

Semiconductor Software Strategy

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Abstract

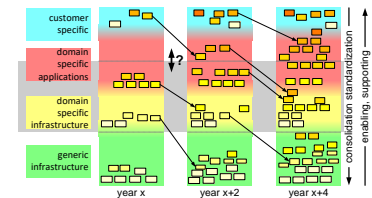
Philips Research is looking for ways to improve the software productivity. The business rationale for this research are the needs of semiconductor customers, the creators of consumer appliances. Technological developments, such as miniaturization and convergence have a strong impact on the form, function 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.

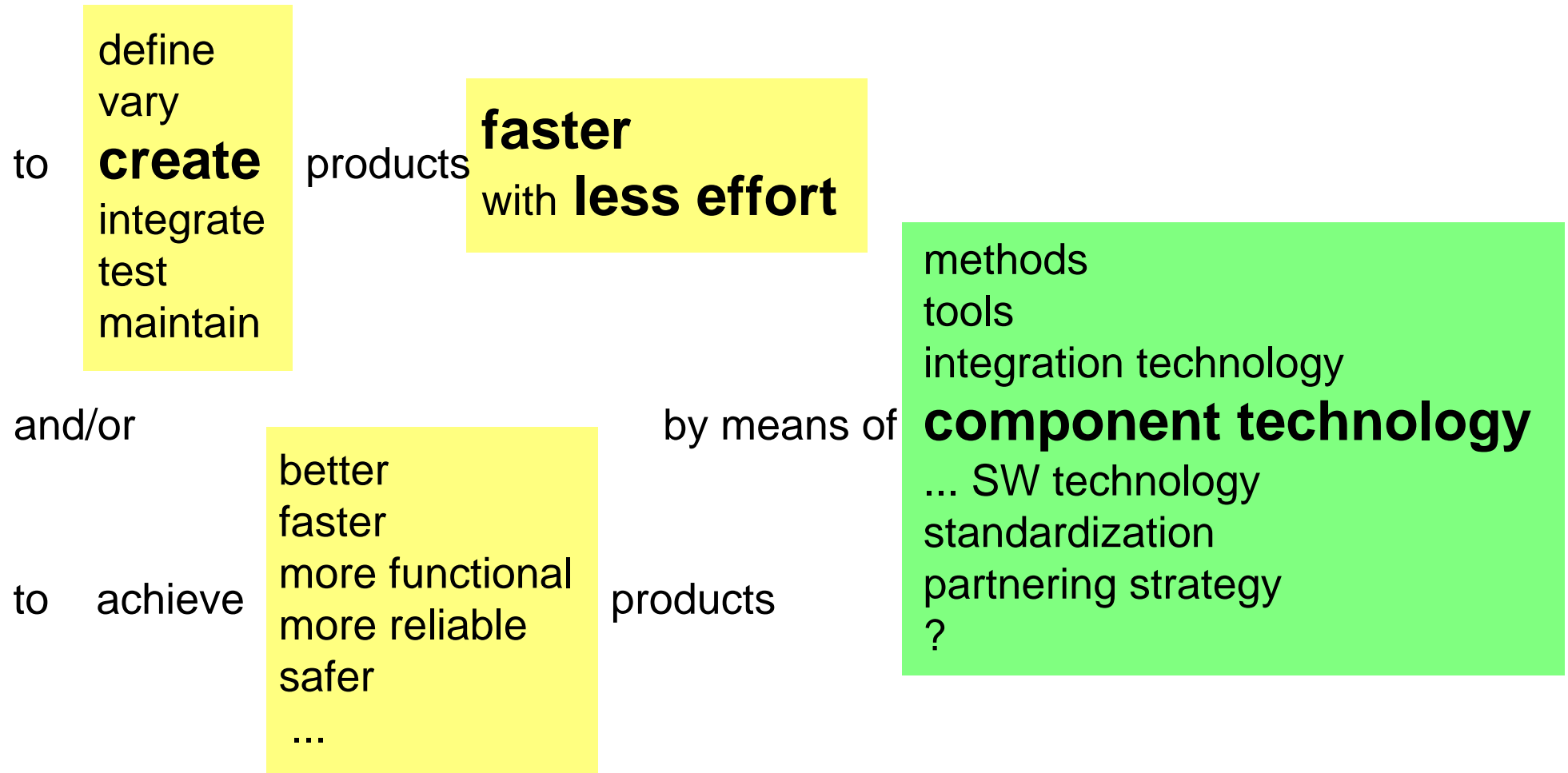
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Software productivity and components research goals



