Abstract
The enterprise and its application is a complex system in itself. Specification and design decisions can have a significant impact on this system. We show a number of relevant application models with the purpose to be able to reason about specification and design in relation to the impact on the enterprise.
Understanding Usage and Life Cycle Context

High Level Visual Models
+ value chain
+ map of competitors, partners, suppliers
+ context diagram
+ stakeholder diagram
+ infrastructure diagram
+ aspect diagrams e.g. security, data integrity, ..
+ customer key driver graph
+ life cycle key driver graph

relations beyond actual system!

- commercial
- financial
- legal
- strategic
- tactical
- operational
- social
- technical
Simplified Web Shop Value Chain

- Suppliers
- Virtual shop
- Sales
- Order
- Goods flow
- Goods
- Management
- Products
- Customers
- Finance
- Payment
- Customers
- Service level
- IT services
- Web services
- IT infrastructure
Simplistic Customer Key Driver Graph

- high sales
  - right pricing
  - right presentation
  - up to date product offering
- fast delivery
  - fast goods processing
  - goods flow tuning
- low capital use
  - minimal stocks
- predictable (low) cost level
  - strategic outsourcing
  - service level agreement
  - reduce running cost
- accurate financial status
  - financial processes
- prevention of virtual crime
  - access control
  - security management

- easy change of product database
- easy update of product attributes
- responsive portal
- reporting & analysis
- easy update of flow
- service cost/volume
- financial reporting & analysis
- work flow support
- access administration
- authentication
- auditing, logging
- security reporting
Example Assessment of Design Choices

Are these concerns: relevant? significant?

What is the impact at enterprise level?
Example Zero Order Problem Statement

How does the picture cache design impact predictable (low) cost level responsive portal service cost/volume

- high sales
- fast delivery
- low capital use
- accurate financial status
- prevention of virtual crime

- right pricing
- right presentation
- goods flow tuning
- fast goods processing
- minimal stocks
- strategic outsourcing
- service level agreement
- reduce running cost
- financial processes
- access control
- security management

- up to date product offering
- easy change of product database
- easy update of product attributes
- reporting&analysis
- easy update of flow
- financial
- reporting&analysis
- work flow support
- access administration
- authentication
- auditing, logging
- security reporting

reduce running cost
Zero Order Cost Model

\[
\text{total cost} = f + s(v) + p \times v + g \times v
\]
where
\[
f = \text{fixed base cost}
\]
\[
s = \text{service cost, see below}
\]
\[
p = \text{personnel cost including overheads}
\]
\[
v = \text{volume}
\]
\[
g = \text{goods flow handling}
\]

Service cost \( s(v) = b + c \times v \)
where
\[
b = \text{fixed base cost}
\]
\[
c = \text{cost / volume}
\]
\[
v = \text{volume}
\]
all including provider margin
**Example Low Volume, Labor Intensive, Shop**

*low volume, labor intensive, shop*

Fixed costs and personnel cost dominate:
Service cost changes have negligible impact on total cost!

\[
\text{total cost} = f + s(v) + p \cdot v + g \cdot v
\]

where
- \( f \) = fixed base cost
- \( s \) = service cost, see below
- \( p \) = personnel cost including overheads
- \( v \) = volume
- \( g \) = goods flow handling

\[
s(v) = b + c \cdot v
\]

where
- \( b \) = fixed base cost
- \( c \) = cost / volume
- \( v \) = volume

All including provider margin

**Modeling and Analysis: Application Models**

Version: 0.1
March 6, 2013
MAAMzeroOrderModelQuantified
Example High Volume, Highly Automated, Shop

**high volume, highly automated, shop**

variable service costs dominate:

service cost changes have big impact on total cost!

\[
\text{total cost} = f + s(v) + p \cdot v + g \cdot v
\]

where
- \(f\) = fixed base cost
- \(s\) = service cost, see below
- \(p\) = personnel cost including overheads
- \(v\) = volume
- \(g\) = goods flow handling

service cost \(s(v) = b + c \cdot v\)

where
- \(b\) = fixed base cost
- \(c\) = cost / volume
- \(v\) = volume

all including provider margin

<table>
<thead>
<tr>
<th></th>
<th>fixed base</th>
<th>personnel</th>
<th>goods flow</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1M</td>
<td>1M</td>
<td>1M</td>
</tr>
<tr>
<td>variable service</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>fixed base</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>personnel</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>goods flow</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>fixed base</th>
<th>personnel</th>
<th>goods flow</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1M</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td>100M</td>
<td></td>
<td>101k</td>
</tr>
</tbody>
</table>

\(s(100k) = 101k\)

<table>
<thead>
<tr>
<th></th>
<th>fixed base</th>
<th>personnel</th>
<th>goods flow</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1M</td>
<td></td>
<td></td>
</tr>
<tr>
<td>variable service</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>fixed base</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>personnel</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>goods flow</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>fixed base</th>
<th>personnel</th>
<th>goods flow</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1M</td>
<td>0.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>fixed service</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>variable service</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>fixed base</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>personnel</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>goods flow</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>fixed base</th>
<th>personnel</th>
<th>goods flow</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1M</td>
<td></td>
<td></td>
</tr>
<tr>
<td>fixed service</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>variable service</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>fixed base</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>personnel</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>goods flow</td>
</tr>
</tbody>
</table>

variable service costs dominate:
service cost changes have big impact on total cost!
Very simple, very coarse, zero order models provide insight in relevance of specification and design issues.

These models are used to identify relevant issues.