

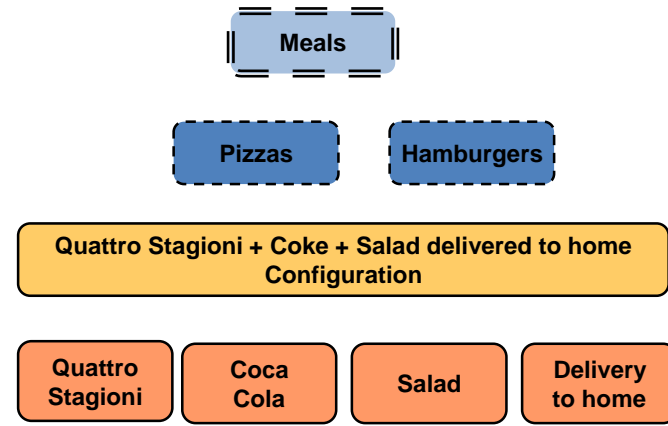
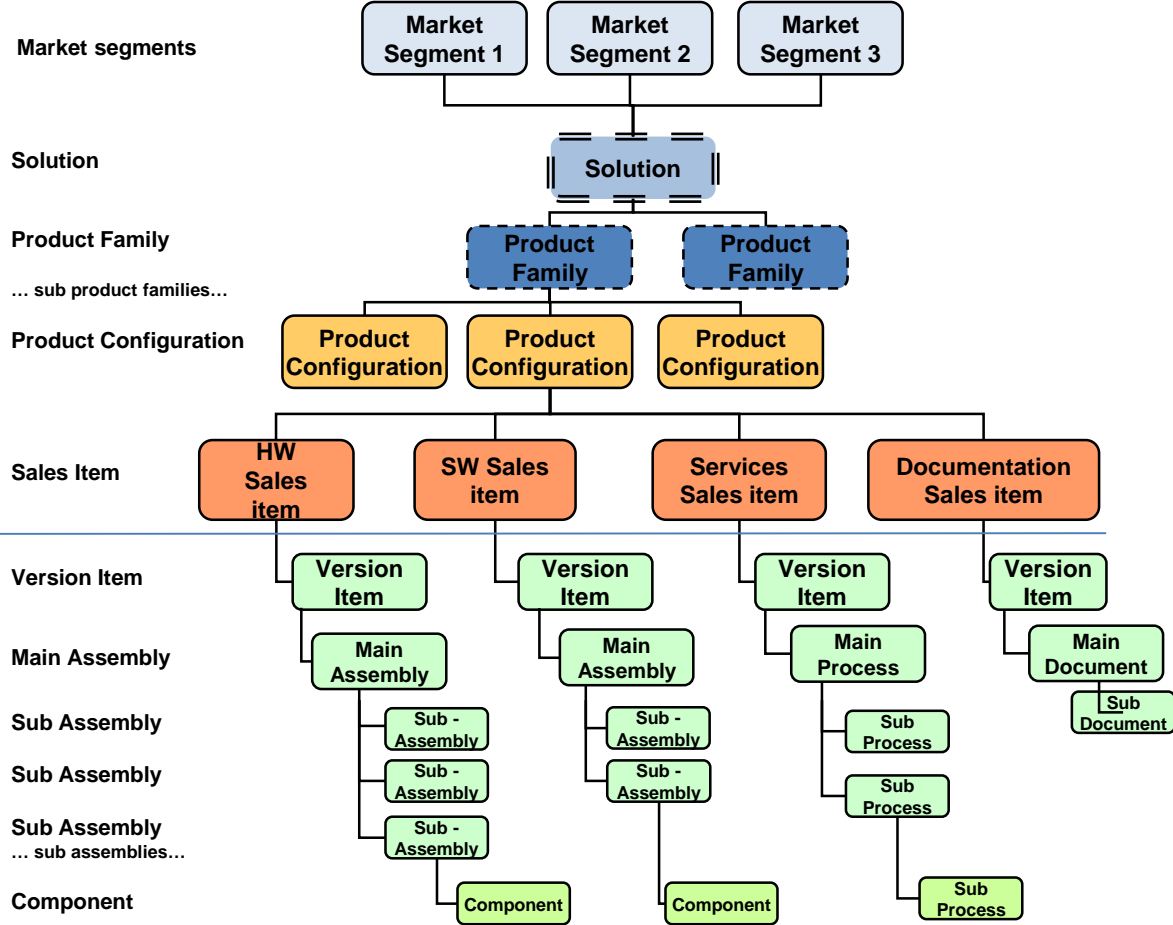
# RAIN työpaja 30.8.2017

