

Roadmapping for Strategy Support

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Abstract

Formulating and deploying a strategy requires a combination of vision and analysis. Roadmapping is a tool to explore and articulate future needs and trends for different dimensions.

Unfortunately most companies limit their roadmaps to either products and technology. In this tutorial we will show how to increase the roadmap value by integrating dimensions such as the market and customer context, the product portfolio, the technology, competences and supply chain, and processes. Roadmapping helps by relating these different dimensions in time, with a horizon of many years. We will discuss how to create and maintain roadmaps and give practical tips on the format.

Biography



Gerrit MULLER, originally from the Netherlands, received his Master's degree in physics from the University of Amsterdam in 1979. He worked from 1980 until 1997 at Philips Medical Systems as a system architect, followed by two years at ASML as a manager of systems engineering, returning to Philips (Research) in 1999. Since 2003 he has worked as a senior research fellow at the Embedded Systems Institute in Eindhoven, focusing on developing system architecture methods and the education of new system architects, receiving his doctorate in 2004. In January 2008 he became a full professor of systems engineering at Buskerud University College in Kongsberg, Norway.

All information (System Architecture articles, course material, curriculum vitae) can be found at: Gaudí systems architecting <http://www.gaudisite.nl/>

Tutorial Human Side of Systems Architecting

by *Gerrit Muller* Buskerud University Collge and Embedded Systems Institute

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Abstract

Formulating and deploying a strategy requires a combination of vision and analysis. Roadmapping is a tool to explore and articulate future needs and trends for different dimensions, such as the market and customer context, the product portfolio, the technology, competences and supply chain, and processes. Roadmapping helps by relating these different dimensions in time, with a horizon of many years. We will discuss how to create and maintain roadmaps and give practical tips on the format.

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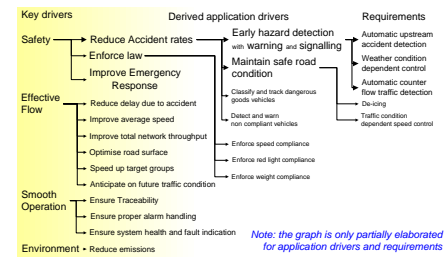
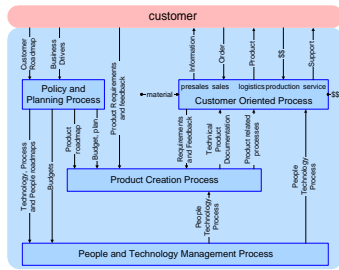


Have you seen roadmaps in your organization?

What do you see in these roadmaps?

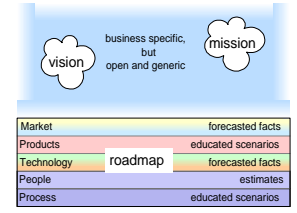
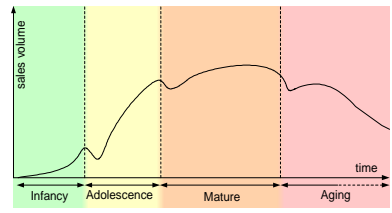
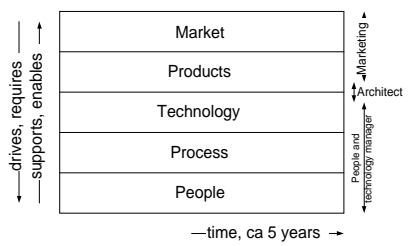
Figure of Contents™

