

# 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.

## Distribution

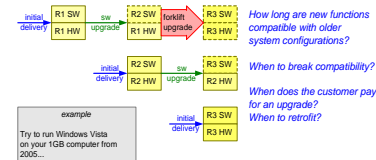
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from conception to disposal

product life cycle management  
process

business  
the money dimension

heart beat of changes  
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complexity  
huge number of configurations

conclusion

# Introduction: Basic System Life Cycle

introduction  
from conception to disposal

product life cycle management  
process

business  
the money dimension

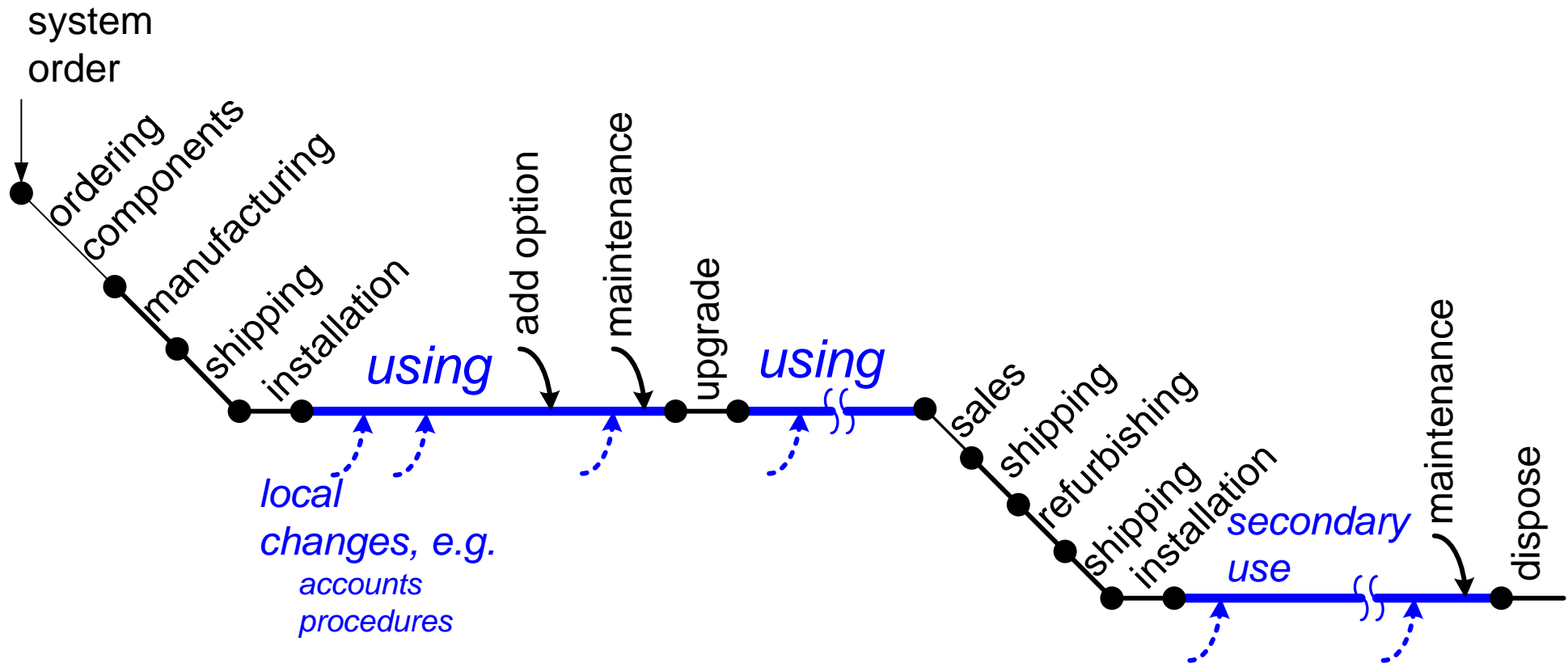
heart beat of changes  
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complexity  
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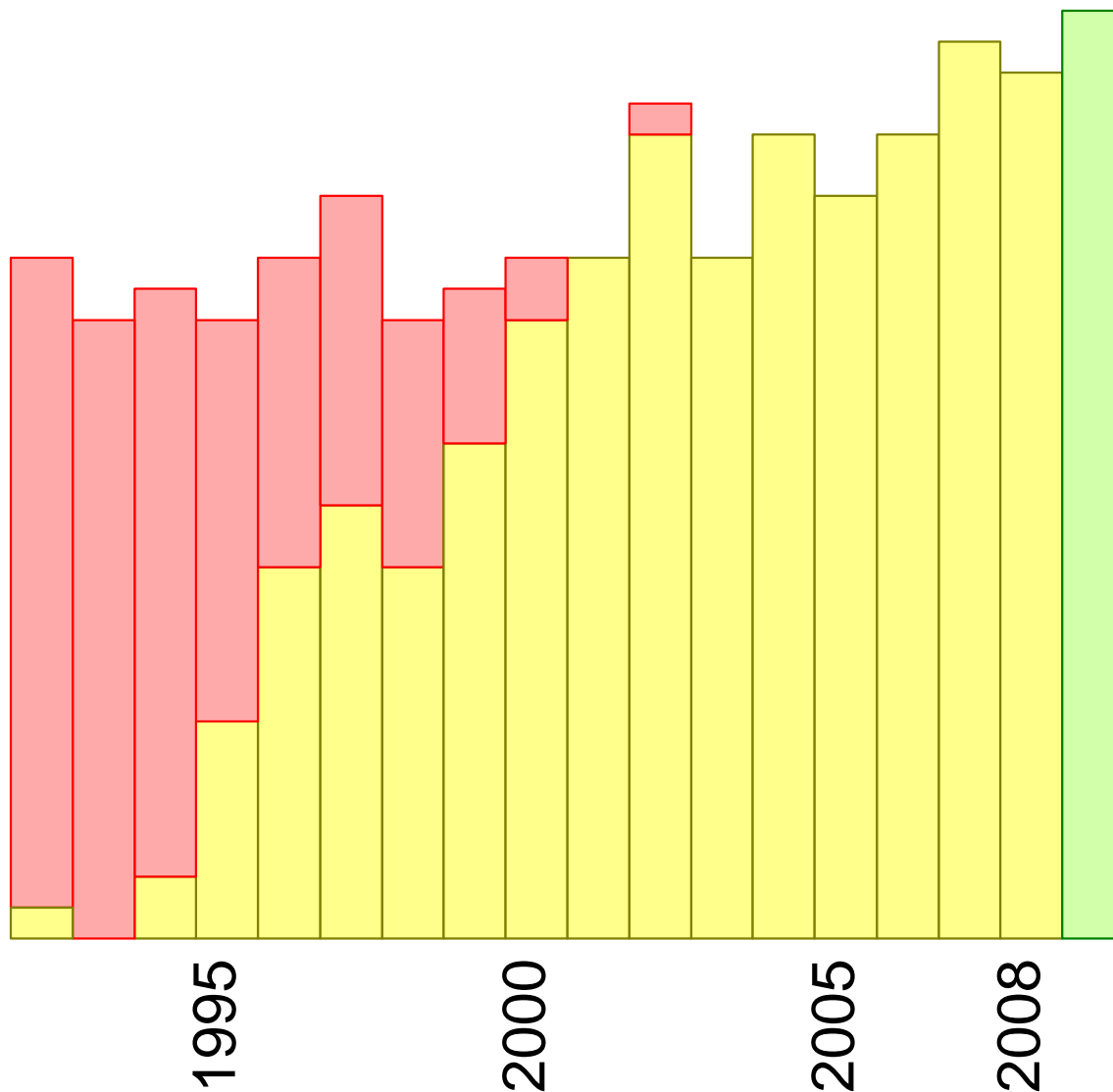
conclusion