## Product master data and the business process related product data over life cycle

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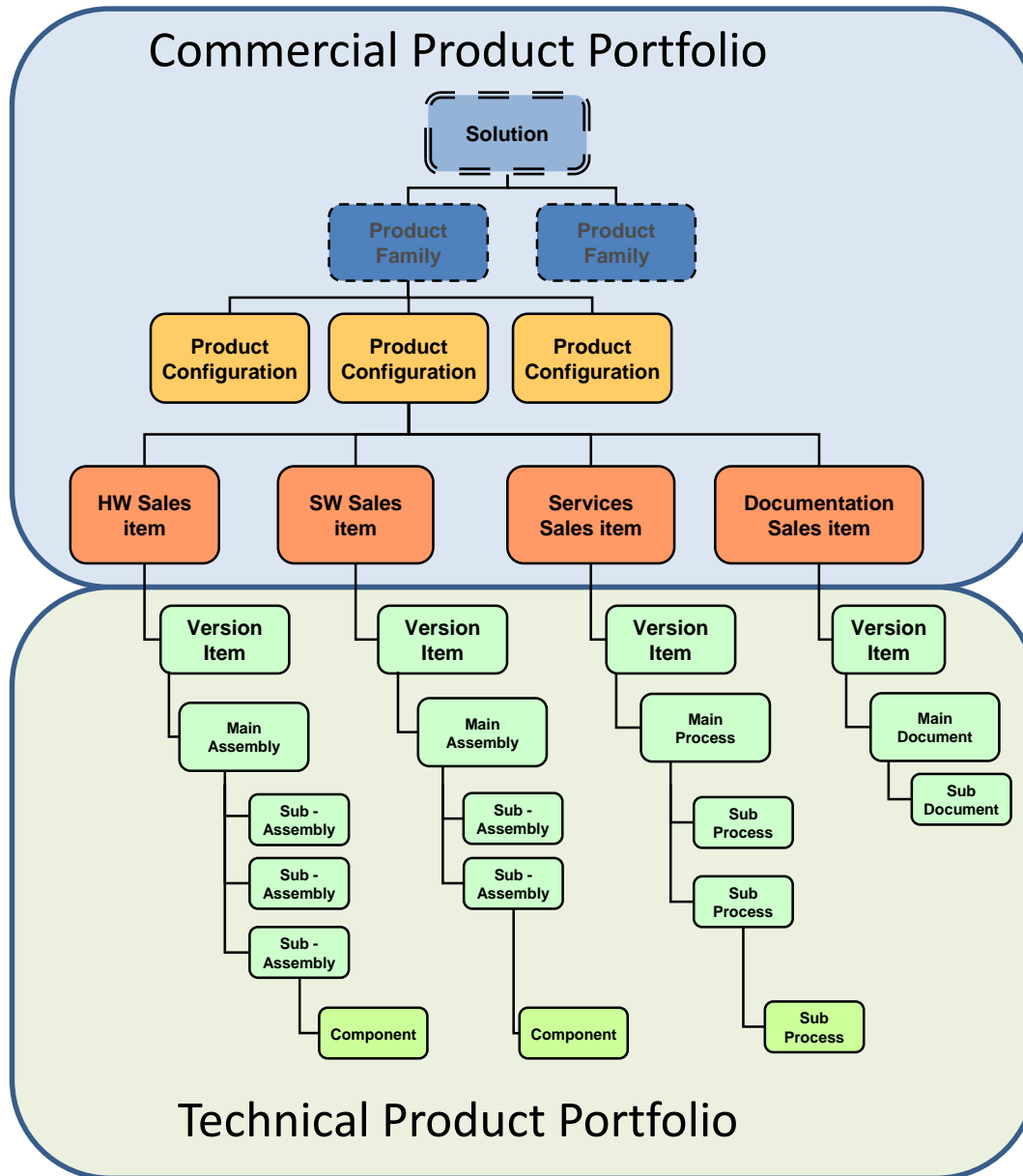
# Vertical productisation

## Product structure layers

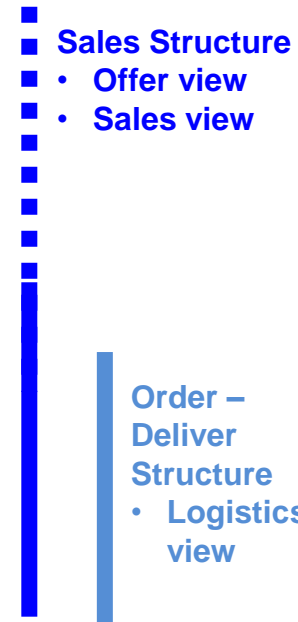


# Commercial and Technical Portfolios

Product structure - The Sales and Cost structures – Product Profitability



$$\text{Product Profitability} = \text{Sales} / \text{Costs}$$



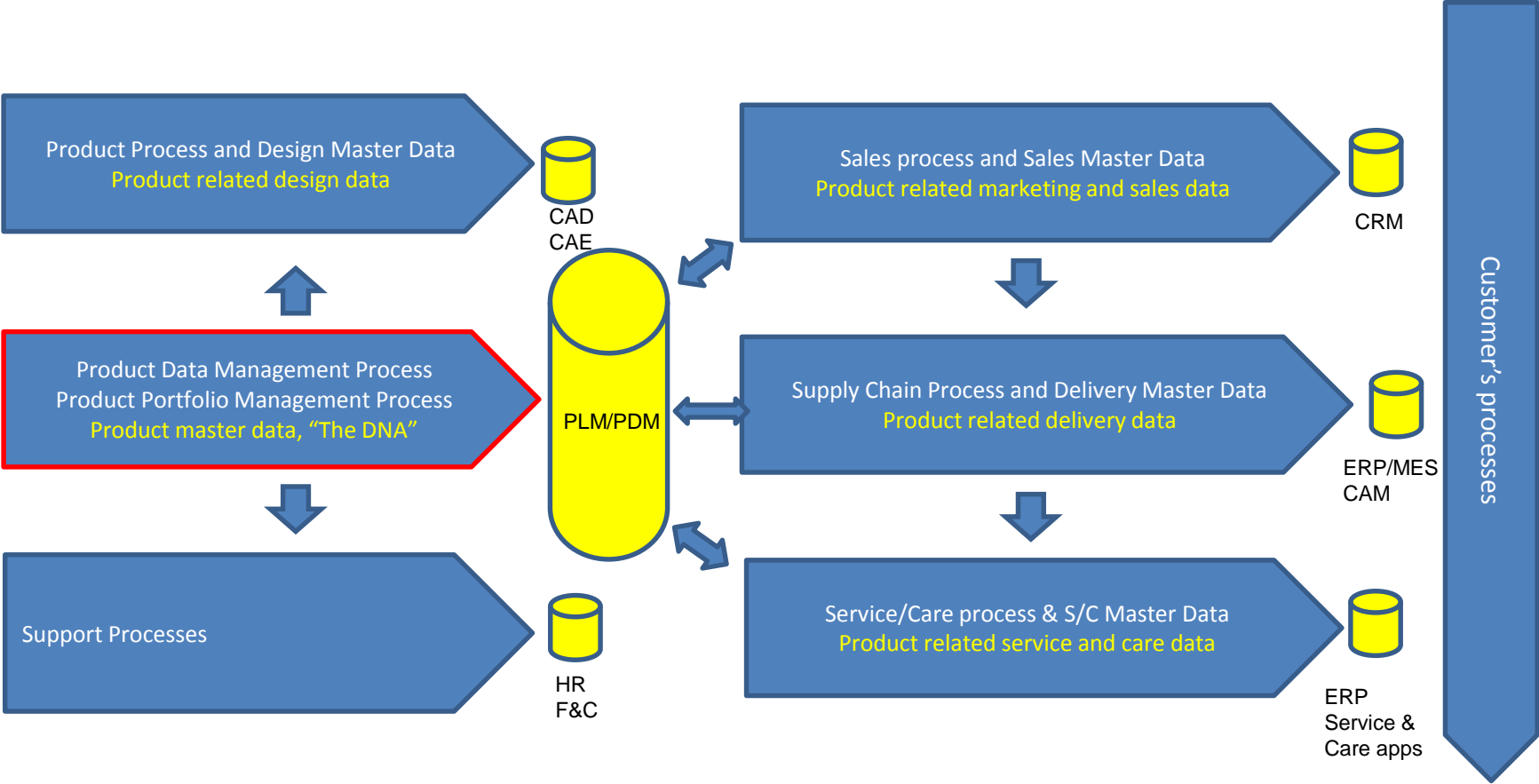
**Physical Structure (technical and manufacturing)**