1. brainstorm roadmapping



2. Business Processes

3. Key Drivers



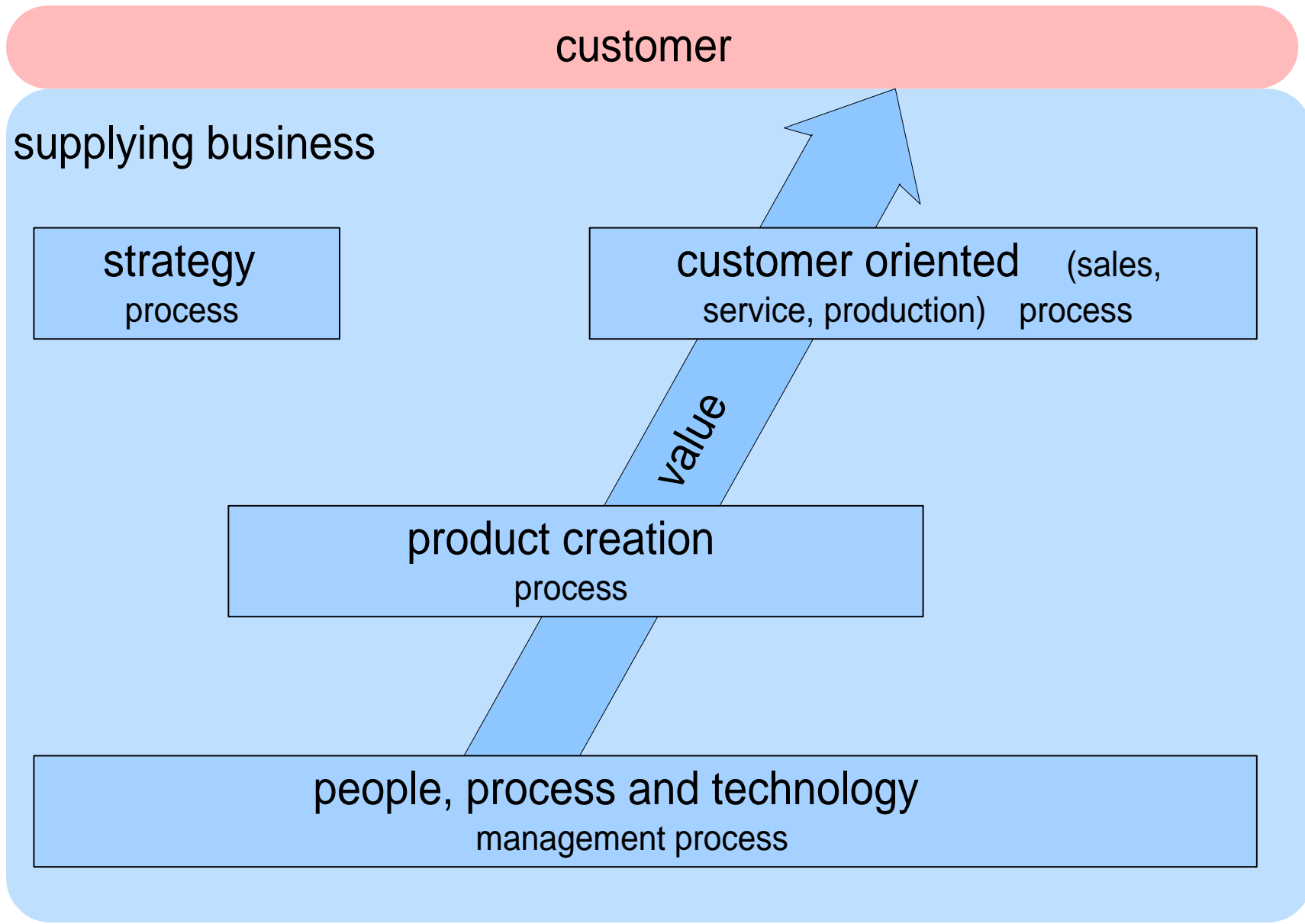
4. Roadmapping

5. Market Product Life Cycle

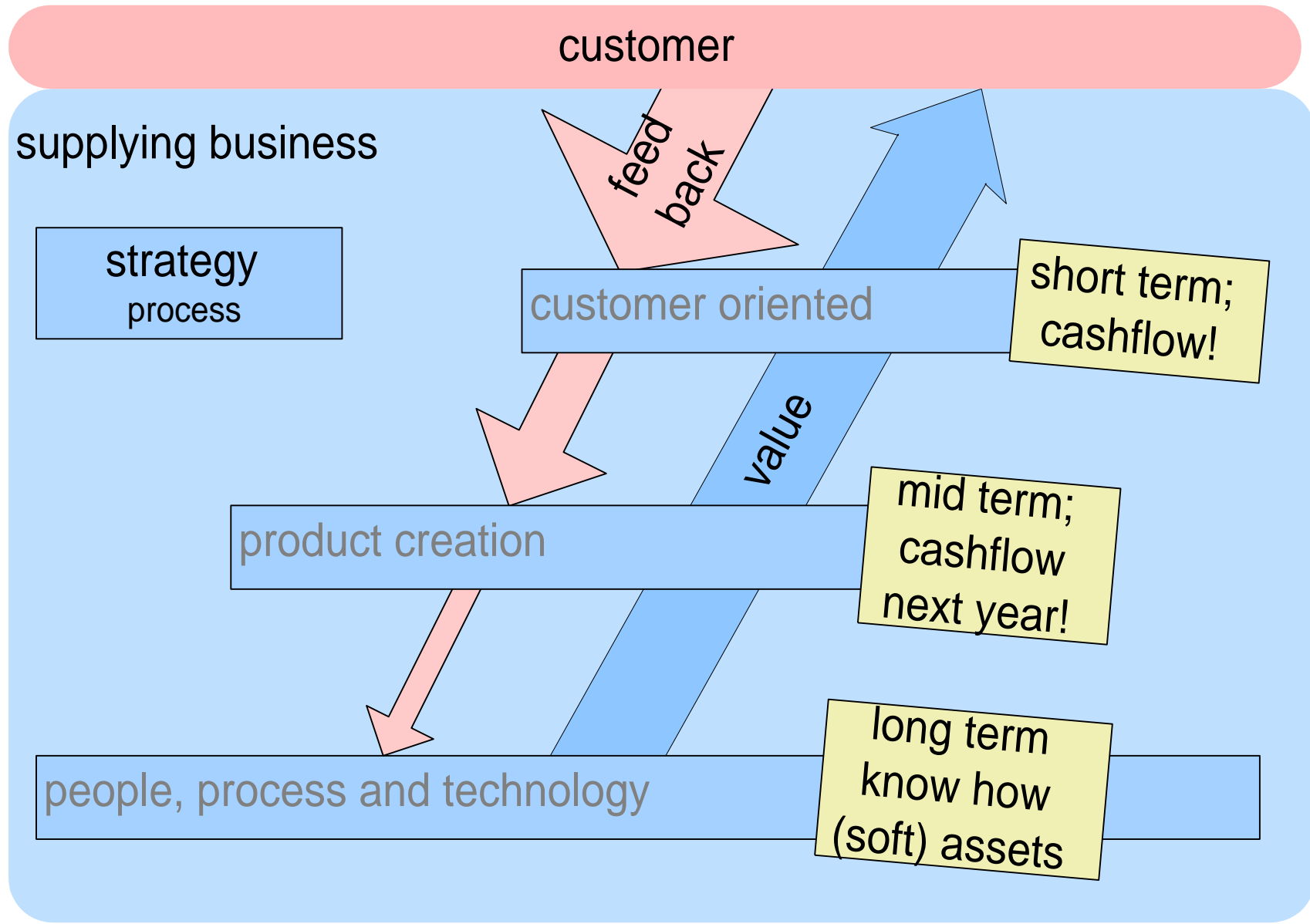
6. Strategy

summary

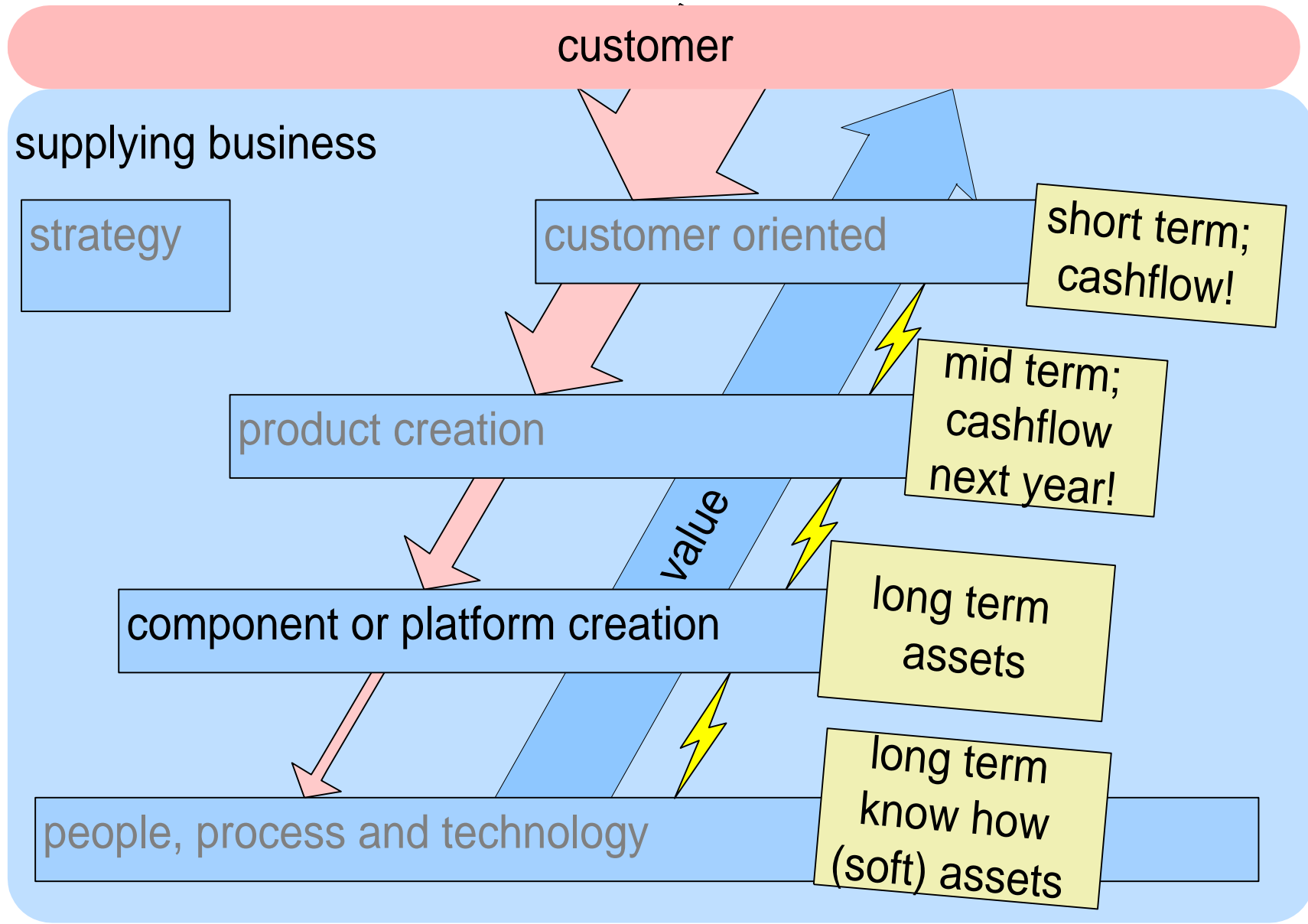
Simplified process view



Tension between processes



Platform strategy adds one layer



Key Drivers How To

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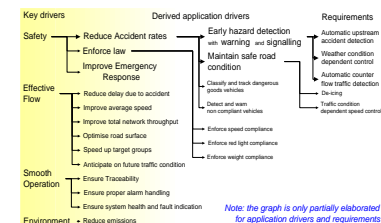
Abstract

The notion of "business key drivers" is introduced and a method is described to link these key drivers to the product specification.

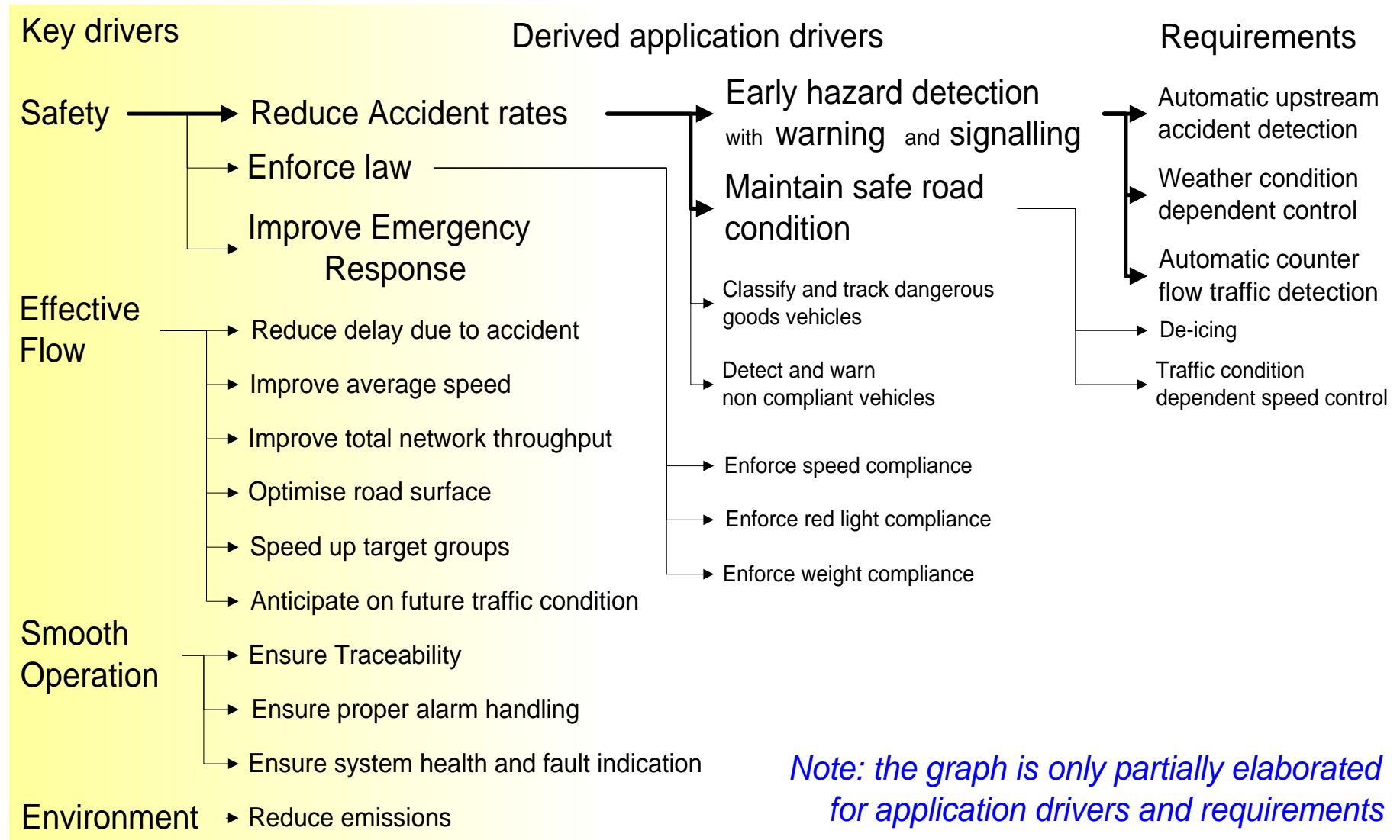
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Example Motorway Management Analysis



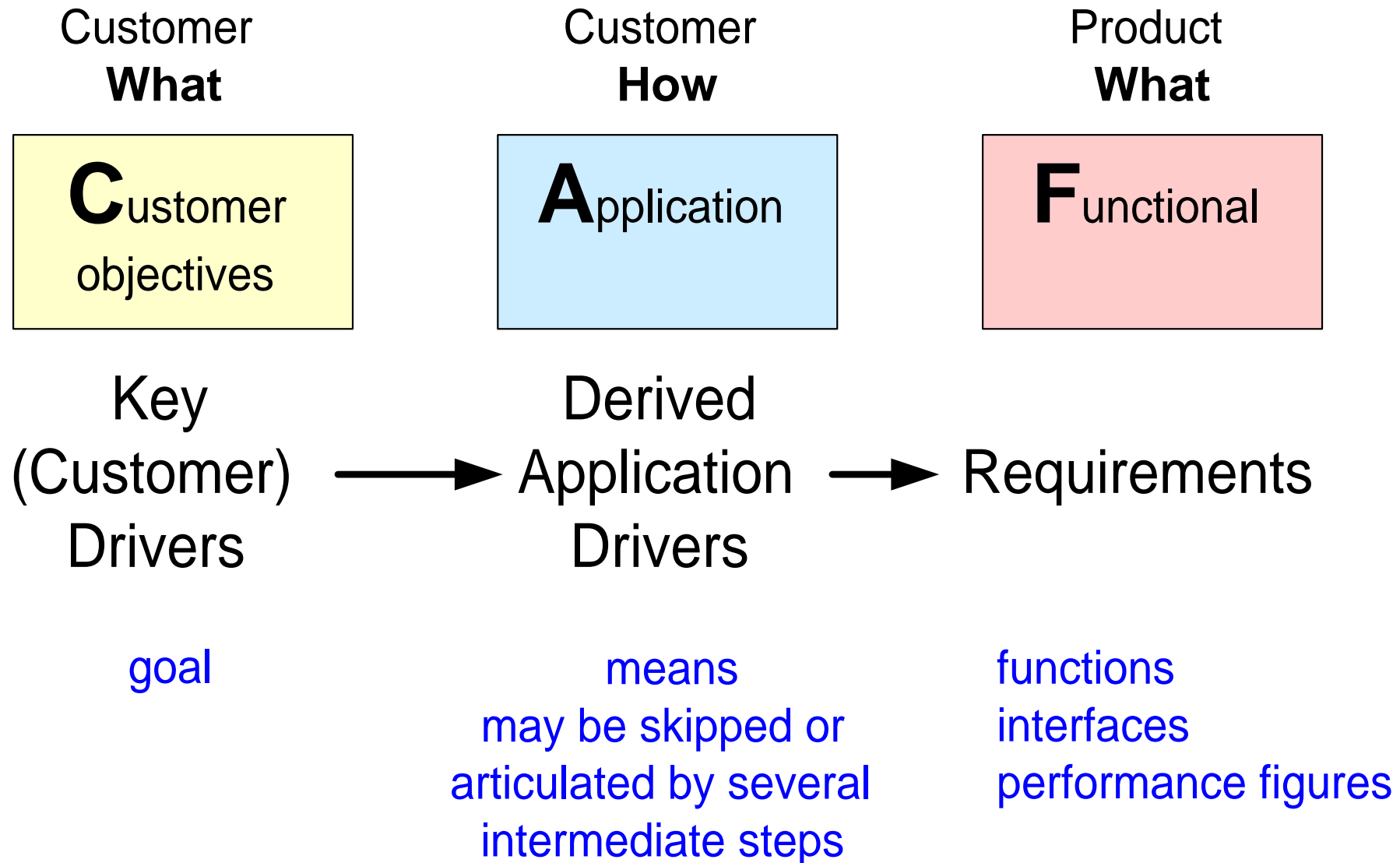
Method to create Key Driver Graph

- | | |
|--|--|
| • Define the scope specific. | in terms of stakeholder or market segments |
| • Acquire and analyze facts | extract facts from the product specification
and ask why questions about the specification of existing products . |
| • Build a graph of relations between drivers and requirements
by means of brainstorming and discussions | where requirements
may have multiple drivers |
| • Obtain feedback | discuss with customers , observe their reactions |
| • Iterate many times | increased understanding often triggers the move of issues
from driver to requirement or vice versa and rephrasing |

Recommendation for the Definition of Key Drivers

- Limit the number of key drivers minimal 3, maximal 6
- Don't leave out the obvious key drivers for instance the well-known main function of the product
- Use short names, recognized by the customer.
- Use market/customer specific names, no generic names for instance replace “ ease of use ” by
“minimal number of actions for experienced users ”,
or “efficiency ” by “integral cost per patient ”
- Don ' t worry about the exact boundary between create clear goal means relations
Customer Objective and Application

Transformation of Key Drivers into Requirements



What are the key drivers of your customers?