# System Life Cycle after Creation



# Volume of Installed Base versus New deliveries



*installed base  
10..20 times  
initial deliveries*

legend

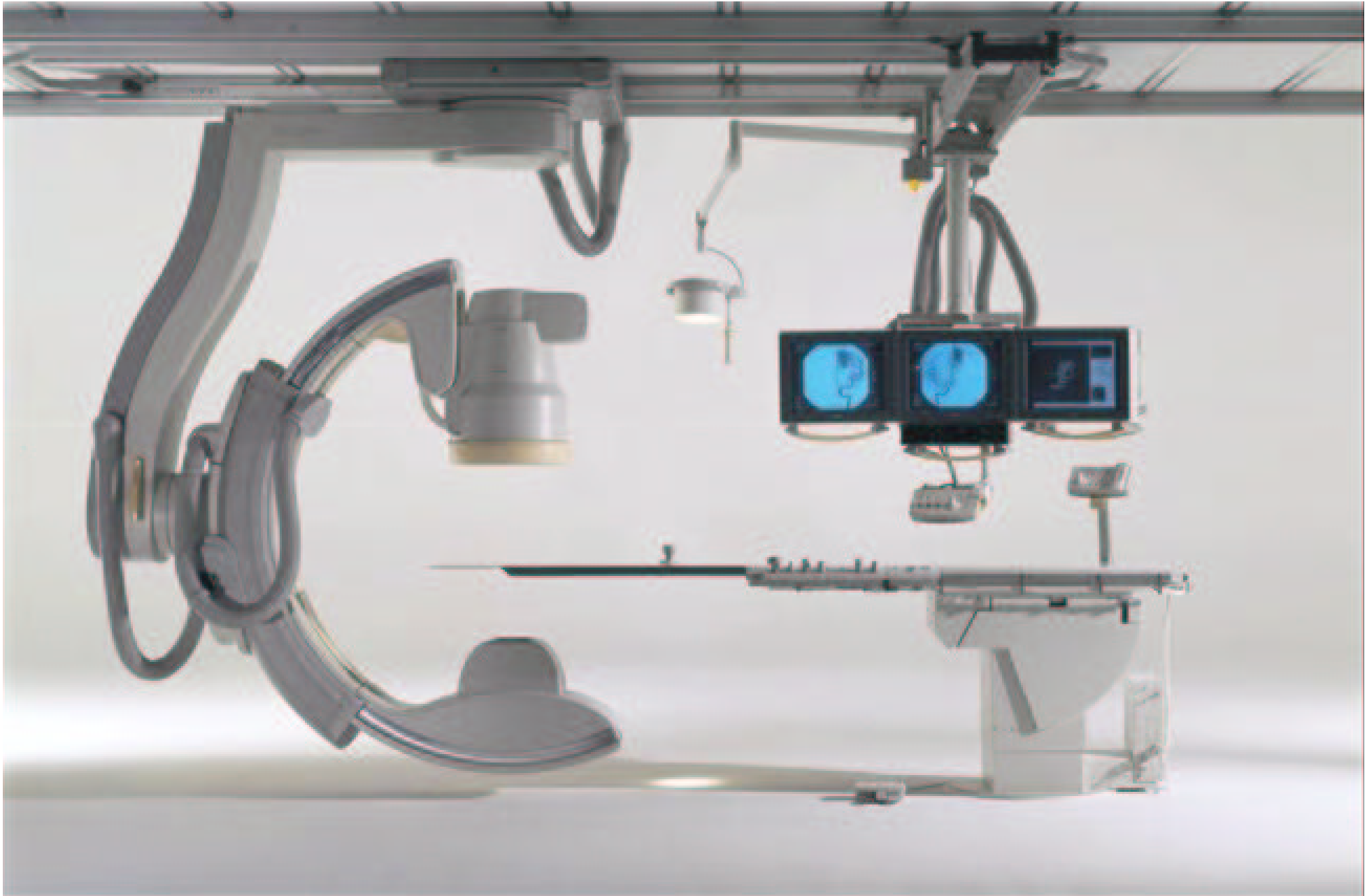
initial deliveries

installed base

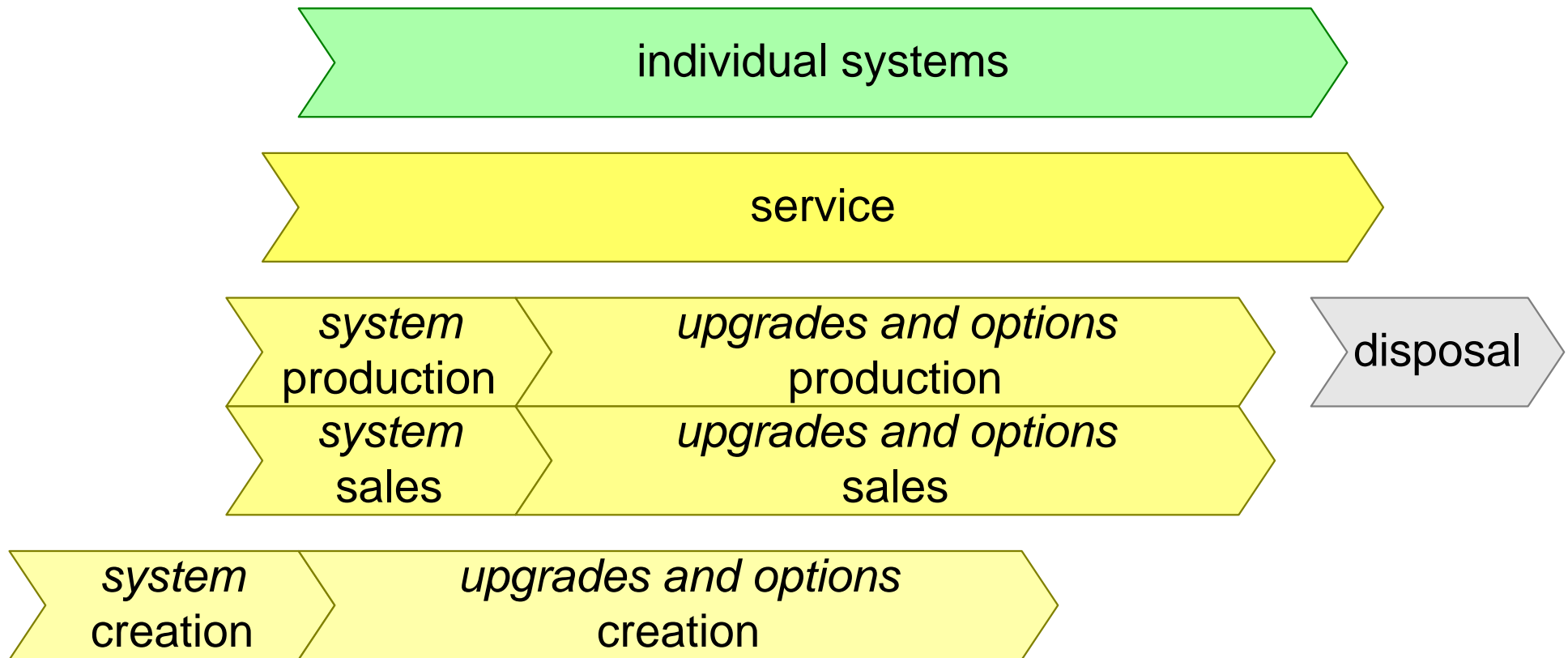
decommissioned

this is an entirely fictitious case

# Case: X-ray Catherization System



# Product Related Life Cycles



introduction  
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# product life cycle management process

