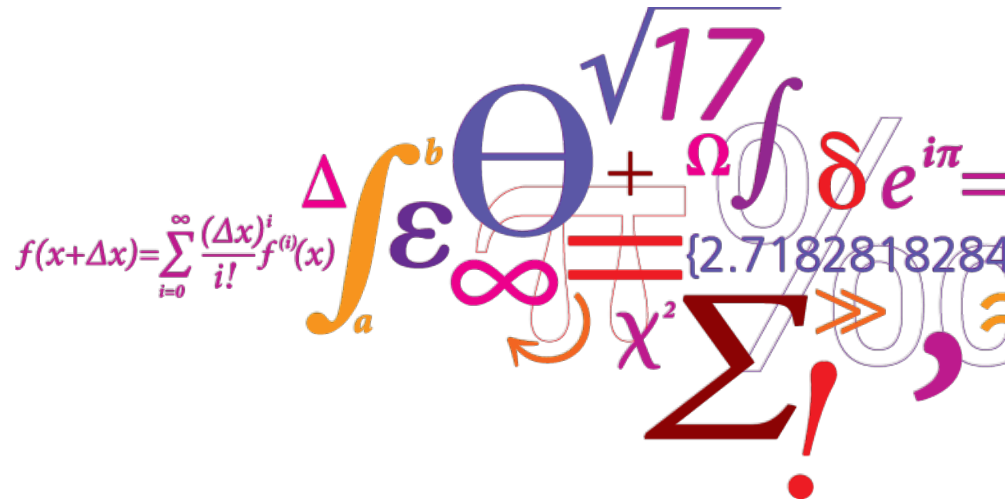


IMPACT ON COST ACCURACY AND PROFITABILITY FROM IMPLEMENTING PRODUCT CONFIGURATION SYSTEM – A CASE STUDY

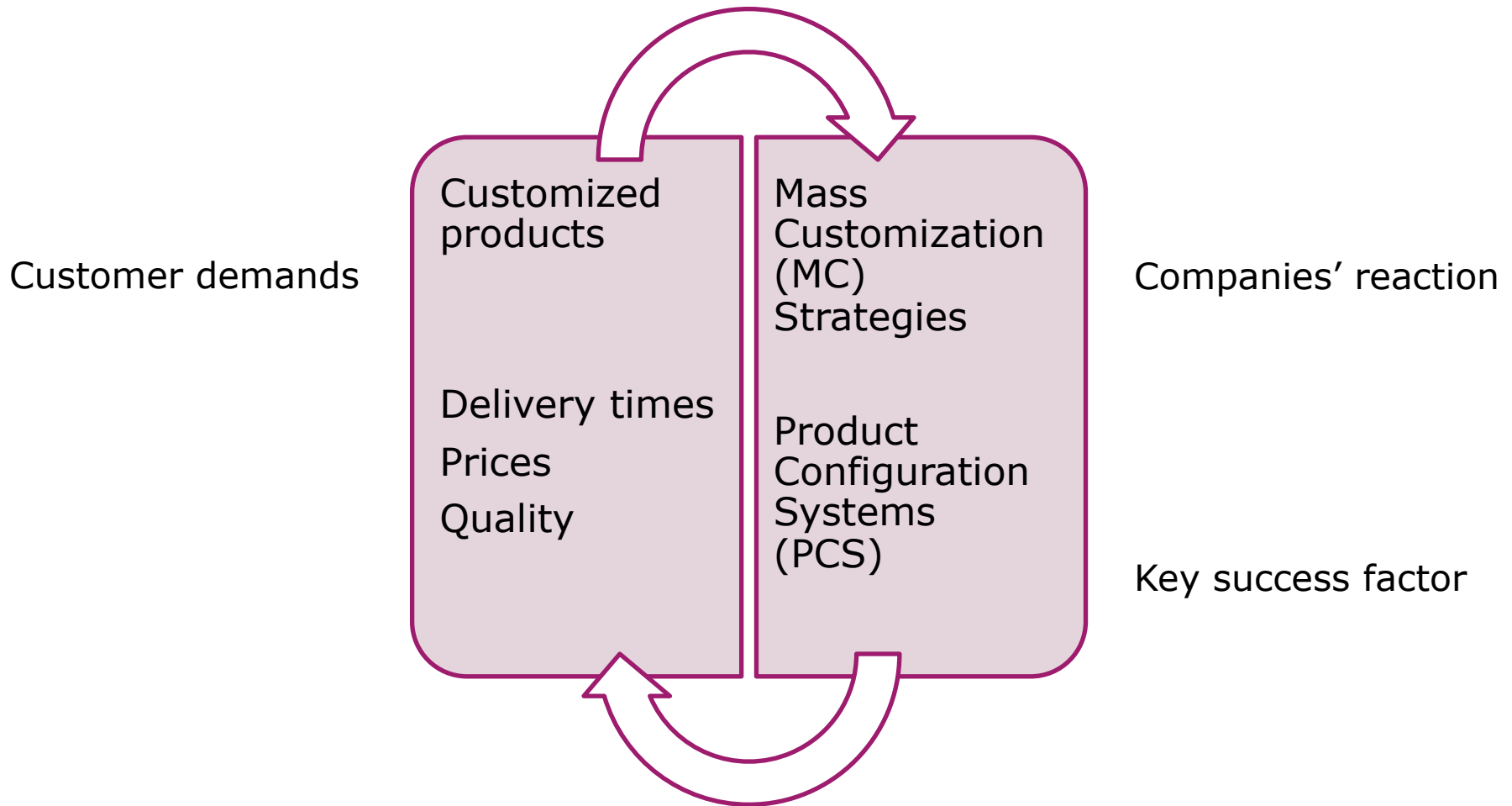
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Agenda

