

Module Product Families and Generic Developments

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Abstract

This module addresses product families and generic developments.

Distribution

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status: preliminary

draft

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Product Families and Generic Aspects

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Abstract

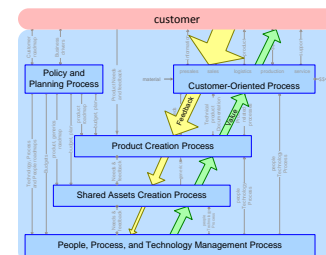
Most products fit in a larger family of products. The members of such a product family share a lot of functionality and features. It is attractive to share implementations, designs et cetera between those members to increase the efficiency of the entire company.

In practice many difficulties pop up when product developments become coupled, due to the partial developments which are shared. This article discusses the advantages and disadvantages of a family approach based on shared developments and provides some methods to increase the chance on success.

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Typical Examples of Generic Developments

Platform

Common components

Standard design

Framework

Family architecture

Generic aspects, functions, or features

Reuse

Products (in project environment)

Claimed Advantages of Generic Developments

Reduced time to market	building on shared components
Reduced cost per function	build every function only once
Improved quality	maturing realization
Improved reliability	
Improved predictability	
Easier diversity management	modularity
Increases uniformity	less learning
Employees only have to understand one base system	
Larger purchasing power	economy of scale
Means to consolidate knowledge	
Increase added value	not reinventing existing functionality
Enables parallel developments of multiple products	
“Free” feature propagation	product-to-product or project-to-project

Experiences with reuse, from counterproductive to effective

bad

longer time to market
high investments
lots of maintenance
poor quality
poor reliability
diversity is opposed
lot of know how required
predictable too late
dependability
knowledge dilution
lack of market focus
interference
but integration required

good

reduced time to market
reduced investment
reduced (shared) maintenance cost
improved quality
improved reliability
easier diversity management
understanding of one base system
improved predictability
larger purchasing power
means to consolidate knowledge
increase added value
enables parallel developments
free feature propagation

Successful examples of reuse

homogeneous domain

cath lab
MRI
television
waferstepper

hardware dominated

car
airplane
shaver
television

limited scope

audio codec
compression library
streaming library

Limits of successful reuse

struggle with integration/convergence with other domains

TV: digital networks and media
cath lab: US imaging, MRI

poor/slow response on paradigm shifts

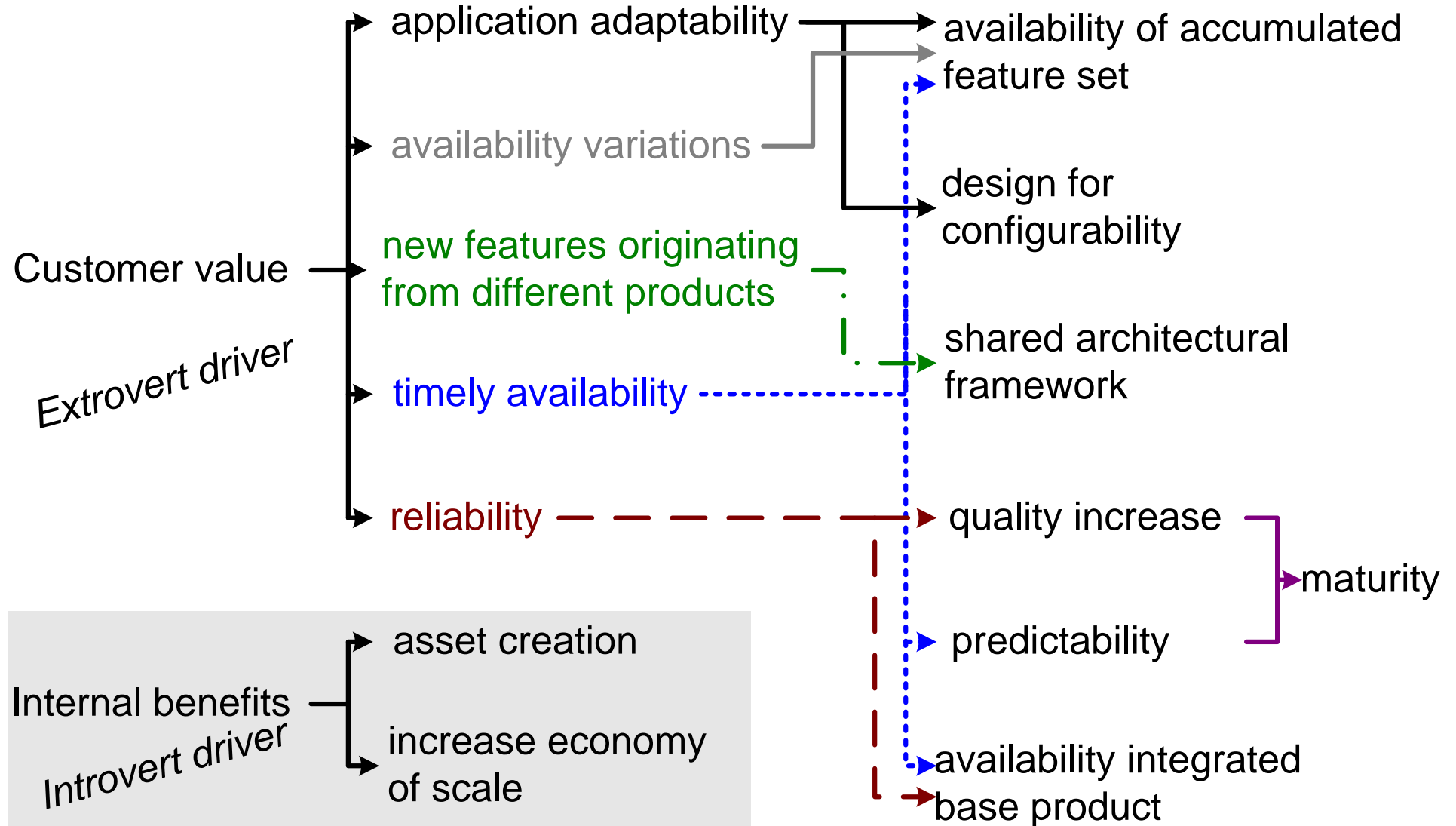
TV: LCD screens
cath lab: image based acquisition control