Can you quantify these key drivers?

Roadmapping

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Abstract

This article describes what a roadmap is, how to create and maintain a roadmap, the involvement of the stakeholders, and criteria for the structure of a roadmap.

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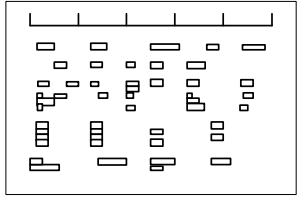
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The Roadmap Integrates Five Views



Granularity of Roadmap Material

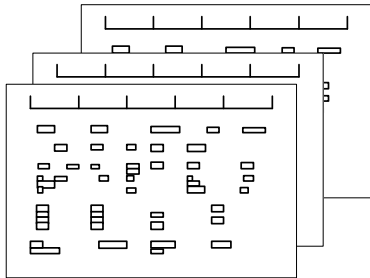


**Toplevel
roadmap**

Single page

Poster

part of many presentations

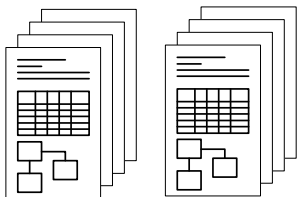


**Supporting
roadmaps**

Single page
per view
or per driver

Poster

part of many presentations



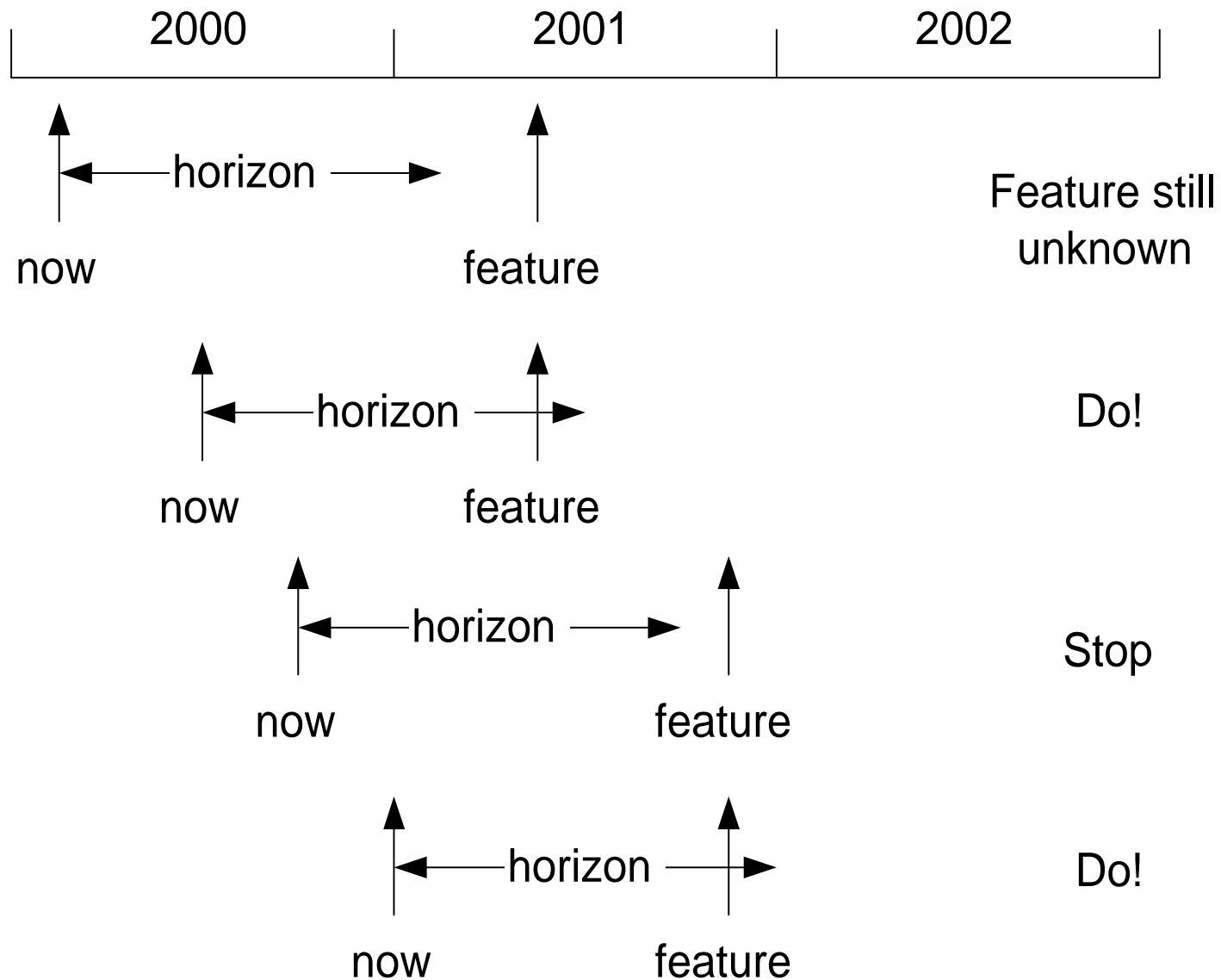
**Supporting
reports**

Document
per relevant
subject

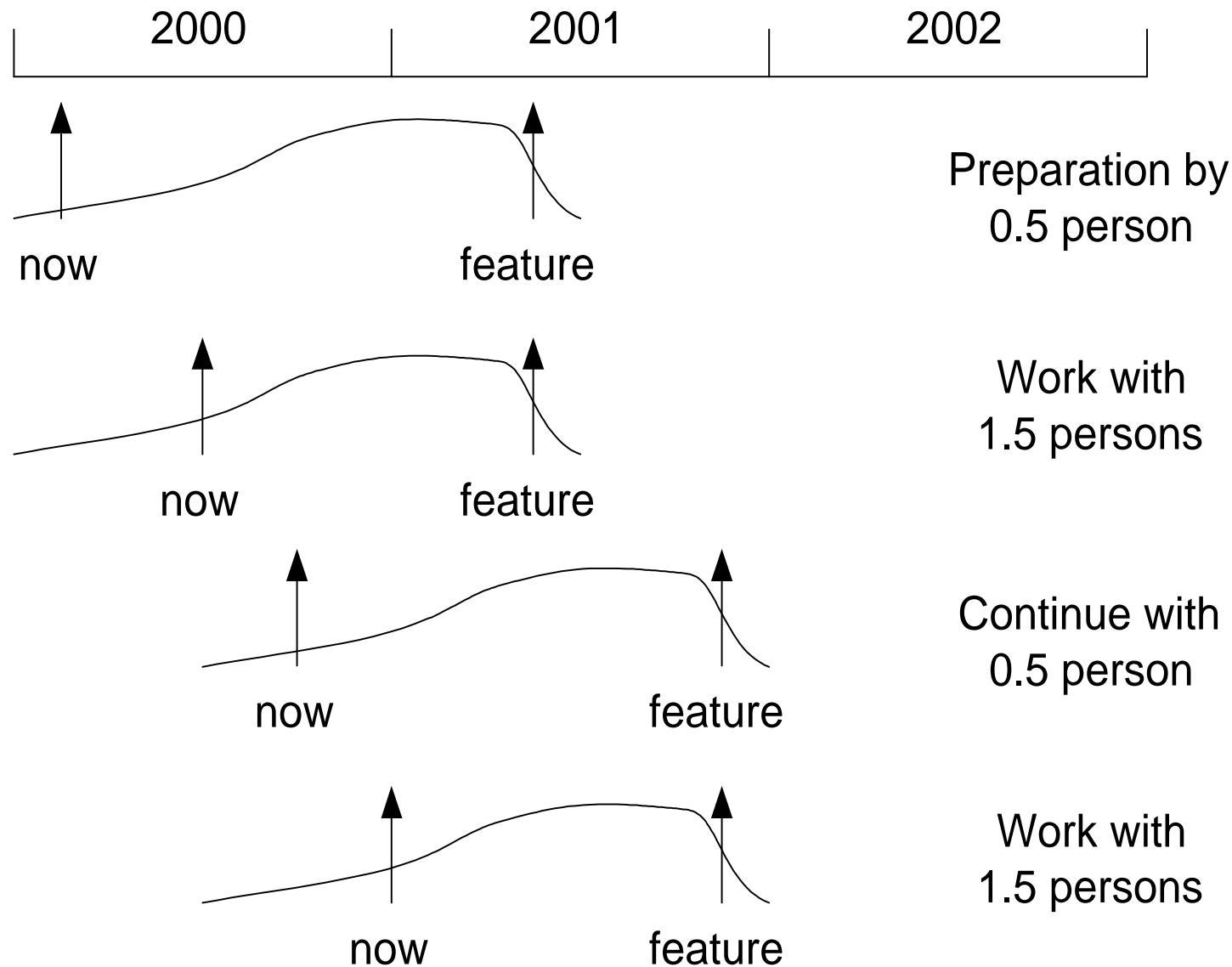
Problems that Occur without Roadmapping

- Frequent changes in product policy
- Late start up of long lead activities, such as people recruitment and process change
- Diverging activities of teams
- Missed market opportunities