Customer viewpoint

Convergence -> Integration and Diversity



GSM phone



firewall



dvd



audio
microset



pda



watch



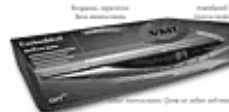
sailboat



surveillance
camera



cable
modem



set top box



headphone



pen



garment



car



camera



speech



mp3



television



Communicator



Ambient Intelligence
living room



car navigation



computer



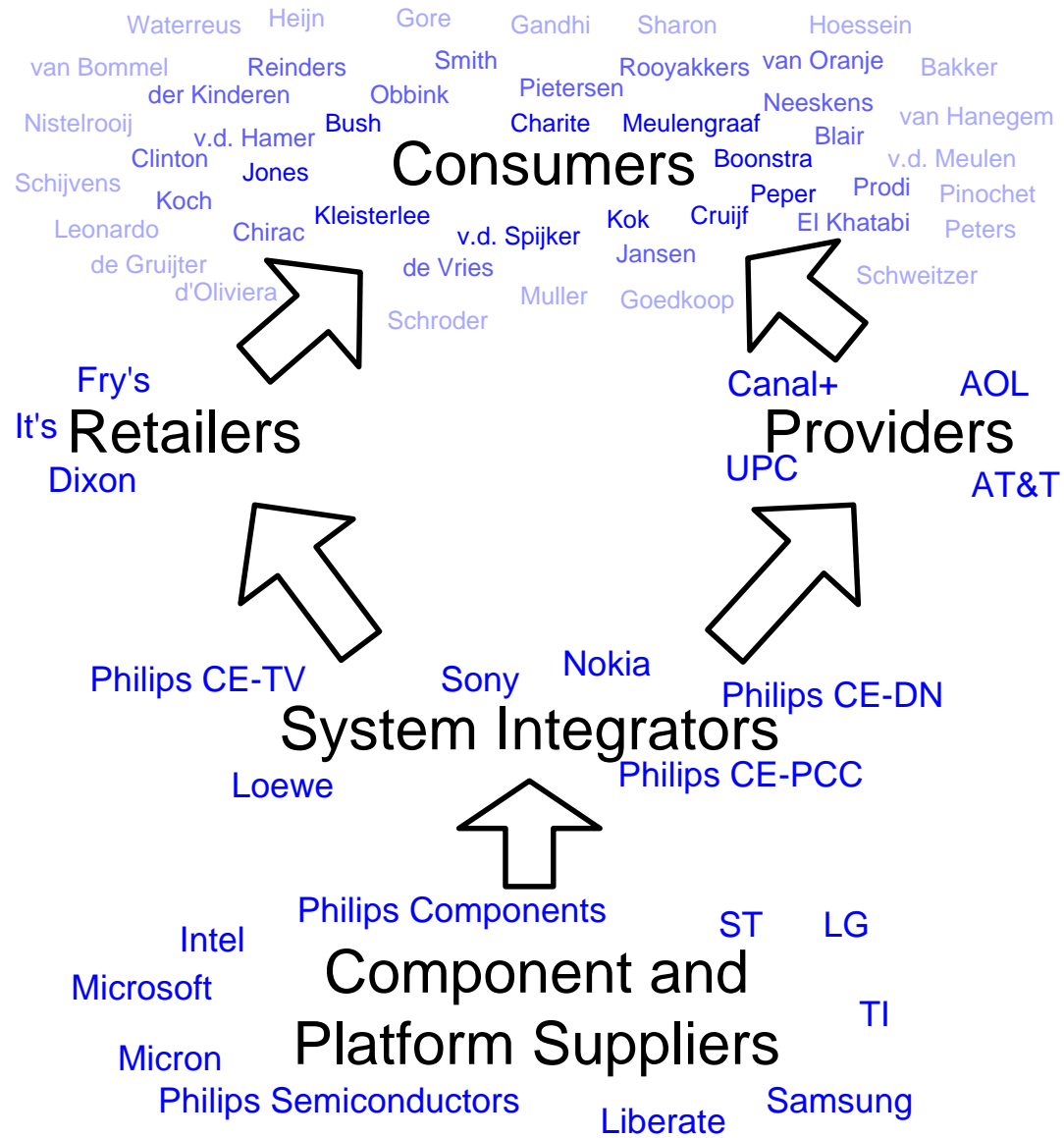
games



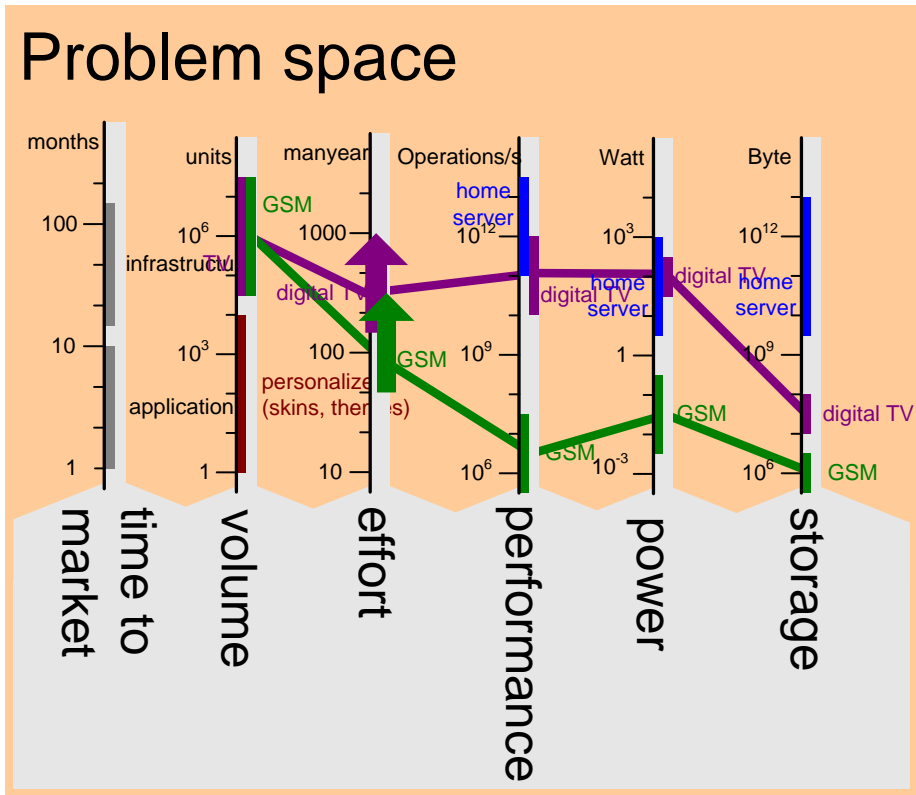
flat display

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

Value chain

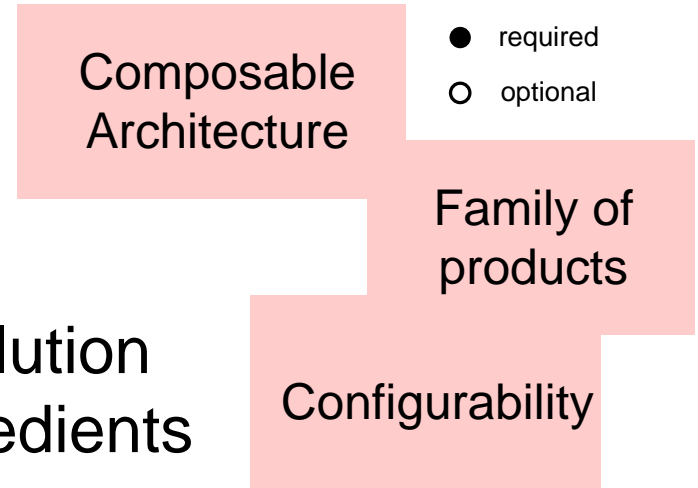


Exploring problem space and solution ingredients



Technologies	MIPS	TriMedia	MPEG decoder	ARM	Real	GSM	RF amp	Bluetooth	TCP/IP	MP3	pSOS	WinCE	1394	GPS
Systems														
watch				●	○	○	○	●	○	○	●	○		○
communicator	○	○	○	●	●	●	●	○	●	○	●	○		○
digital TV	●	●	●					○	○	○	●	○	●	
set top box	●	●	●					○	●	○	●	○	●	
pda	○	○	○	●	○	○	○	○	●	○		●		○
camcorder	●	●	●			○	○	○	○	○	●		●	○

● required
○ optional



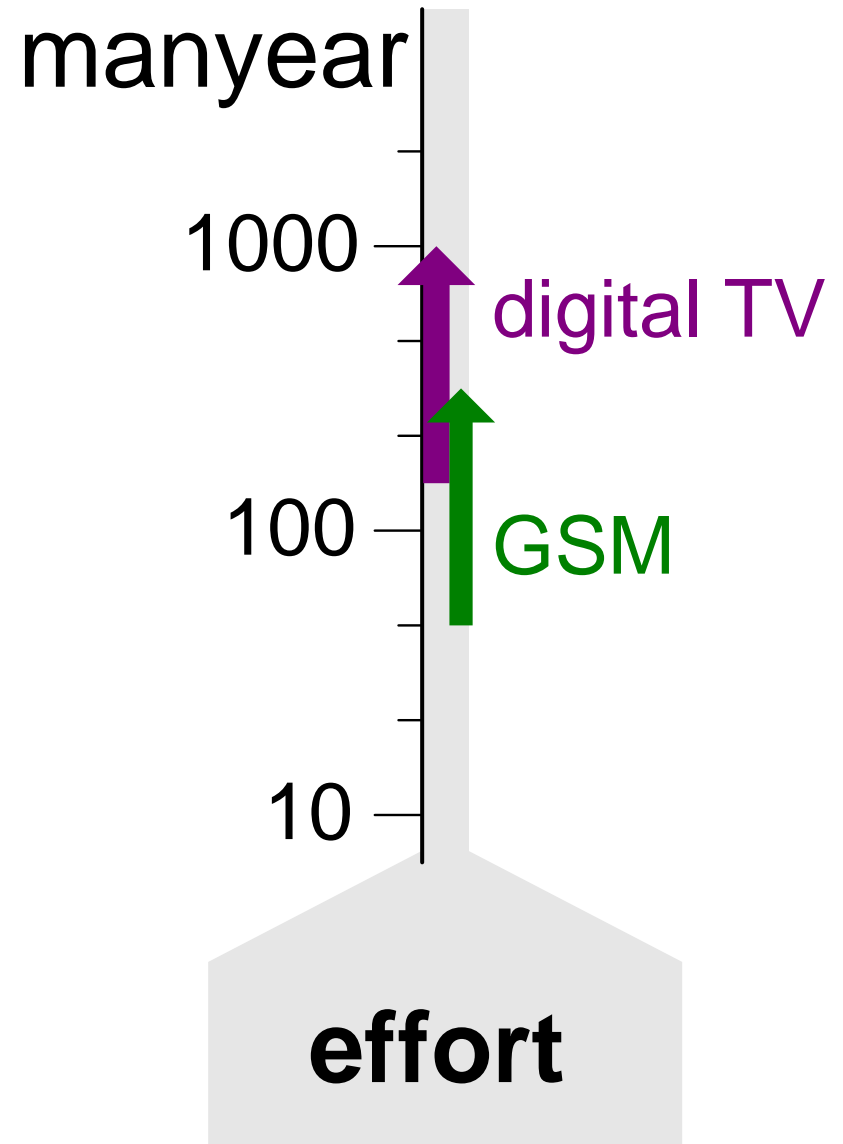
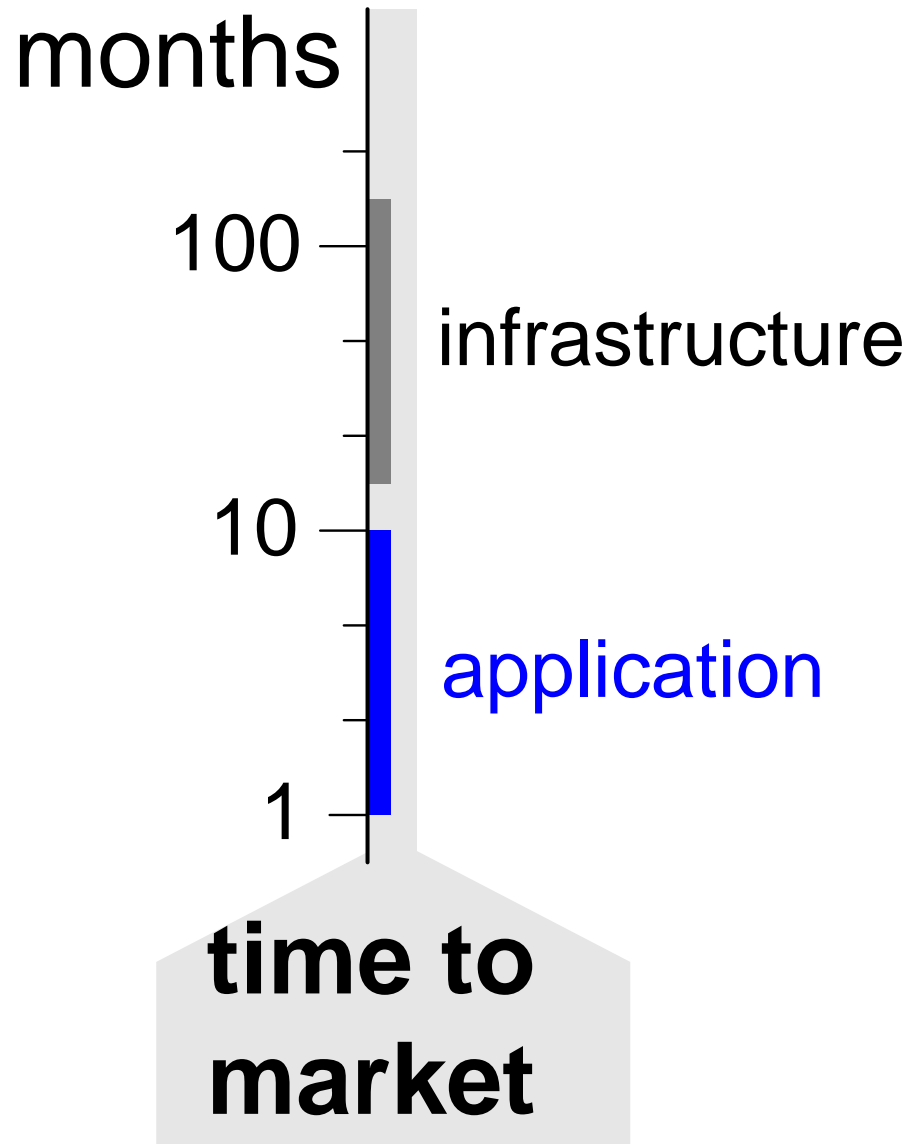
Programmability, flexibility

