Product Life Cycle Management

by Gerrit Muller University of South-Eastern Norway-NISE

e-mail: gaudisite@gmail.com

www.gaudisite.nl

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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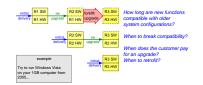


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introduction from conception to disposal

product life cycle management process

business the money dimension

heart beat of changes the time dimension

complexity
huge number of configurations



Introduction: Basic System Life Cycle

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product life cycle management process

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conclusion

conception creation p

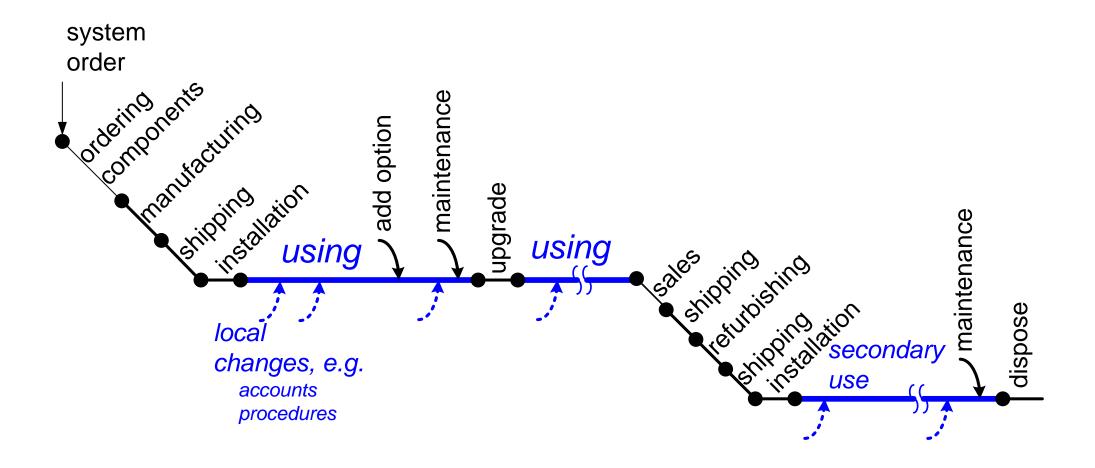
production

operation

disposal

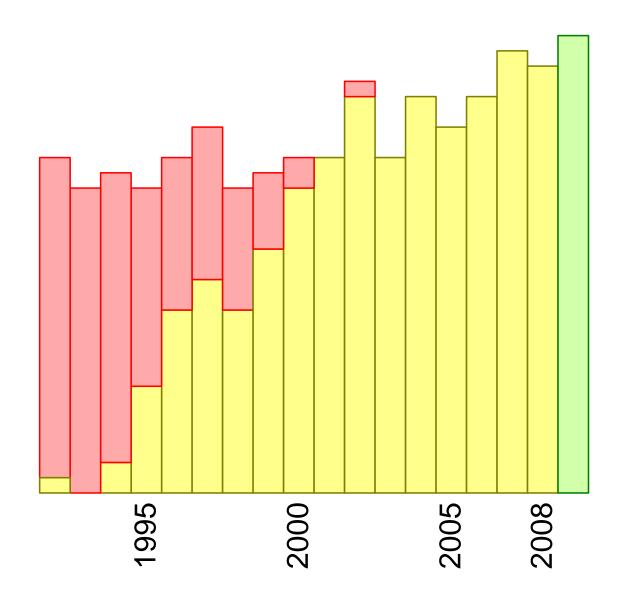


System Life Cycle after Creation





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

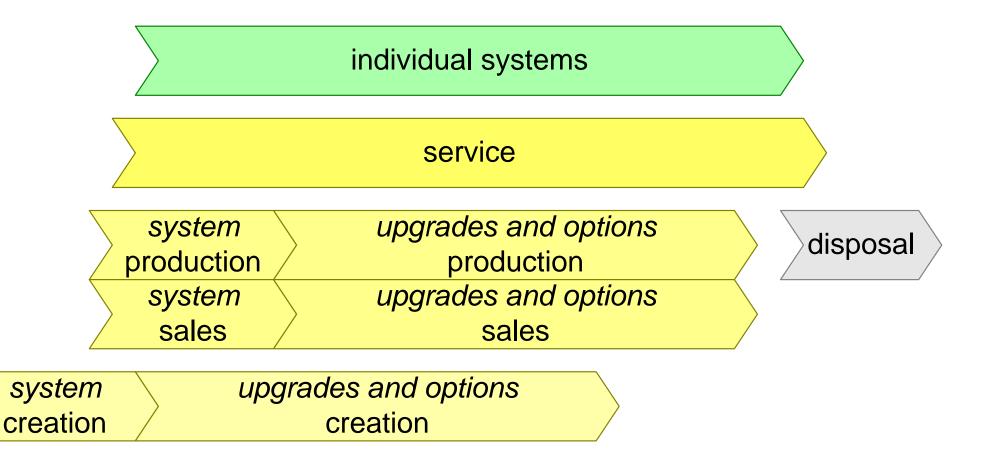


Case: X-ray Catherization System





Product Related Life Cycles





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business

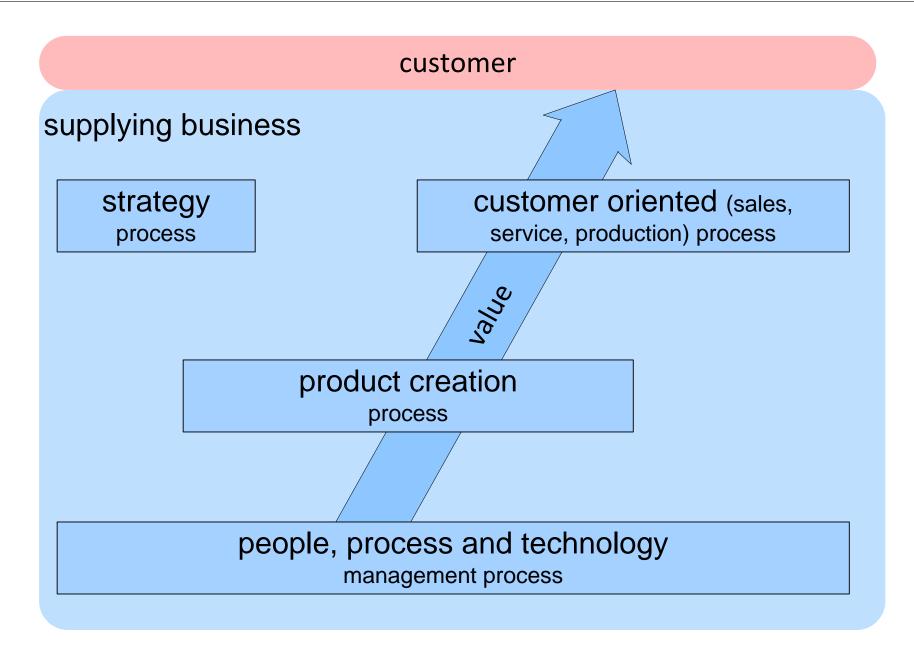
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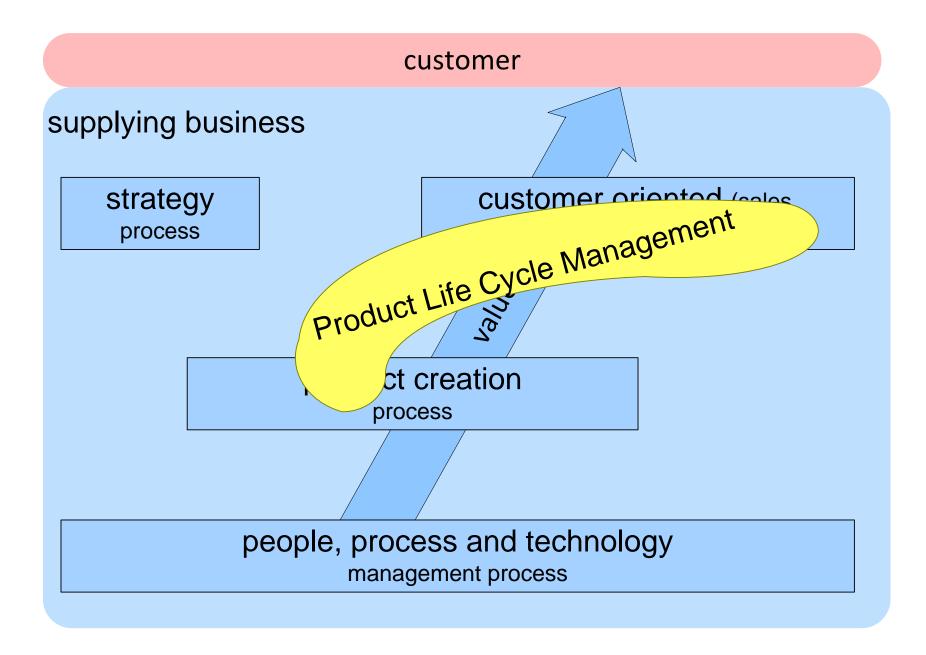