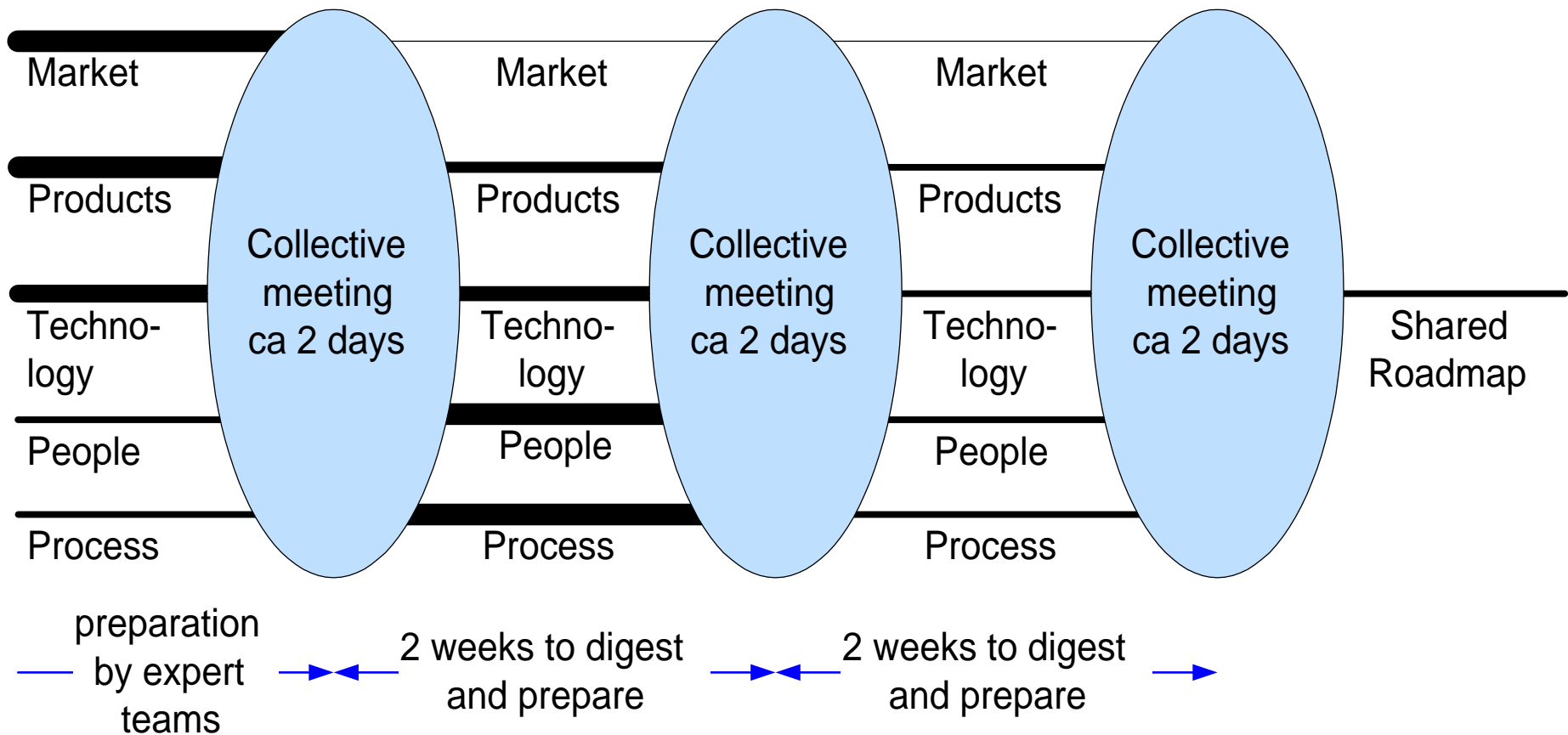
Management with a Limited Horizon



Management with a Broader Time Perspective



Creation or Update of Roadmap in Burst Mode



Typical Stakeholders of a Roadmap

- Business manager (overall enterprise responsible)
- Marketing manager
- People and technology manager(s)
- Operational manager(s)
- Architect

Target of the First Session

- Shared vision on market
- First iteration of possible products as an answer to the market
- Share technology status, as starting point for technology roadmap
- Explore people and technology status, to identify main issues

Target of the Second Session

- Obtaining a shared vision on the desired technology roadmap
- Sharing the people and process issues required for the products defined in the first iteration
- Analyzing a few scenarios for products, technologies, people, and process

The Roadmap Update Visualized in Time

Market: What is required by the customers and how?

Products: Which packaging of technology into products fulfils the customer needs?

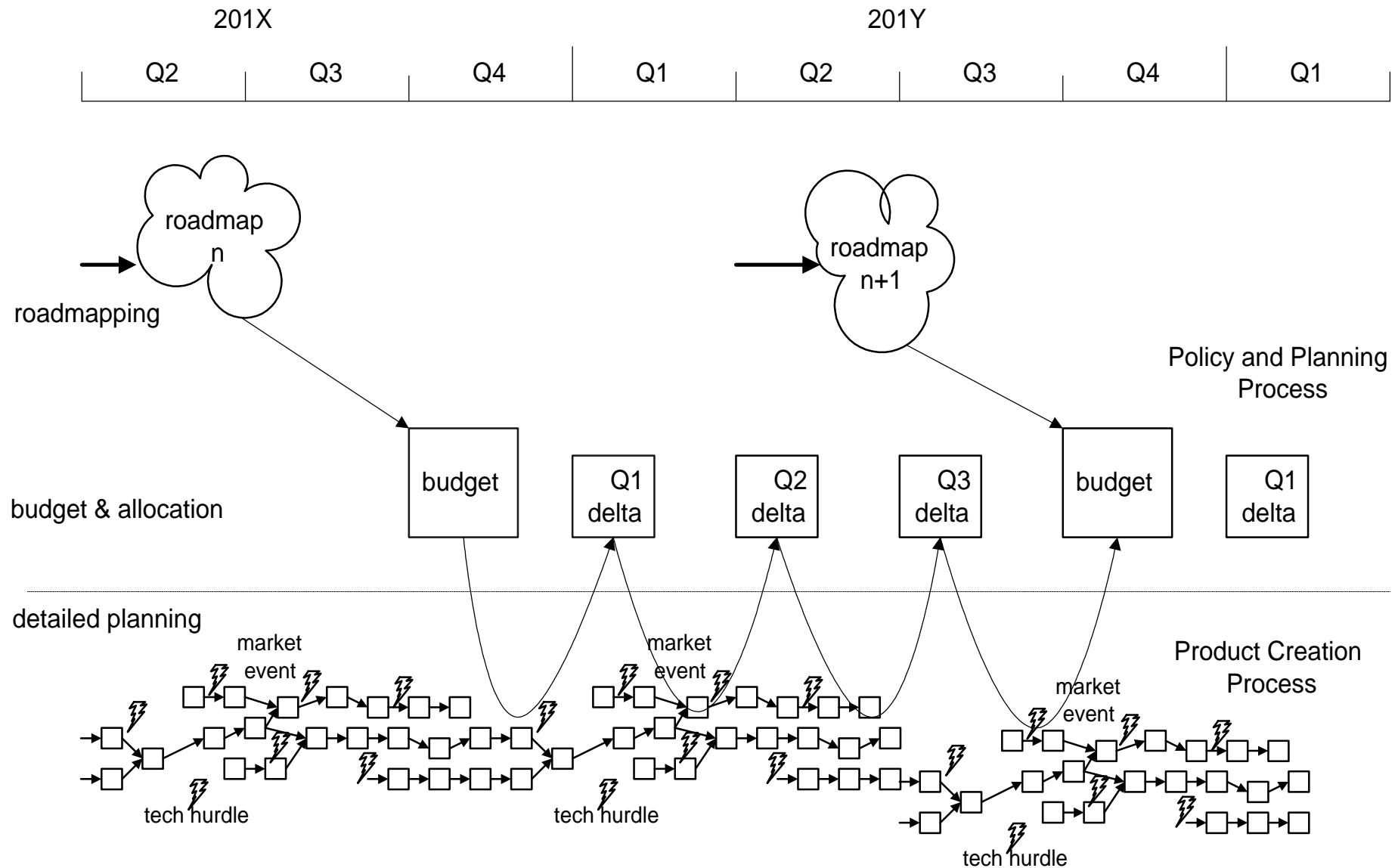
Technology: Which technological trends are relevant?

People: What kind and how many people are required to realize the products and the technology?

Process: Which processes are required to realize the products and technologies with these people?

———— Time ———>

From Roadmap to Detailed Plans



3-Tier Approach

	horizon	update	scope	type
Roadmap	5 years	1 year	Portfolio	Vision
Budget	1 year	3 months	Program	Commitment
Detailed plan	1 mnth..1yr	1 day..1 mnth	Project or activity	Control means

Roadmap Essentials

- Selection of most important or relevant issues
- Key drivers as a means to structure the roadmap
- Nothing is certain; ambiguity is normal
- Use facts whenever possible
- Don't panic in case of impossibilities

Requirements for a Good Roadmap

- Recognizable issues for all stakeholders
- Clear positioning in time; uncertainty can be visualized
- The main events (enabling or constraining) must be present
- Limited amount of information to maintain the overview

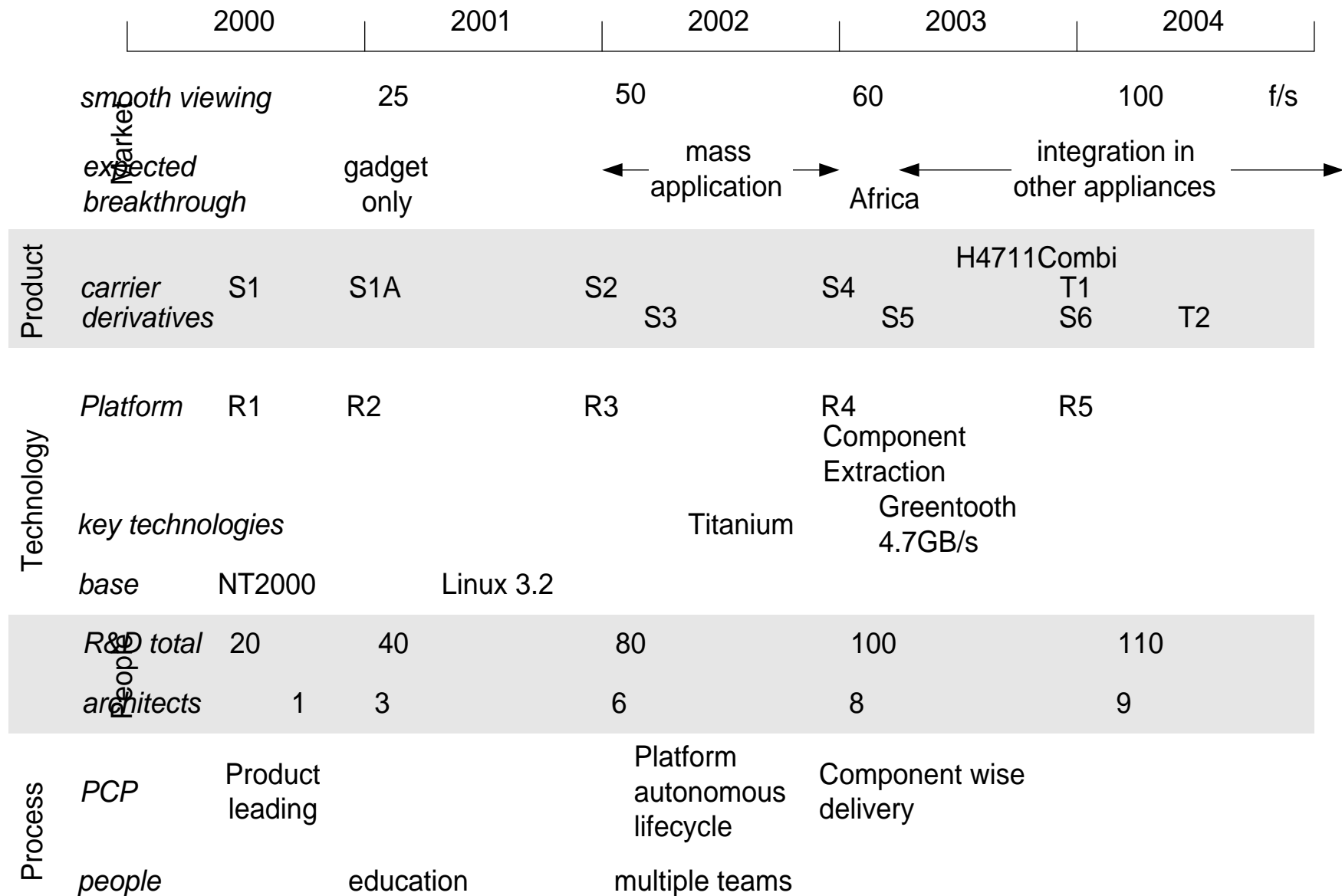
Sources of Facts

- Market analysis reports (number of customers, market size, competition, trends)
- Installed base (change requests, problem reports, historical data)
- Manufacturing (statistical process control)
- Suppliers (roadmaps, historical data)
- Internal reports (technology studies, simulations)

