

Product Life Cycle Management

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Abstract

Product Life Cycle Management addresses the full life cycles of products, from conception until disposal. The creation of the product determines largely what can be done with the product in the later life cycle phases. From business perspective the installed base, all systems that are operational in the field, is an asset that provides many opportunities. From technical perspective the operational life of products is quite a challenge, because systems keep evolving to fit in the market and to benefit from technical capabilities. This creates a variety of operational configurations that have to be served.

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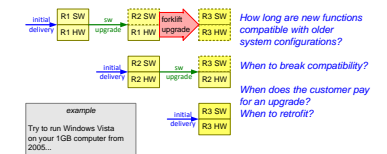


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from conception to disposal

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complexity
huge number of configurations

conclusion

Introduction: Basic System Life Cycle

introduction
from conception to disposal

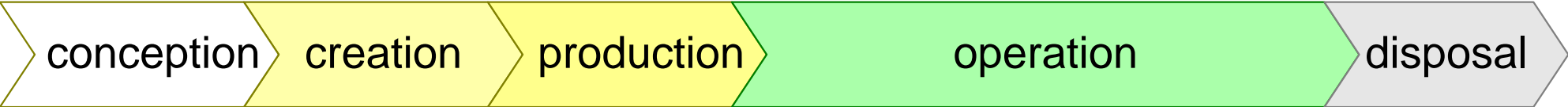
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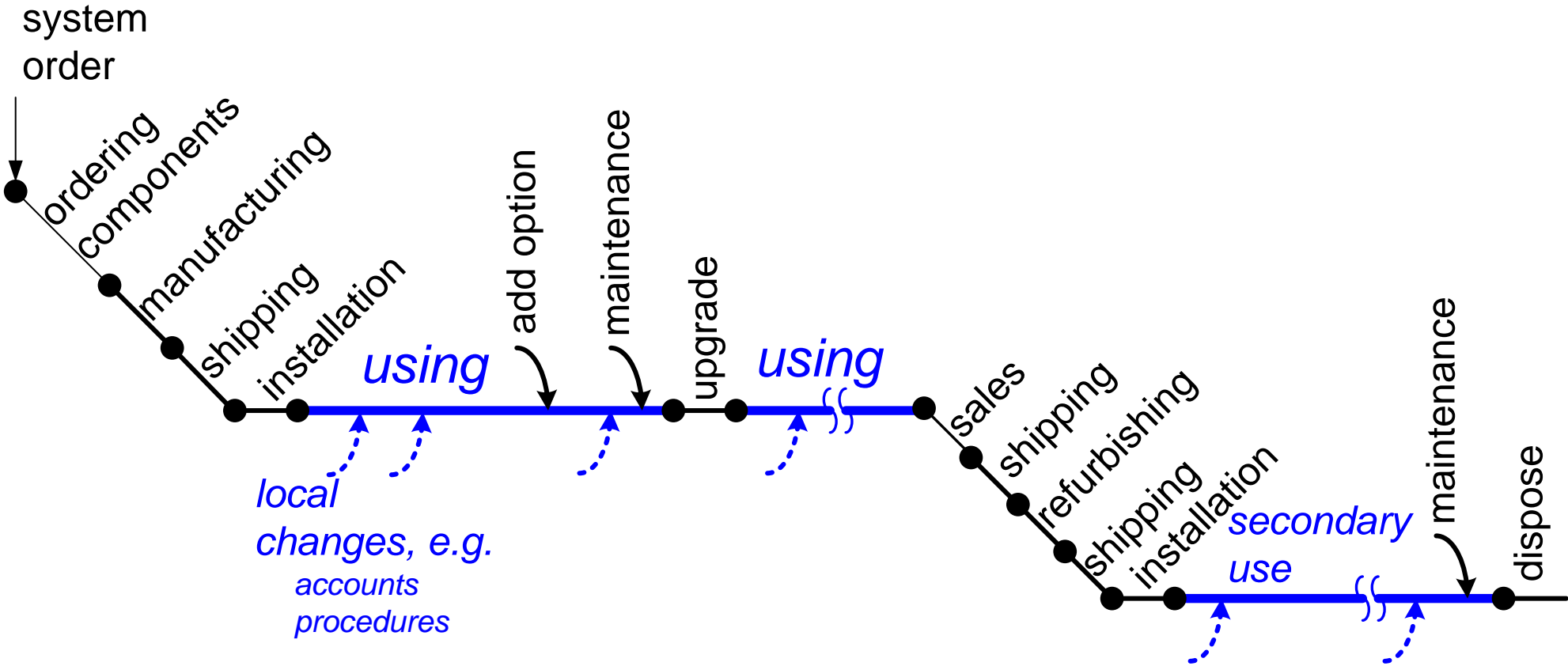
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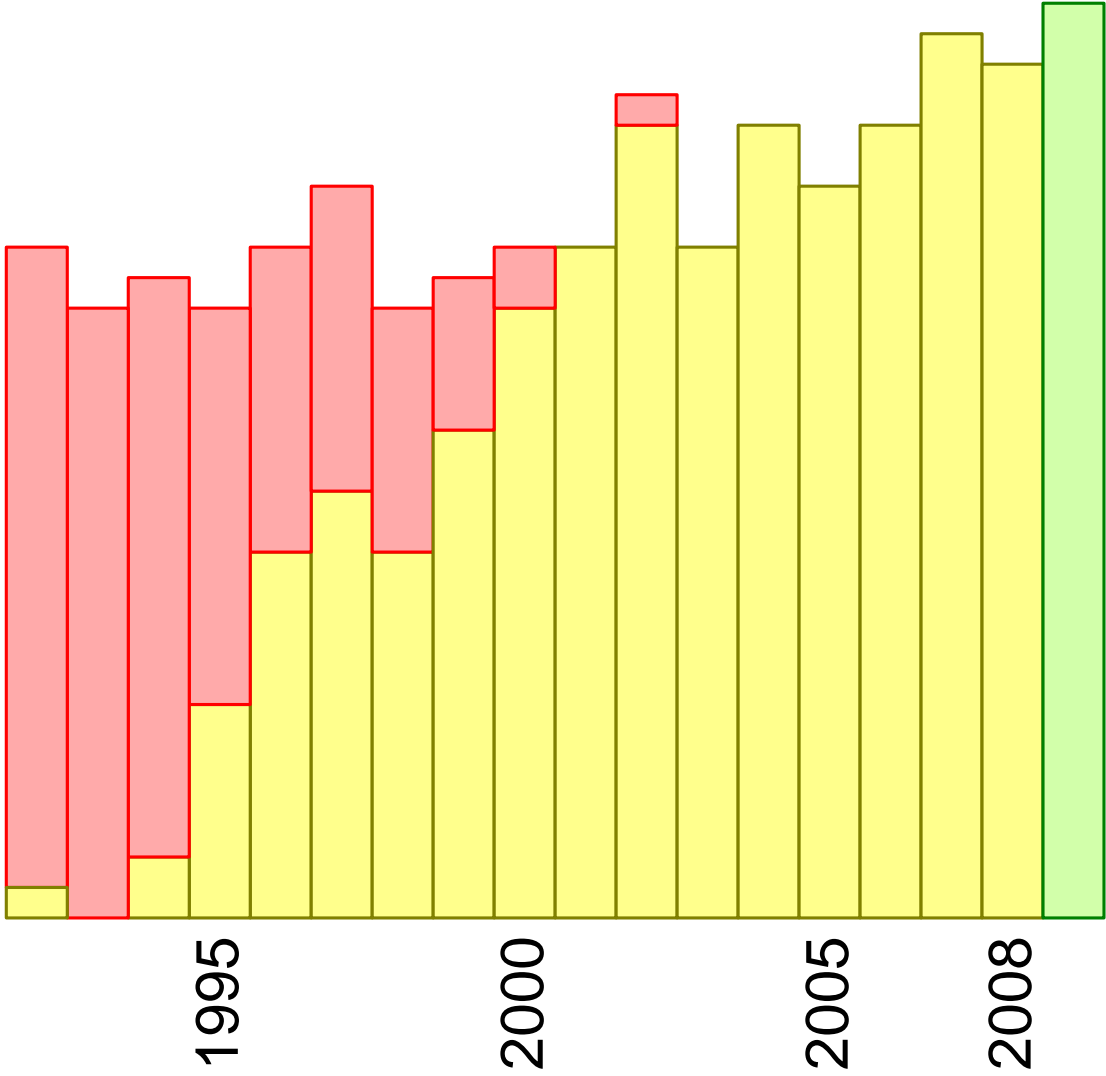
conclusion