Increase supplier content

Competitive Performance / cost / power

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

Dominant customer concerns



Trends in hardware and software

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

Semiconductor viewpoint

Changes in semiconductor country in the last decade

analog



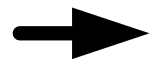
digital

single function



multiple functions

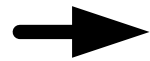
mm² Si



"system" solution

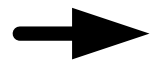
deverticalization
software ?!

small team



large team

separate
markets



convergence markets

Strategic questions for Semiconductor company

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?

How and with whom to partner?

which hardware IP

How to do all of this fast enough?

Thomson, TI, Intel, Samsung, ...

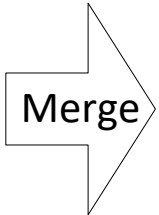
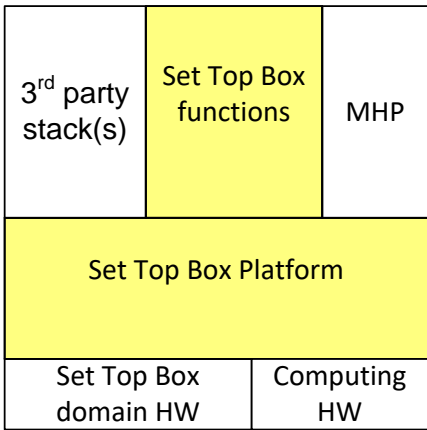
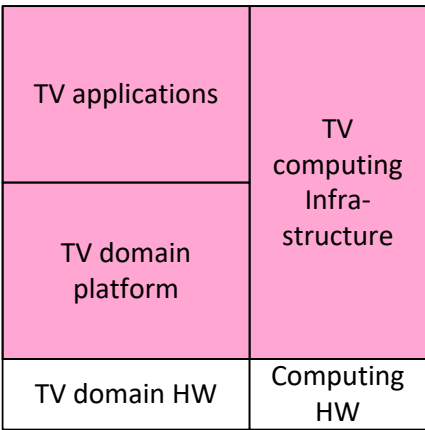
Which architecture?

How to protect customers software investments?

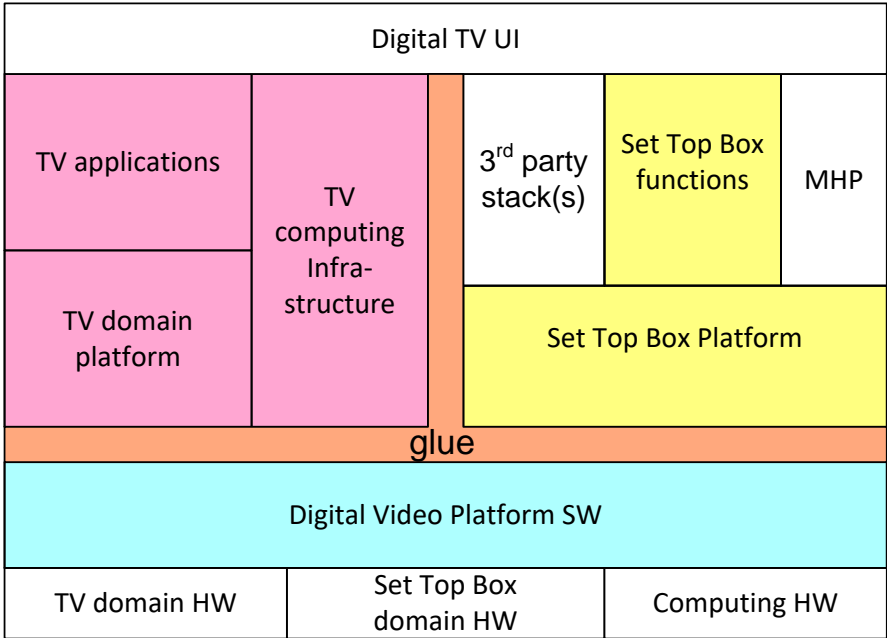
How to enable application reuse across domain boundaries?