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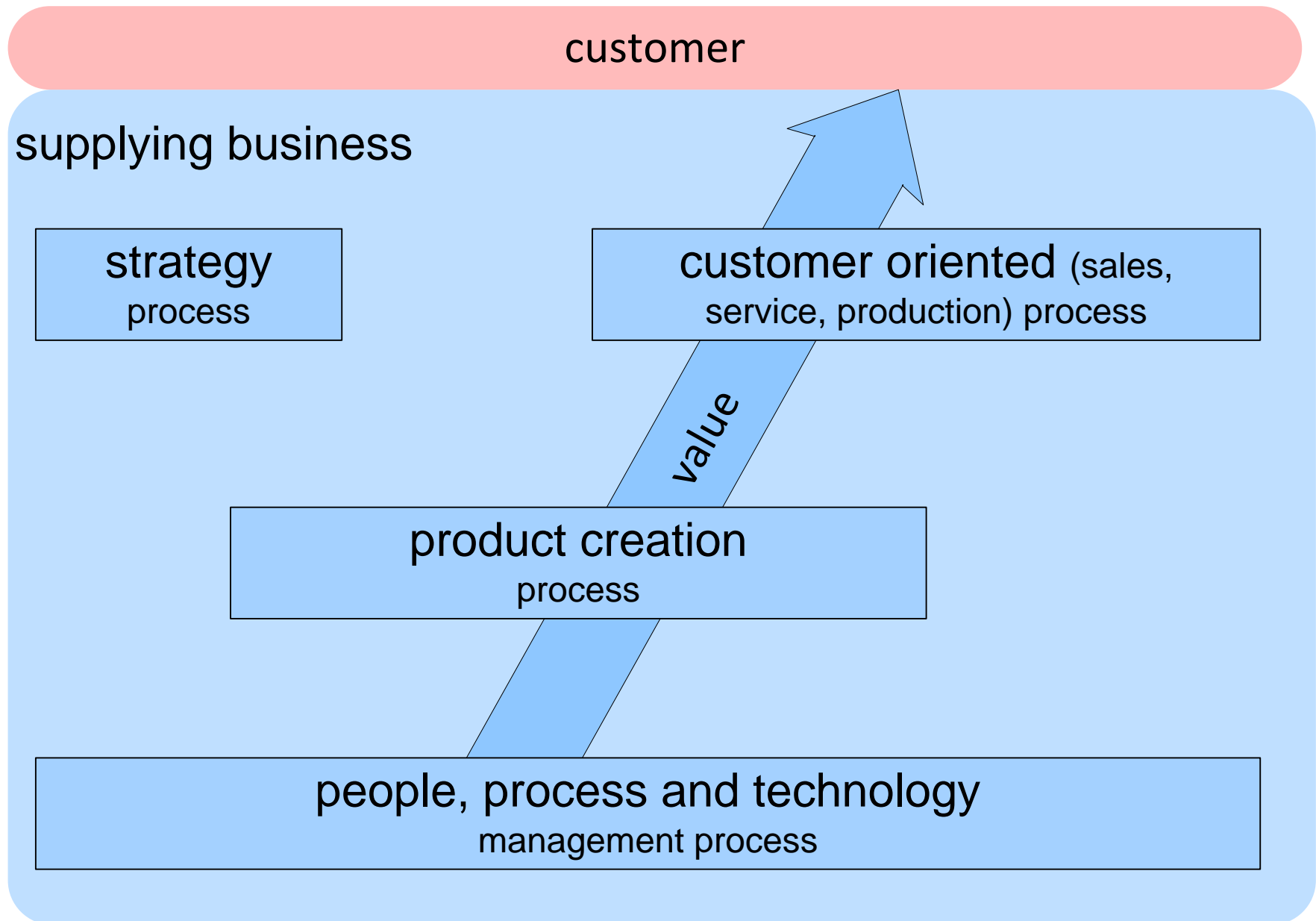
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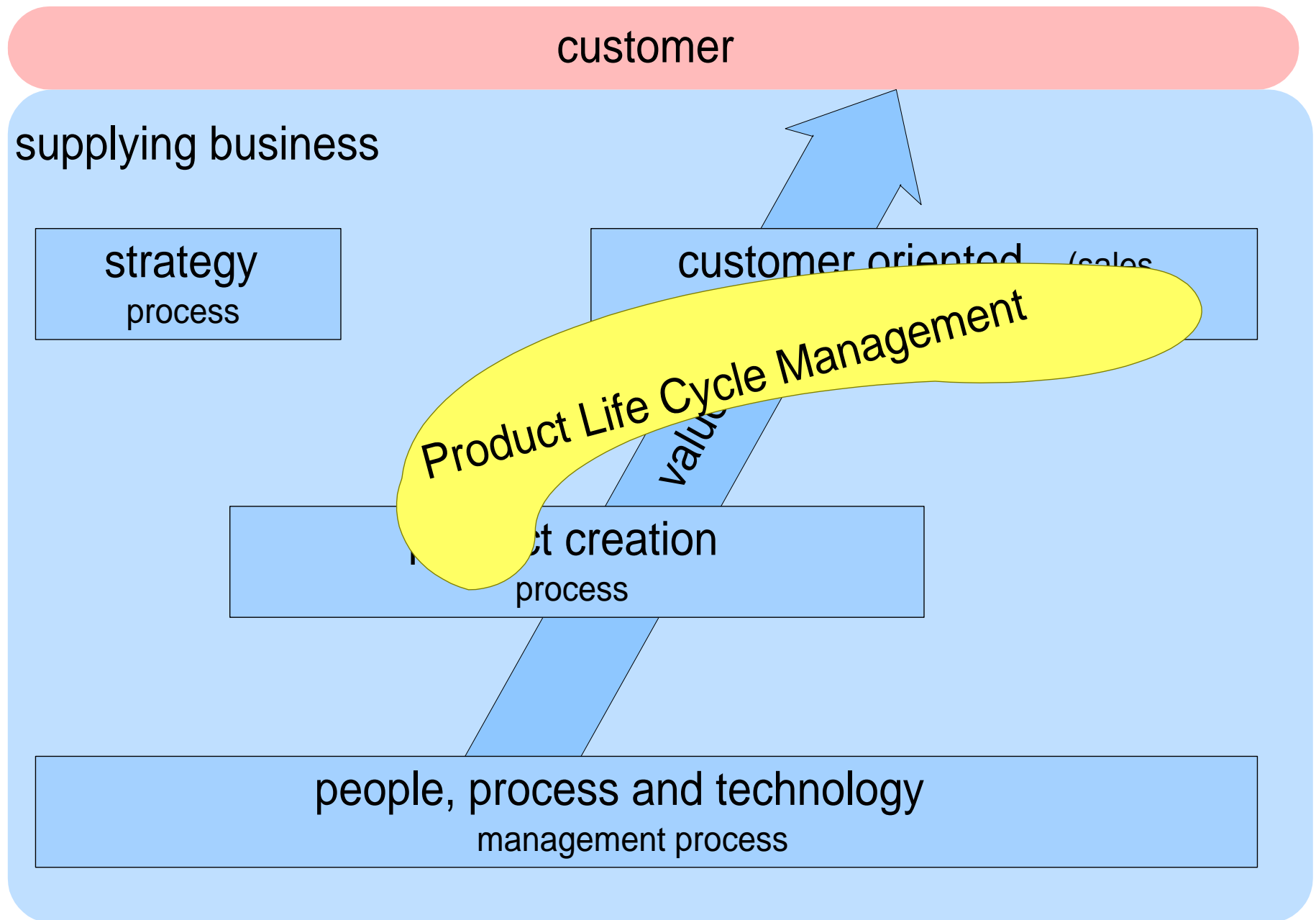
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# Simplified process view