System Life Cycle after Creation



Volume of Installed Base versus New deliveries



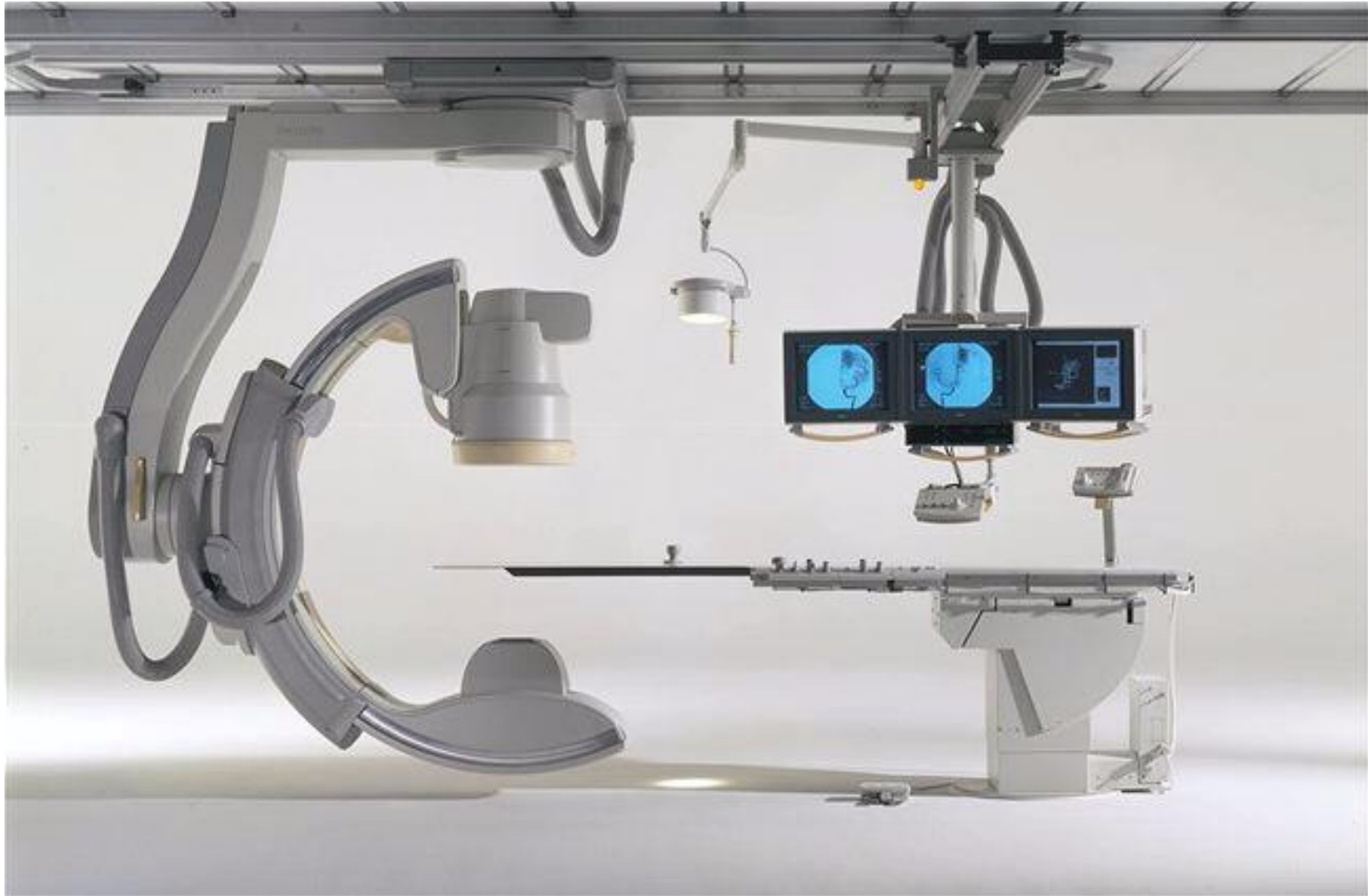
*installed base
10..20 times
initial deliveries*

legend

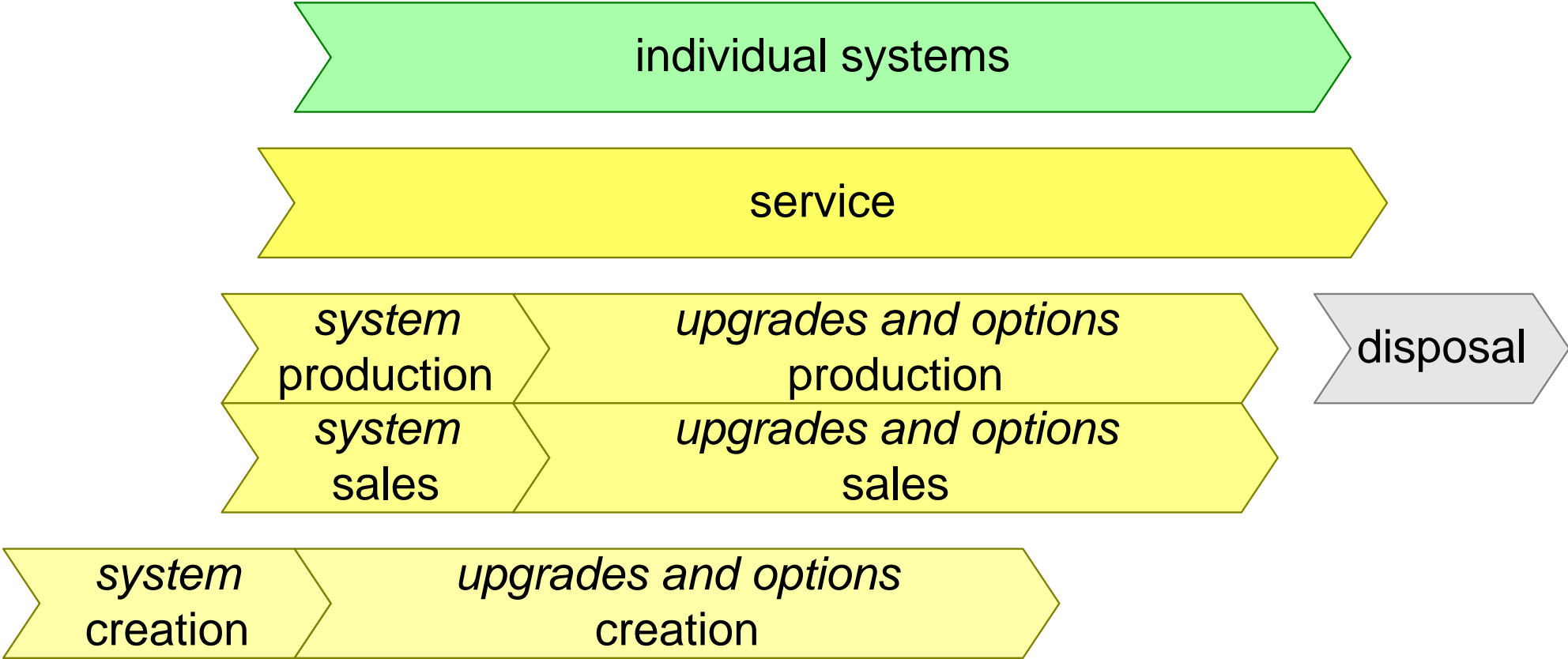
- initial deliveries
- installed base
- decommisioned