- Product specific items
- Horizontal common items, modules and components
- Horizontal technology platforms

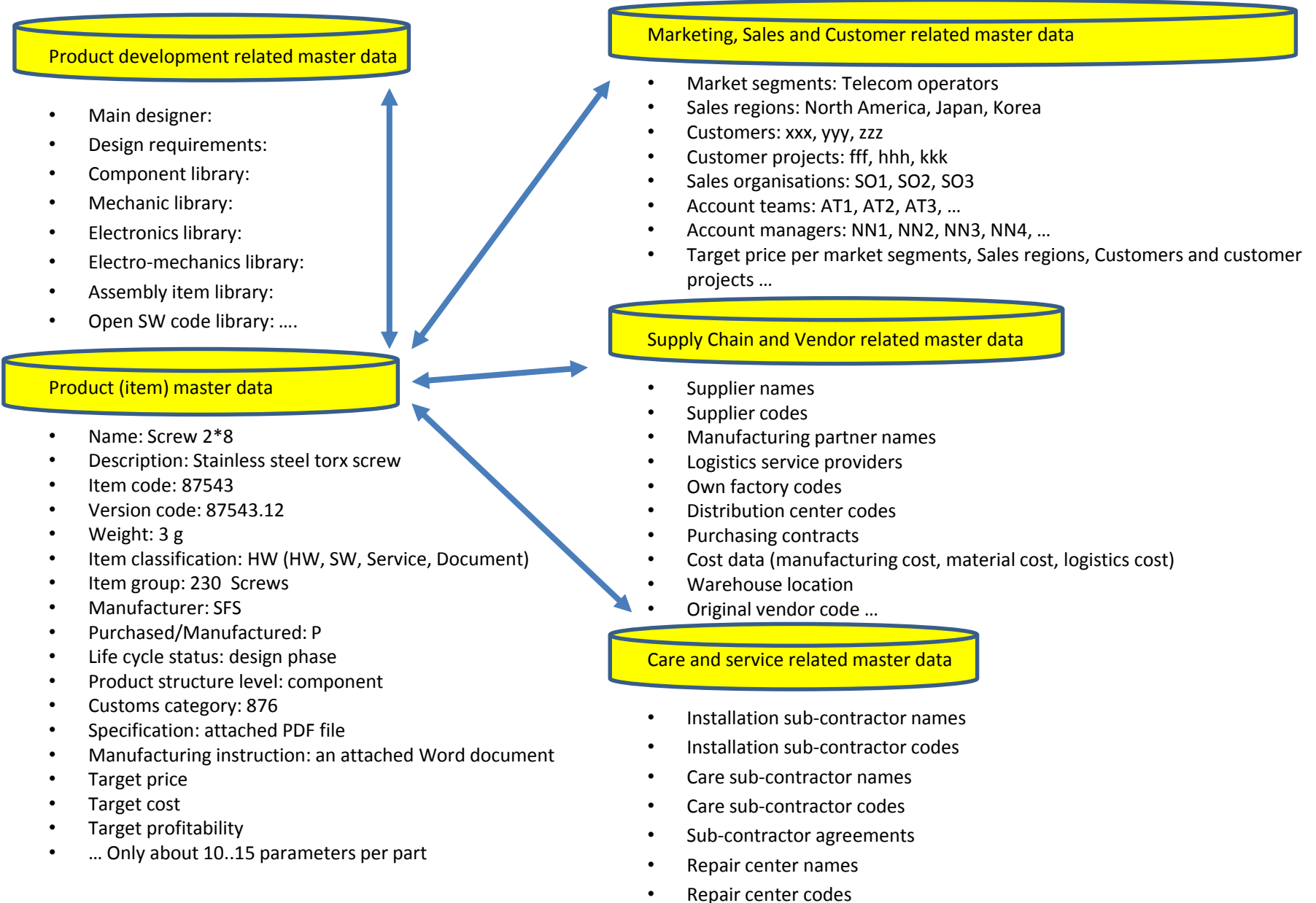
Sales

Cost

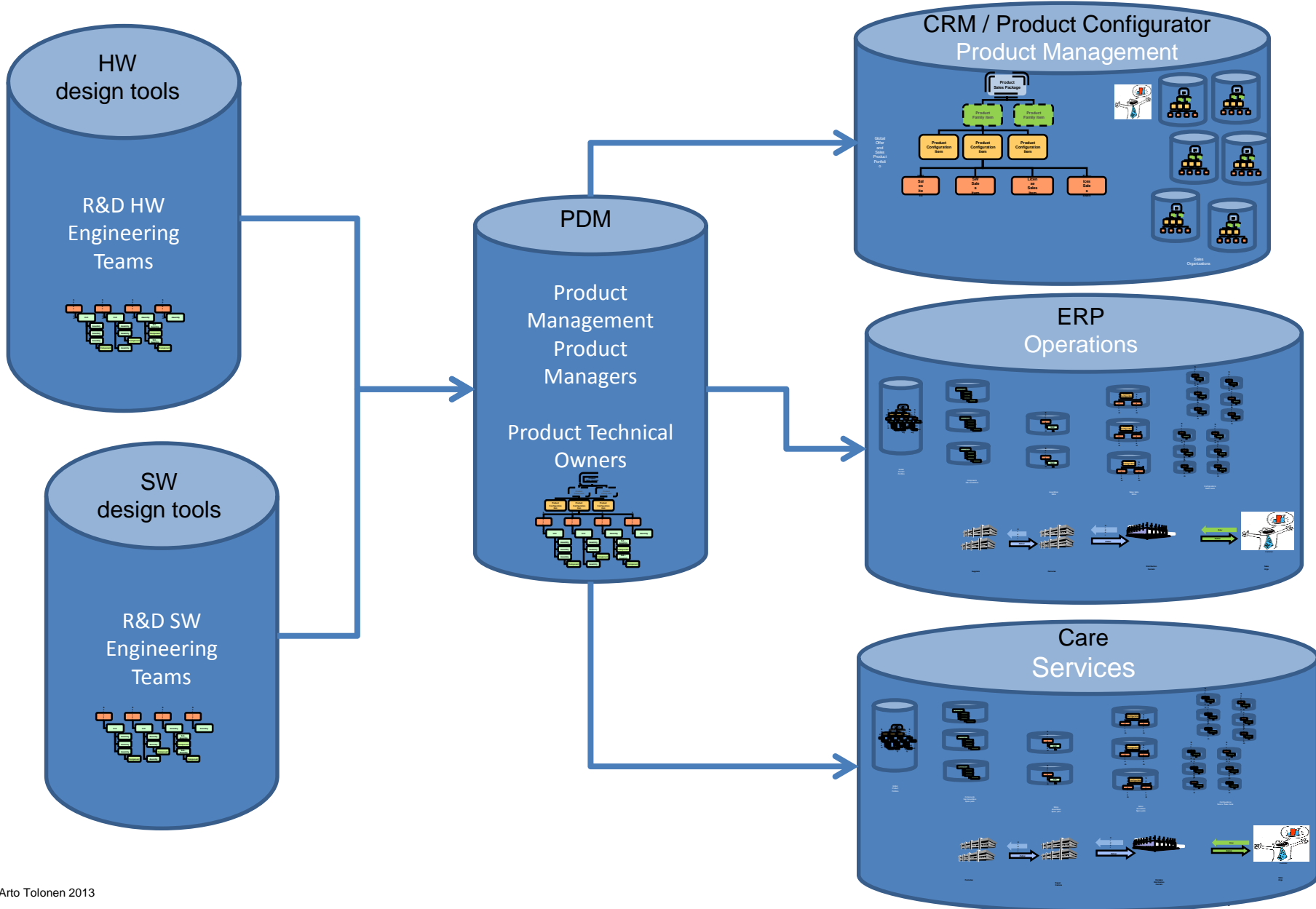