software maintenance, configurations, integration, release

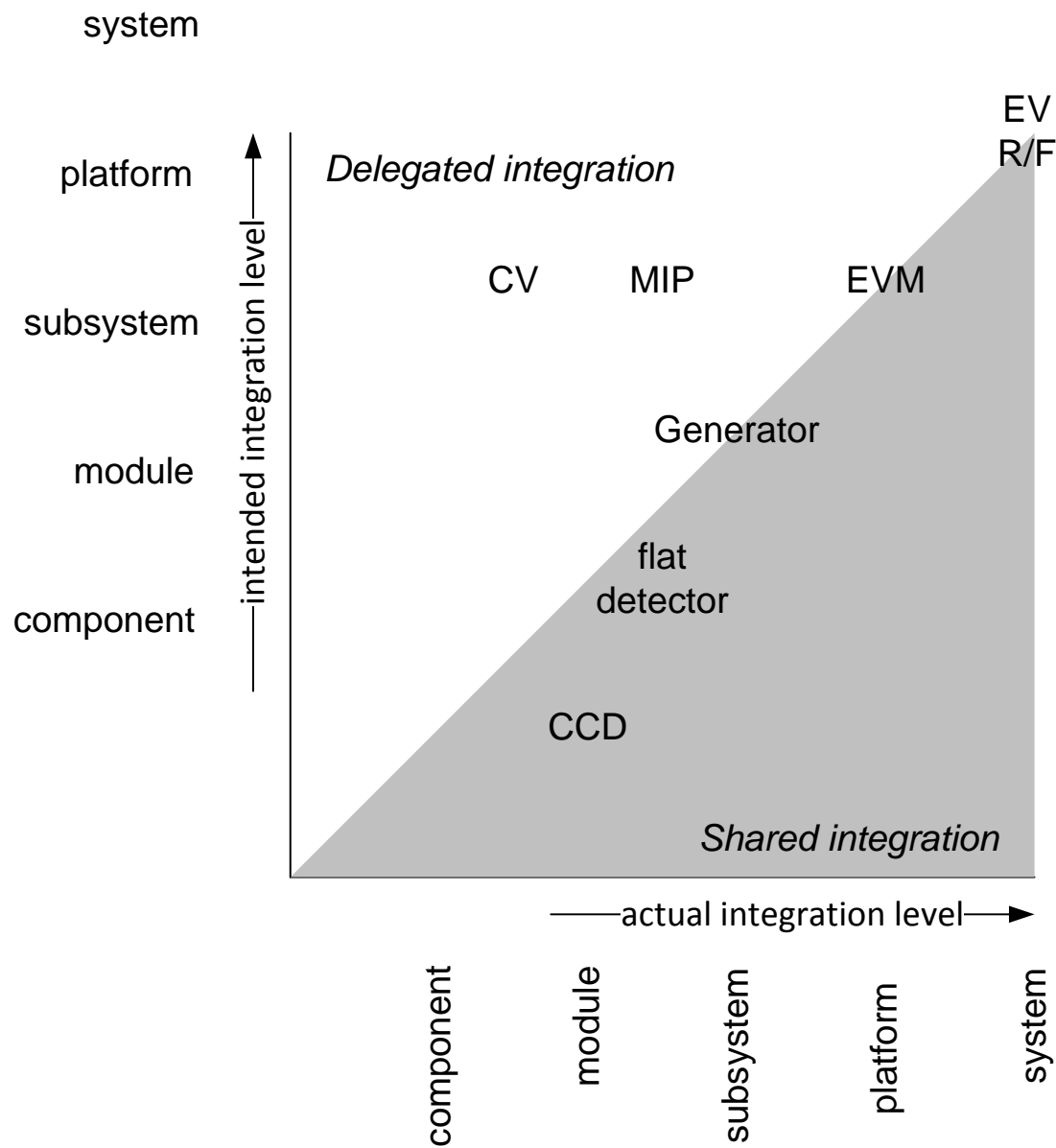
MRI: integration and test
wafersteppers: number of configurations

how to innovate??