Simplified process view





Positioning PLM





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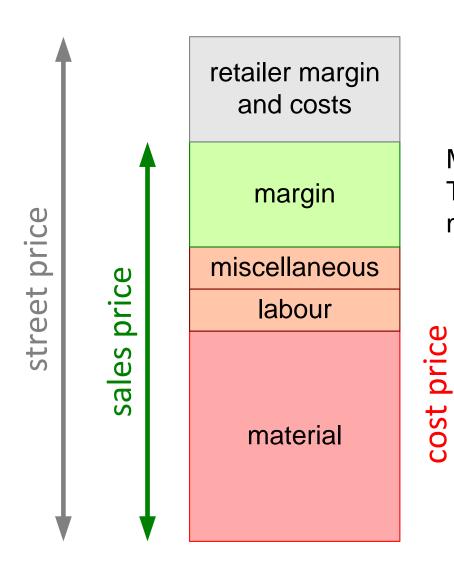
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Product Margin = Sales Price - Cost



Margin per product.
The margin over the sales volume,
must cover the fixed costs, and generate profit

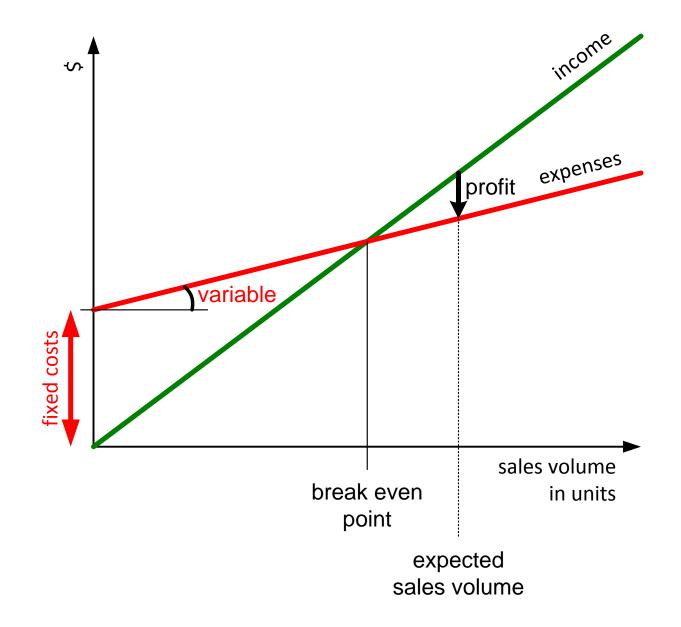
transportation, insurance, royalties per product, ...

Cost per product, excluding fixed costs

purchase price of components may cover development cost of supplier



Profit as function of sales volume





Investments, more than R&D

financing

marketing, sales

training sales&service

NRE: outsourcing, royalties

research and development

business dependent: pharmaceutics 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