# Product master data and business process related product data



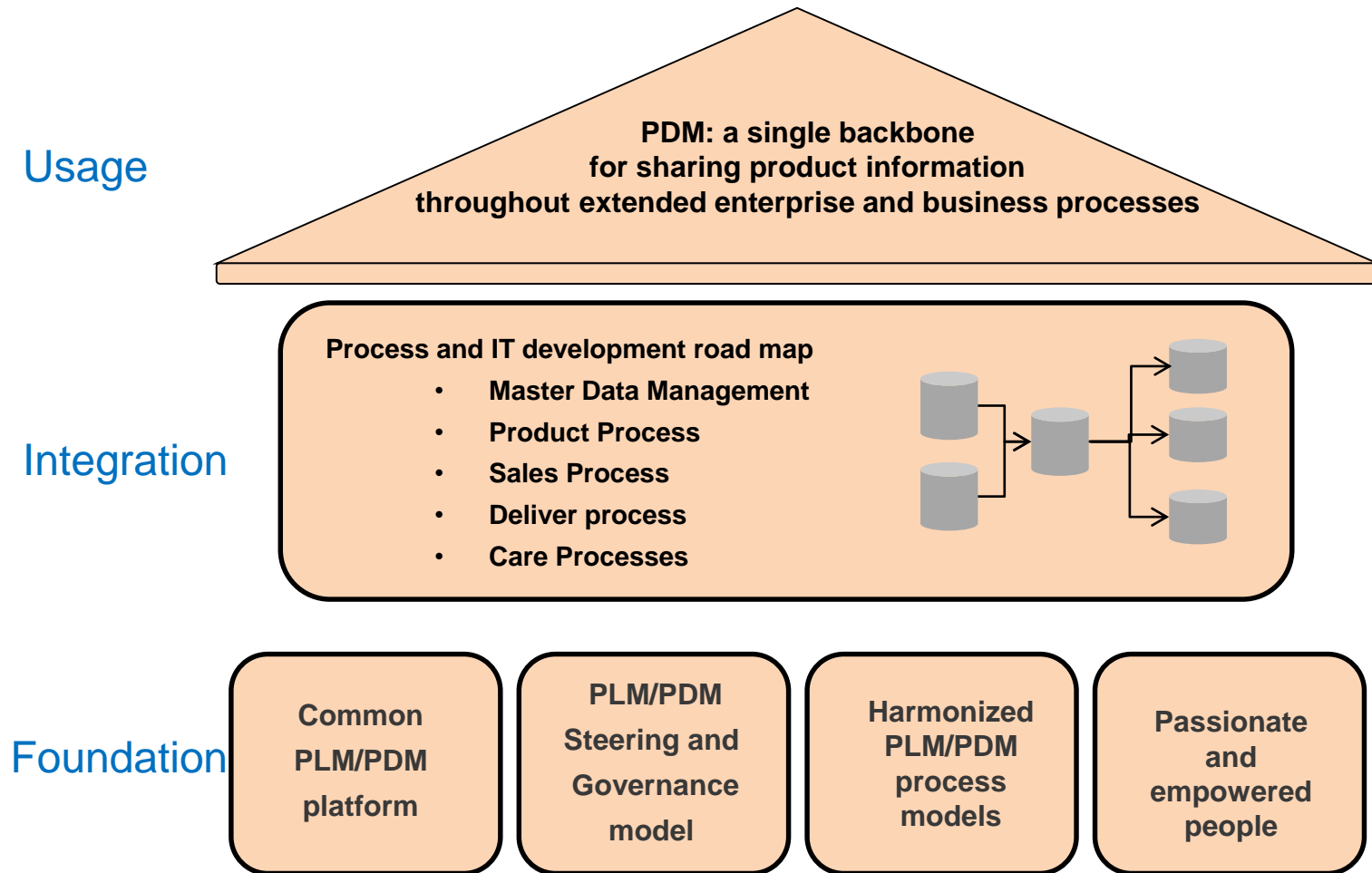
# Examples of the product master data – business process related product data