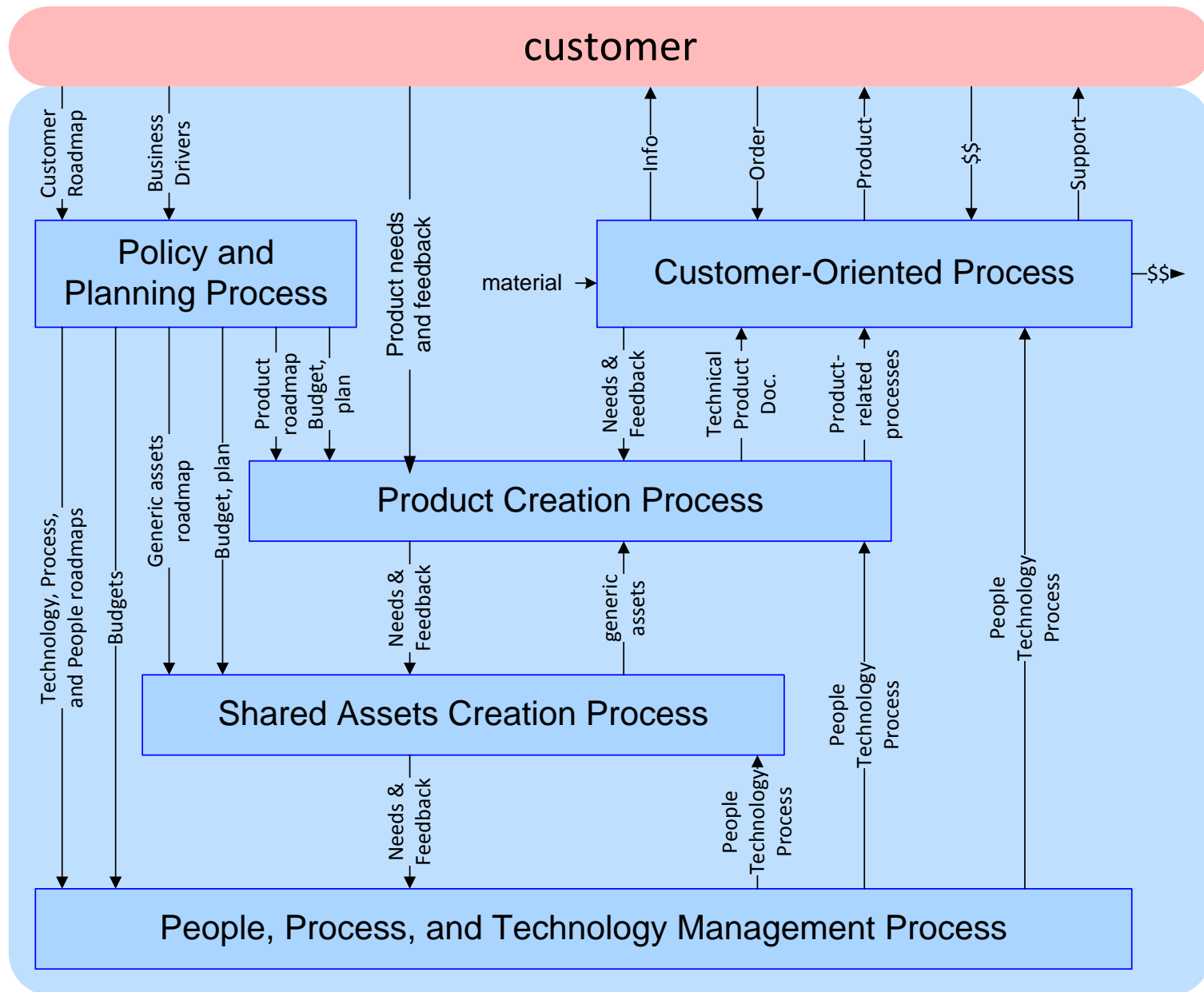
Drivers for Generic Developments



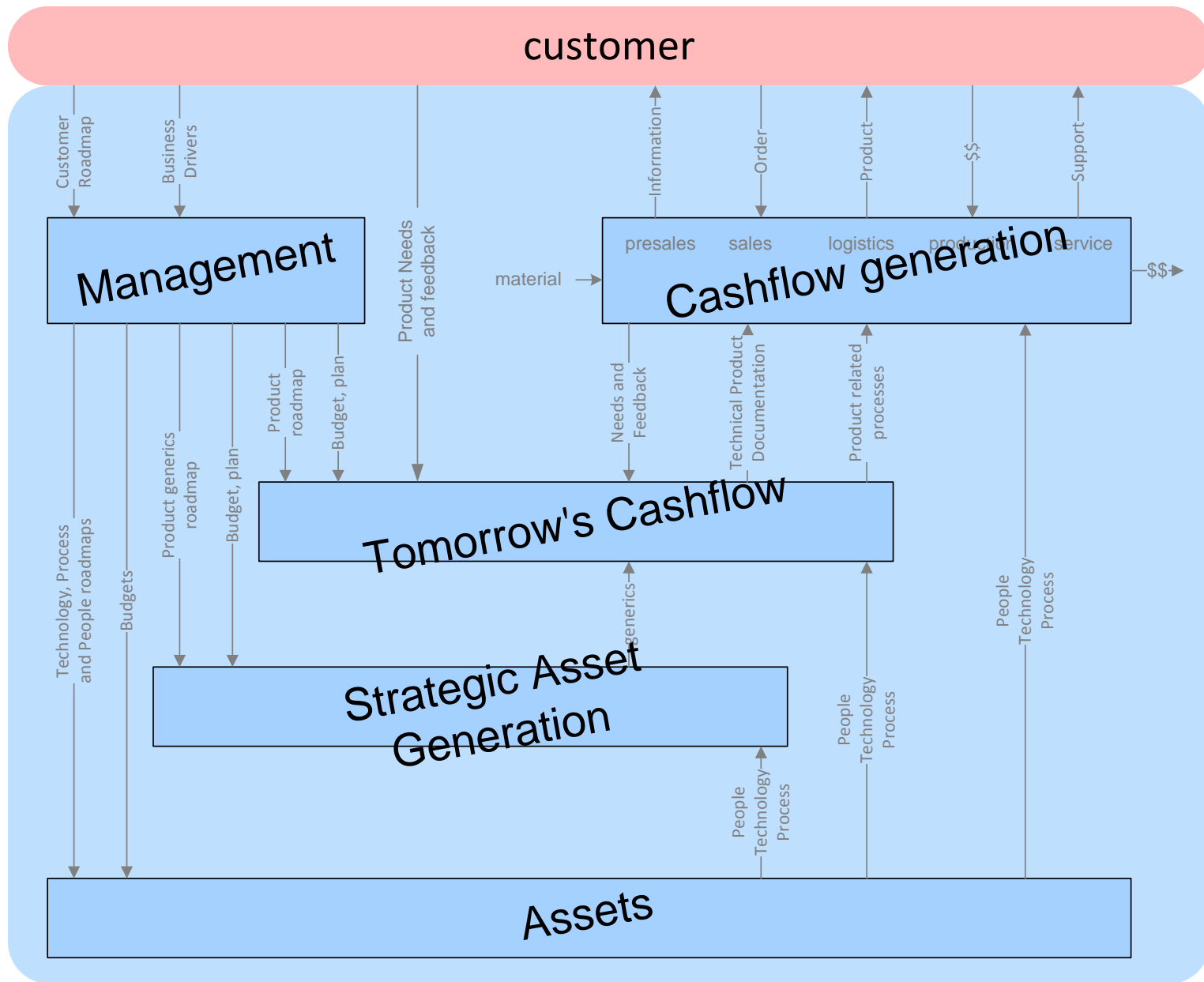
Granularity of generic developments shown in 2 dimensions