Simplistic Architecting: Digital TV

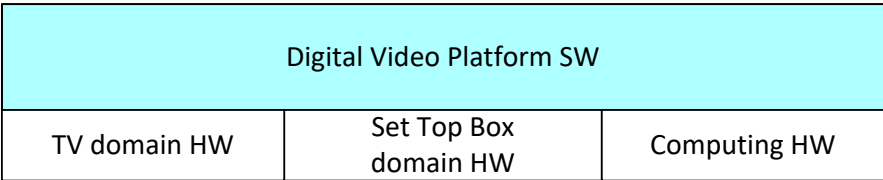
analog TV Set top box



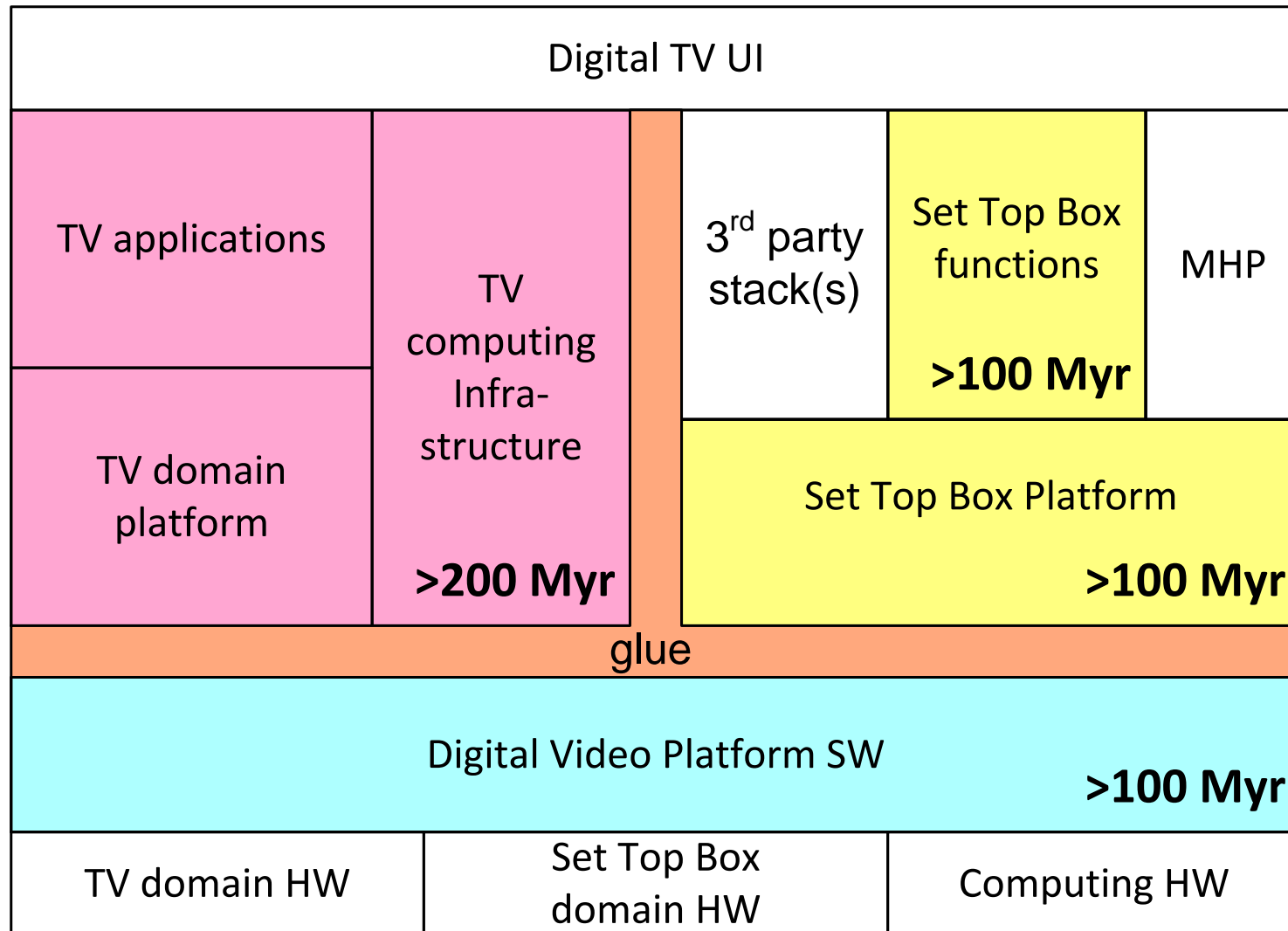
Digital TV



Digital Video Platform