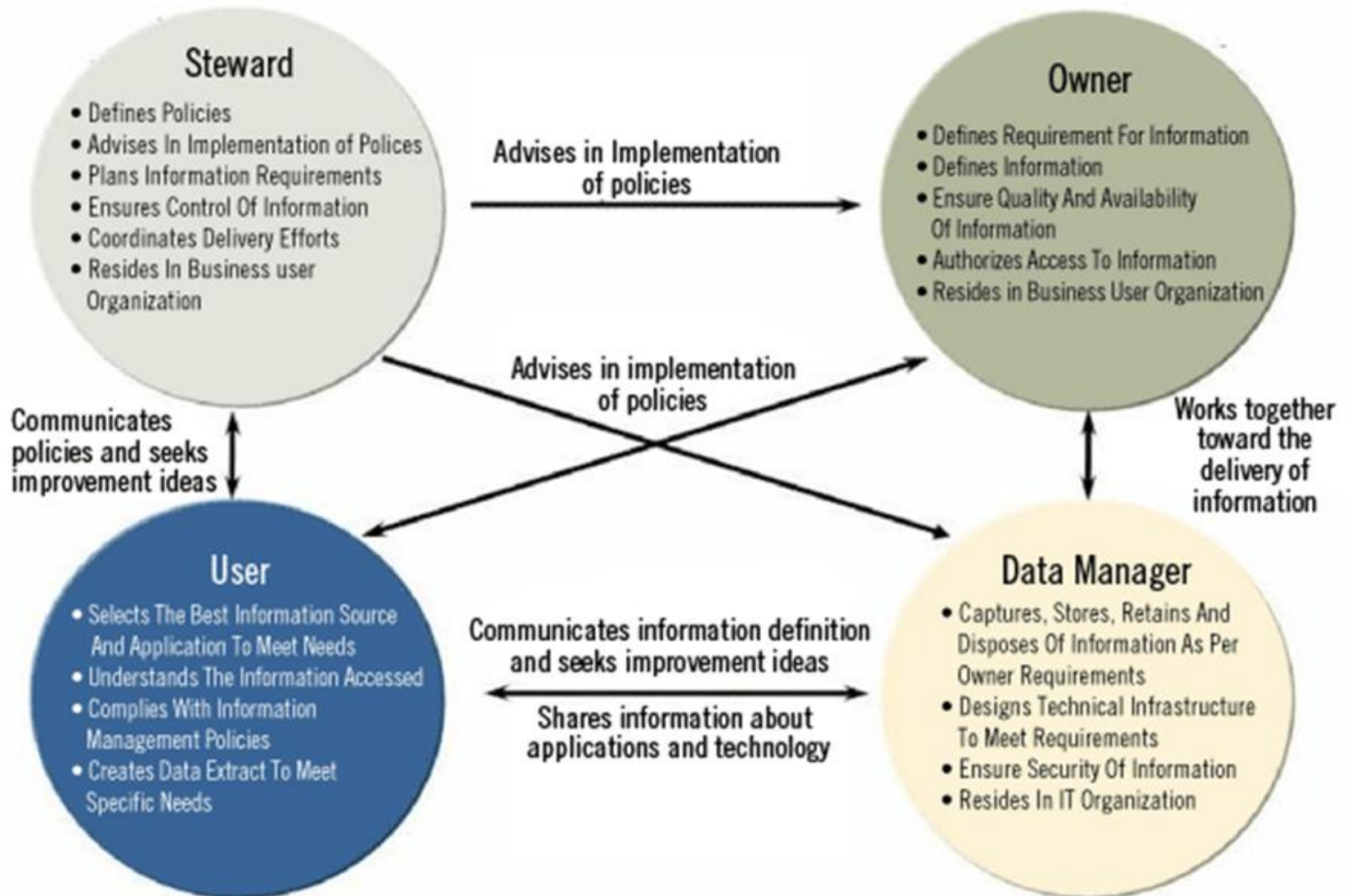
# Key information systems for product data management and business processes