# Positioning PLM



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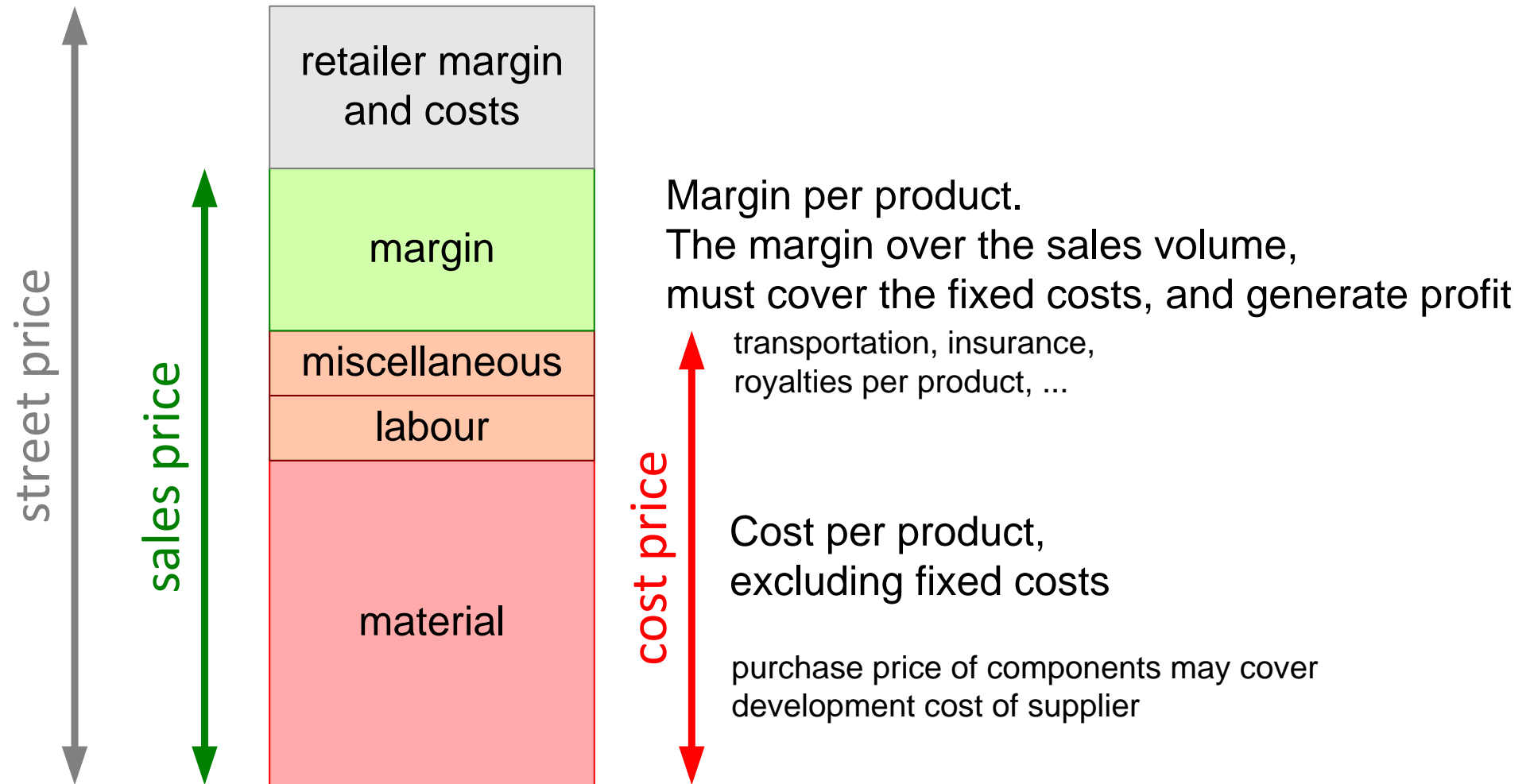
# business the money dimension

heart beat of changes  
the time dimension

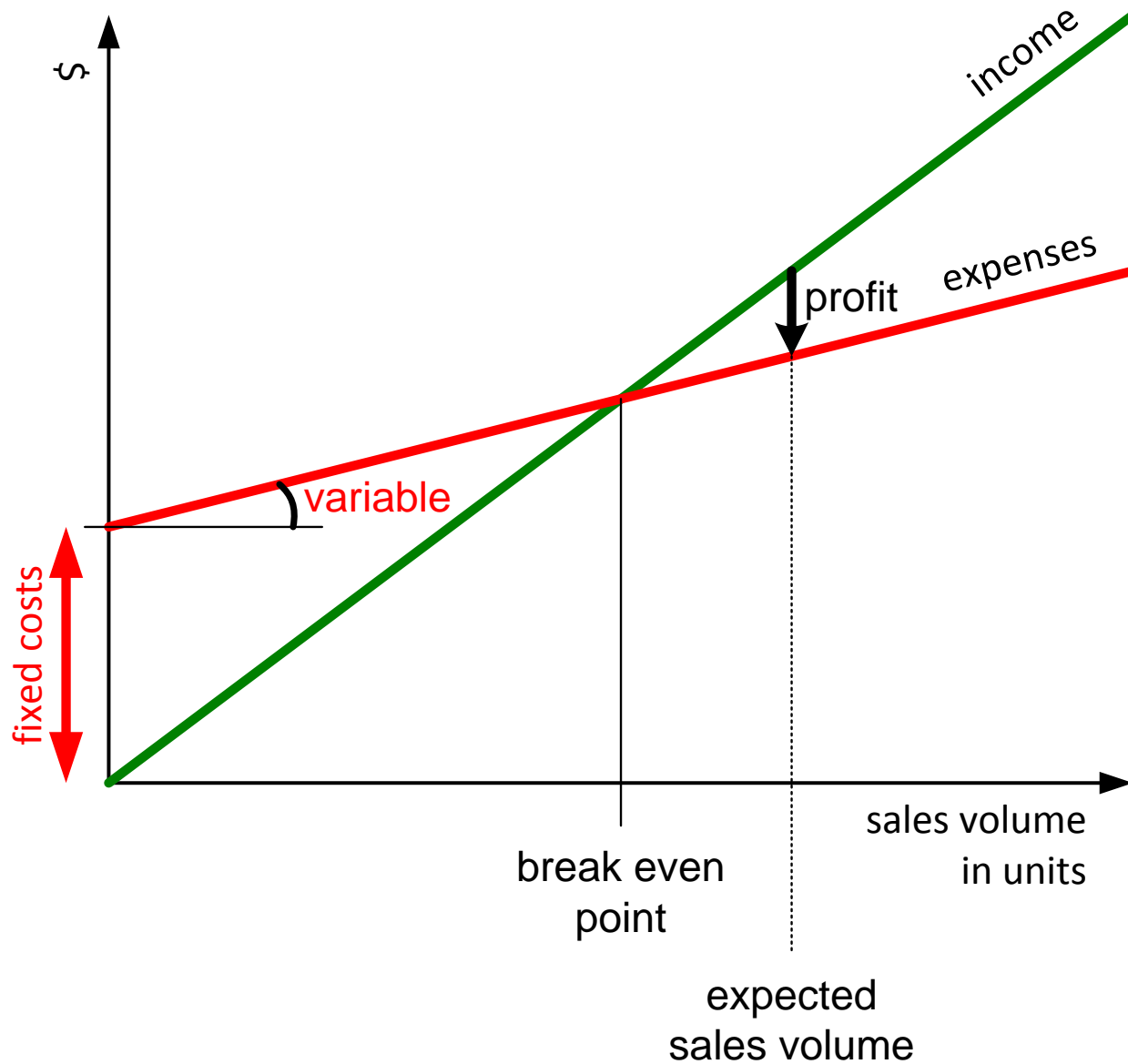
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# Product Margin = Sales Price - Cost