other recurring income

services

options, accessories

products

income_{service}

sales price_{option} * volume_{option}
options

sales price_{product} * volume _{product}

license fees pay per movie

content, portal updates maintenance

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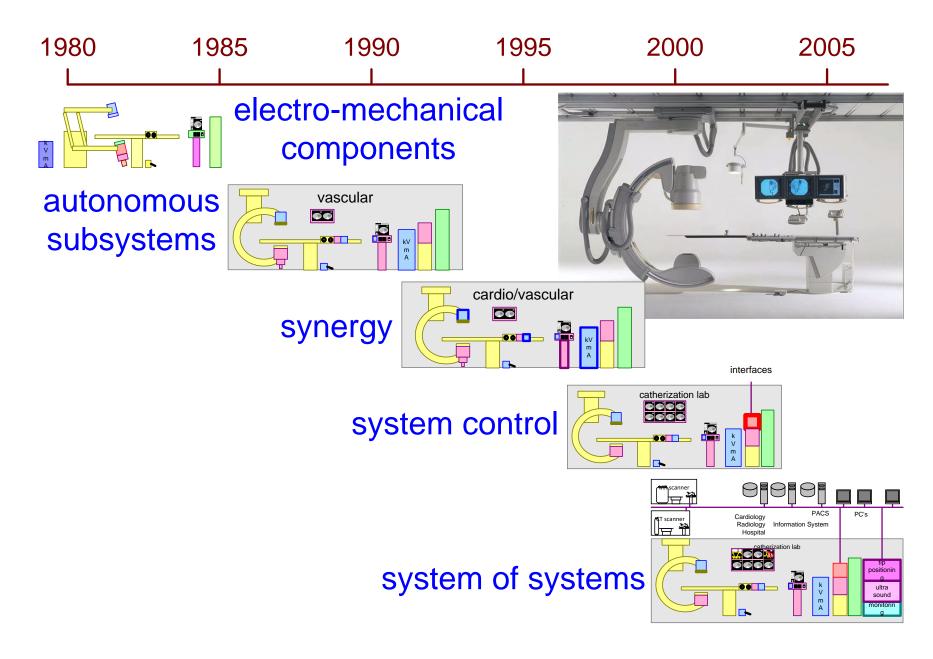
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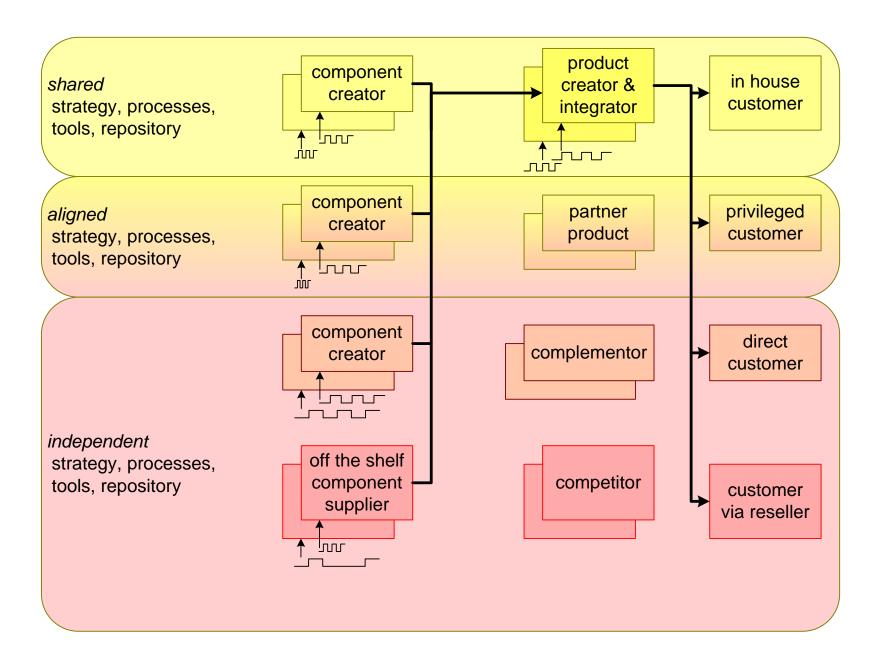