this is an entirely fictitious case

Case: X-ray Catherization System



Product Related Life Cycles



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from conception to disposal

product life cycle management process

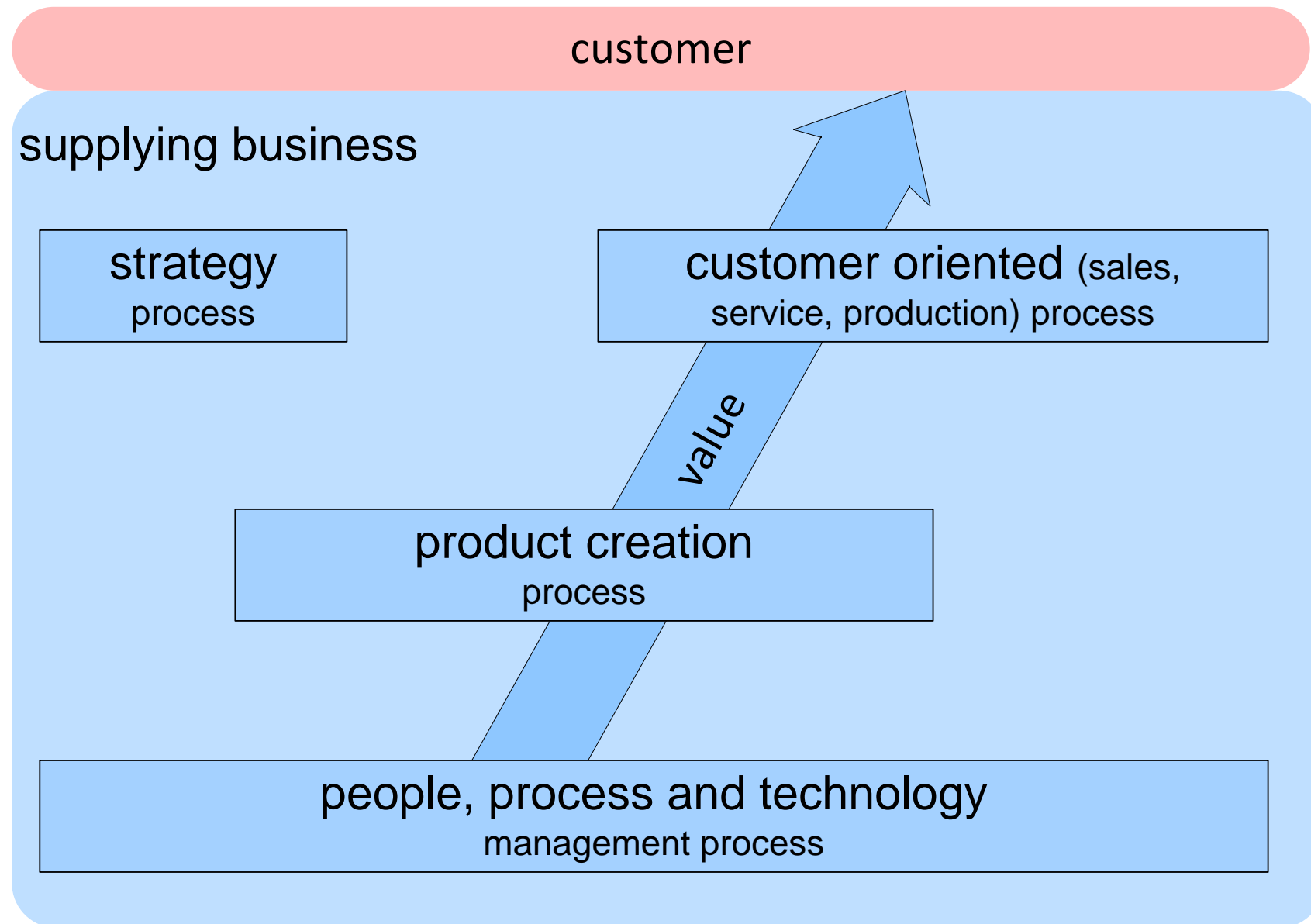
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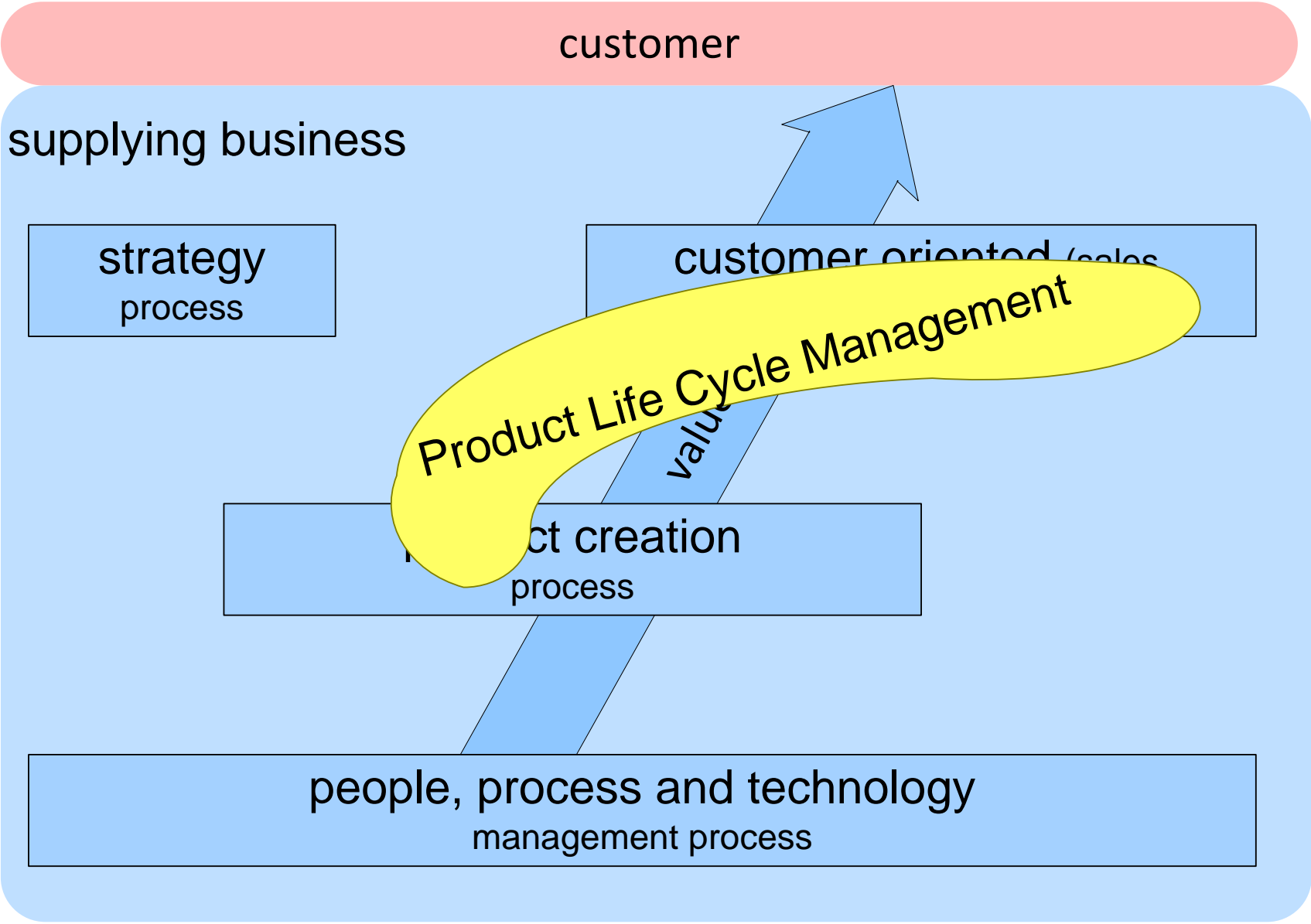
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Simplified process view