# Profit as function of sales volume



# Investments, more than R&D



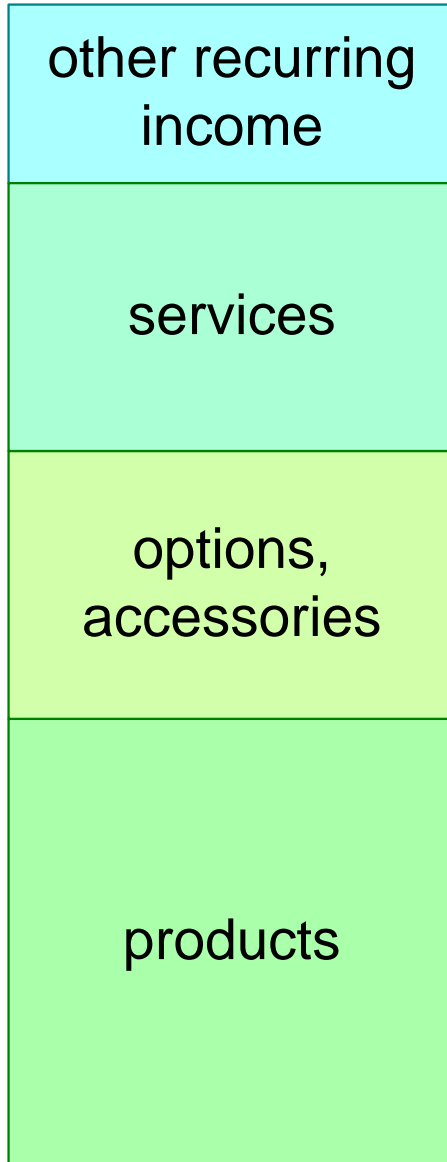
business dependent:  
pharmaceuticals industry  
sales cost >> R&D cost

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:  
 $R\&D\ investment = Effort * rate$