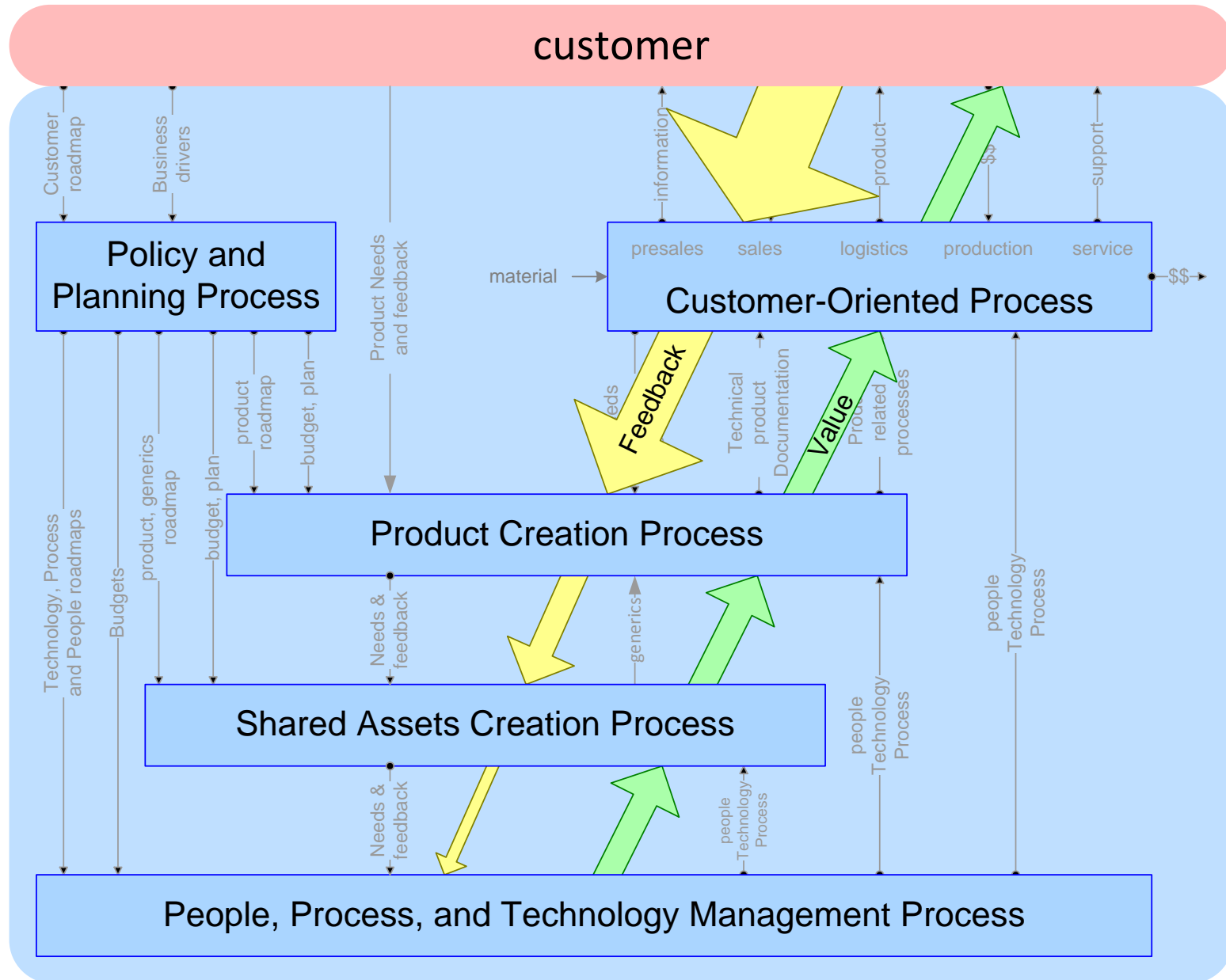
Modified Process Decomposition