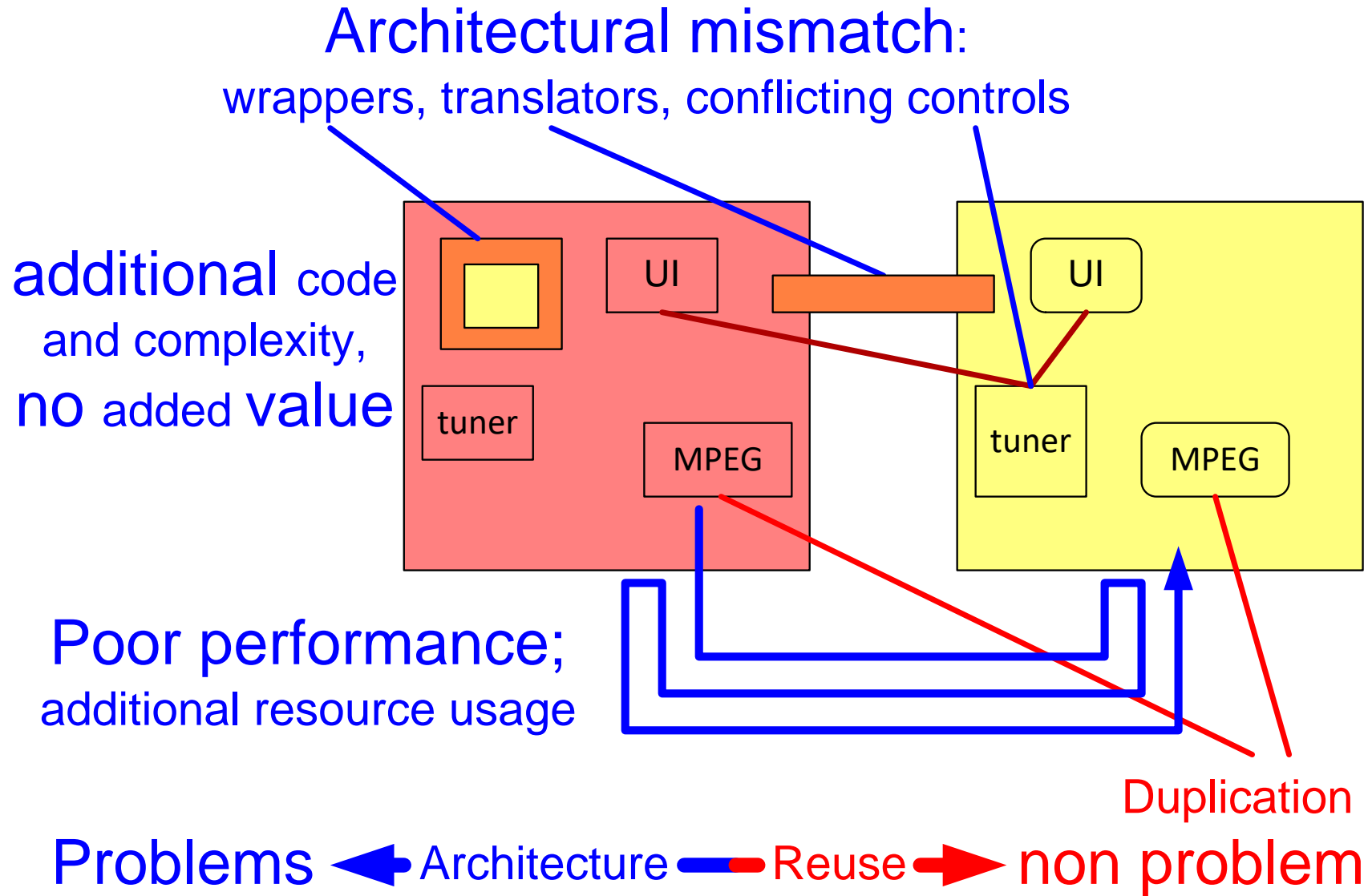


Available Code Assets

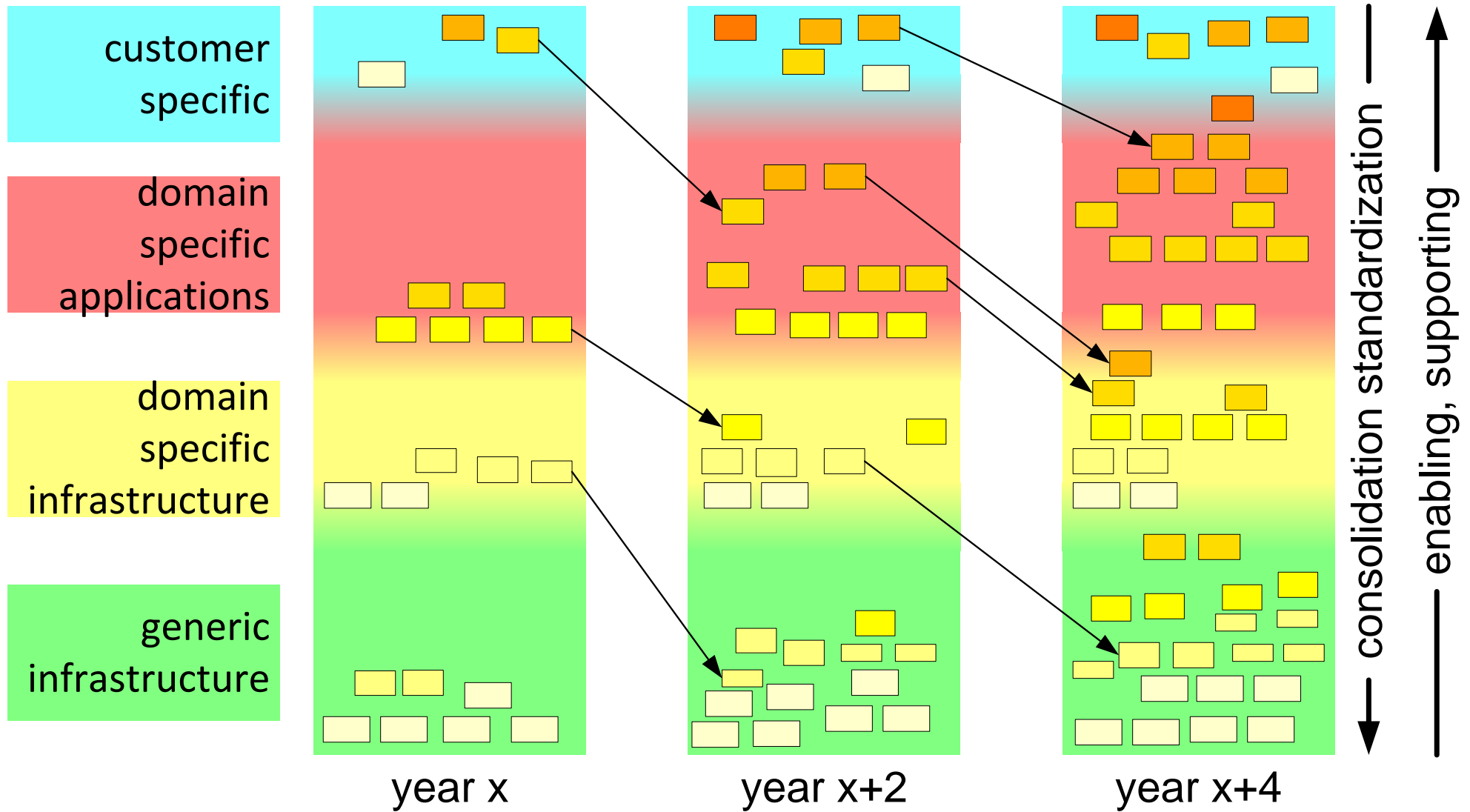


"Legacy" code > 500 Myr

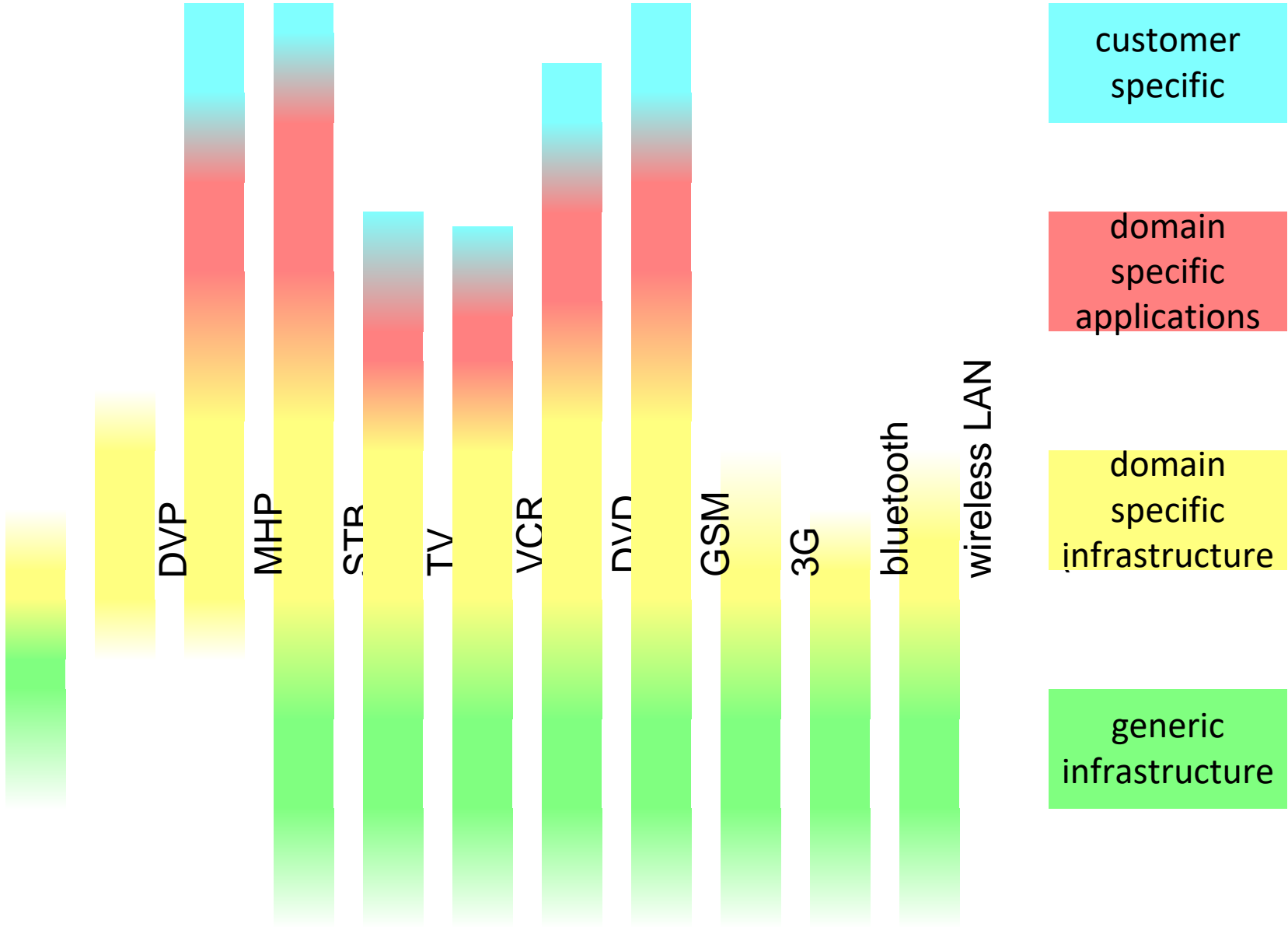
Merge problems



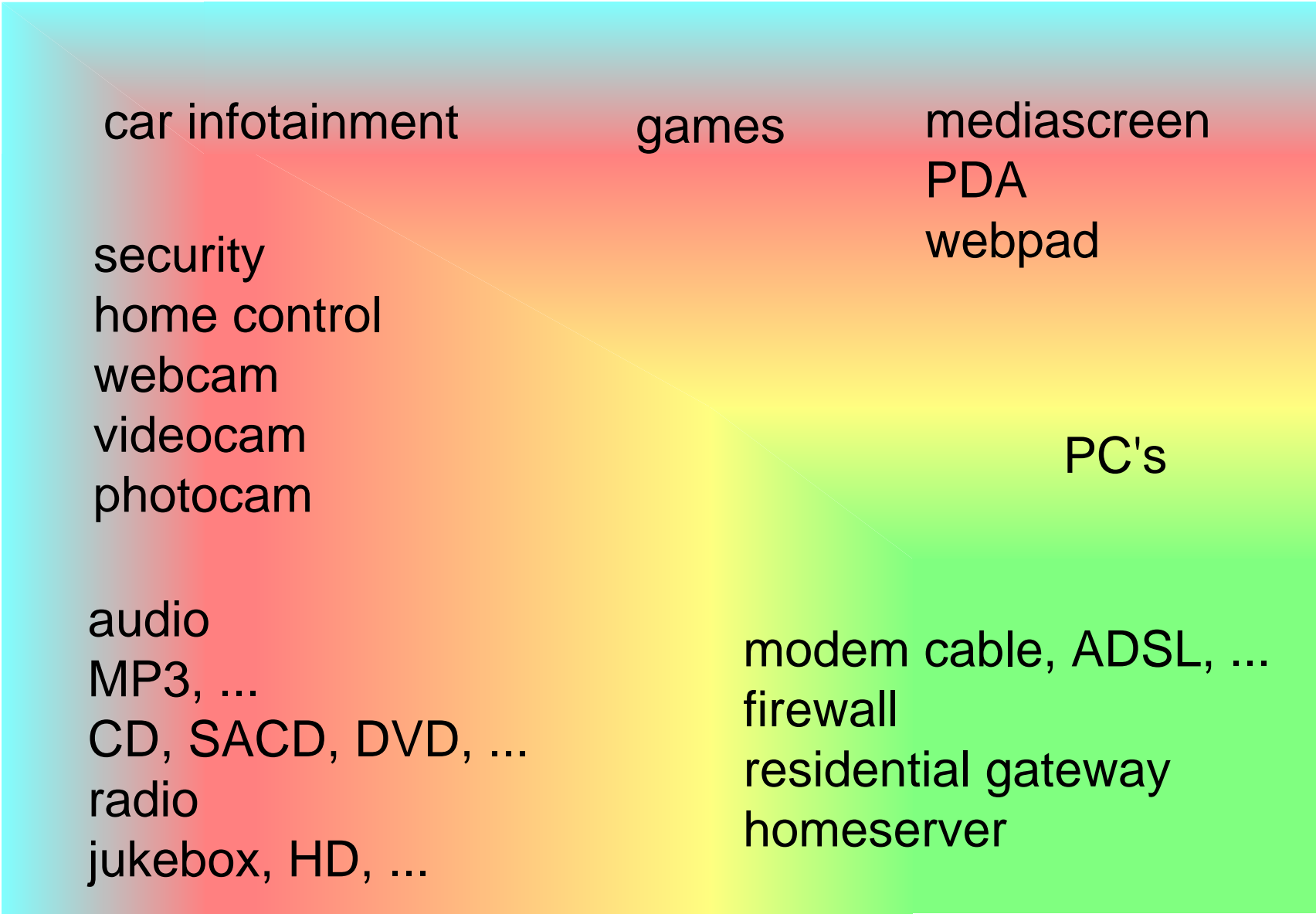
