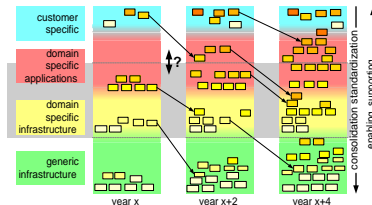


# Semiconductor Software Strategy



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## Abstract

Philips Research is looking for ways to improve the software productivity. The business rationale for this research are the needs of semiconductor customers, the creators of consumer appliances. Technological developments, such as miniaturization and convergence have a strong impact on the form, function and content of consumer appliances. The appliance makers are struggling with the consequences, especially with the exponential increasing SW effort.

The customer and the semiconductor viewpoint are shown. Strategic questions for semiconductors are identified and discussed, such as the need for architecture, legacy and scoping.

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version: 0

status: planned

September 9, 2018

# 1 Introduction

Philips Research is exploring ways to increase the software productivity for consumer appliances, see figure 1 which summarizes the research goals of the software productivity and component research.

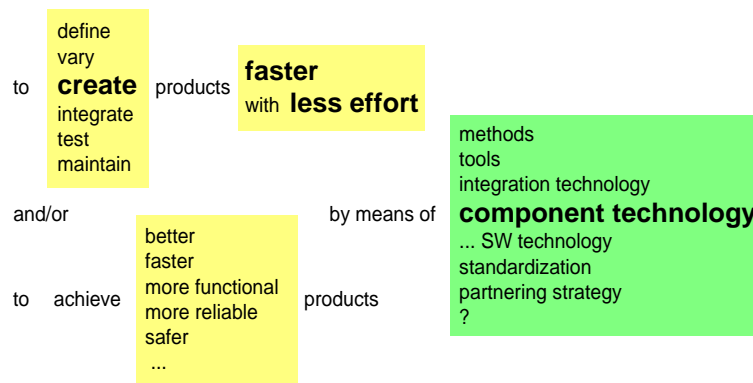


Figure 1: Software productivity and components research goals

The business rationale of this research is that creators of consumer appliances are struggling with the exploding amount of software needed in these appliances. As customers of semiconductor companies they are looking for ways to cope with the software. See section 2 for a description of the customer viewpoint.

One of the dominant solution directions is buying software from third parties, such as the suppliers of the hardware. For semiconductor companies it is no longer sufficient to sell hardware only, a system solution is being asked for. See section 3

## 2 The customers problem



from PSAVAT 2001; "Light Weight Architectures; The way of the future? "