Example: Evolution of X-ray Systems



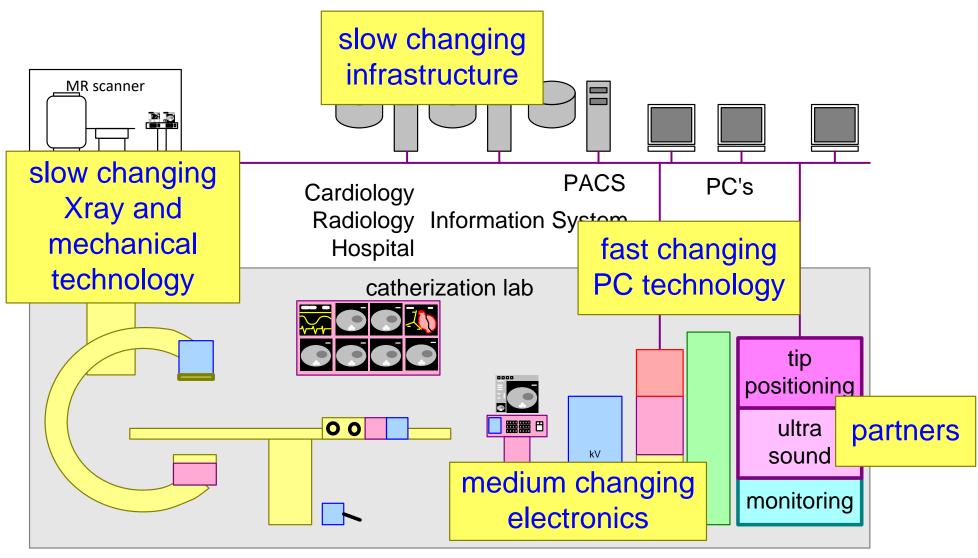


Creation Chain





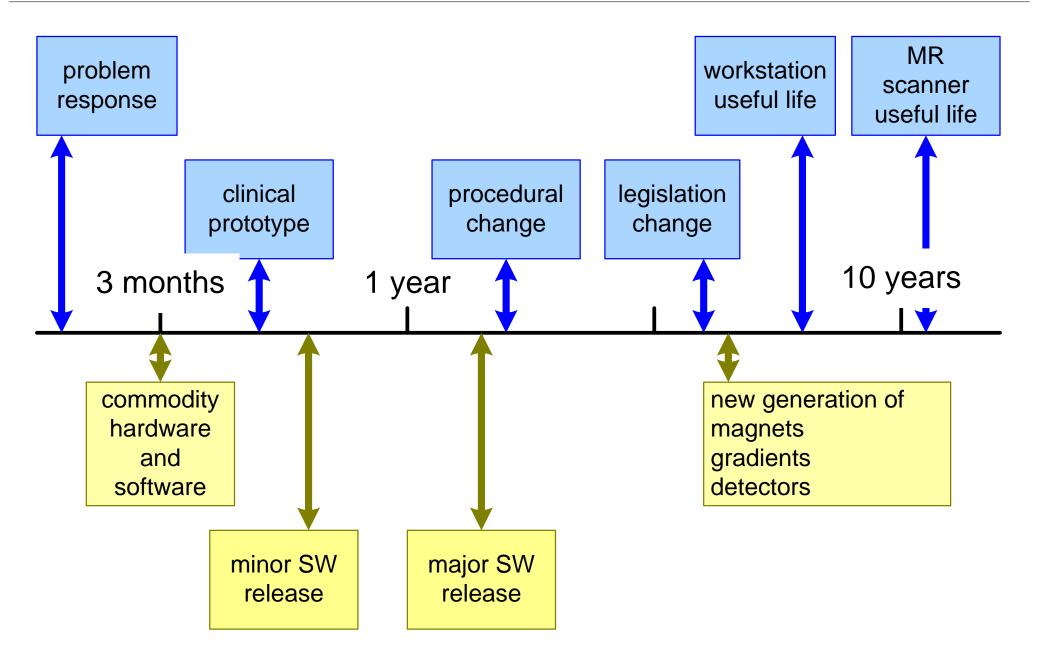
Example: X-ray Catherization System



X-ray catherization environment anno 2005



Example of Time Scale Model for Changes





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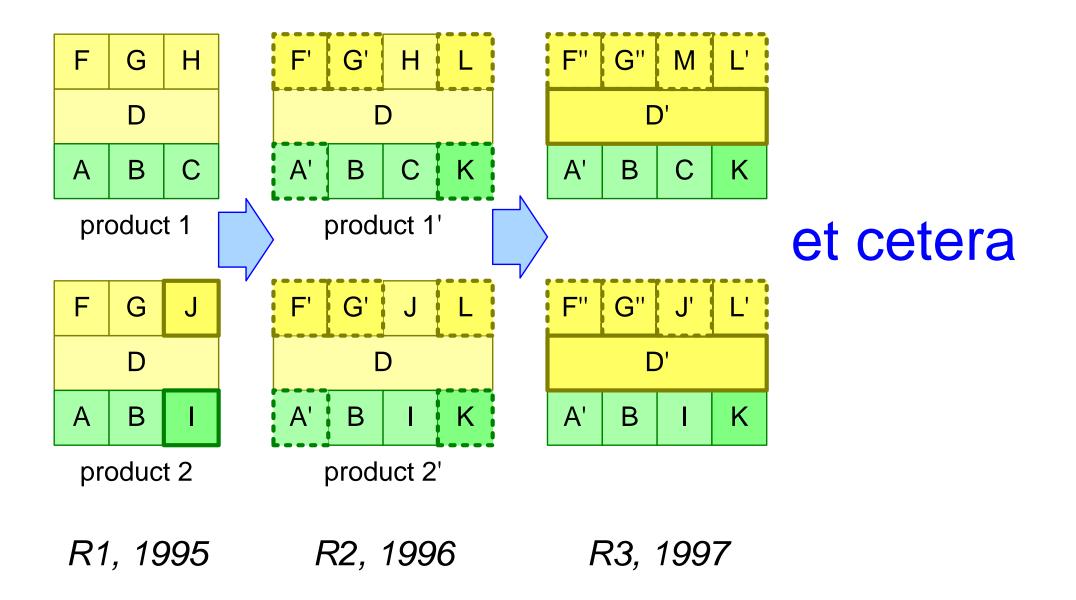
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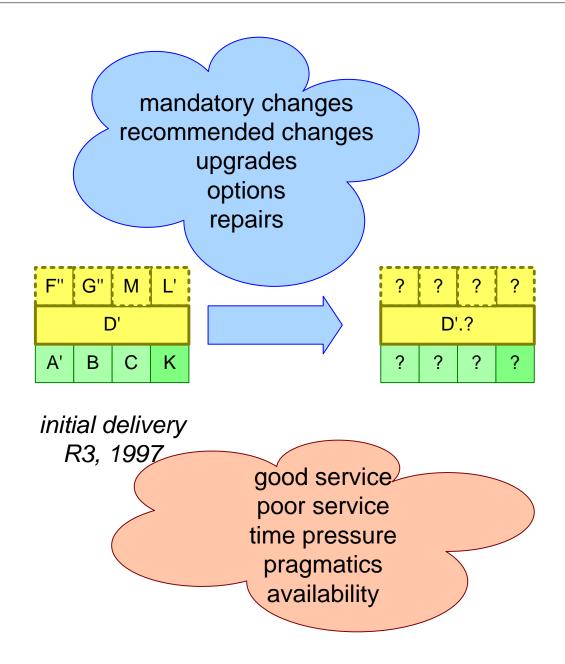


Product Configurations Evolve Continuously



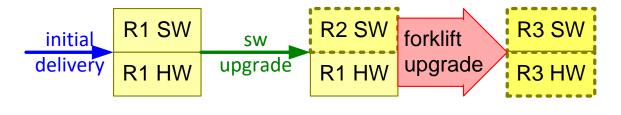


Regression of Configuration