- Introduction
- Research Method
- Case study
- Results
- Conclusions

Introduction



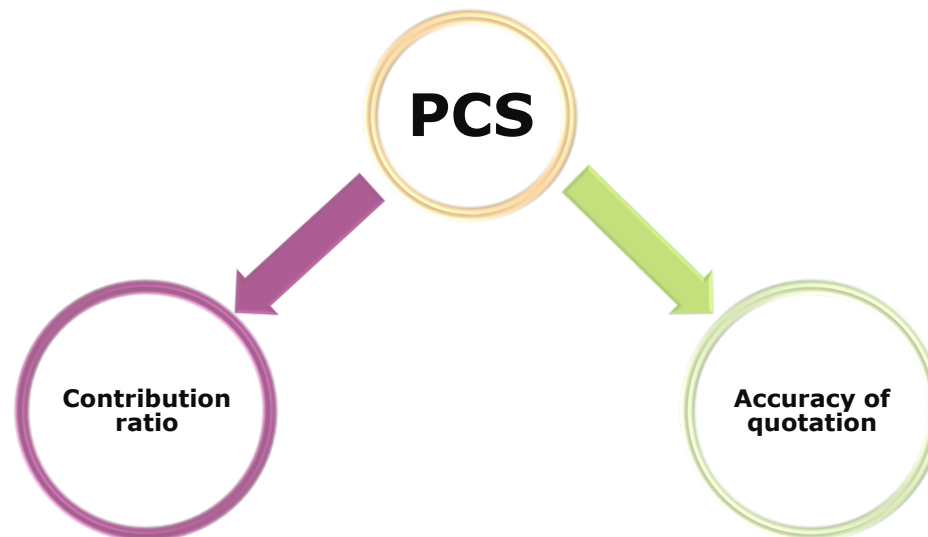
Benefits from PCS

Various benefits have been identified from implementing PCSs:

- Shorter **lead-times** and more **on time deliveries**
- Improved **quality** of the product specifications and of the **product**
- Less **rework** as a result from improved quality and reusability, less iterations
- Improved ability to make the **right decisions** in the early stage of sales and engineering processes
- Increased **number of sales** of products within the company preferred product architecture
- Increased **customer satisfaction**