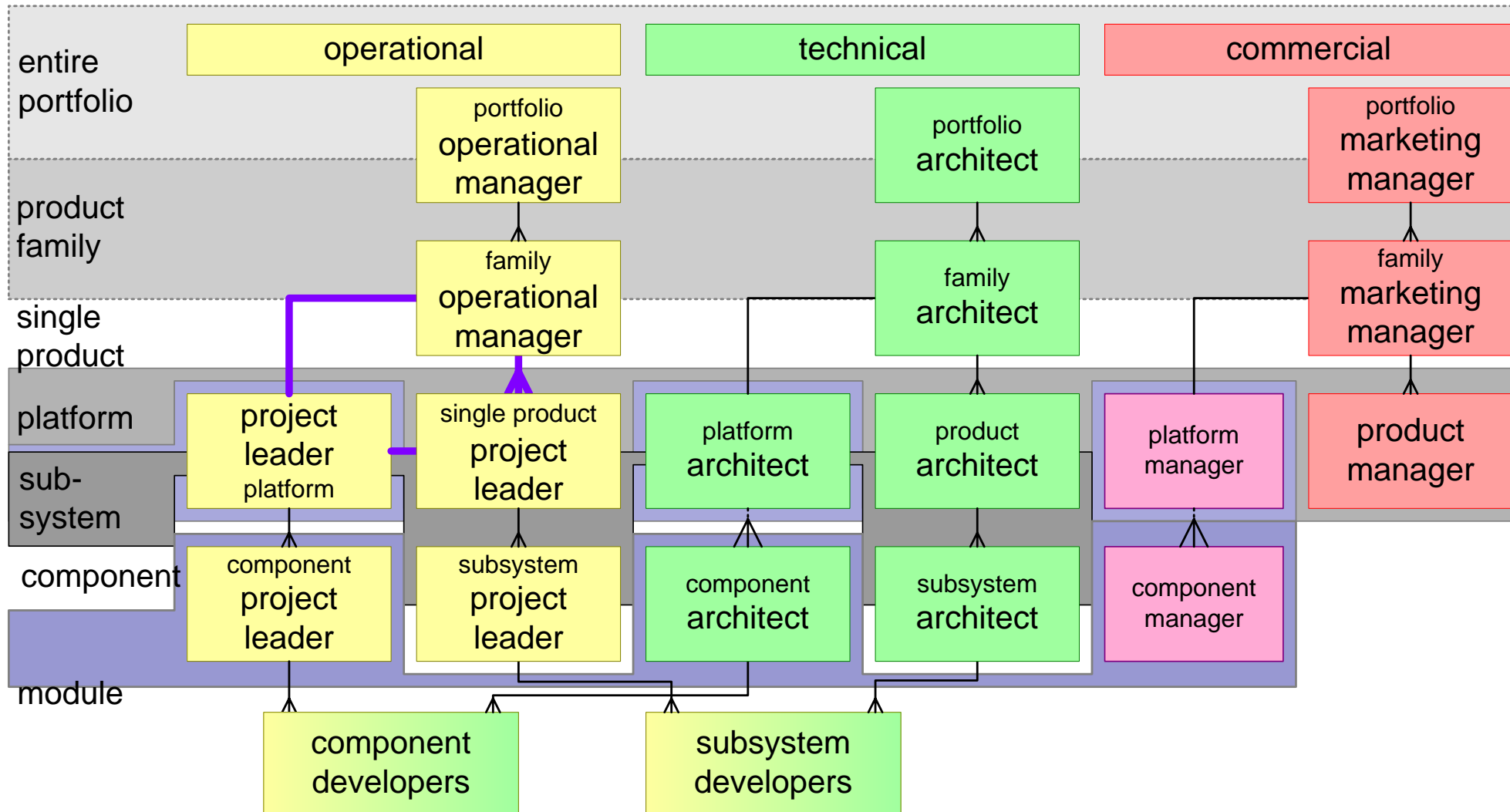
Financial Viewpoint on Process Decomposition