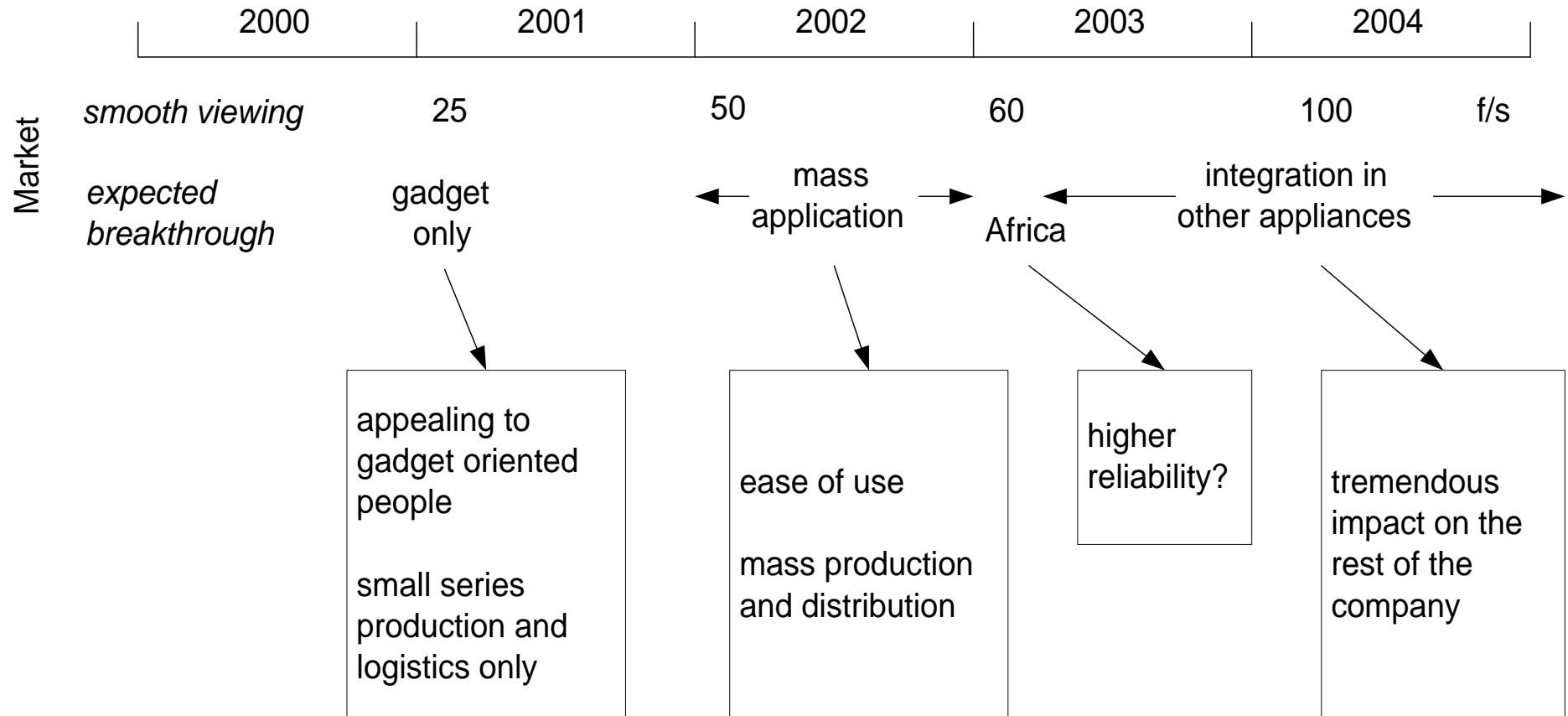
Causes for Overestimation

- Quantization effects of small activities (the amount of time is rounded to manweeks/months/years)
- Uncertainty is translated into margins at every level (module, subsystem, system)
- Counting activities twice (e.g., in technology development and in product development)
- Quantization effects of persons/roles (full time project leader, architect, product manager, et cetera per product)
- Lack of pragmatism (technical ambition is not too bad during the roadmap process, as long as it does not pre-empt a healthy decision)
- Too many bells and whistles without business or customer value