# Necessary elements to manage product data



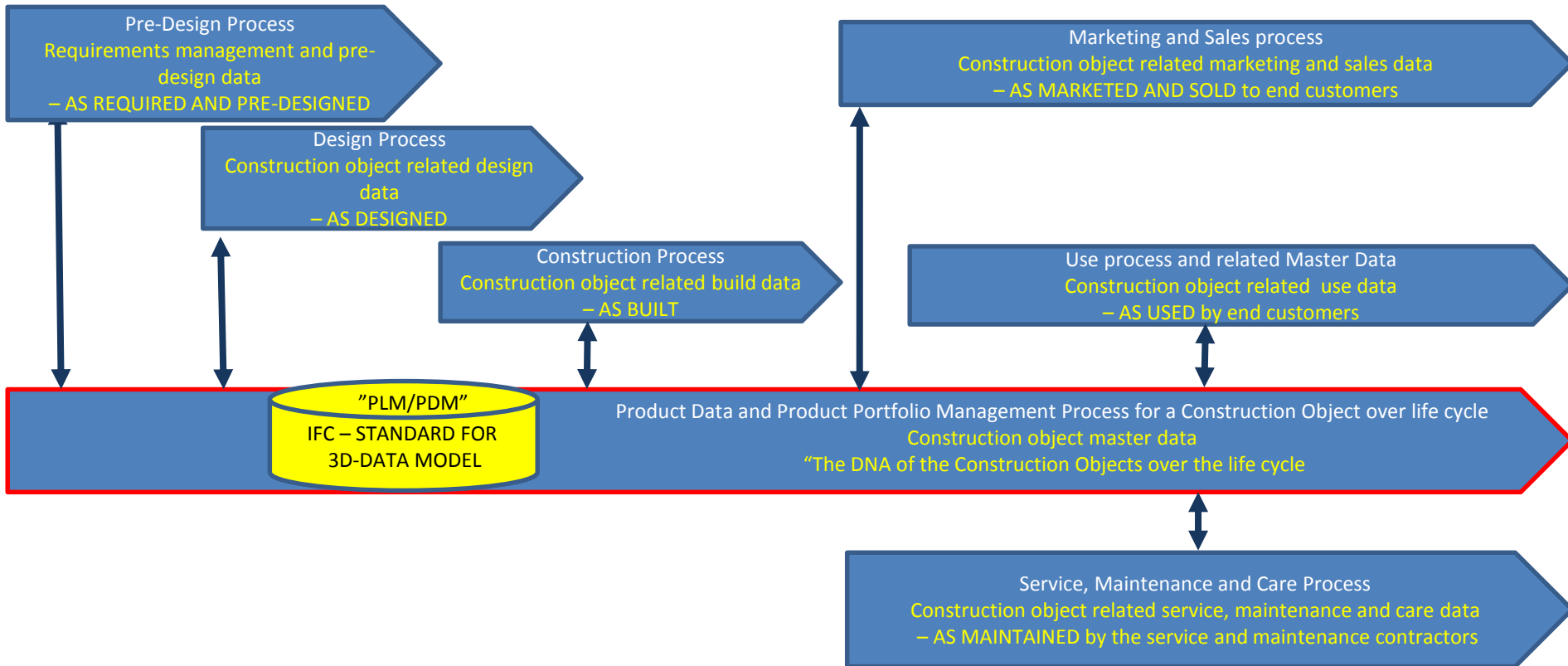
# PRODUCT DATA OWNERSHIP NETWORK - Typical data governance organization roles (Cohen 2006).





How to apply the earlier concept to  
construction business?

## The construction object related master data and the business process related stakeholders and product data



A construction object can be a single house, a bridge, a street, a living area, a city...

## The construction object related master data

"PLM/PDM"

IFC – STANDARD FOR  
3D-DATA MODEL

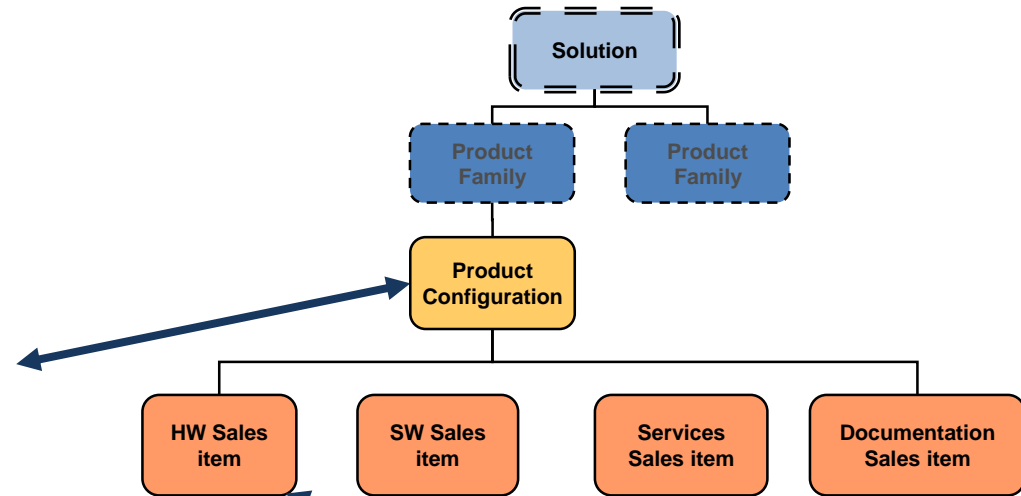
Product Data and Product Portfolio Management Process for a Construction Object over life cycle

Construction object master data

"The DNA of the Construction Objects over the life cycle"

### Product manager owns the product master data

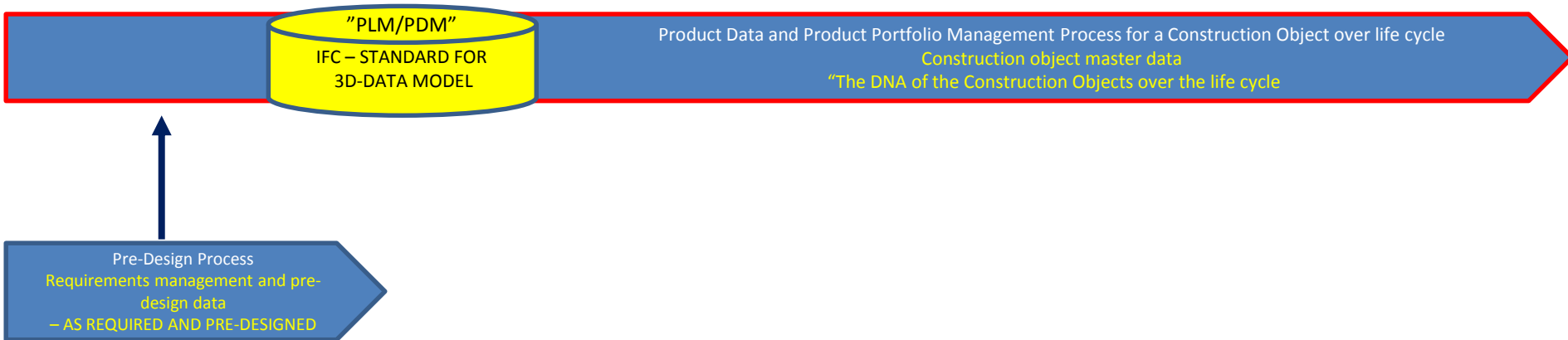
- Name: Log house Matti & Maija
- Description: Log house family house Matti and Maija
- Item code: 87543
- Version code: 87543.12
- Square meters: 123 m<sup>2</sup>
- Rooms: Kitchen, Living room, 3 bedrooms, integrated garage
- Item classification: Wood
- Item group: Wooden family house
- Manufacturer: Kuusamon Puu
- Purchased/Manufactured: M
- Life cycle status: design
- Product structure level: product configuration
- Customs category: 876
- Specification: attached PDF file
- Manufacturing instruction: an attached Word document
- Sales target price: 140 000€
- Target cost (turnkey): 110 000€
- Target net profitability: 15%
- ...