Figure 2: Convergence results in more integration and diversity

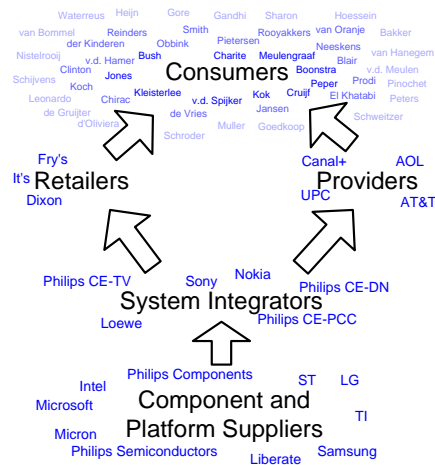


Figure 3: Value chain

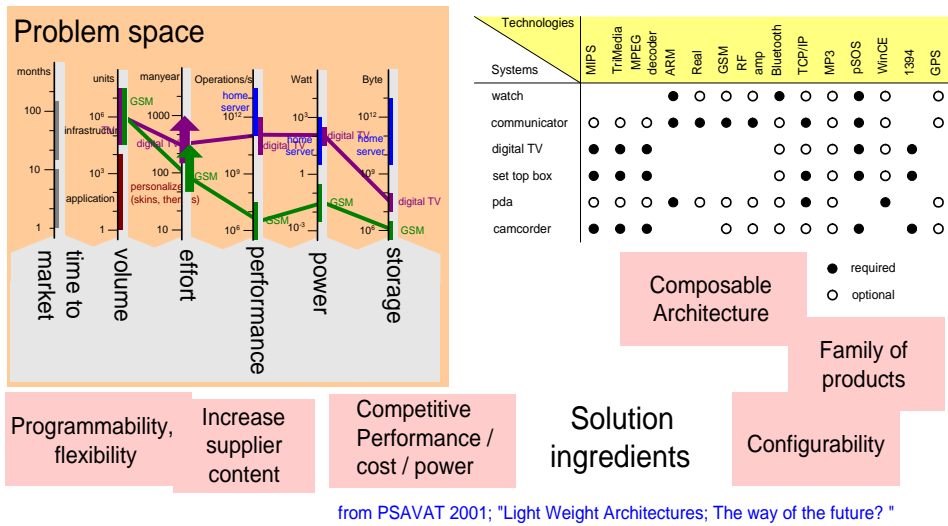


Figure 4: Exploring problem space and solution ingredients

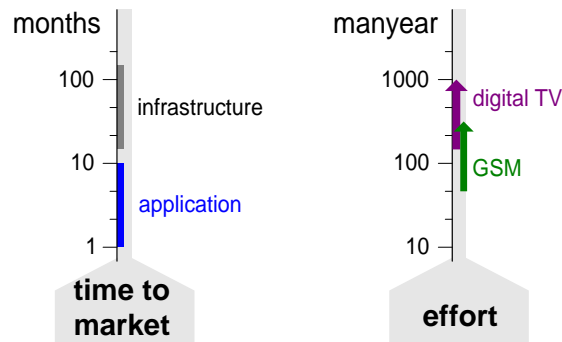


Figure 5: Dominant customer concerns

direct product costs mostly determined by hardware  
how about software license costs?

development costs : software becomes more expensive than hardware

time to market : software is limiting factor

software often synonymous with integration

product value mostly determined by software  
SW is integrating technology  
SW implements functional behavior

Figure 6: Trends in hardware and software

### 3 Semiconductor viewpoint

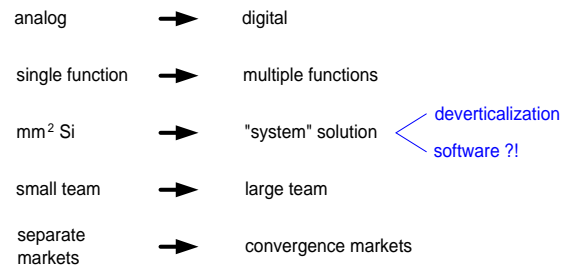


Figure 7: Changes in semiconductor country in the last decade

How to protect customers SW investments?

How to enable SW application reuse across domain boundaries?

Which software architecture?                      which hardware architecture

Which software to make?                      which hardware IP  
How and with whom to partner?

How to do all of this fast enough?                      Thomson, TI, Intel, Samsung, ...