Positioning PLM



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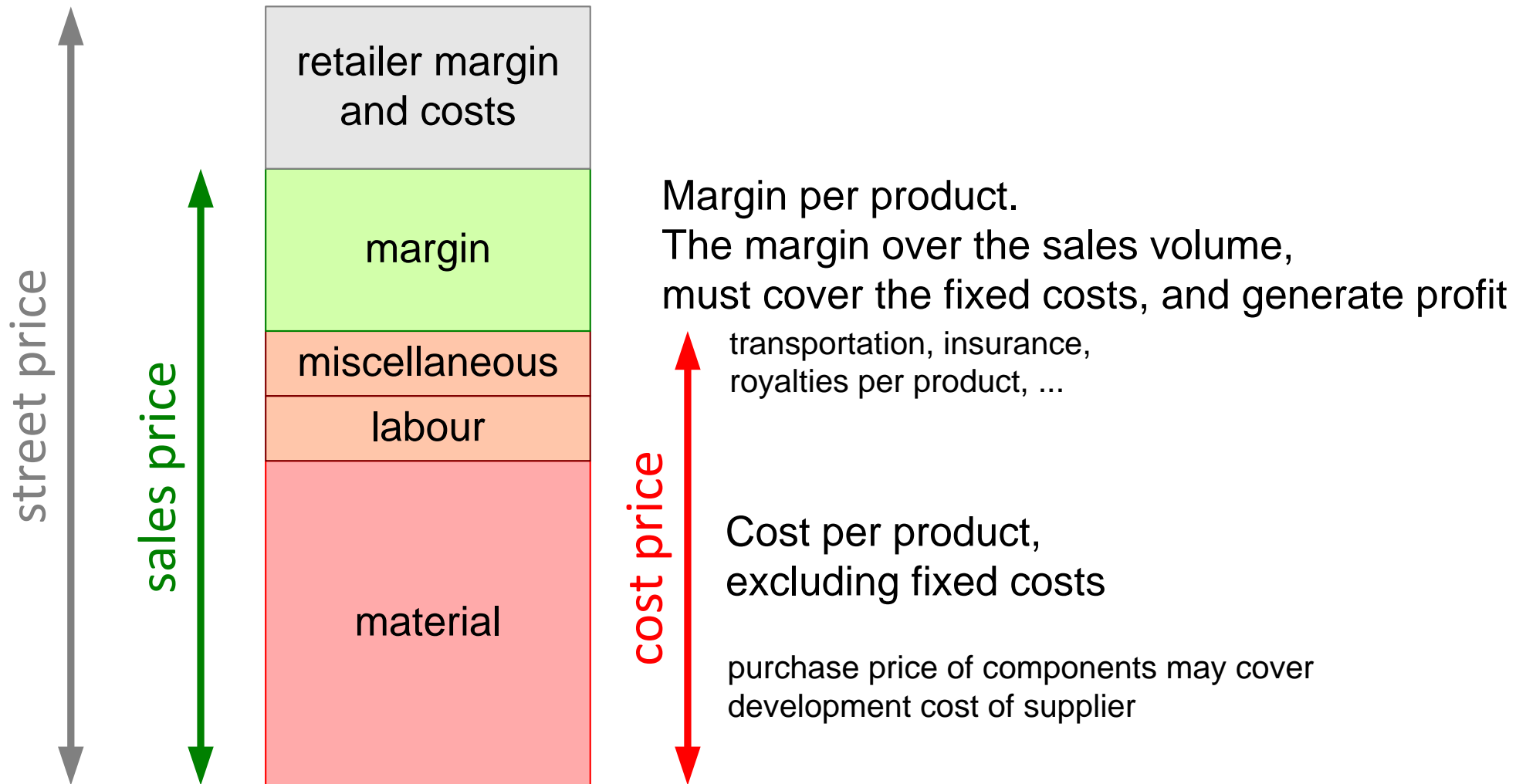
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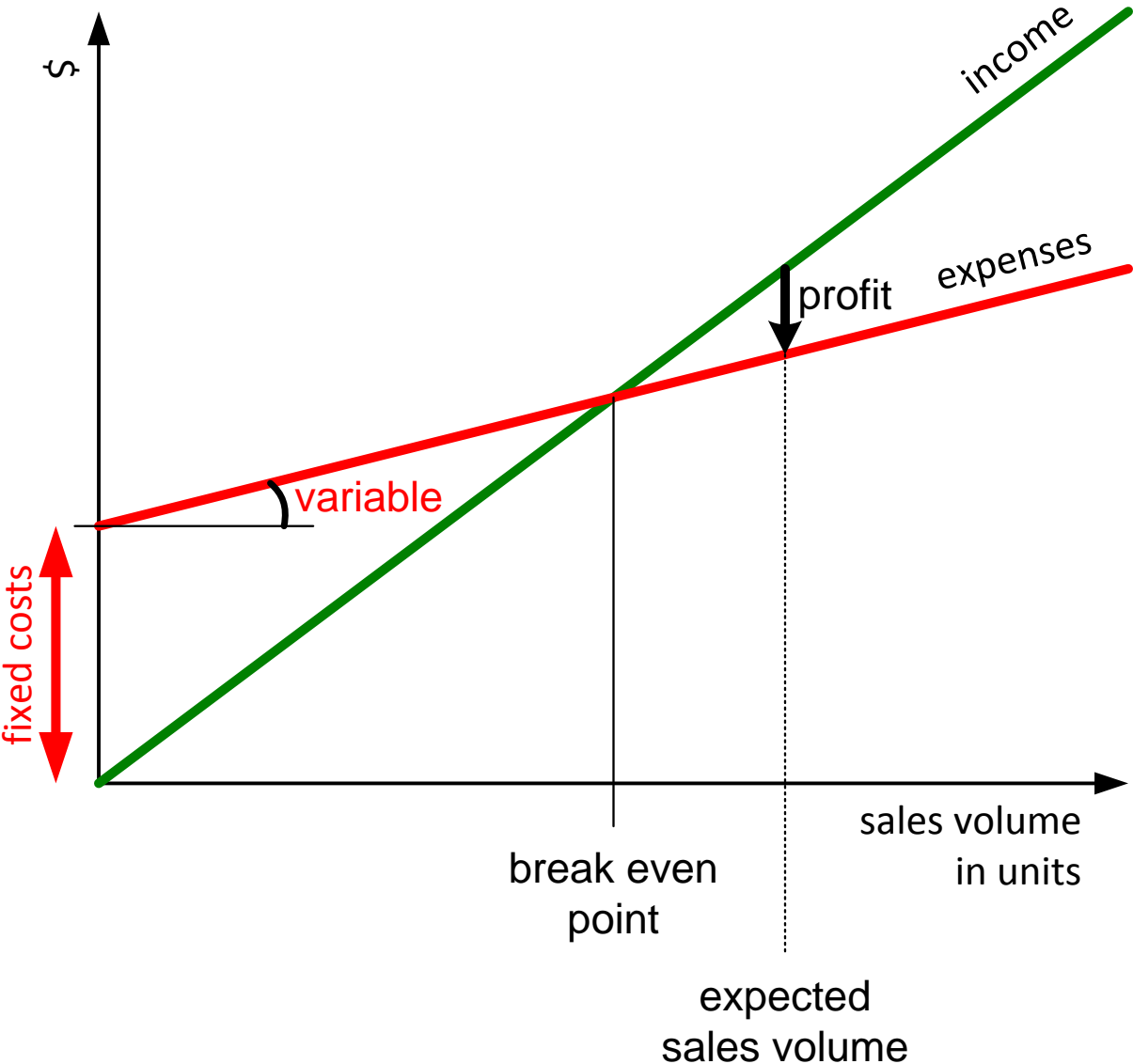
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Product Margin = Sales Price - Cost