### Product manager owns the product master data

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>• Name: Integrated garage Matti &amp; Maija</li> <li>• Description: Integrated log garage Matti and Maija</li> <li>• Item code: 87545</li> <li>• Version code: 87545.03</li> <li>• Square meters: 32 m<sup>2</sup></li> <li>• Rooms: 1 garage</li> <li>• Item classification: Log wood</li> <li>• Item group: Log house garage</li> <li>• Manufacturer: Kuusamon Puu</li> <li>• Purchased/Manufactured: M</li> </ul> | <ul style="list-style-type: none"> <li>• Life cycle status: design</li> <li>• Product structure level: sales item</li> <li>• Customs category: 876</li> <li>• Specification: attached PDF file</li> <li>• Manufacturing instruction: an attached Word document</li> <li>• Target price: 22 000€</li> <li>• Target cost (turnkey): 10 000€</li> <li>• Target net profitability: 45%</li> </ul> |
|---|---|

## The requirements management pre-design process related data AS REQUIRED AND PRE-DESIGNED



### Requirements:

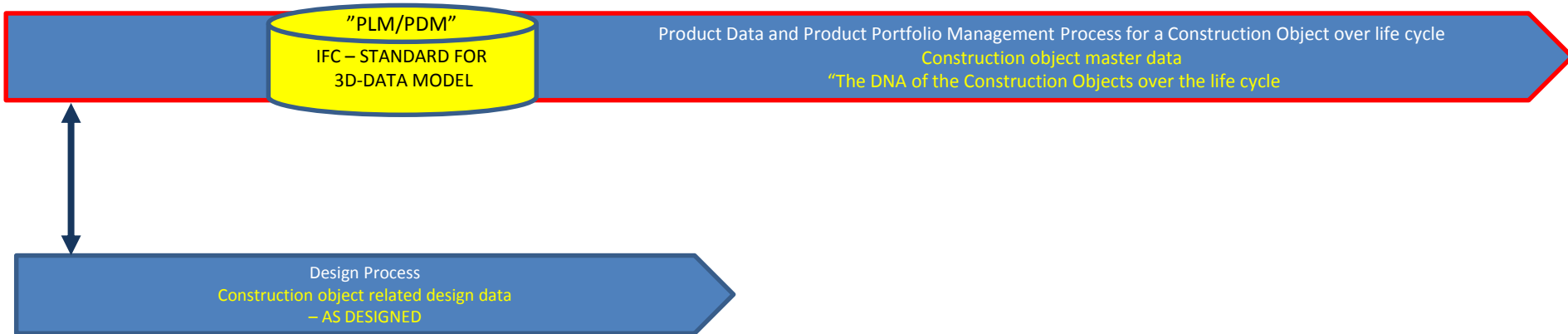
- Temperature range: -45C /40C
- Square meters: 123 m2
- Rooms: Kitchen, Living room, 3 bedrooms, integrated garage
- Material type: Log Wood
- Life cycle status: requirements management and pre-design
- Product structure level: product configuration
- Original customer requirement specification: attached PDF file
- Country, area and community related specifications: Finland, rural area, Kauniainen
- Type of construction site: field
- Legal requirements:...
- Customer target price: 130 000 - 150 000€
- Sales target price: **140 000€**
- Target cost: **110 000€** (as pre-designed)
- Target net profitability: **21%**
- .....

### Stakeholder:

End customer, <u>Sales manager</u>	x
End customer, <u>Sales manager</u>	x
End customer, <u>Sales manager</u>	x
End customer, <u>Sales Manager</u>	x
<u>Product manager</u>	x
<u>Product manager</u>	x
Sales manager	
End customer, <u>Sales manager</u>	
End customer, <u>Sales manager</u>	
City of Kauniainen, <u>Sales manager</u>	
End customer, <u>Sales manager</u>	
Sales manager, <u>Product manager</u>	x
Sales manager, <u>Product manager</u>	x
Sales manager, <u>Product manager</u>	x

**to be as  
product master  
data in PDM**

## The design process related data AS DESIGNED



### Design parameters:

- Temperature range: -45C /40C
- Square meters: 123 m2
- Rooms: Kitchen, Living room, 3 bedrooms, integrated garage
- Material type: Log Wood
- Life cycle status: requirements management and pre-design
- Product structure level: product configuration
- Design specification: attached PDF file
- Construction design for groundwork
- Heating, Water and Air design
- Sales target price: **140 000€**
- Target cost: 115 000€ -> **112 000€** (as designed)
- Target net profitability: 21%-> **20%**
- .....

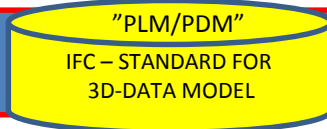
### Stakeholder: (owner underlined)

Product manager, Designer  
Product manager, Architect, Designer, End customer  
Product manager, Architect, Designer, End Customer  
Product manager Architect, Designer  
Product manager  
Product manager  
Designer  
Designer  
LVI designer  
Product manager, Sales manager  
Product manager, designer  
Product manager

### to be as product master data in PDM

x  
x  
x  
x  
x  
x  
x  
x  
x  
x

# The construction process related data AS CONSTRUCTED



Product Data and Product Portfolio Management Process for a Construction Object over life cycle  
Construction object master data  
"The DNA of the Construction Objects over the life cycle"

## Product master data parameters

- Square meters: 123 m2
- Rooms: Kitchen, Living room, 3 bedrooms, integrated garage
- Material type: Log Wood
- Life cycle status: construction
- Product structure level: product configuration
- Sales target price: **140 000€**
- Target cost: 112 000€ -> **90 000€** (as constructed)
- Target net profitability: 20% -> **36%**
- .....