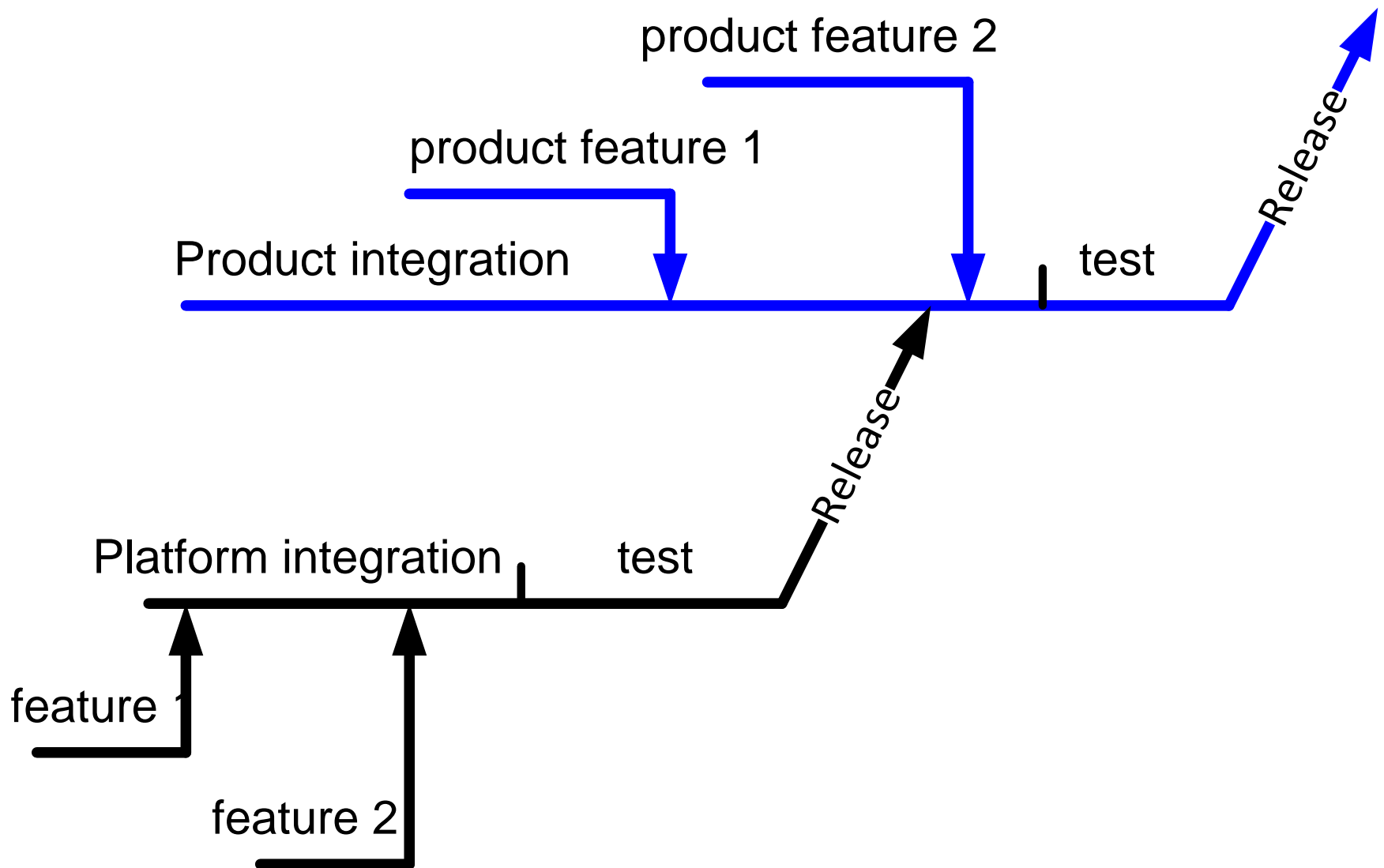
Value and Feedback Flow



Modified Operational Organization PCP



Propagation Delay Platform Feature to Market



Sources of Failure in Generic Developments

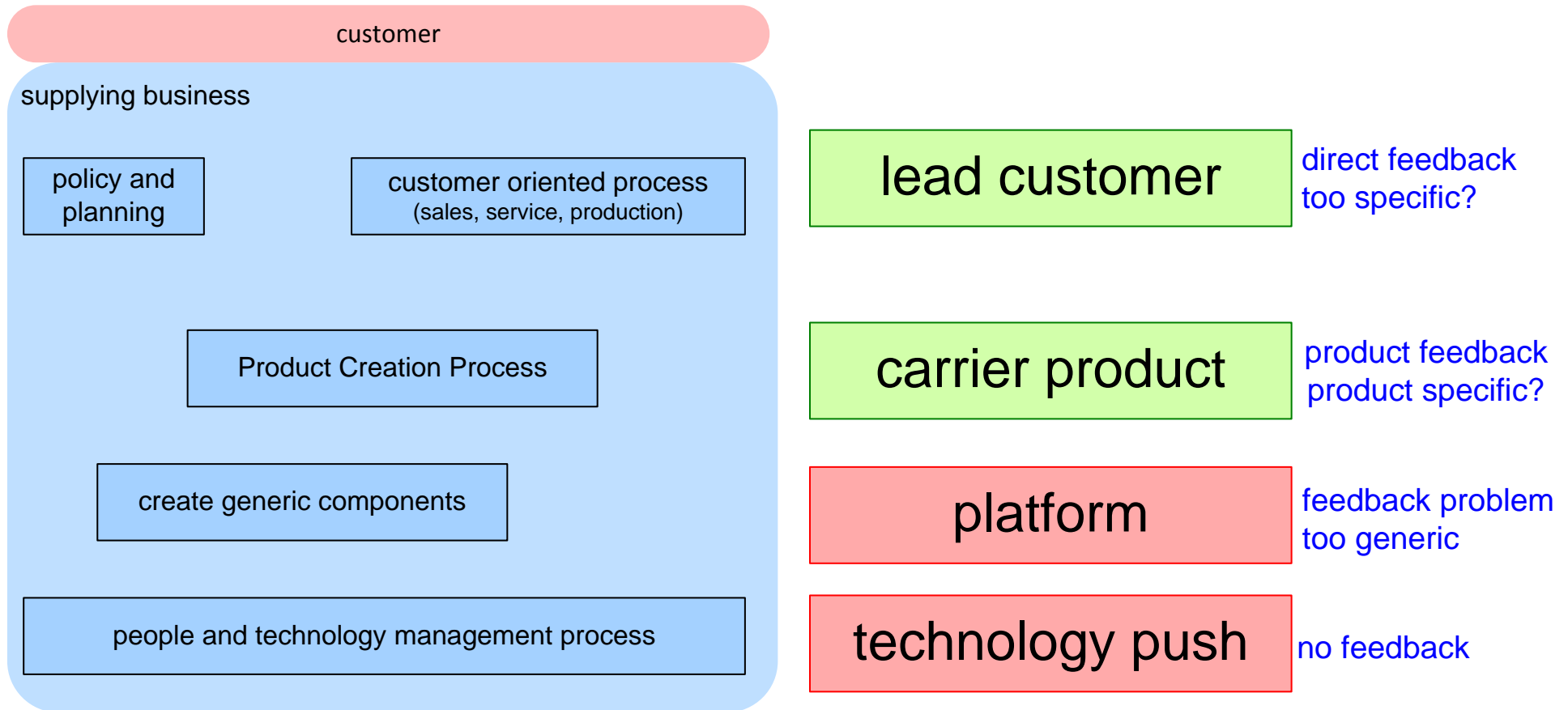
Technical

- Too generic
- Innovation stops (stable interfaces)
- Vulnerability

Process/People/Organization

- Forced cooperation
- Time platform feature to market
- Unrealistic expectations
- Distance platform developer to customer
- No marketing ownership