Evolution of functionality



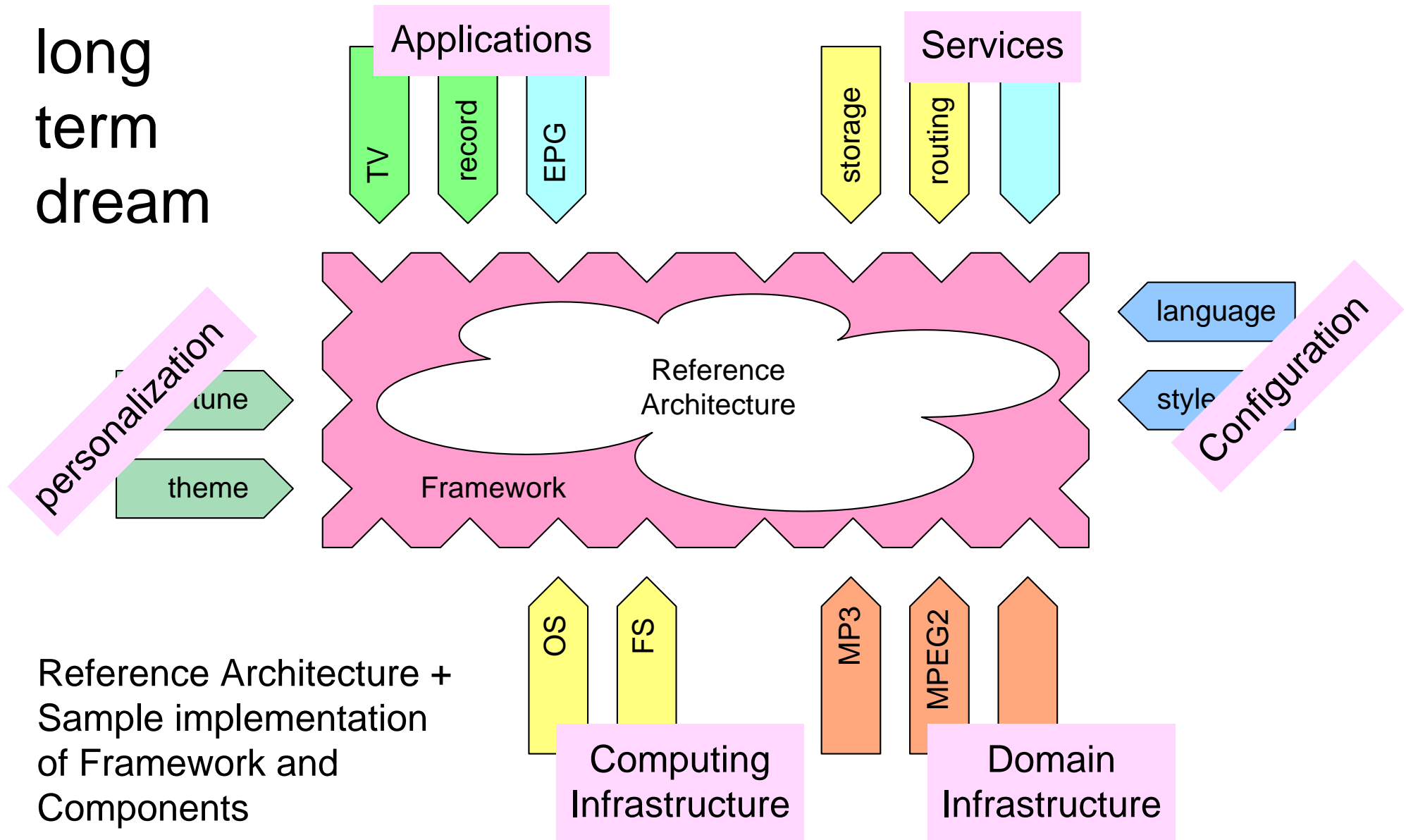
Existing SW stacks



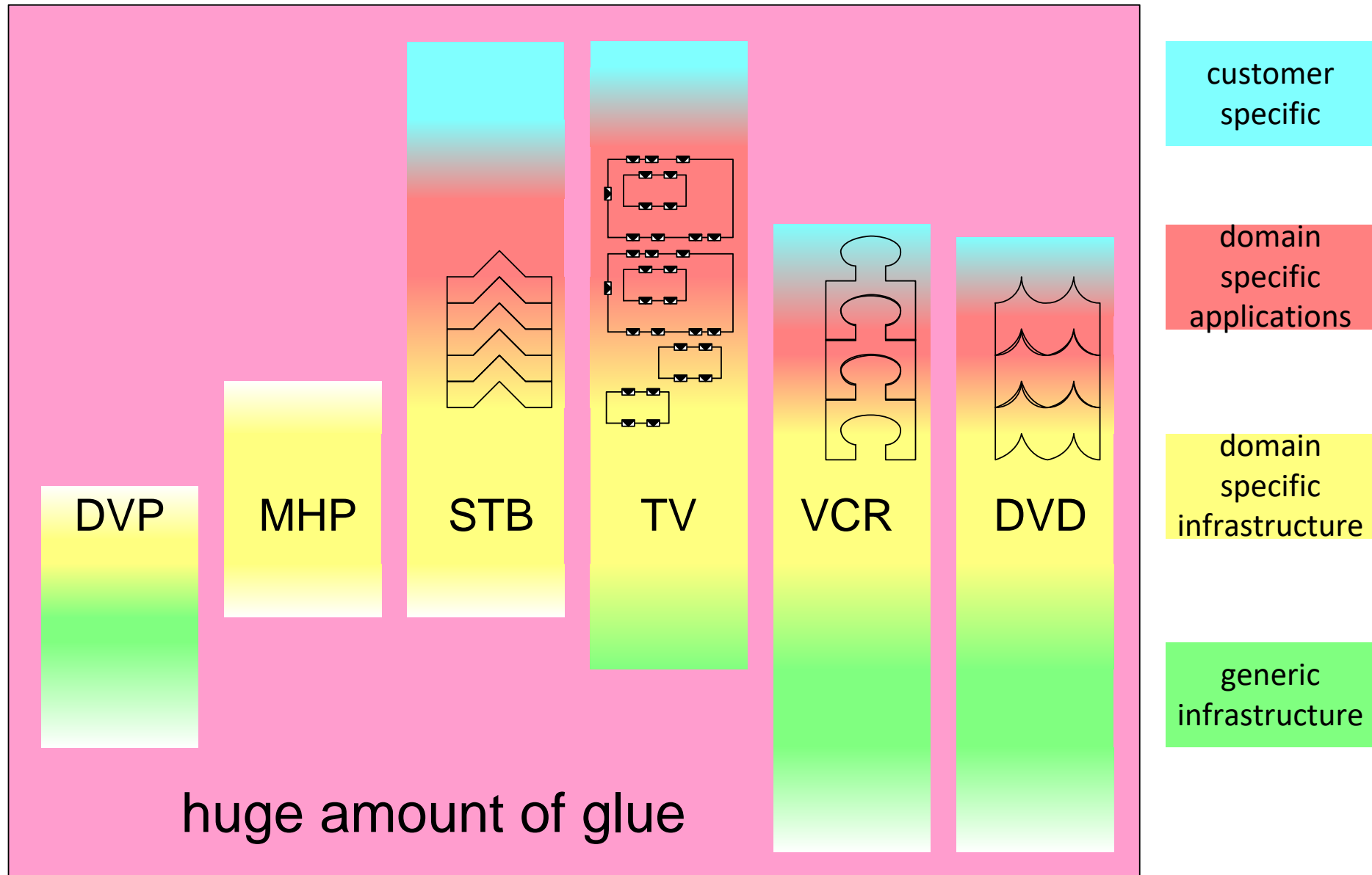
But there are much more domains and stacks