Profit as function of sales volume



Investments, more than R&D



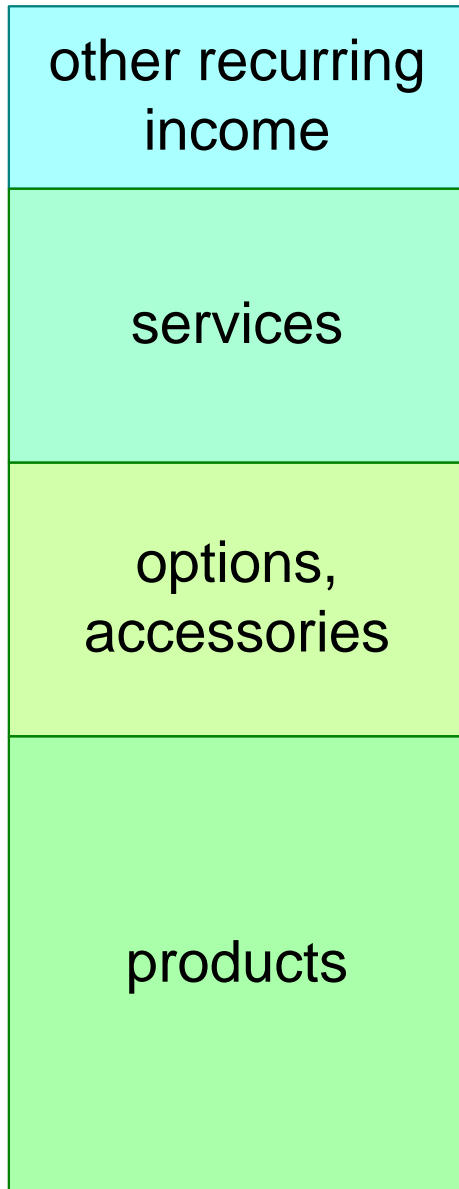
business dependent:
pharmaceuticals industry
sales cost >> R&D cost

strategic choice:
NRE or per product

including:
staff, training, tools, housing
materials, prototypes
overhead
certification

often a standard staffing rate is used
that covers most costs above:
 $R\&D \text{ investment} = \text{Effort} * \text{rate}$

Income, more than product sales only



$$\sum_{\text{services}} \text{income}_{\text{service}}$$

$$\sum_{\text{options}} \text{sales price}_{\text{option}} * \text{volume}_{\text{option}}$$