Research focus

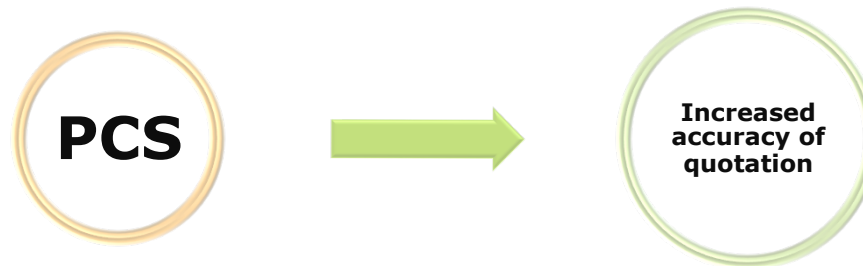
- The link between the various benefits and the impact on the company's profitability is still unexplored territory
- This article aims to assess the impact from implementation of PCSs on company's profitability by analyzing the accuracy of the cost calculations in the sales phase and the products' profitability in terms of contribution ratios



Propositions

- **Proposition 1**

The accuracy of the cost calculations in the quotation is increased by implementing a PCS



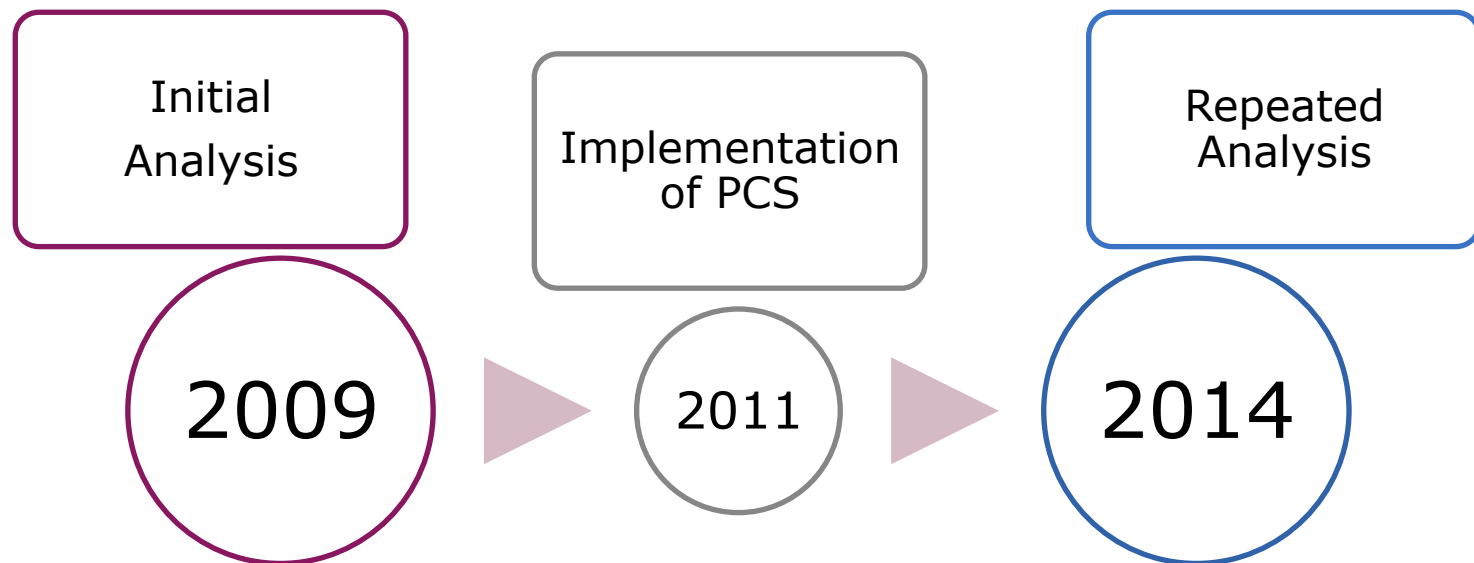
- **Proposition 2**

The contribution ratio of products is increased when they are included in a PCS



Research method

- The relevant literature is analyzed in terms of PCSs and the benefits that can be achieved from implementing such a system
- Empirical evidence: Longitudinal case study



