Quantifying Product Line Benefits

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Motivation (1/2)

Contents
- Motivation
- Development Effort
- Time-to-Market
- Customer Issues
- Features
- COTS Integration
- Certification
- Summary

- Qualitative arguments for product line engineering, such as
  - Effort reduction
  - Time-to-market reduction
  - Quality improvement

  etc. are often used.
- Quantitative models exist few, validation of these models hardly any

⇒Few examples of well-constructed business cases for product line engineering exist

⇒Convincing business cases should demonstrate how product line engineering leads to the fulfillment of the goals of the potential investors in product line

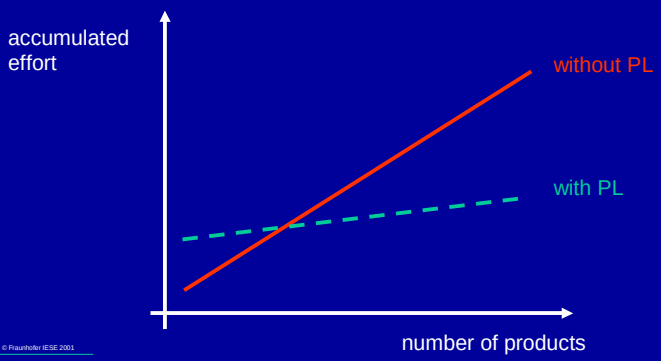
Motivation (2/2)

- Who are the people we want to / need to convince:

- Business cases are interest- / viewpoint-specific
- Example: 7 Hypotheses how software product lines support the particular goals of a product manager.

Hyp. 1: Development Effort

- After some initial investment,
  the effort that has to be spent per product derived from a product line decreases significantly below
  the effort that has to be spend for the development of the same product as single system,
  yielding cumulative effort savings.



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Hyp. 2: Time-to-market

Contents
- Motivation
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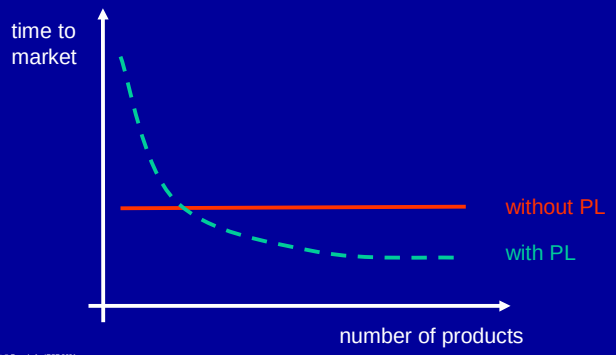
- After some initial investment, the time to market per product derived from a product line decreases down to a certain minimum and significantly below the respective time to market in the case of single system development.



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Hyp. 3: Time to close Customer Issues

Contents
- Motivation
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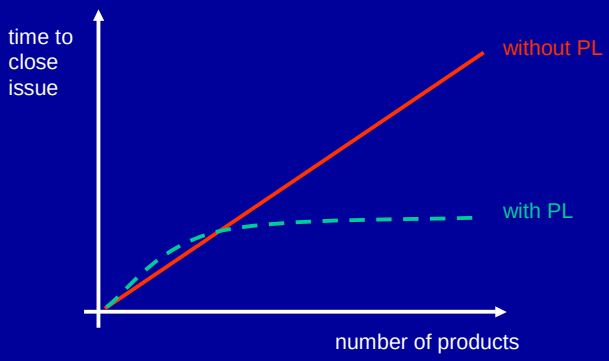
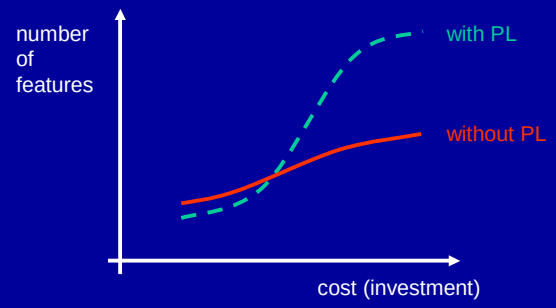
- The time to close customer issues remains almost constant within a product line, whereas it increases proportional to the number of products for single system development.



