Computer Aided Cost Engineering

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Computer Aided Cost Engineering

Content

> Digitalisation – new tools
  - Shift to digital
  - Overview of some CACE tools

> How is it used and evolving
  - Cost over the Product Life Cycle
  - Evolution in CACE software
  - Conclusion & Discussion
Adaption of modern tools has increased our productivity, but also changed way of working.

Related applications:
- Email
- Publishing tools
- Presentation tools
- Etc.

Change in WoW is ‘irreversible’
- Computer Aided Manufacturing
- Rapid Prototyping
- AM
- Visualization tools
- FEM analytical tools
- Etc.

What will happen with Cost Engineering?
Digitalization of tools increases productivity

What's happening with cost estimation tools?

Electronic calculators, since early 1970s
Spread sheets, since late 1970s
Cost estimation software, since around 2000s
WordPerfect, since 1979. R4.2 overtook WordStar as most popular. R5.1 (1989) was most popular

Current situation
• Various solutions available from many vendors with mixed backgrounds, but...
  • No dominant design (in functionality, features, approach etc.).

In general
• No harmonisation, fragmented tool landscape

Evolution expected
• Dominant design appears (in features, approach etc.)
• Growth of functionality and level of automation
• Integration into CAD or PLM suits
• Differentiation of features linked to license models
• Common use through value chain (from data exchange towards cost reference models)

What tools will future cost engineers use?
Many cost estimation tools available, using different approaches

**Automated** – CAD model based / black box

- SolidWorks Costing
- Dassault
- Concurrent Costing
- Boothroyd Dewhurst DFMA
- aPriori
- Costimator
- MTI Systems

**ABC** / bottom up / open book

- Teamcenter Product Cost Management
- Siemens
- Clean Sheet
- McKinsey

Home grown templates (many templates for different technologies (injection molding, extrusion, die casting) and cases (e.g. lighting factories))

Note, the list of tools shown is known to be not exhaustive.
Cost estimation approach: **Automated Costing**

**Synopsis**

- Fast – based on 3D CAD input
- Automatically identify cost drivers in design
- Evaluate design / manufacturing alternatives
- Automatically monitor changing product cost (overnight)
- Black box (less strong in nego support)

**Venture, not yet linked to CAD or ERP vendor**
Teamcenter Product Cost Management

Synopsis

- Requires manual input / detailed
- Very large supporting data set (labor rates, machine rates)
- Evaluate Supply Chain alternatives
- Should cost / open book; strong in nego support

- Part of Siemens PLM suit, expect more CAD based functionality in future

Cost estimation approach: Activity Based Costing
Facton

Synopsis

• Requires manual input / detailed
• Very large supporting data set (labor rates, machine rates)
• Evaluate Supply Chain alternatives
• Should cost / open book; strong in nego support
• Linked to SAP

Cost estimation approach: Activity Based Costing
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Cost over the life cycle; from concept to phase out

- Defining products:
  - High(er) impact, lower urgency
  - Typical use of cost insights
    - Cost Avoidance: challenge architectures
    - Cost Savings: challenge cost price
  - Required accuracy: Low
  - Cost down potential: High

- Producing products:
  - Low(er) impact, higher urgency

- Influence on Cost
  - 70~80% Cost locked in early phase
  - Purchase spend ~60% of revenue

- Cost of Change
  - Development
  - SOP

- Pre-calculation
  - R&D
  - Engineering
  - Manufacturing

- Post-calculation

- Cost Maintenance

*indicative savings potential range
Different types of use will influence functional evolution

Functions supported

- R&D
- Engineering
- PLM
- Purchasing
- Supply Chain

Types of functionality

- Part cost
- Cost driver analysis
- Evaluation design alternatives
- Mould cost
- Part cost
- Negotiation support (should cost, open book)
- Evaluate supply chain scenario’s
IT landscape integration will influence evolution in CACE software.
Various trends in CACE software

Types of use

• Two different approaches emerge;
  CAD based (automated) ↔ ABC / bottom up / open book
• Integration in suit of business applications (around CAD, PLM, ERP)
• Professional software houses ↔ consulting firms

General

• Digitalization progressing – applications getting more advanced
• Enterprise Data Warehouse > linking of various databases & systems; allows to derive more information from data
• Master Data > needs to be managed, roles to be defined, interaction with Purchasing function
Is Computer Aided Cost Estimating mature yet?
The use of CACE will change way of working in cost engineering!

... bring faster insight in should-cost, evaluation of alternatives
>> more cost transparency

... a need to maintain master data available in CACE software
(material cost, OH levels etc.)

... evolve over time. Current software is showing no standardization yet in approach. CAD/PLM vendors might integrate CACE in portfolio’s.

... ultimately change relations in supply chains (towards a handshake model?)

Standardizing via tools will help to drive a consistent approach, efficient output and reliable costs analysis.
Where does is stop?

evolution never ends
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