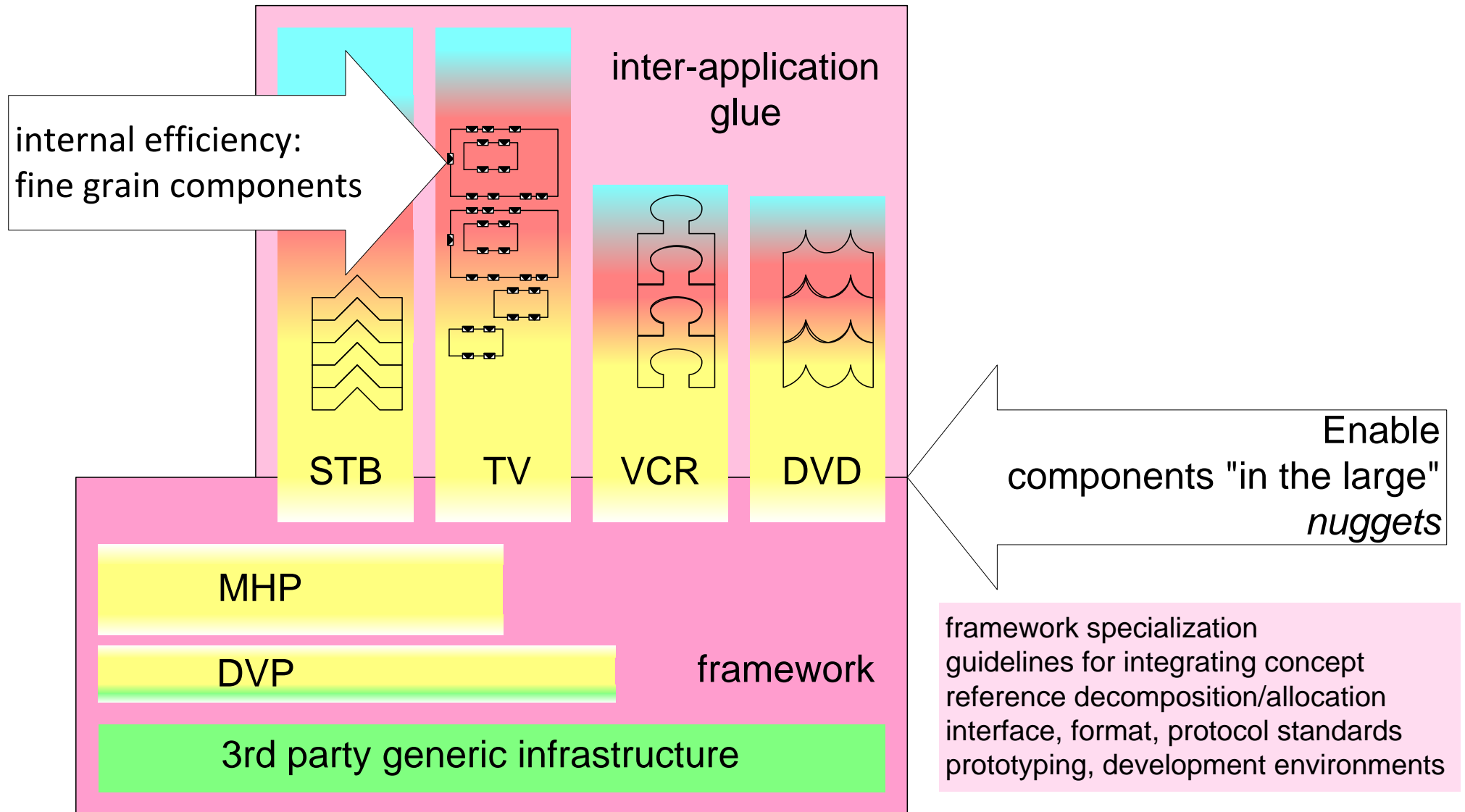
Ideal homogeneous situation?



Today's reality?