# 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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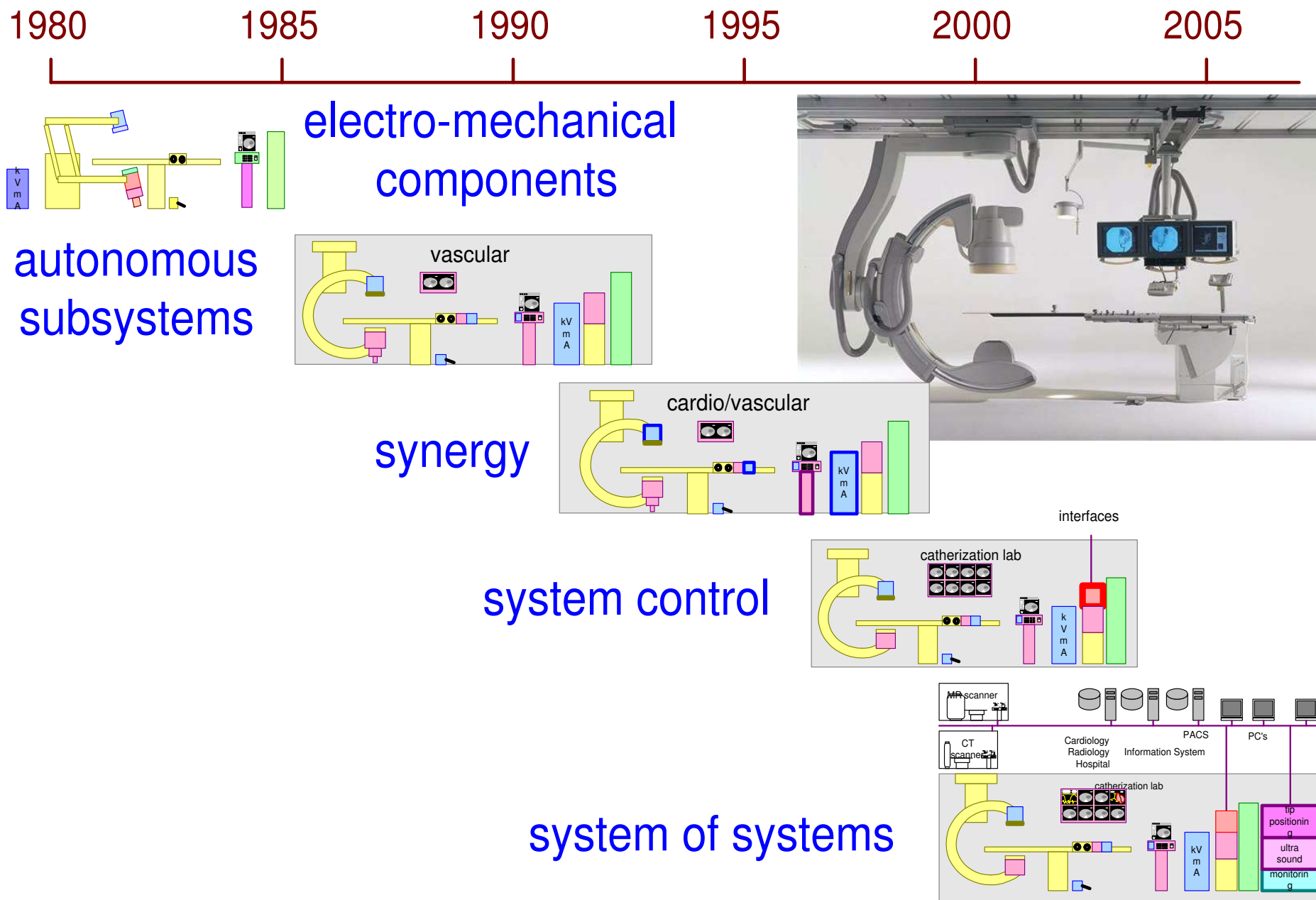
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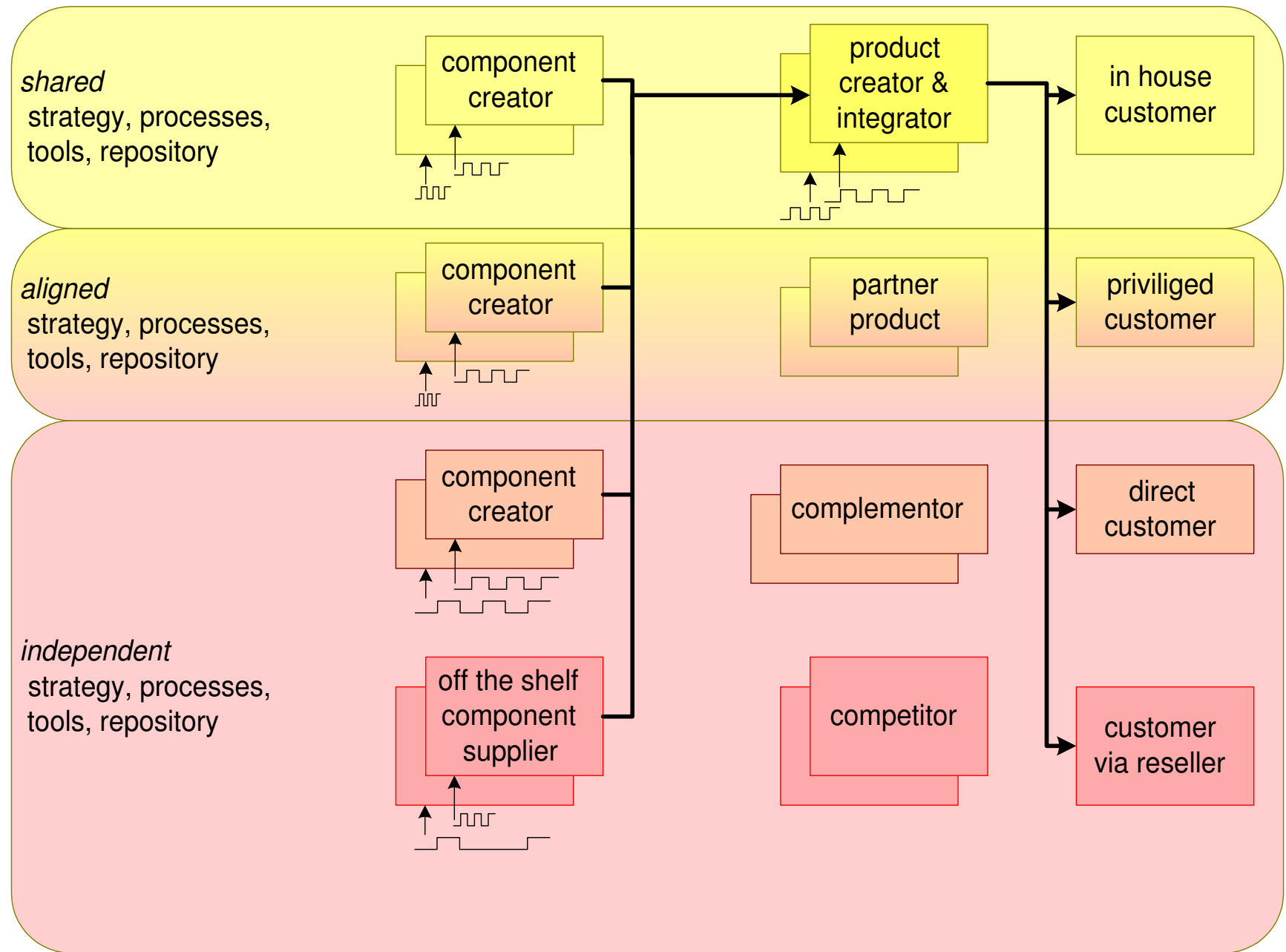
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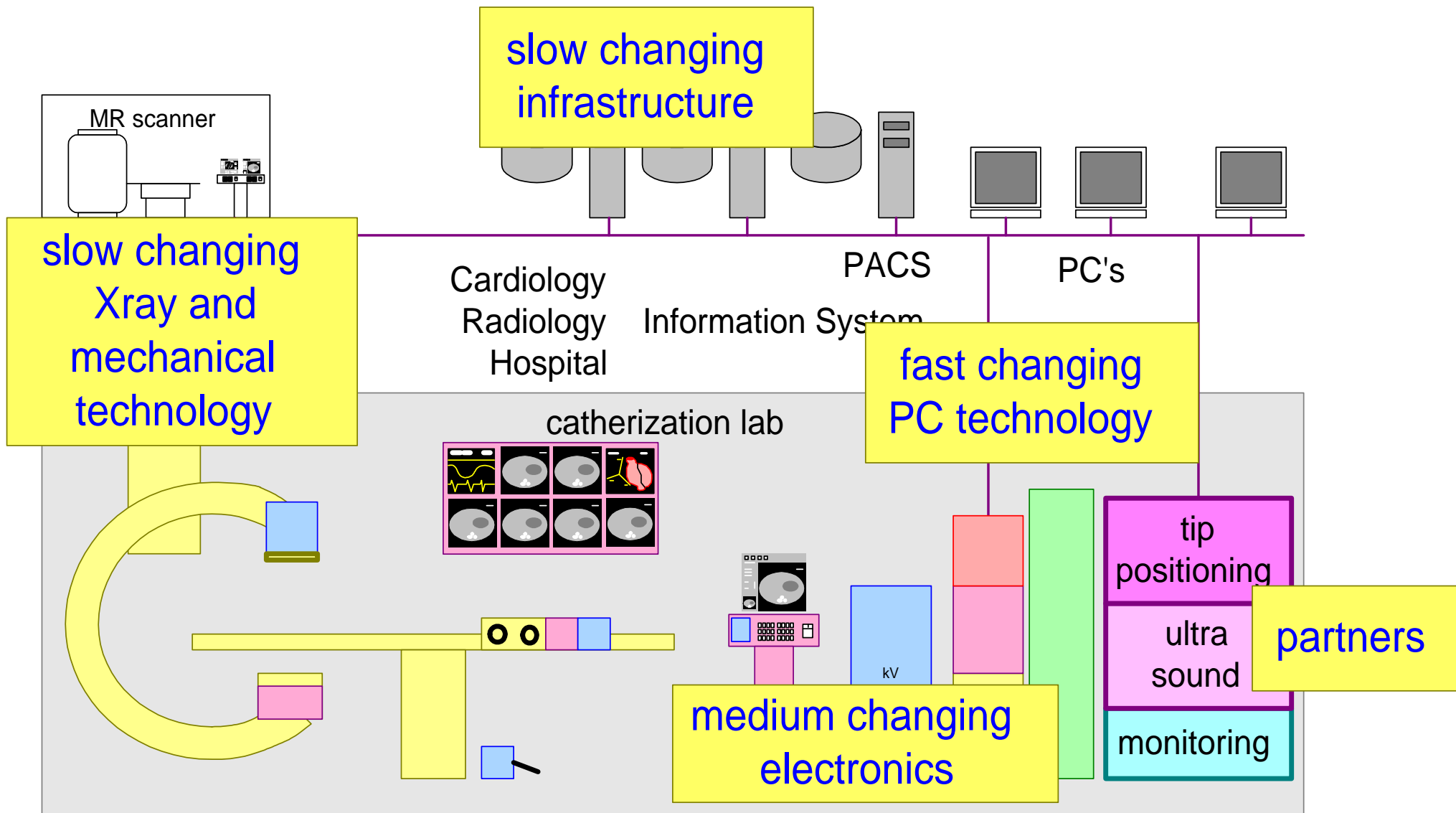
# Example: Evolution of X-ray Systems