$$\text{sales price}_{\text{product}} * \text{volume}_{\text{product}}$$

license fees
pay per movie

content, portal
updates
maintenance

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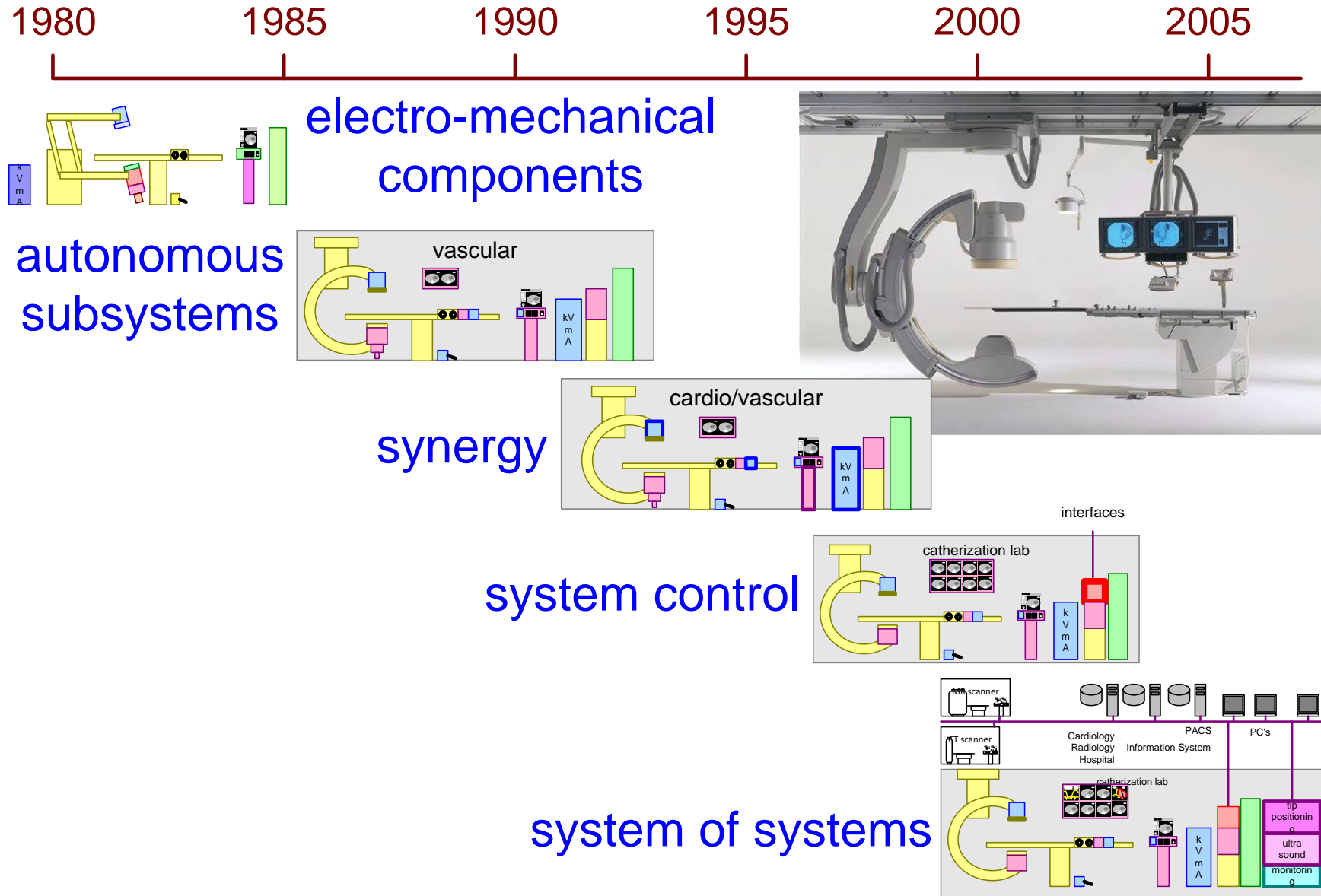
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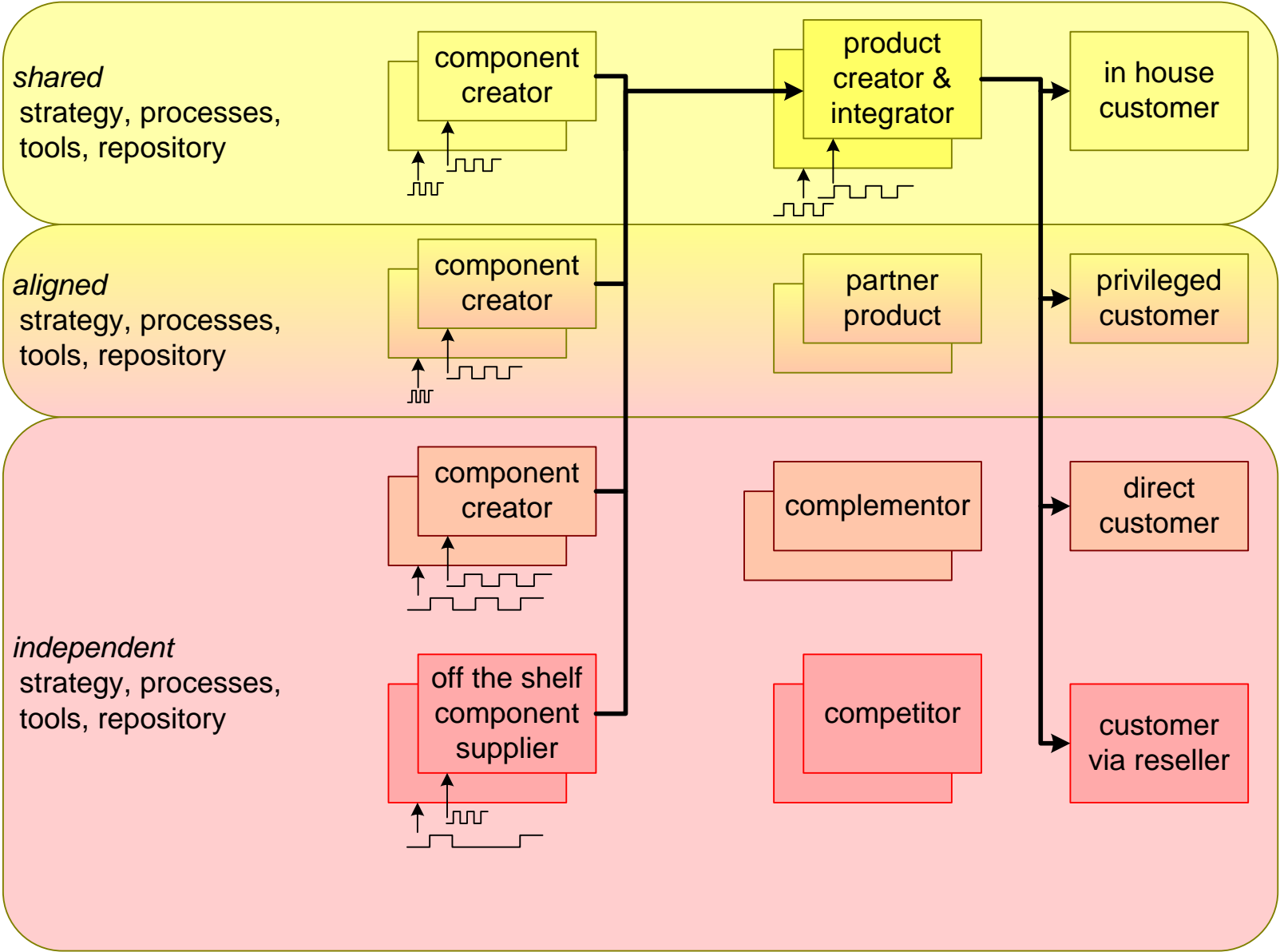
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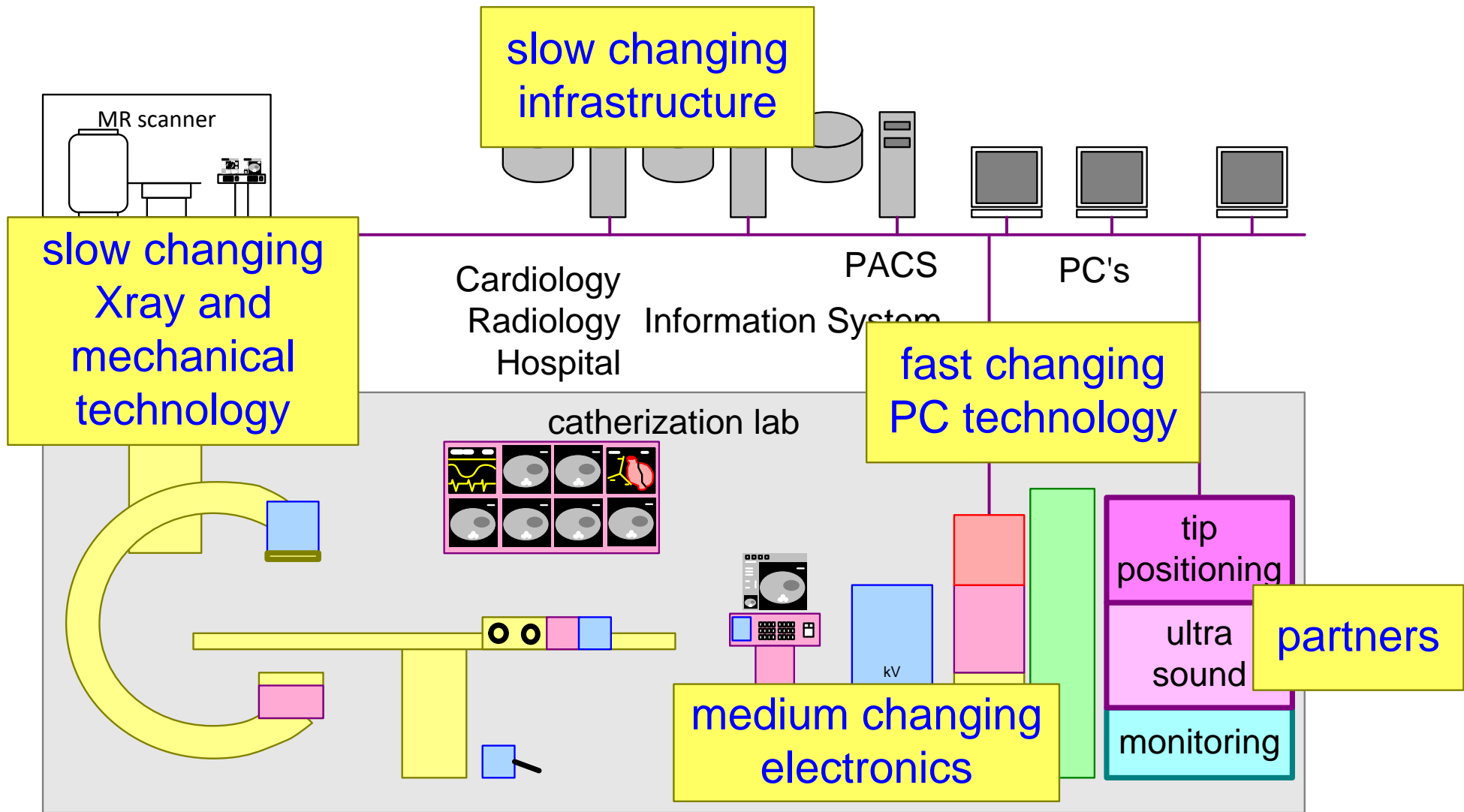
Example: Evolution of X-ray Systems



