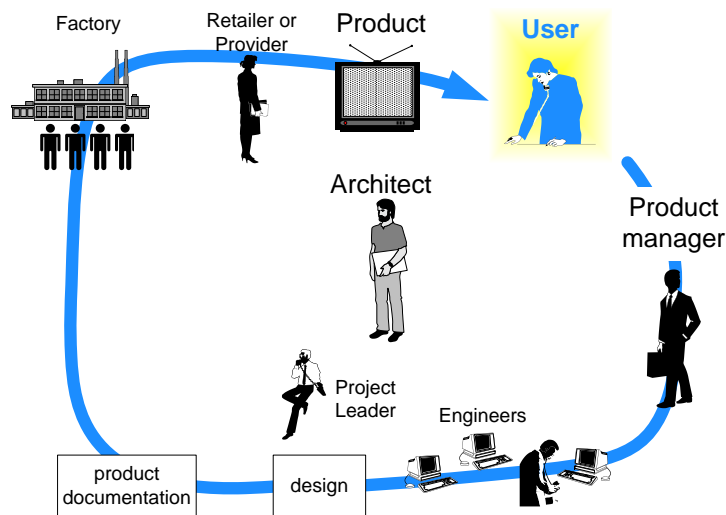

Figure 2: Product Creation Cycle

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

different stakeholders, ranging from potential customers, and product managers to development engineers and production personnel.
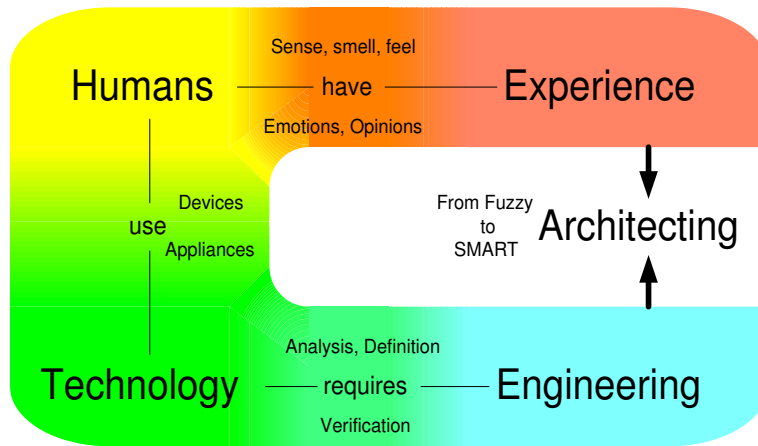

Figure 3: Bridging the gap between Human Experience and Engineering

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*
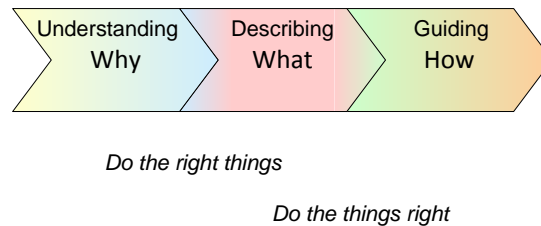

Figure 4: Architecting visualized

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
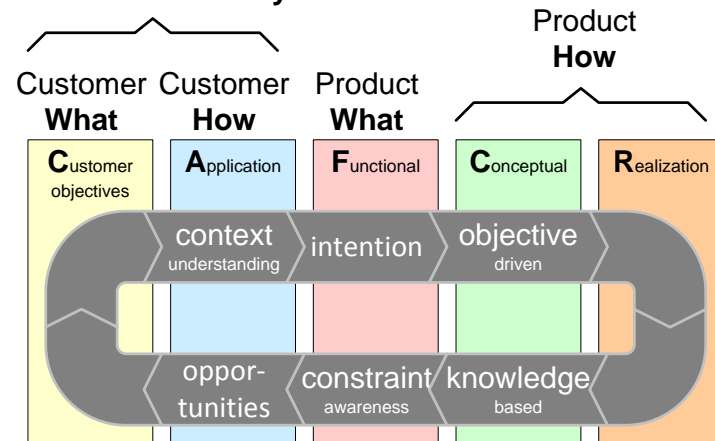- integrating concepts

Figure 6 visualizes these 5 **how** views.