Figure 8: Strategic questions for Semiconductor company

## 4 Which architecture?

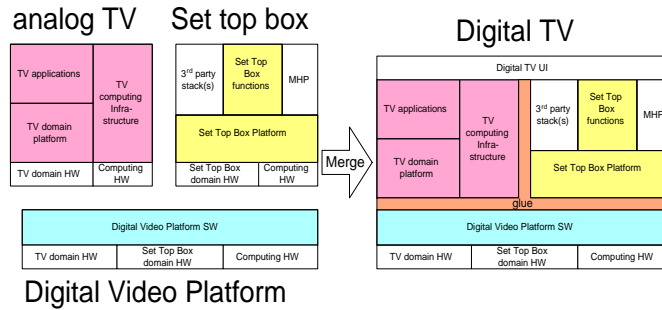


Figure 9: Simplistic Architecting: Digital TV

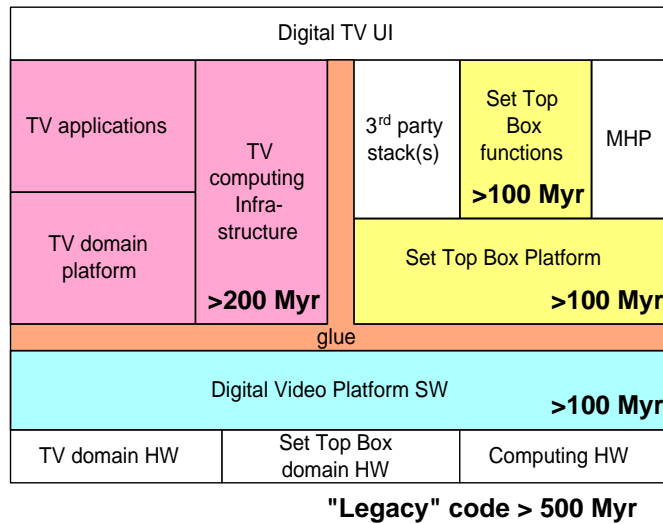


Figure 10: Available Code Assets

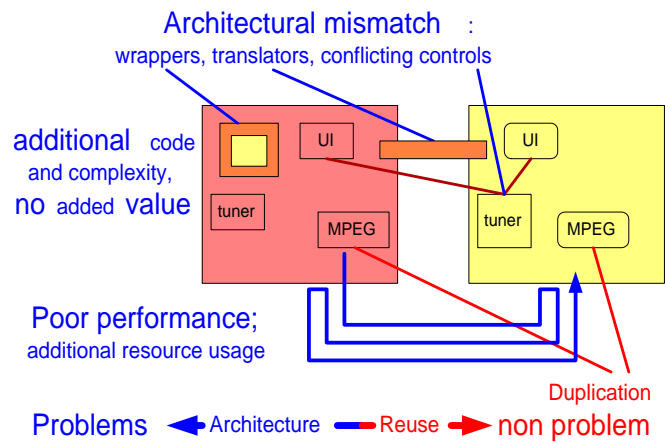


Figure 11: Merge problems

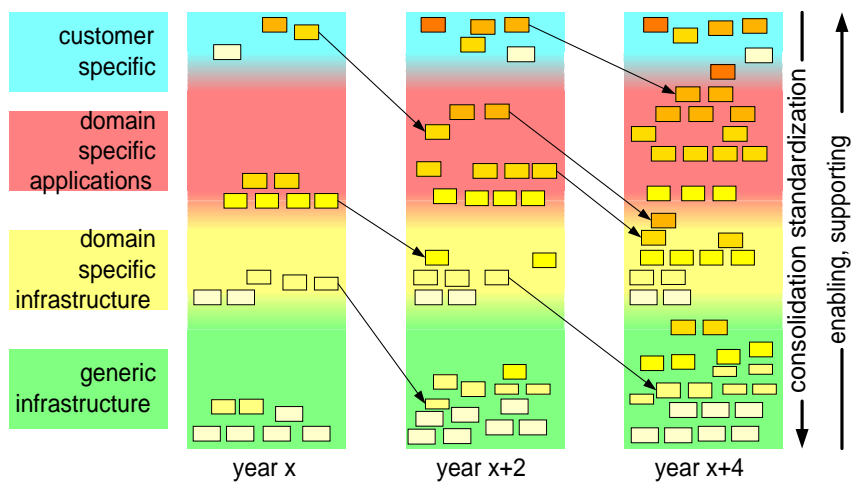


Figure 12: Evolution of functionality