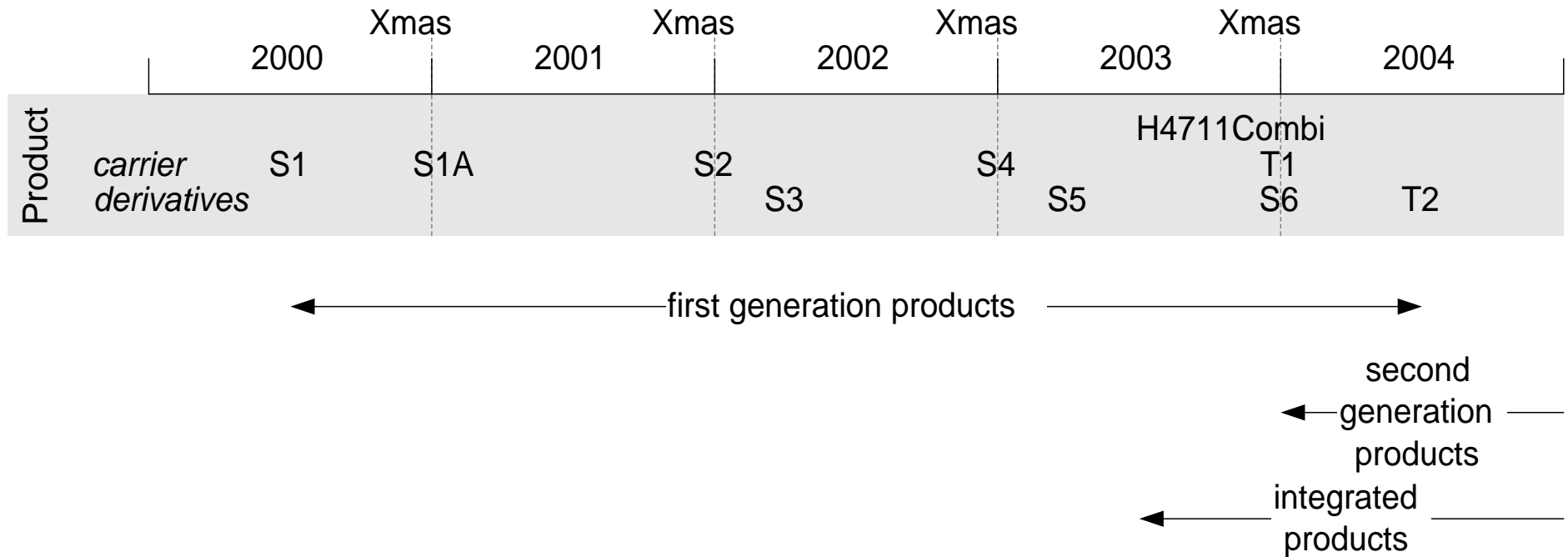
Academic Example of a Roadmap



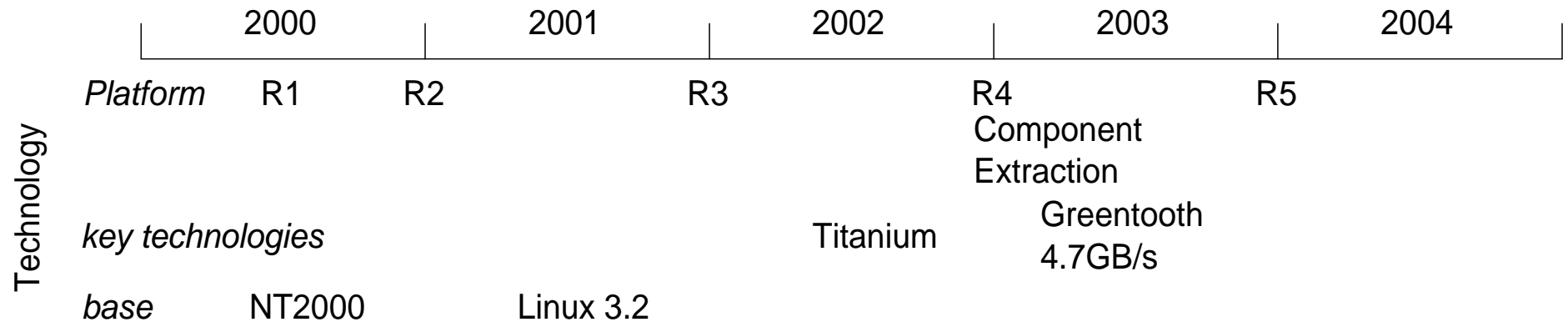
Example Market Roadmap



Example Product Roadmap



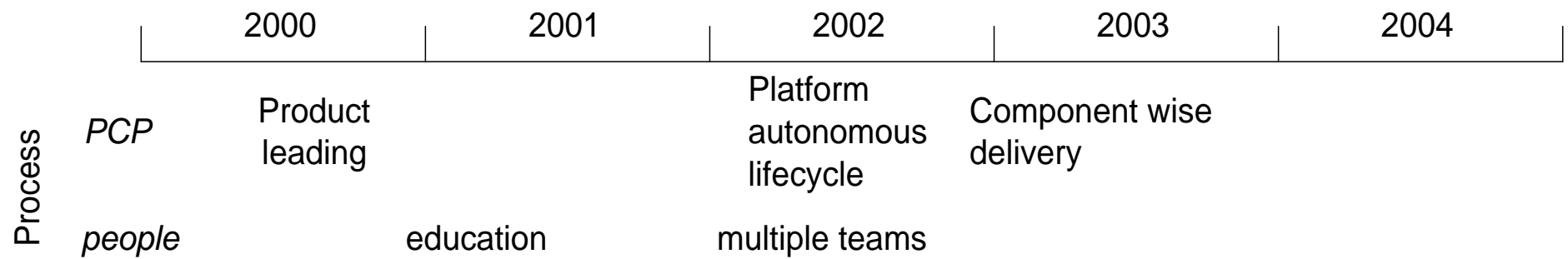
Example Technology Roadmap



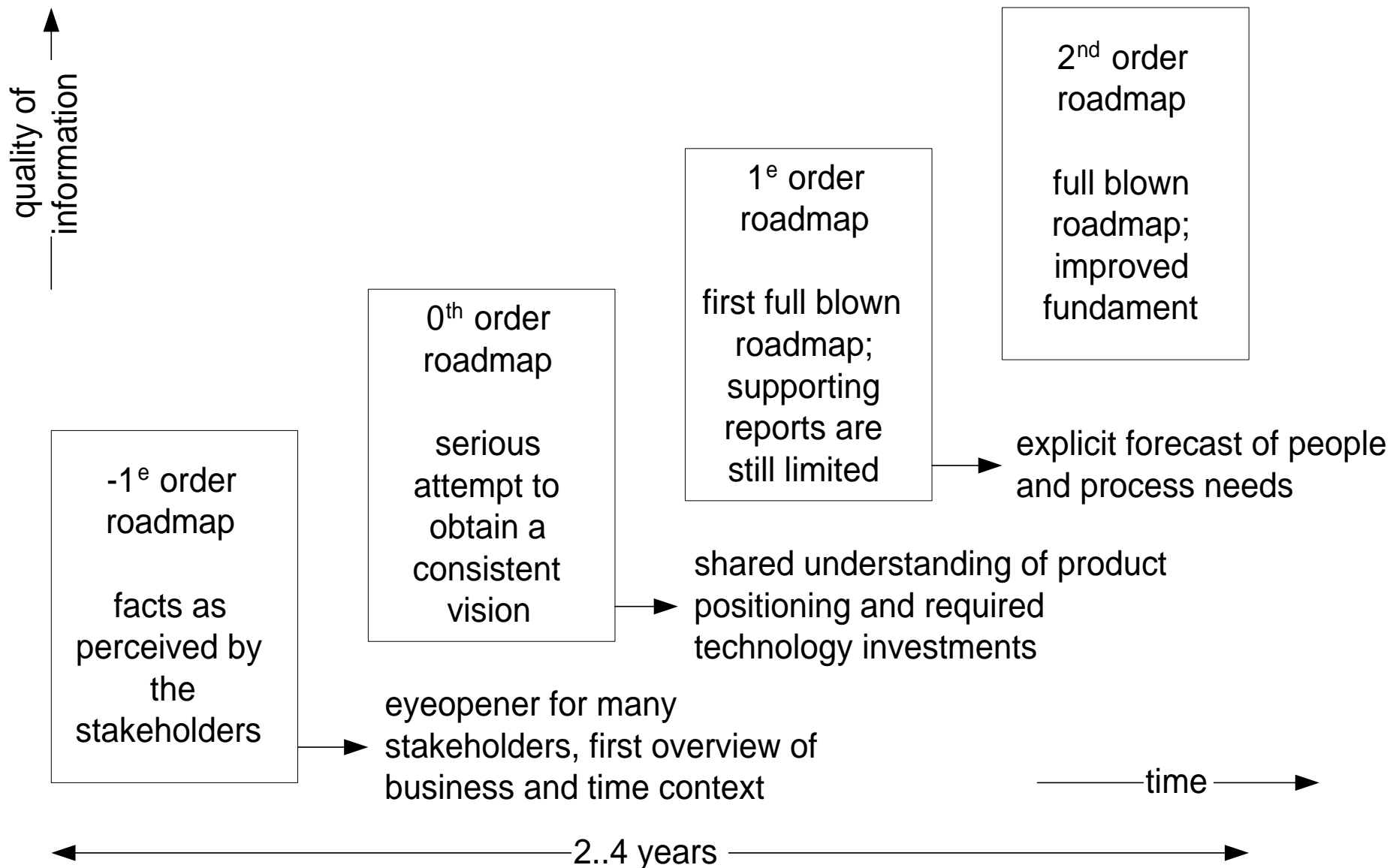
Example People Roadmap

		2000	2001	2002	2003	2004
People	<i>R&D total</i>	20	40	80	100	110
	<i>architects</i>	1	3	6	8	9

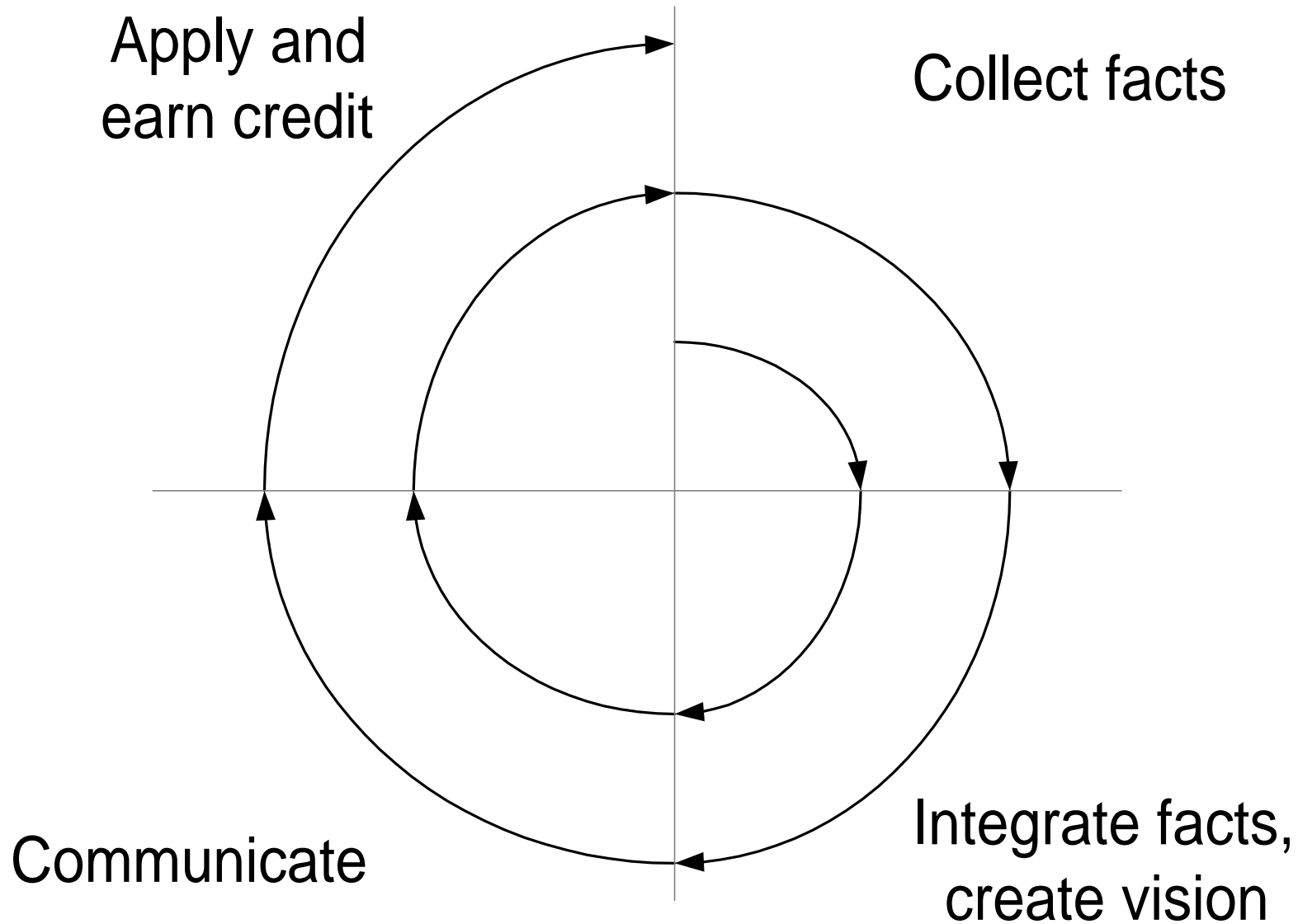
Example Process Roadmap



Bootstrapping the Roadmap Process



Roadmap Bootstrapping Spiral Model



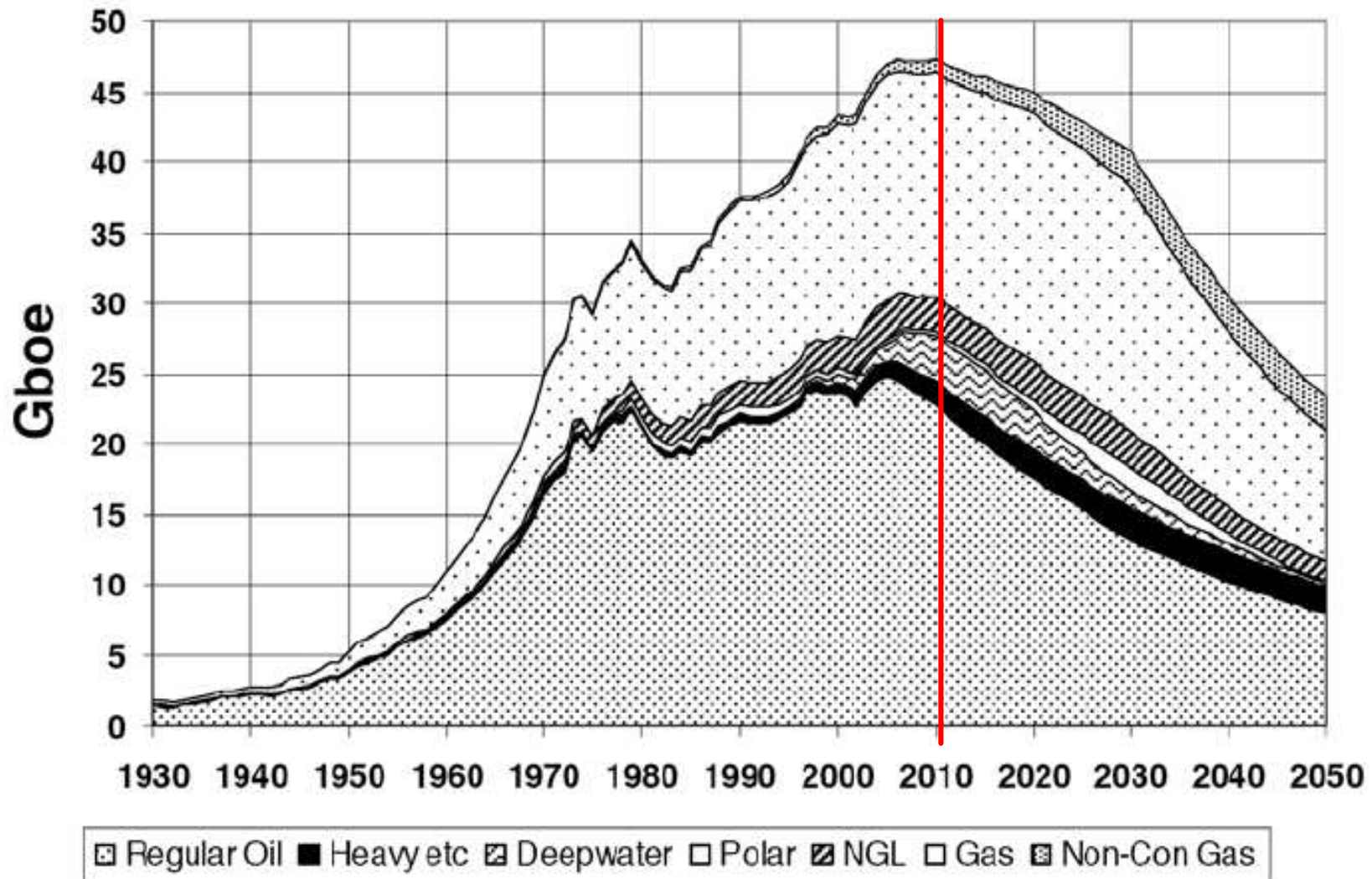
Change Management Heuristics

- People don't want to **be** changed. They are quite often willing to change.
- Changing the way of working or the culture costs many years.
- Work at multiple tracks at the same time, a.o. managerial, operational, strategic, etc.
- Earn credit by showing usable results.