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.
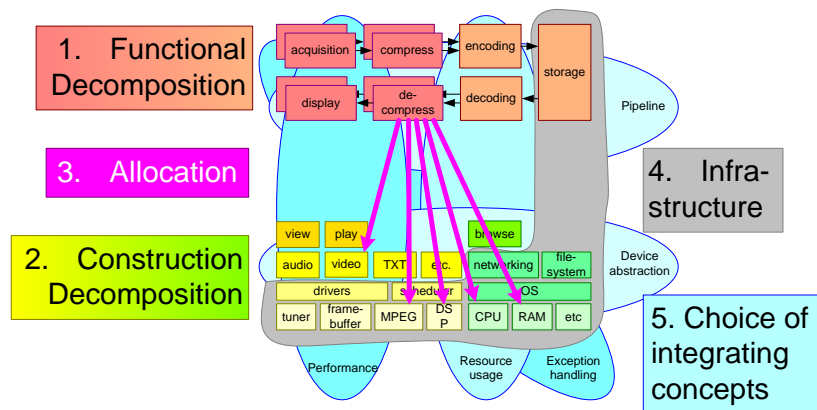

Figure 6: Guiding **how** by providing five *how*-viewpoints
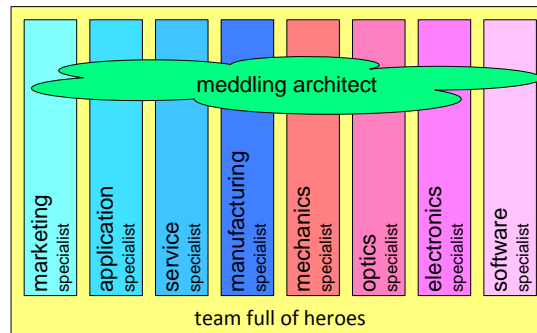
4 The architect

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.
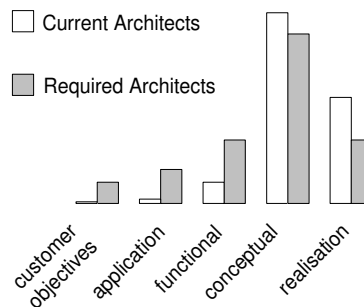

Figure 8: Required architect know-how per view, typical for current architects and the preferred profile.

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.
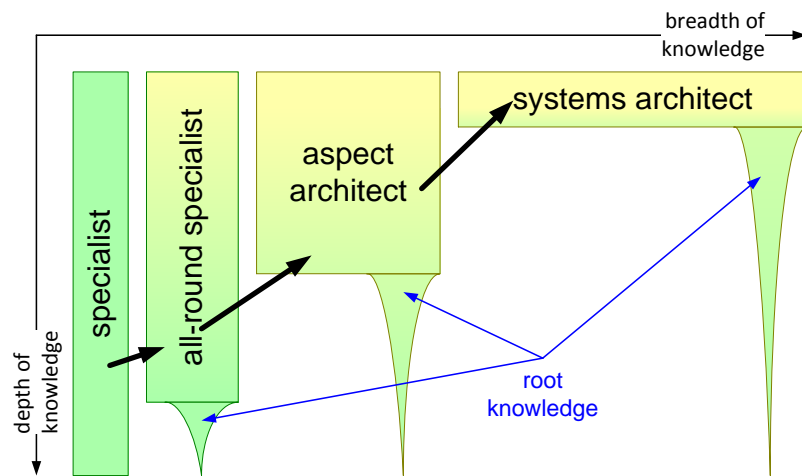
Figure 9: The architect maintains technical roots

References

[1] Gerrit Muller. The system architecture homepage. `http://www.gaudisite.nl/index.html`, 1999.

History
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- minor change
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- Created, no changelog yet