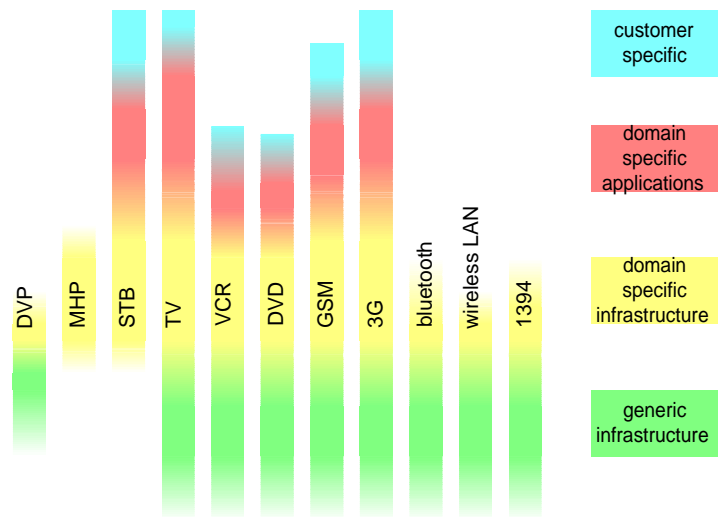


Figure 13: Existing SW stacks

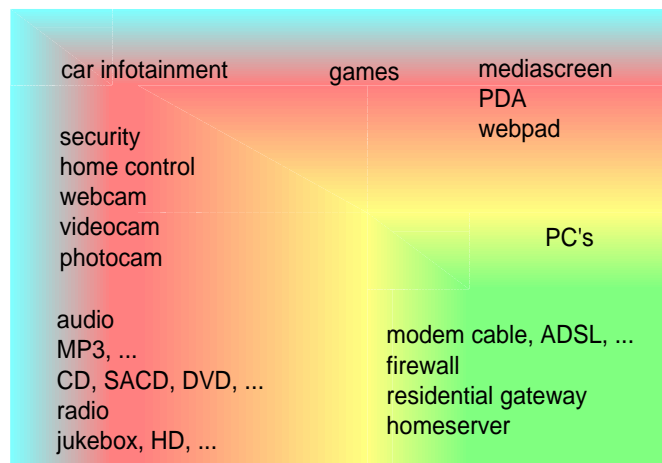


Figure 14: But there are much more domains and stacks

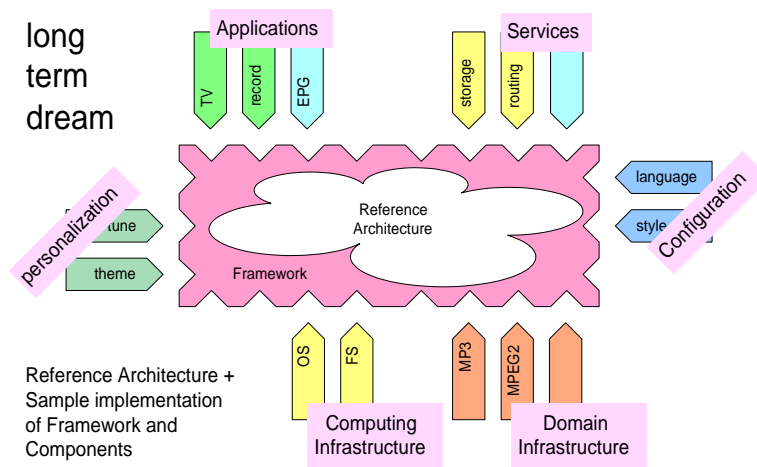


Figure 15: Ideal homogeneous situation?

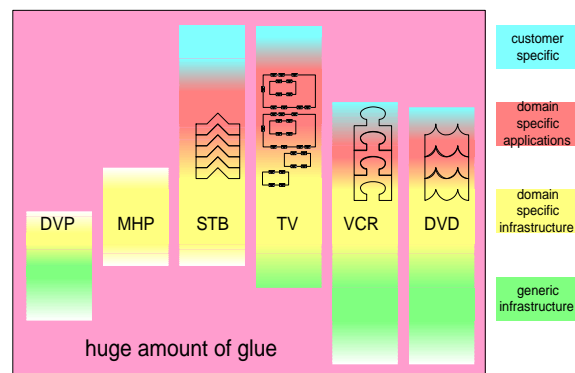


Figure 16: Today's reality?

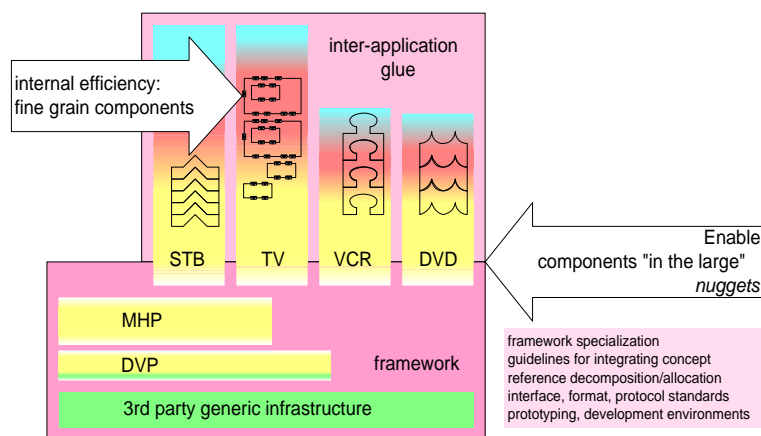


Figure 17: Achievable solution?