- Limitations: Generalizability (exploratory study)

Case study

Introduction to the case company

- Building industry
- 100 employees
- 15 million EUR turnover (2014)
- 50 projects on average every year
- The company manufactures pre-made structural elements for buildings
- The product portfolio consists mainly of six products; A, B, C, D, E and F
 - A,B,C and D have standard product architecture
 - E non-standardized solutions
 - F additional features

Case study

Background

- In **2009** the process of making budgetary quotation and the accuracy of the cost estimation were analysed, which revealed the following problems:
 - Inaccuracy in the cost estimations
 - Errors in the quotation process that could be traced to human mistakes
- In order to address those challenges the company invested in a PCS that was implemented in the beginning of **2011**
- In **2013** the system was able to configure all product types except for type E
- There is still resistance at the company to use the PCS and therefore it is not used by all sales persons
- In **2014** the impact on the companies profitability from implementing the PCS where analysed

Case study

Performance before and after implementing PCS

Year	Average deviation in CR	Average abs deviation in CR	Percentages of projects with greater abs deviation in CR than 10%	Average CR per project
2009	-1,5%	5,4%	14,6%	25,0%
2011	-3,6%	7,7%	28,5%	25,5%
2012	-0,7%	4,9%	8,9%	27,6%
2013	-2,4%	4,9%	9,5%	28,8%
2014	-1,1%	3,9%	2,2%	28,6%

Contribution margin (CM)

CM=sales price-cost

Contribution ratio (CR)

CR= CM/sales price

Deviation in CR

Actual CR –
Estimated CR

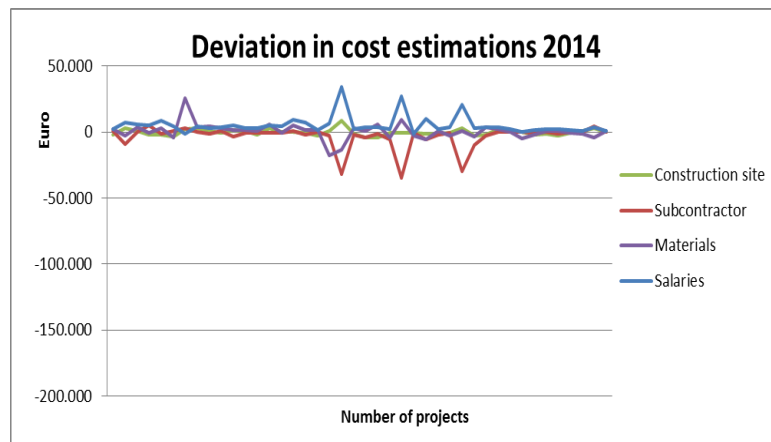
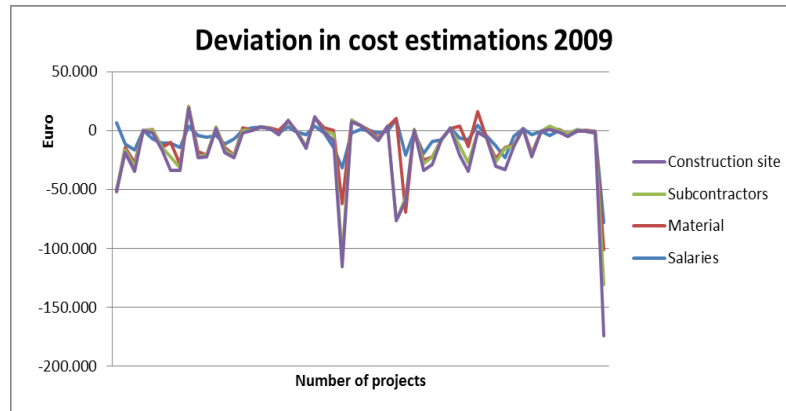
Abs deviation in CR

|Actual CR –
Estimated CR|

- In 2011 the first year the PCS was implemented the deviation in contribution ration (CR) increased
- Percentages of projects with greater deviation than 10% has been significantly reduced
- **The average CR per project have been steadily increasing**