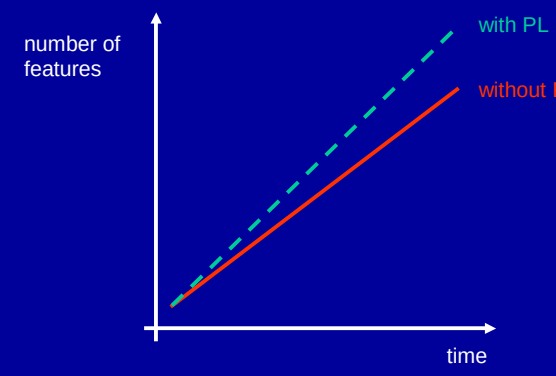
Hyp. 4: Number of Features (over Money)

- Beyond a certain minimum investment, more features can be developed with a given amount of money when developed within a product line than without.



Hyp. 5: Number of Features (over Time)

- With software product line development, more features can be developed within a given amount of time than without.



Hyp. 6: Time to integrate COTS Components

- The time per product to integrate COTS components into a product line decreases with a growing number of products, whereas it remains constant for products produced as single systems.

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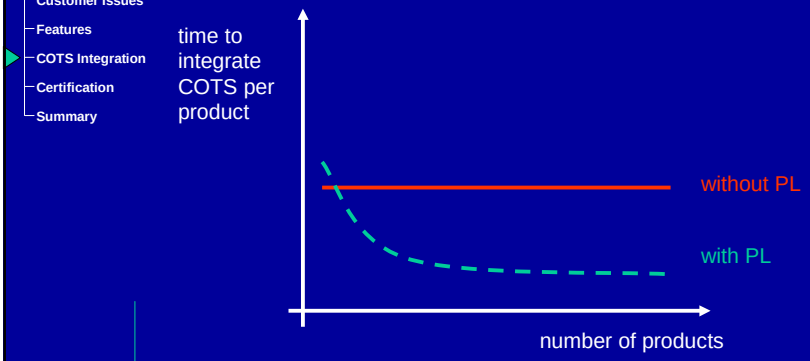

Hyp. 7: Time for Certification

- Beyond a certain minimum of products, the time to certify a product developed within a product line decreases below the time needed to certify products that have been developed as single systems.

Contents
- Motivation
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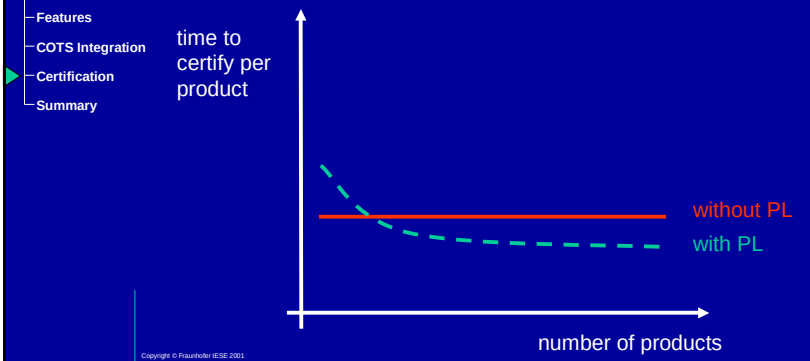

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Summary

Contents

Presented: 7 hypotheses, that, if validated, would (hopefully) convince a product manager to invest in product line engineering.

Issues to be discussed:

- What about the hypotheses and the shape of the different curves?
- What other arguments are there for a product manager?
- What are respective business cases needed to convince other customer groups?

- Where can we get currently existing / available data,
  can they be made accessible in comparable form (repeatable)?
- How can / should experiments be designed in order to produce quantitative data,
  what environment is needed to perform them?