Creation Chain

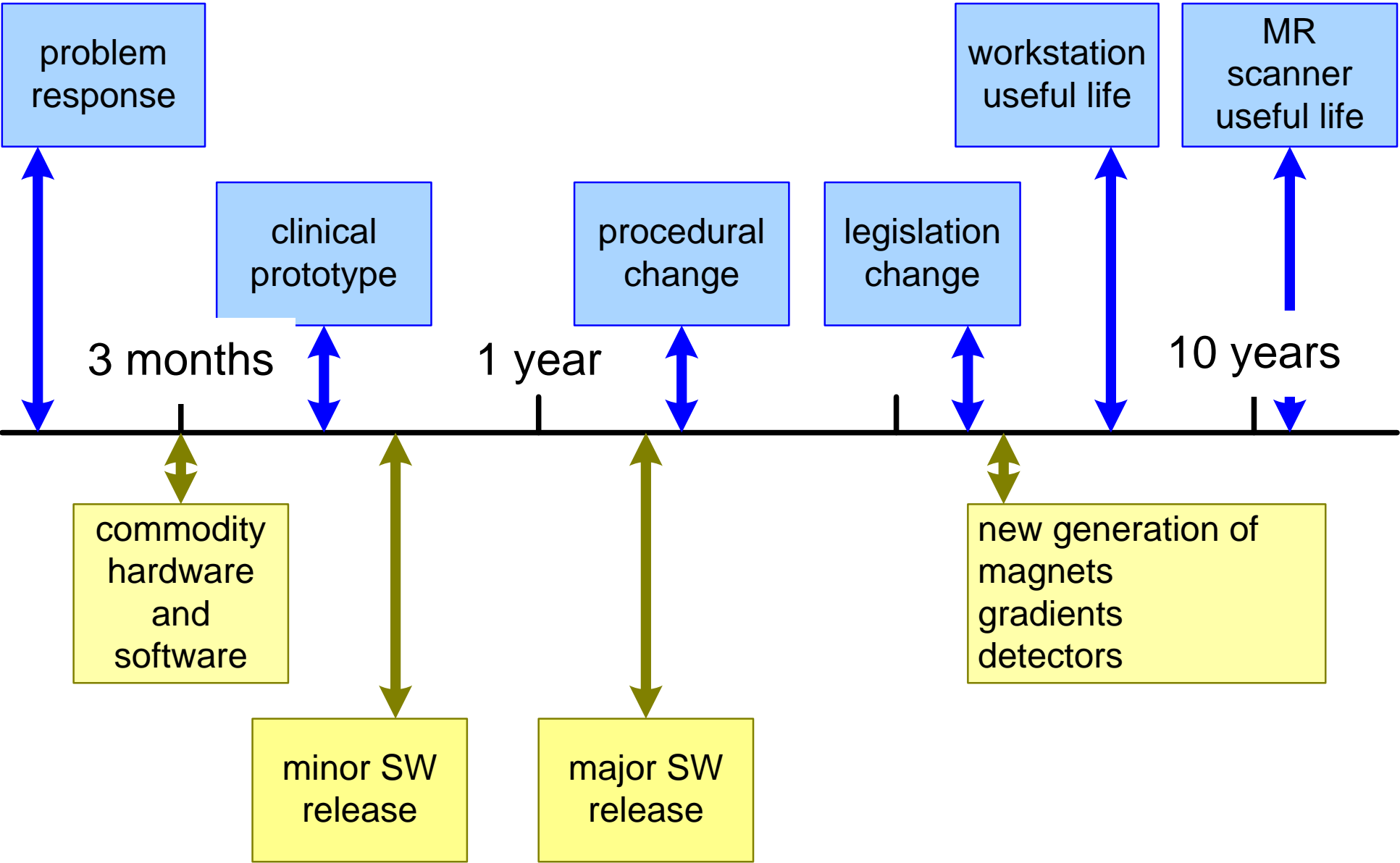


Example: X-ray Catherization System



X-ray catherization environment anno 2005

Example of Time Scale Model for Changes



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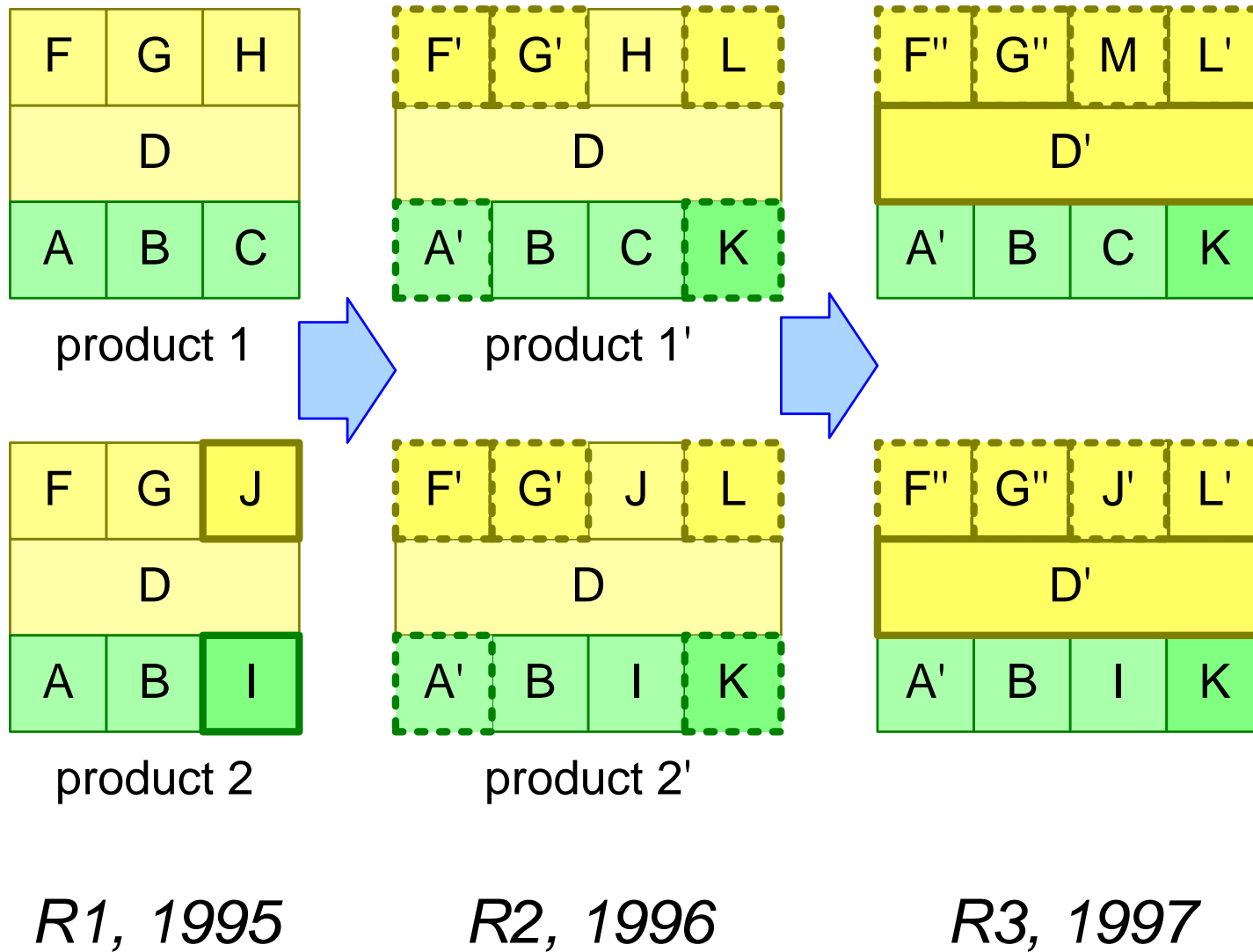
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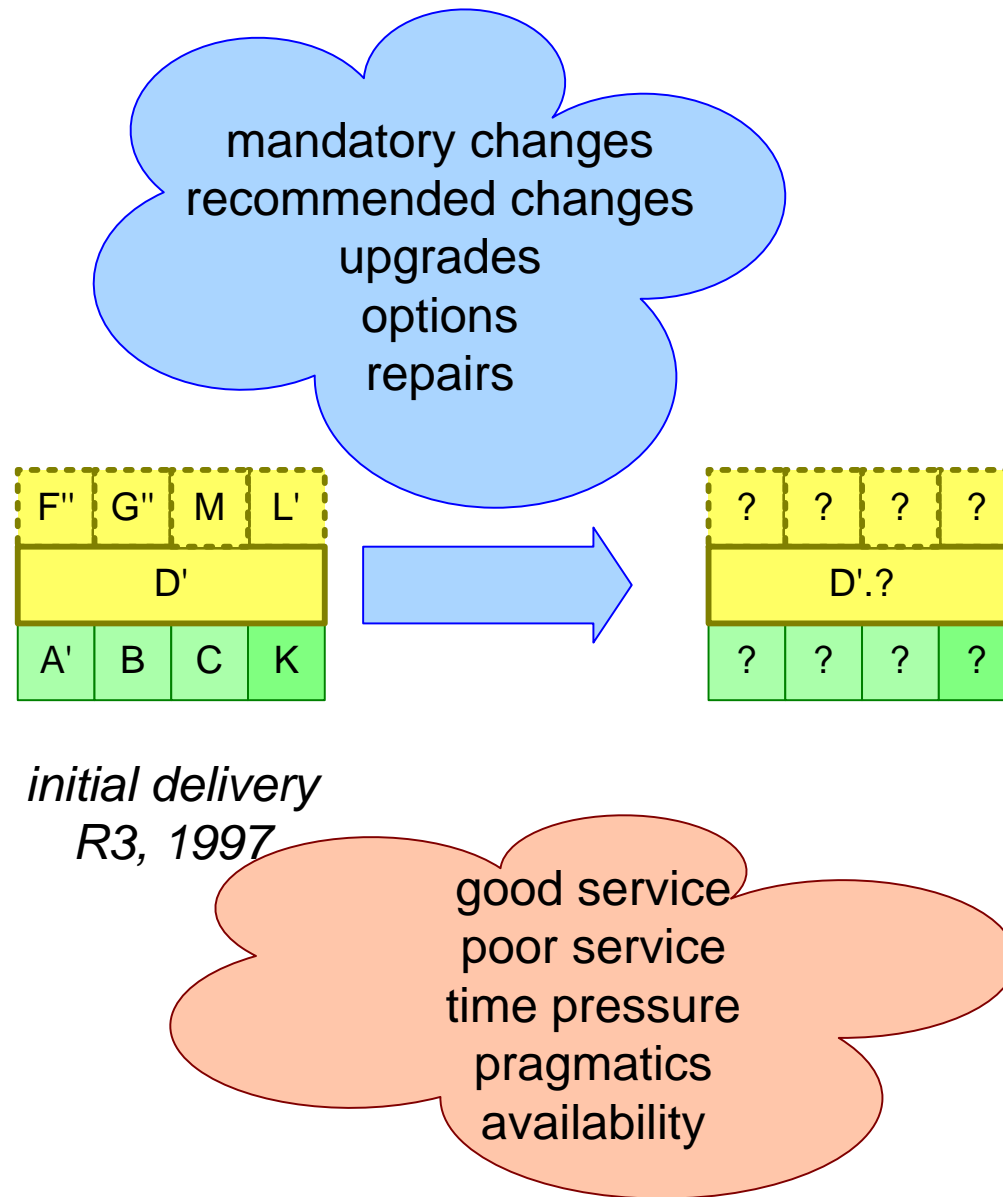
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Product Configurations Evolve Continuously