# Creation Chain

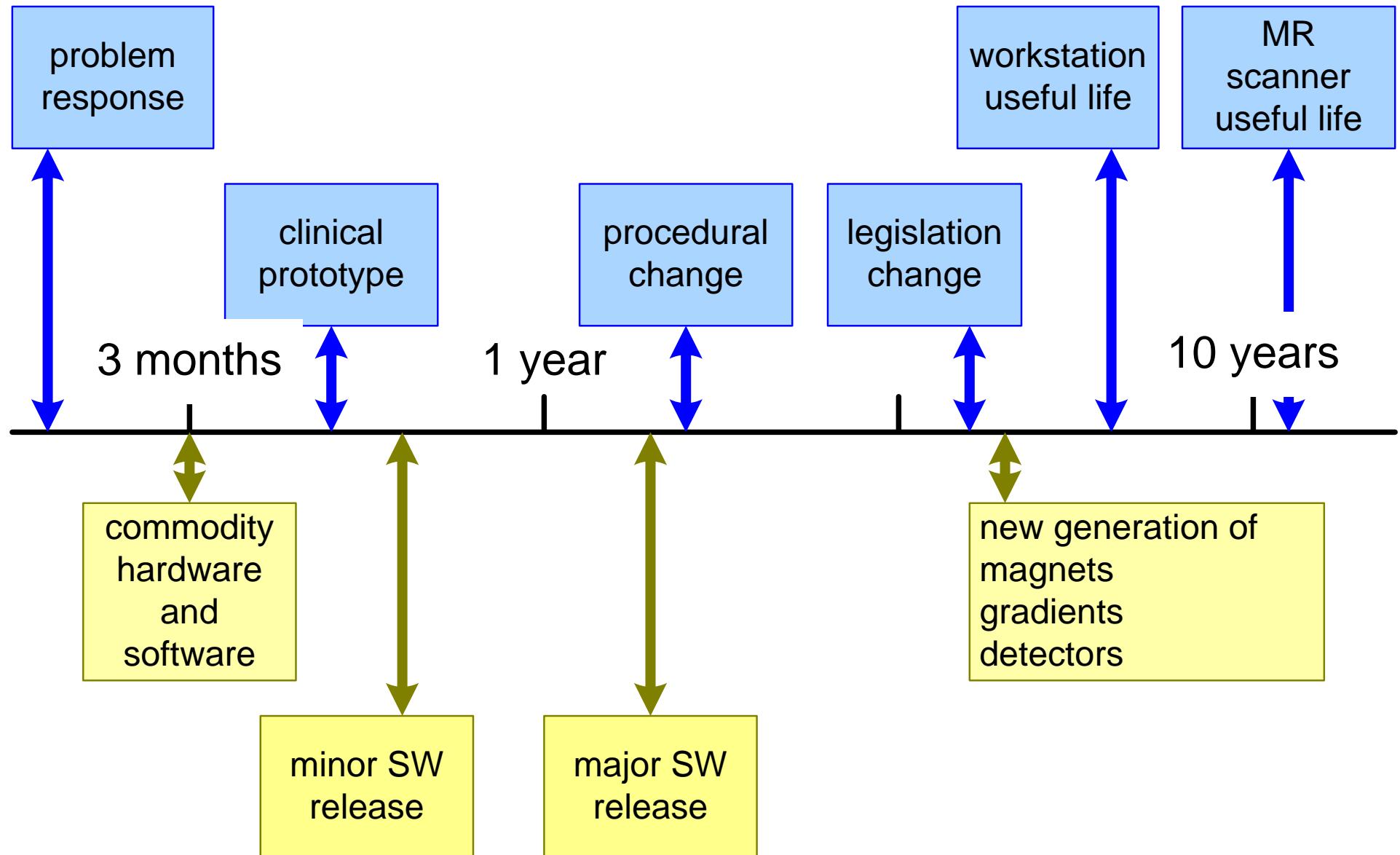


# Example: X-ray Catherization System



*X-ray catherization environment anno 2005*

# Example of Time Scale Model for Changes



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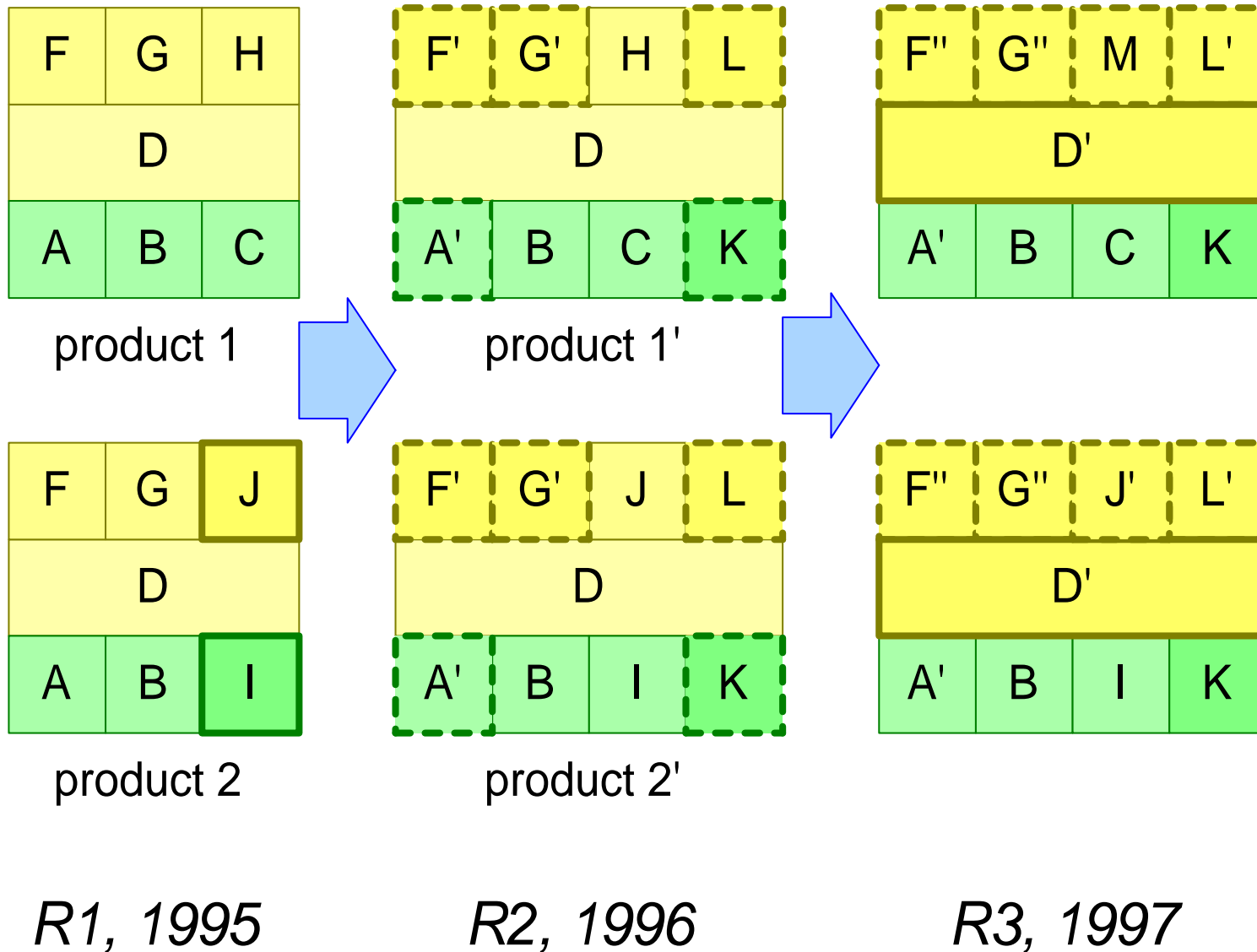
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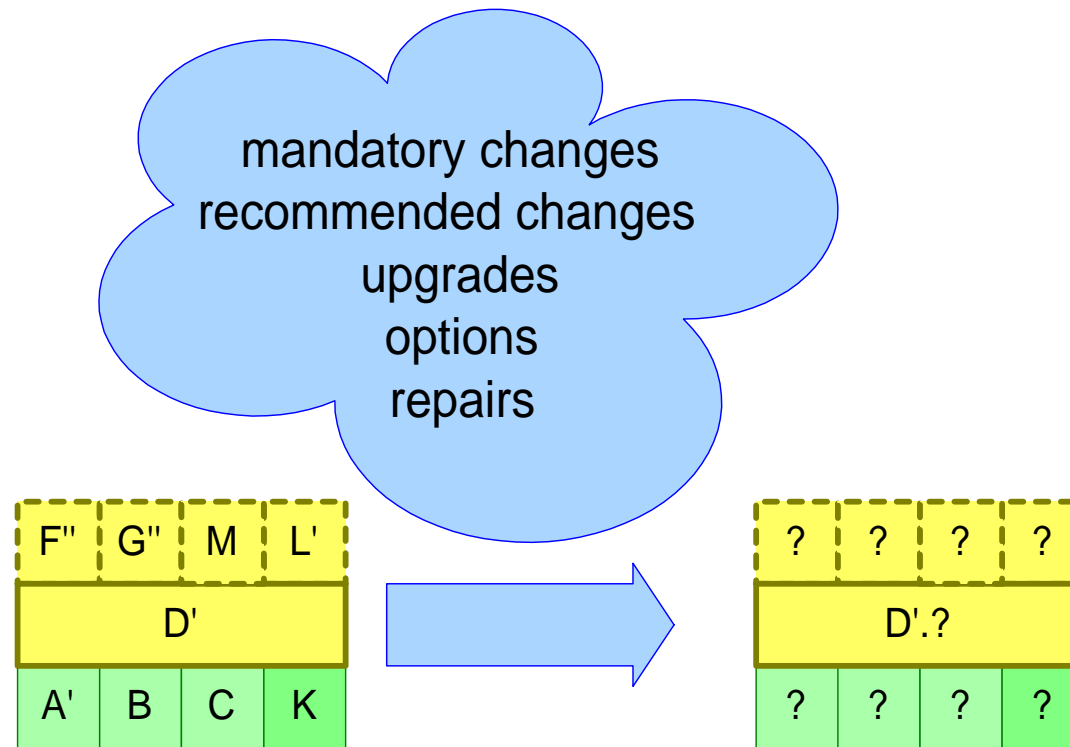
**complexity**  
**huge number of configurations**