Compatibility and Upgrading



How long are new functions compatible with older system configurations?



When to break compatibility?

example

initial R3 SW delivery R3 HW

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

When does the customer pay for an upgrade? When to retrofit?



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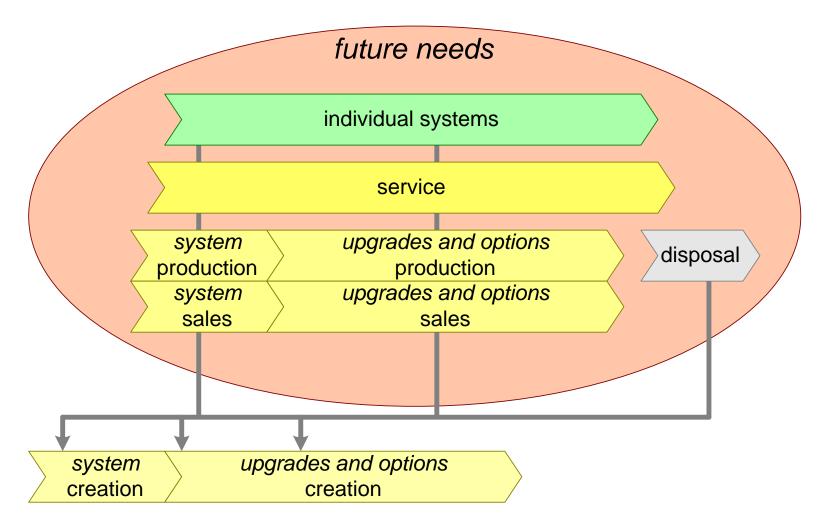
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Systems Engineering and PLM



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



Basic System Life Cycle

conception creation production operation disposal