- Bureaucratic process (no flexibility)
- New employees, knowledge dilution
- Underestimation of platform support
- Overstretching of product scope
- Nonmanagement, organizational scope increase
- Underestimation of integration
- Component/platform determines business policy
- Subcritical investment

Models for Generic Development



Exercise Generic Developments

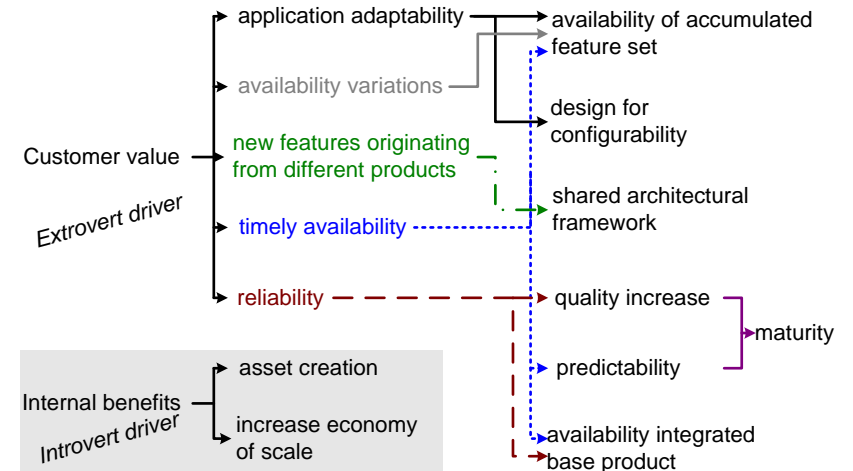
What are the top 3 benefits for your product family or generic development?
What are the top 3 disadvantages?