conclusion

# Product Configurations Evolve Continuously



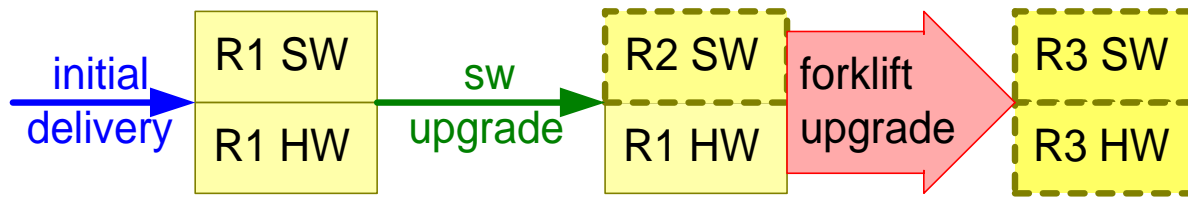
# Regression of Configuration



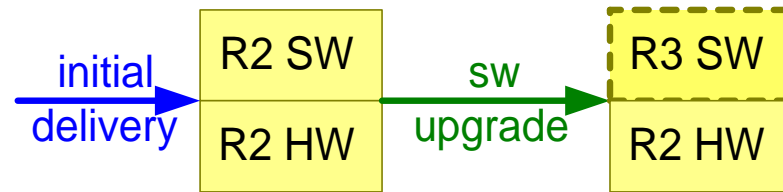
*initial delivery*  
*R3, 1997*



# Compatibility and Upgrading



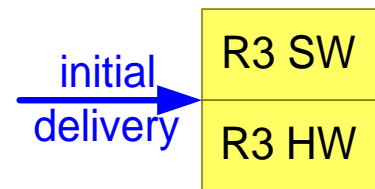
*How long are new functions compatible with older system configurations?*



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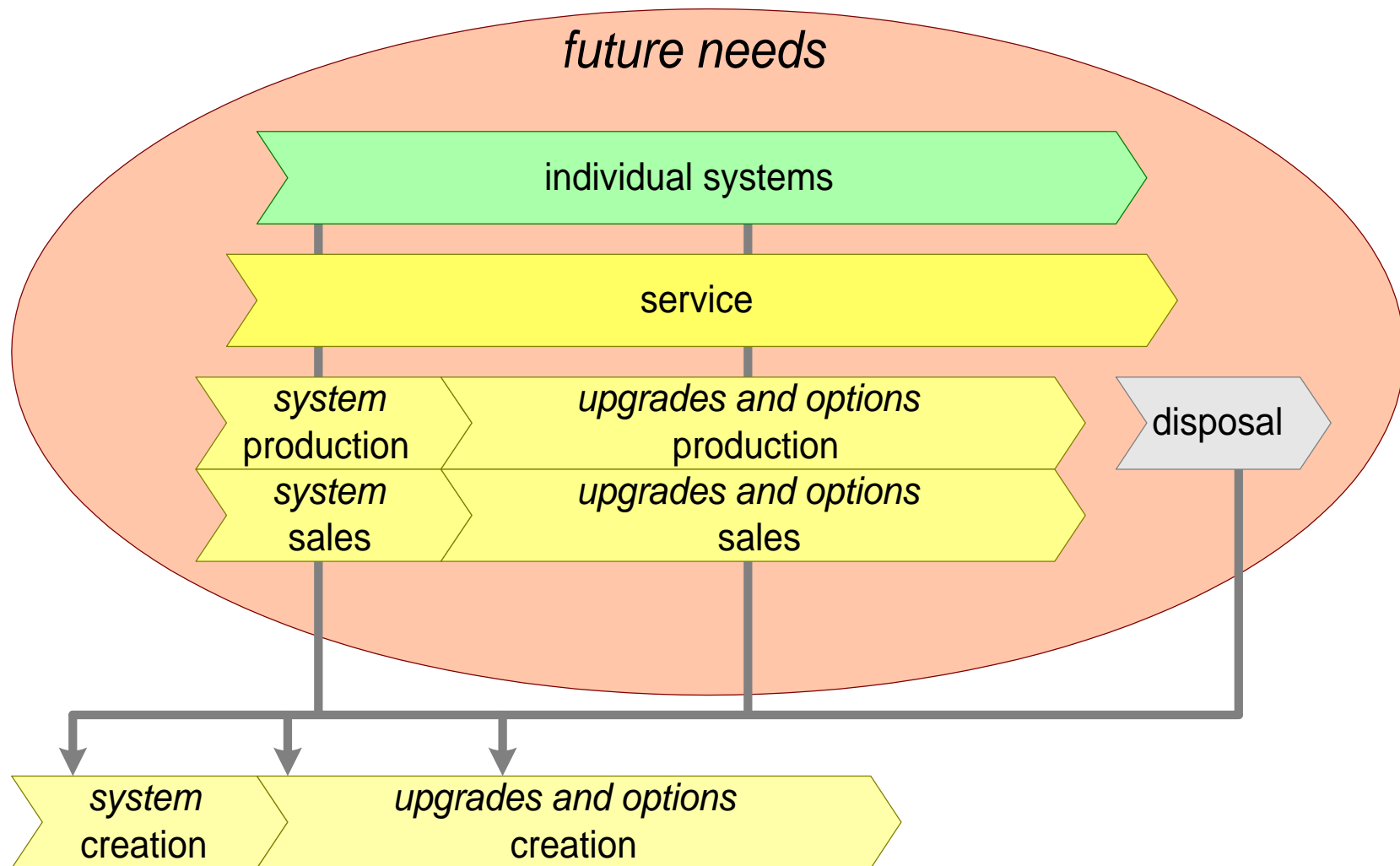
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*Systems Engineering: anticipation of future needs  
when creating new systems and features*

# Basic System Life Cycle

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