Oil and Gas Production Forecast

Figure 3: Oil & Gas production profile, 2008 case base

source ASPO 2008 <www.aspo-spain.org/aspo7/files/Dossier_ASPO_VII.pdf>



Brainstorm Trends Oil and Gas Production

Brain storm

Trends in oil and gas production

social

demographic

regulatory

political

economical

geographic

ecological

technical

competing energy sources

other

Market Product lifecycle consequences for architecting

by *Gerrit Muller* Embedded Systems Institute
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Abstract

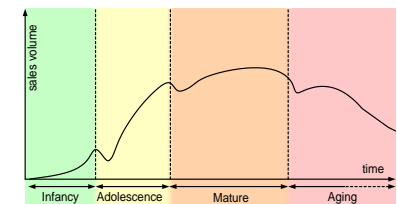
The lifecycle of a product category in the market determines many aspects of the architecting approach. The lifecycle consists typical of 4 phases: infancy, adolescence, mature and aging.

A discontinuity in market success is seen in the transition from one phase to the next phase. The explanation given is that the phases differ in characteristics and require different approaches. The right approach for one phase is sub optimal for the next phase. A set of characteristics per phase is given and the consequences for architecting are discussed.

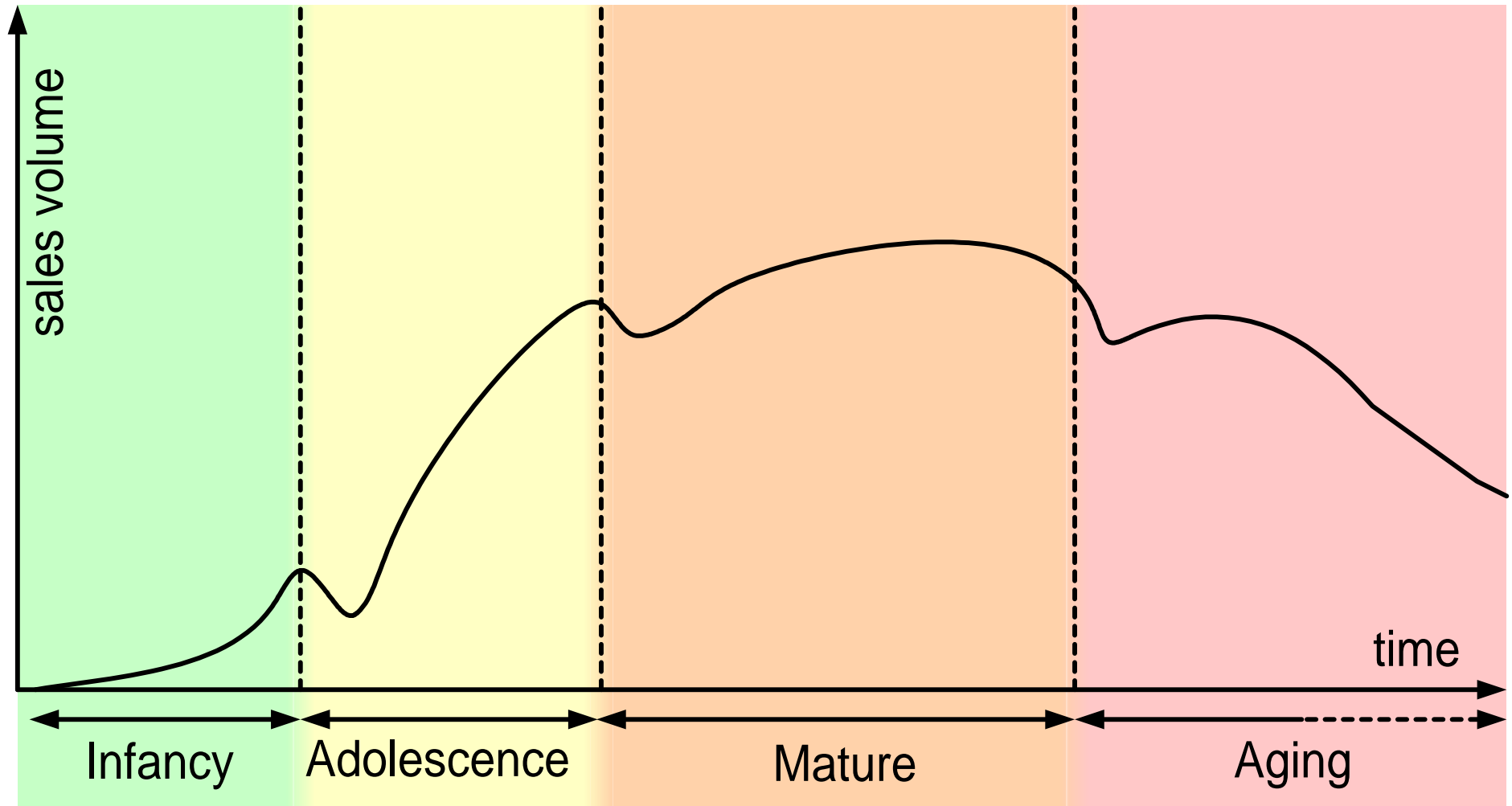
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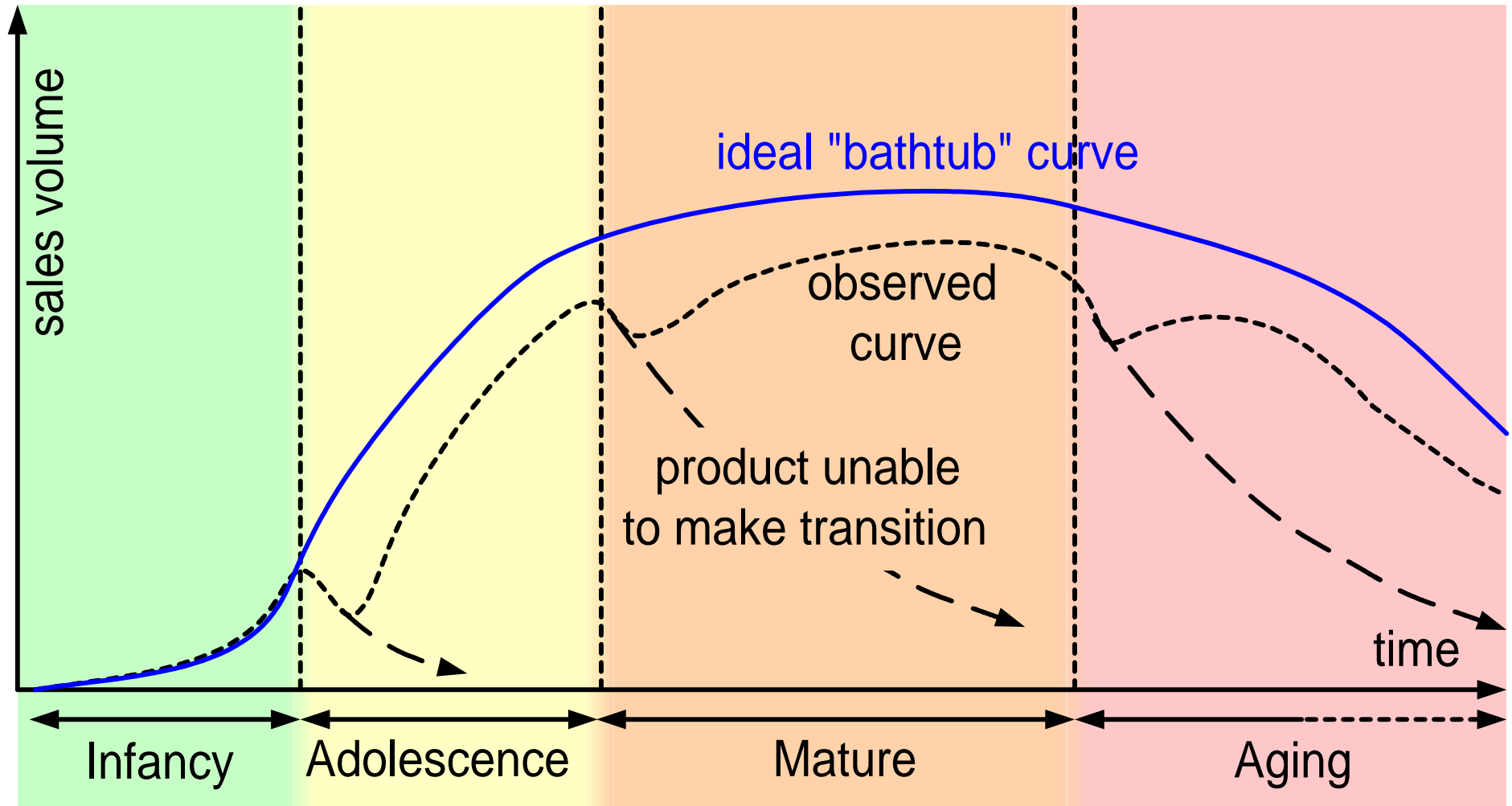
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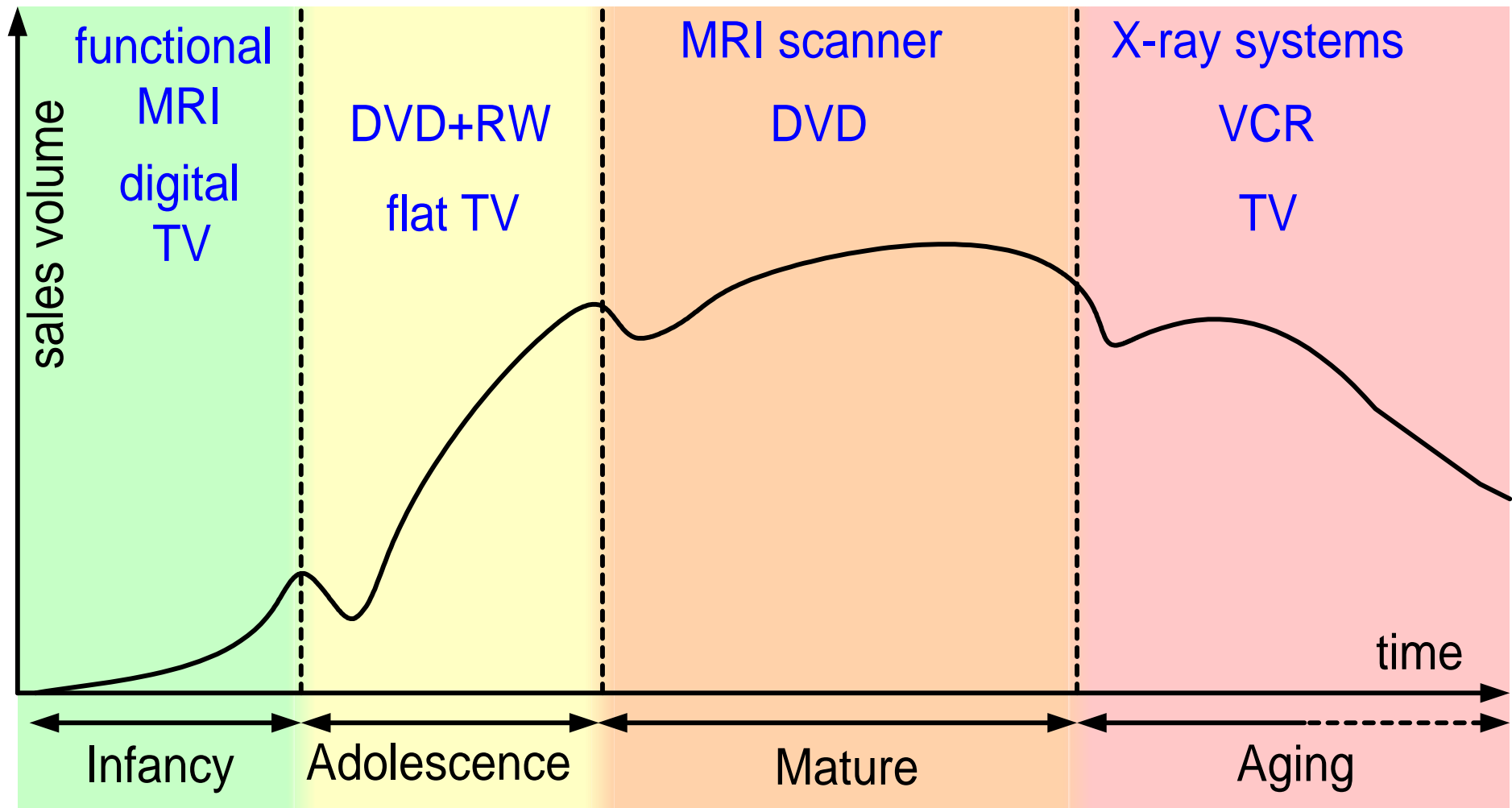
Market product lifecycle phases