## 5 Which software to make

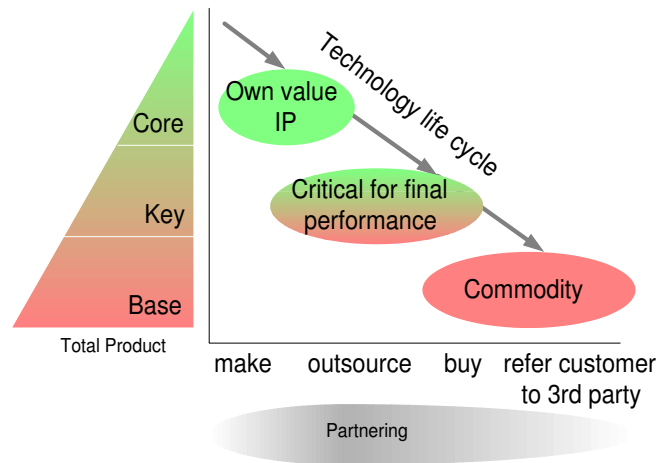


Figure 18: Core, key or base technology?

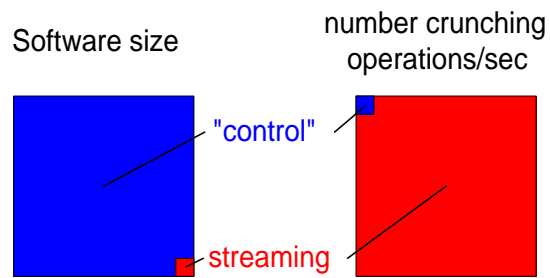


Figure 19: Streaming: one of Philips' core strengths

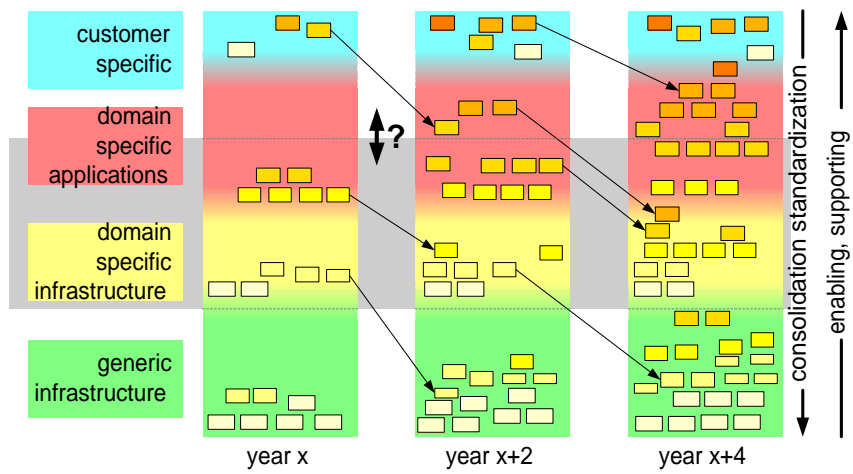


Figure 20: Our territory?

## 6 Summary

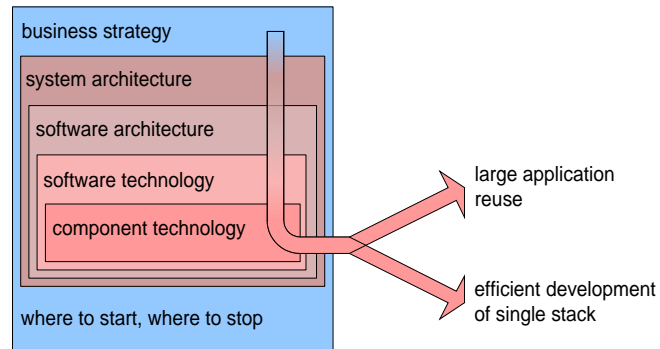


Figure 21: Summary

## References

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

## History

**Version: 0, date: April 8, 2002 changed by: Gerrit Muller**

- Created, no changelog yet