## Stakeholder

Product manager, Construction manager  
Product manager, Construction manager  
Product manager, Construction manager  
Product manager  
Product manager  
Product manager, Sales manager  
Product manager, Construction manager  
Product manager



Construction Process  
Construction object related build data  
– AS BUILT

## Build parameters

- Building instructions and specification: attached PDF file
- Building instructions for groundwork
- Building instructions for Heating, Water and Air
- .....

## Stakeholder:

Designer, Construction manager  
Designer, Construction manager, Ground work sub contractor  
LVI designer, Construction manager, LVI-subcontractor

## The marketing and sales process related data AS MARKETED AND SOLD

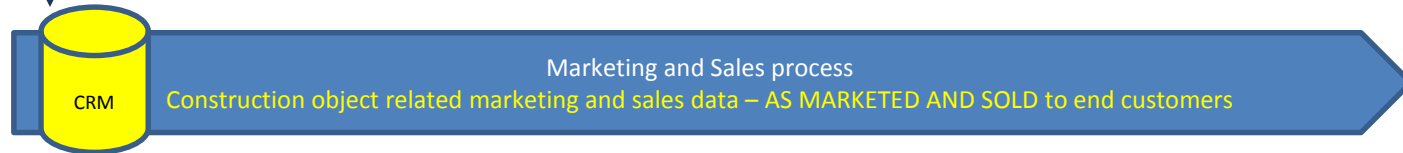


### Product master data parameters

- Square meters: 123 m<sup>2</sup>
- Rooms: Kitchen, Living room, 3 bedrooms, integrated garage
- Material type: Log Wood
- Life cycle status: Maintain
- Product structure level: product configuration
- Sales target price: **140 000€**
- Target cost: 112 000€ -> **90 000€** (as constructed)
- Target net profitability: 20% -> **36%**
- .....

### Stakeholder

- Product manager, Construction manager
- Product manager, Construction manager
- Product manager, Construction manager
- Product manager
- Product manager
- Product manager, Sales manager
- Product manager, Construction manager
- Product manager



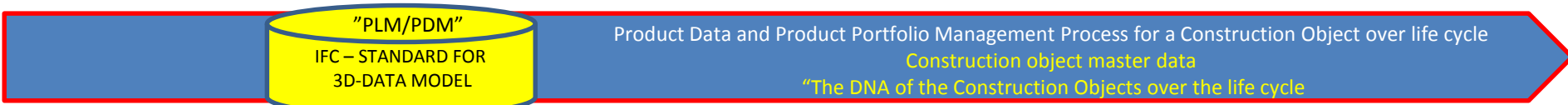
### Marketing and Sales parameters

- Name of the customer
- Customer address
- Actual customer price: **160 000€**
- Rental price: 500€/month
- Marketing material for Sales partners
- .....

### Stakeholder:

- Sales Manager
- Sales manager
- Sales manager
- End customer (owner), Sales manager
- Sales Manager, Sales partners

## The marketing and sales process related data AS USED

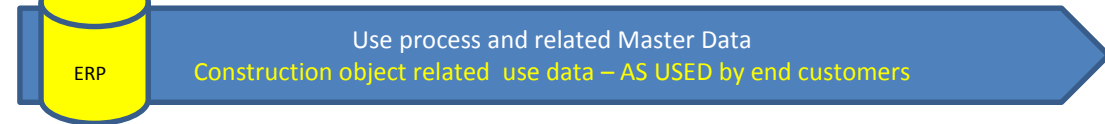
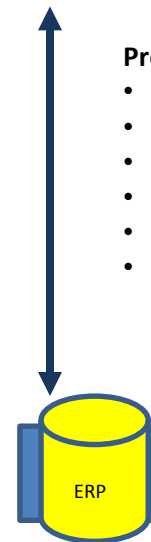


### Product master data parameters

- Square meters: 123 m2
- Rooms: Kitchen, Living room, 3 bedrooms, integrated garage
- Material type: Log Wood
- Life cycle status: Maintain
- Product structure level: product configuration
- .....

### Stakeholder

- Product manager, Construction manager
- Product manager, Construction manager
- Product manager, Construction manager
- Product manager
- Product manager



### Living process related parameters

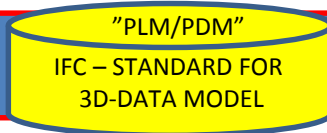
- Name of the owner
- Address of the owner
- Name of the end customer
- Address of the end customer
- Water consumption
- Heating consumption
- Rental price
- .....

### Stakeholder:

- Estate manager, Owner
- Estate manager, Owner
- Estate manager, Owner, End customer
- Estate manager, Owner, End customer
- Estate manager, Owner, End customer
- Estate manager, Owner, End customer
- Estate manager, Owner, End customer



## The marketing and sales process related data AS MAINTAINED



Product Data and Product Portfolio Management Process for a Construction Object over life cycle

Construction object master data

"The DNA of the Construction Objects over the life cycle"

### Product master data parameters

- Sales target price: **140 000€**
- Target cost: 90 000€ -> **95 000€** (maintained)
- Target net profitability: 36% -> **32%**
- .....
- Life cycle status: Maintain
- Type of the water pump
- Type of the cooling fan
- Type of the floor
- .....

### Stakeholder

Product manager, Sales manager  
Product manager, Construction manager  
Product manager

Product manager

Product manager, Estate manager, Care manager  
Product manager, Estate manager, Care manager  
Product manager, Estate manager, Care manager



Service, Maintenance and Care Process

Construction object related service, maintenance and care data – AS MAINTAINED by the service and maintenance contractors

### Service, maintenance and care process related parameters

- Name of the water pump service and care sub-contractor
- Name of the cooling fan service and care sub-contractor
- ....

### Stakeholder:

Estate manager, Care manager, Owner  
Estate manager, Care manager, Owner