Compared with ideal bathtub curve



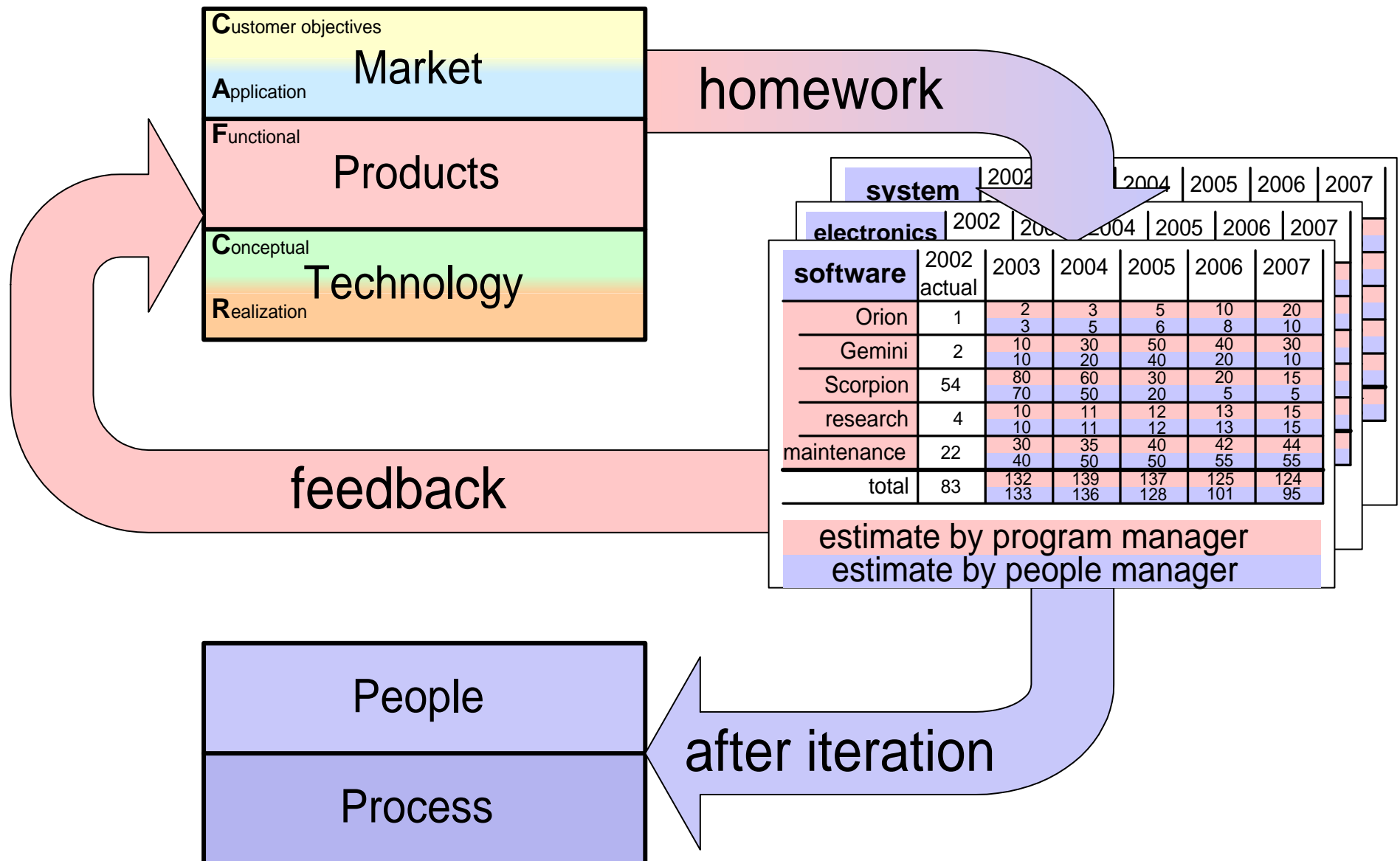
Examples of market product lifecycle



Attributes per phase

	infancy	adolescence	mature	ageing
driving factor	business vision		stable business model	harvesting of assets
value from	responsiveness	features	refinements / service	refining existing assets
requirements	discovery	select strategic	prioritise	low effort high value only
dominant technical concerns	feasibility	scaling	legacy obsolescence	Lack of product know-how Low effort for obsolete technologies
type of people	inventors & pioneers	few inventors & pioneers "designers"	"engineers"	"maintainers"
process	chaotic		bureaucratic	budget driven
dominant pattern	over-dimensioning	conservative expansion	mid-life refactoring	UI gadgets

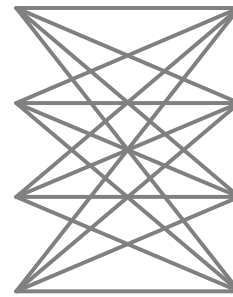
From Market, Product, Technology to People, Process



From roadmap to planning

roadmap

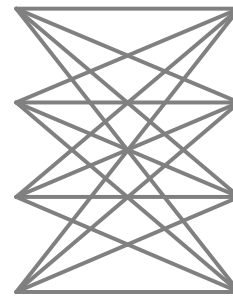
sharing
understanding
exploring
positioning



vision/ambition
opportunities
broader context
consequences

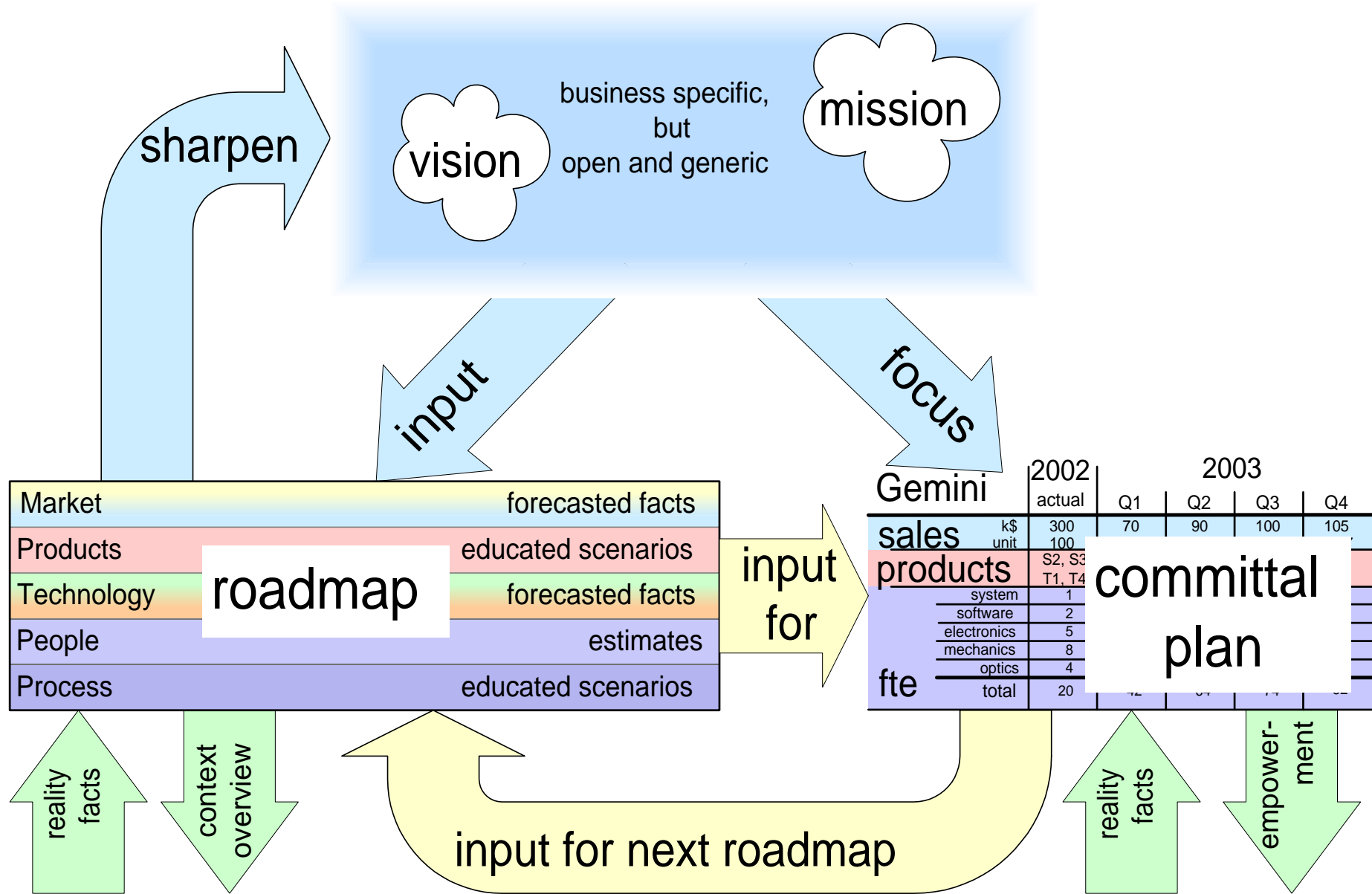
plan

allocate
prepare
commit
empower



milestones
sales
products
people/skills

Summary of strategy process



Summary of role in business