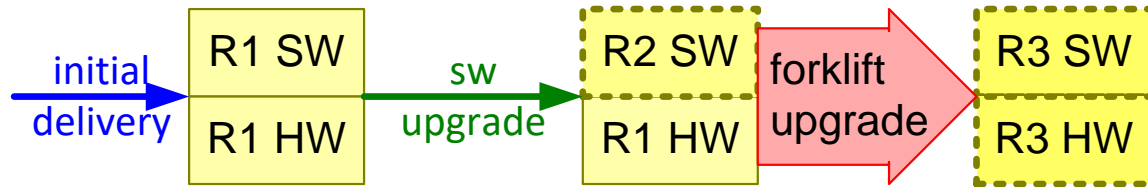


et cetera

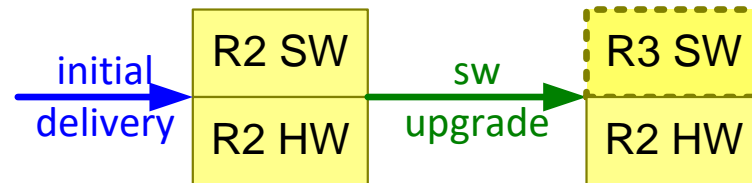
Regression of Configuration



Compatibility and Upgrading



How long are new functions compatible with older system configurations?



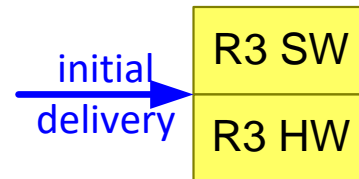
When to break compatibility?

When does the customer pay for an upgrade?

When to retrofit?

example

Try to run Windows Vista on your 1GB computer from 2005...



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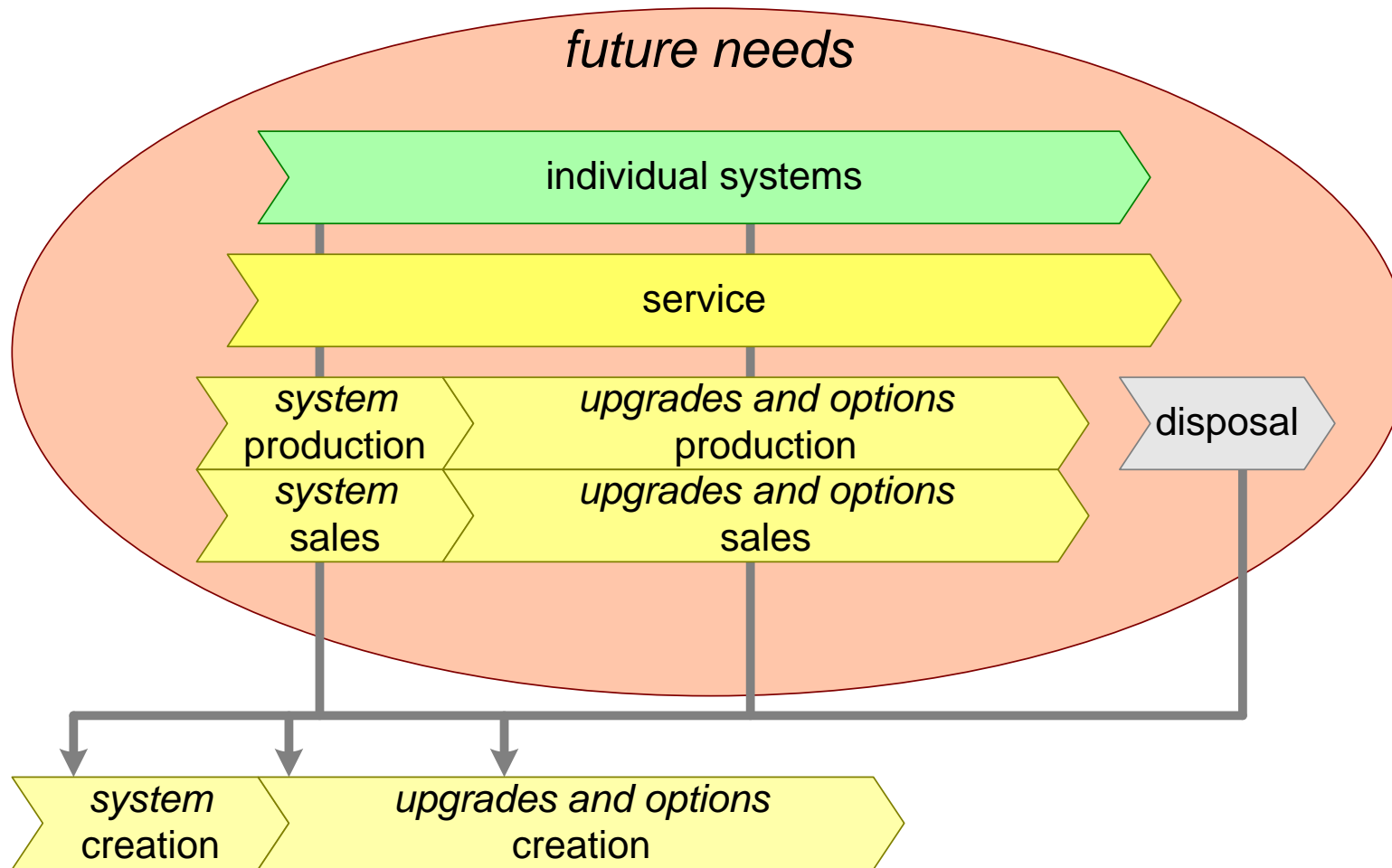
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Systems Engineering and PLM



*Systems Engineering: anticipation of future needs
when creating new systems and features*

Basic System Life Cycle