Case study

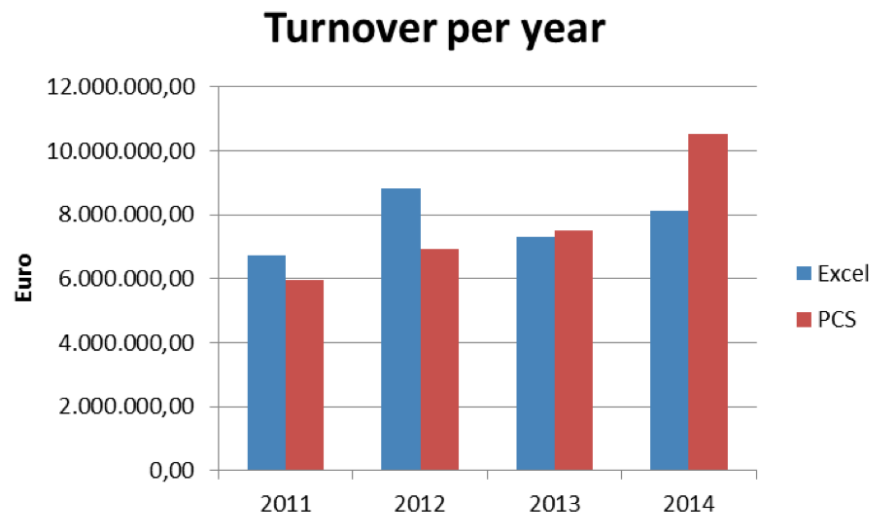
Analysis of the cost structure and the deviations in the CM



- In **2009** a cost analysis was performed in order to assess the economic benefits by implementing a PCS
- Great deviations and irregularities in the pattern
- Mainly negative deviation
- In **2014** the same analysis where repeated
- Deviations can be explained by:
 - New steel structure
 - Outsourcing to subcontractors

Case study

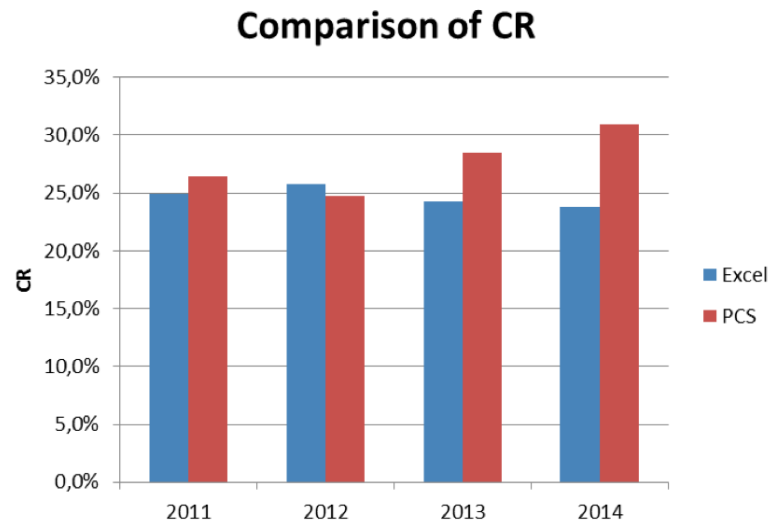
Comparison of budgetary offers made in Excel and PCS