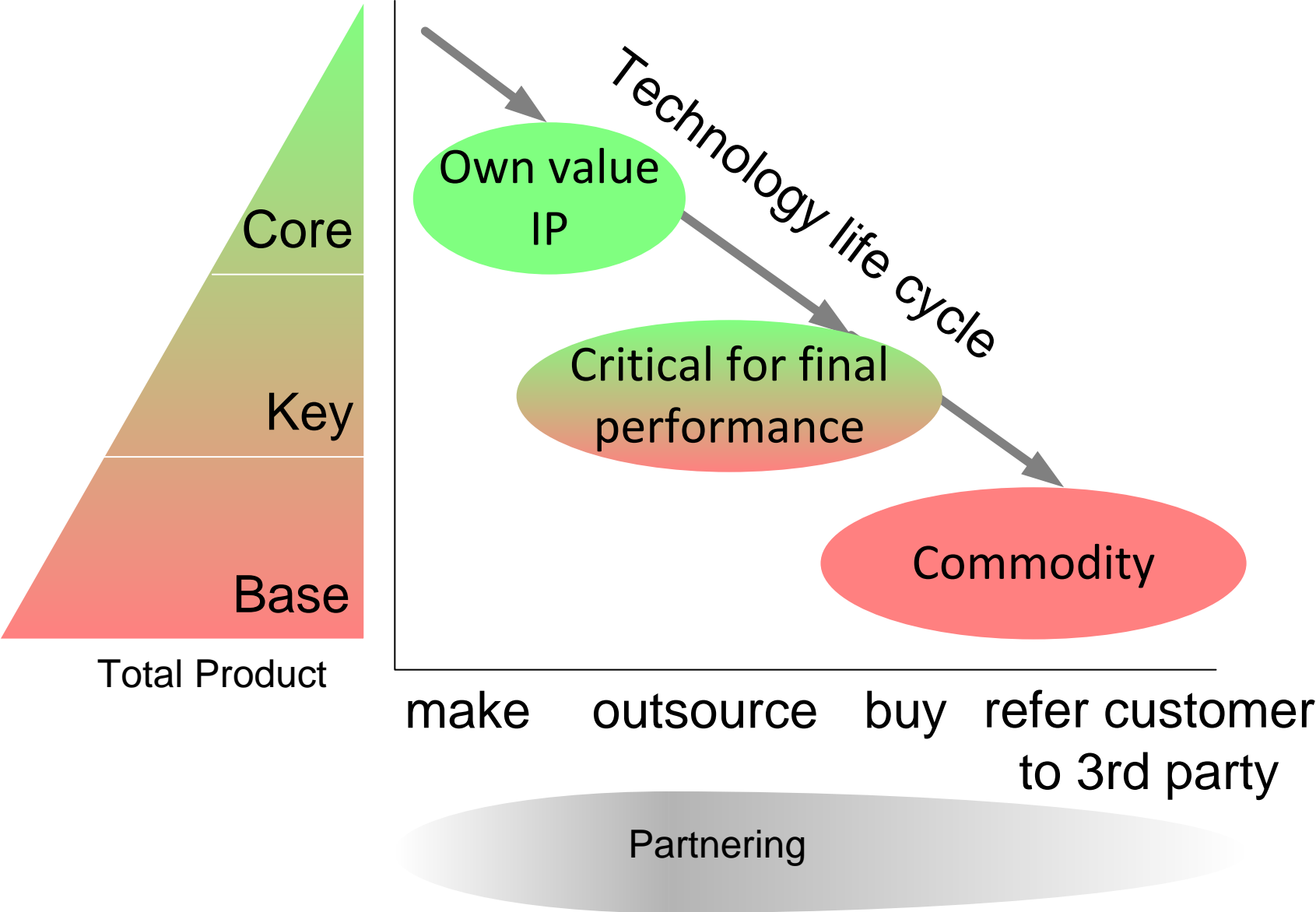


Achievable solution?



Which software to make?

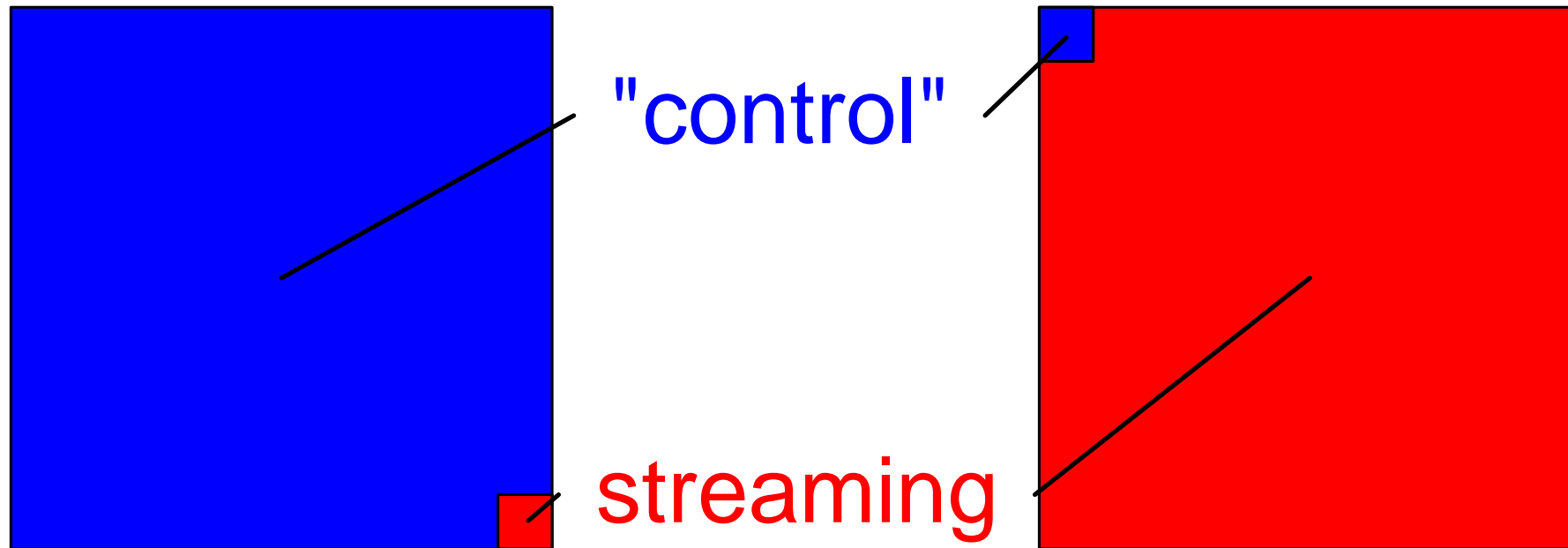
Core, key or base technology?



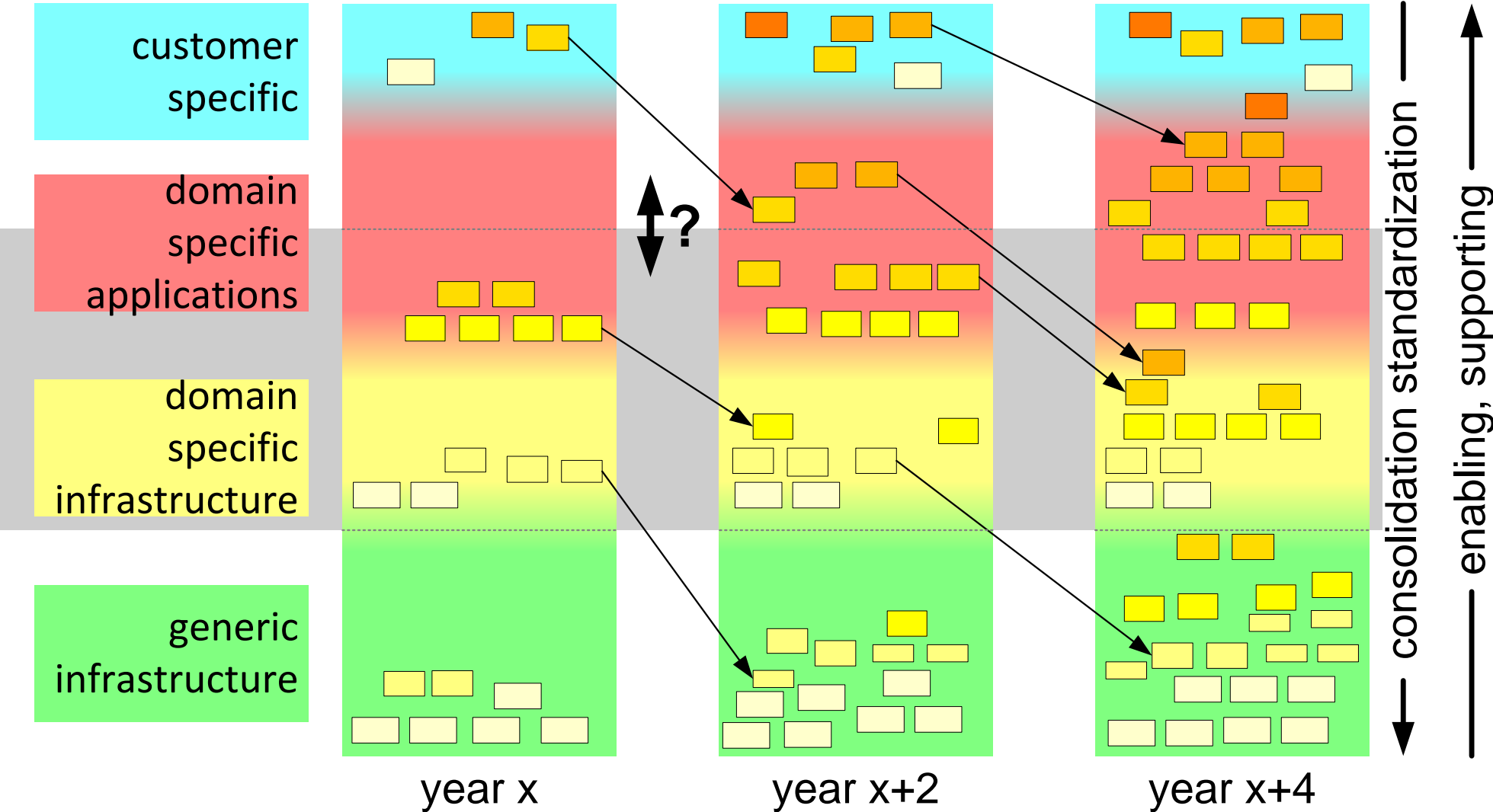
Streaming: one of Philips' core strengths

Software size

number crunching
operations/sec



Our territory?



Summary