Harvesting Synergy

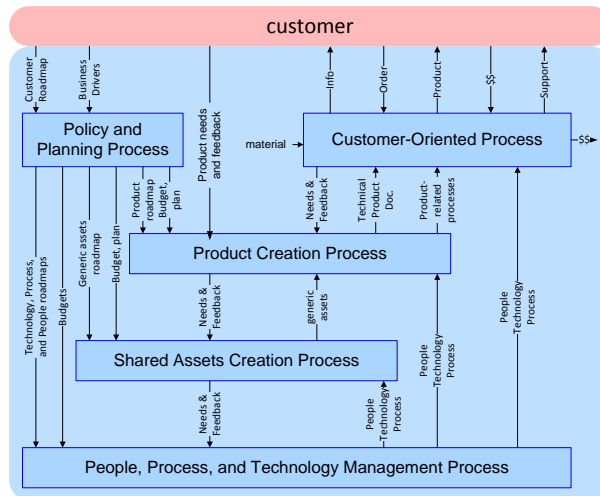
Contradicting Experiences

bad	good
longer time to market	reduced time to market
high investments	reduced investment
lots of maintenance	reduced (shared) maintenance cost
poor quality	improved quality
poor reliability	improved reliability
diversity is opposed	easier diversity management
lot of know how required	understanding of one base system
predictable too late	improved predictability
dependability	larger purchasing power
knowledge dilution	means to consolidate knowledge
lack of market focus	increase added value
interference	enables parallel developments
but integration required	free feature propagation

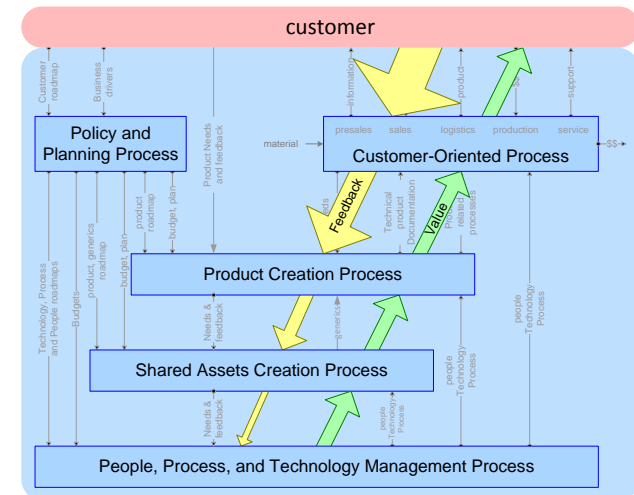
Drivers



Shared Asset Creation Process

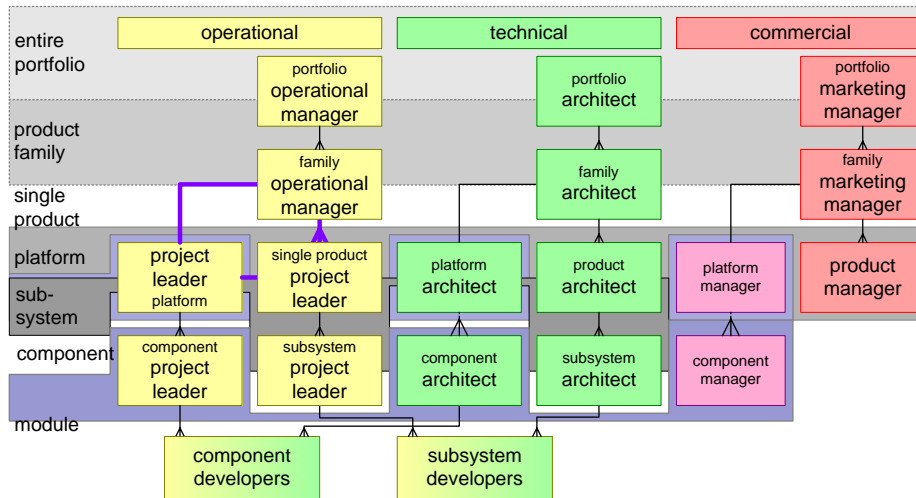


Longer Chains

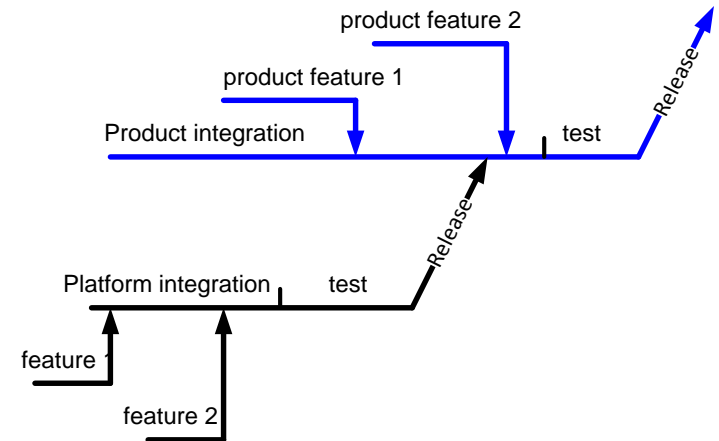


Some Architecting Means

Organizational Complexity



Delay to Market



Pitfalls

Technical

- Too generic
- Innovation stops (stable interfaces)
- Vulnerability

Process/People/Organization

- Forced cooperation
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- Component/platform determines business policy
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Successful and Failing Models