- In **2011-2012** quotation made in Excel contributed more to the yearly turnover
 - Resistance to use the system
 - Errors in the system
 - Utilization of the PCS limited due to product variety included
- In **2013-2014** the quotation generated via the PCS contribute more

Case study

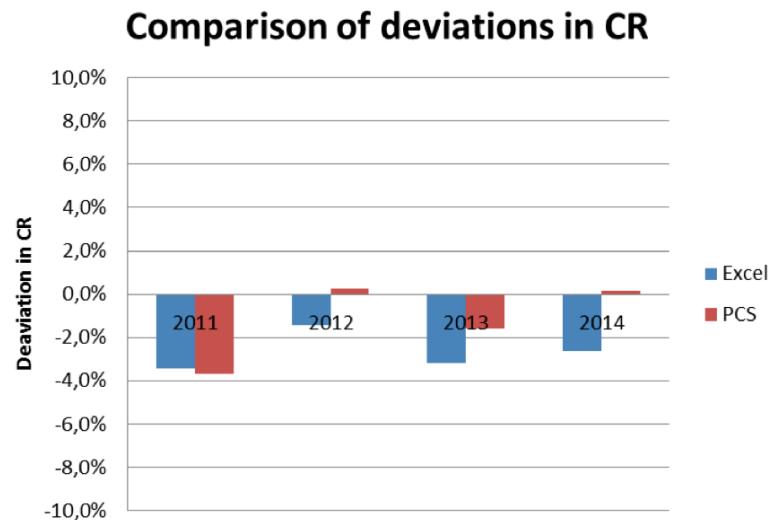
Comparison of budgetary offers made in Excel and PCS



- Higher CR for the quotation generated in the PCS
- Gap between the CR made in Excel and by the PCS is increasing
- Excluding products E (non-standard products) as they are not included in the system only affected the CR by 0.2%.

Case study

Comparison of budgetary offers made in Excel and PCS



- Sales persons using the PCS have less deviations (apart from 2011)
- In 2012 and 2014 the deviations in CR for the PCS are close to zero.

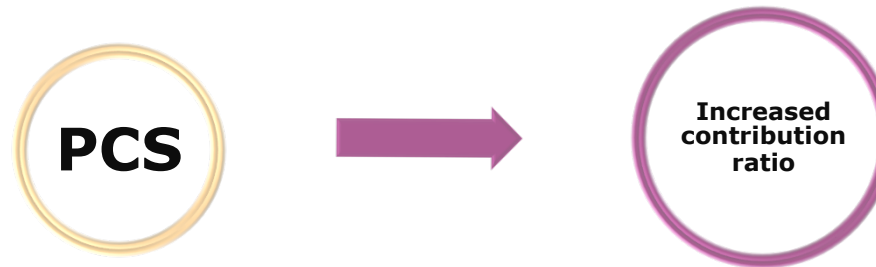
Future initiatives at the company

- Several factors have been identified to improve the company's performance where the aim is to reduce the deviation in the CR even further and increase the overall profitability
 - Implement a **checklist in the end of each configuration** to ensure all the required information are gathered in the sales phase
 - Increase **standardization in the product range** by moving more towards modular based product architecture
 - The company has decided to invest 140.000 Euro in **further development of the PCS**

Conclusions

- Scope: Quantification of the impact of implementing a PCS on product profitability and accuracy of the cost estimations
- The research results show significant improvements:
 - Improved performance of the contribution margins of the products

Proposition 2 : The contribution ratios of products are increased when they are included in a PCS



- Reduction in the deviation of quotations

Proposition 1 : The accuracy of the cost calculations in the quotation is increased by implementing a PCS



Discussion and future research

- This research is the first step in exploring *the impact of a configuration system on products' profitability*.
- The empirical evidence provided in this research is based on a single case study. However, the company is considered to be a typical example and highly representative in the configure-to-order industry.
- By examining more cases, a deeper understanding can be gained and a more detailed explanation of the correlation between configuration tools and product profitability can be provided.

Thank you for listening 😊