Cost Engineering maturity development

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ASML Cost Engineering maturity development

This presentation is a talk about Cost Engineering maturity development

• A bit of chip making
• Context Functions and Competences
• How to organize the Cost Engineering competence
• What we do to maintain and innovate Cost Engineering competence

• Q&A
Our vision is to make possible affordable microelectronics that improve the quality of life.
A 1950 first memory chip vs chip making now

~ 30 – 30 cm
To make it work, well, together, worth it and grow

ASML Knowledge

Suppliers knowledge
Context of Functions and Competences (1-2)

Product

Defined in

Functions: *including Cost per Function*

Focus on **specification and integration** of underlying parts and technologies to achieve the product functionality and performance required.

The nature of a **function doesn’t change in time**, for example a wafer positioning is a function in the machine which will roughly remain the same.

The detailed specification of the required performance of the function, as well as the **technology used for implementation**, will **change in time**, set in the **Technology Roadmap 3, 5, 10 yrs**

Competences: *including Cost of Parts used* (materials, manufacturing, labor, supply chain)

Focus is on **robustness & industrialization of the solutions** while meeting the specifications required by the functions.

Provide the skills, ability and behavior to apply technical know-how predictably and reliably in creating and **improving technologies and parts used** in Products while **continuously learning through experience and adaptation**

**Competence Roadmap** in sync with Function Roadmap
Context Competences (2-2)

• Competence acceptance:
  – Competences should be of continuous importance for the development of functionality in Products.
  – Competences focus on how to predictably apply a technology providing solutions required by the functions.
  – A competence is important enough for the functions development to initiate, manage and review.
  – Competences are to be uniformly implemented in the functions and across the relevant parts of the organization (integral) incl. the co-developers.

• Competence rules
  – Competence knowledge must be available on a continuous basis in the organization and needs to be independent of unique individual expertise.
  – Competences are mutually exclusive to Functions, they need to be independent of specific functionality. If every Competence Owner takes his responsibility we have minimal risks in realizing the functions.
  – Competences take responsibility for their specific wow/process, guidelines, checklists, standards, tool definition, manufacturability, reliability, learning, training in their area.
  – Competence areas are mutually exclusive, they should prevent reinventing the wheel in different parts of the organization.
Developing the competence maturity by

- continuous improvement,
- learning from mistakes,
- propose and execute feasibility studies derived from the Competence technology roadmap
- cooperate with knowledge institutes and training
- introduce new technologies, ways of working and tools

The ultimate goal of the Competence is to yield predictable results that create value and a satisfied customer which requires:

- active involvement in projects
- active involvement of all Competence users inside and its (co-developing) suppliers
- active analysis of operational feedback and prevent recurrence of mistakes
Developing the competence maturity by (2-2)

Cost Engineer  Senior Cost Engineer  CoG Expert

Competences can have different levels of maturity from 1 to 5
The aim is to bring the competence to the highest possible maturity level
Competence owners and leaders get targets to raise the maturity level of the competence
Once the maturity is on a high level, the aim will be to maintain and innovate it.
Maturity of technical competences like Cost Engineering

Bringing levels driving the CE maturity and contribution to make cost predictable for realization during Design to Cost & Supply Chain / Suppliers Cost realization

Level 1: How is Cost Engineering organized and hard skills are covering the FC technology
Level 2: How is Cost Engineering knowledge embed into other competences
Level 3: How are trainings and feedback / lessons learned providing like Design rules
Level 4: How is the competence proved predictability related to Manufacturability & Costs
Level 5: In what way does the customer recognize the impact and is satisfied
A Dace CE competence maturity development landscape

<table>
<thead>
<tr>
<th>Integral product Cost</th>
<th>System / complete Product Cost estimator of design performance scenario’s (Top down, early phase of product generation)</th>
<th>System / complete product Cost analyses and opportunities during feasibility &amp; study phase. Determines cost budgets and is results orientated. Applying Value Engineering for Value Stream Mapping (Value Cost Down, Value up &amp; Valuation, feedback to Design, lessons learned)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost realization controlling of System / product</td>
<td>Drive cost down during design Supply Base Cost fit</td>
<td>Cost realization controlling of Total Cost of Ownership</td>
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<tr>
<th>Cost of Parts, Modules, Sub Systems</th>
<th>Manufacturing Technology: equipment/ tooling &amp; process expert</th>
<th>Cost influencer of mono &amp; multidisciplinary designs creating design guidelines and rules (increasing Cost awareness). Cost influencer in Early Supplier Involvement and Supplier workshops</th>
<th>Manufacturing &amp; factory champion (person to go to) Applying Value engineering for cost solutions and drive technology innovation</th>
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</thead>
<tbody>
<tr>
<td>Knowledge / Expert</td>
<td>Influencer</td>
<td>Champion / Solution &amp; results</td>
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Plotting the competence levels and maturity
Through Factory standard cost method we challenge our Supply Chain to extend Cost effectiveness & PLM (Product Life Cycle Management)