“Any intelligent fool can make things bigger, more complex and more violent. It takes a touch of genius – and a lot of courage – to move in the opposite direction.” – Albert Einstein

Expanding markets, new technologies and increased demand for customized products are just a few of the forces that currently place pressure on industrial companies to offer greater product variety. If not properly managed, such an increase in variety can result in increased levels of complexity in the products, product portfolio, production and logistic processes, as well as in sales and administrative processes, ultimately leading to lower profitability for companies.

The aim of the PhD project is to develop concepts and methods to analyse, quantify and reduce complexity in industrial companies to improve their competitiveness in the current business environment.

The overriding research question for this project is: “How can complexity be identified, quantified and reduced in industrial companies?” As a first step in answering this question, key causes of complexity in industrial companies will be isolated for study and analysed for their impact on various business processes, such as sales processes, order handling, production and distribution. Once the complexity factors have been analysed, the project will continue on to identify, categorize and prioritize a set of initiatives for reducing complexity in organisations.

The primary method which will be used to answer the research question is a case study of the complexity management initiatives at ROCKWOOL, an international manufacturer of stonewool insulation. To increase generalisability of the findings, other industrial companies will be investigated and analysed using the same approach. Relevant frameworks and models of complexity will be applied from the literature, such as the model for complexity in manufacturers shown in the figure below, to analyse the data gathered through the case study. Other analysis methods such as descriptive statistics, regression analysis and linear programming will be employed to model the relationships between increasing product range complexity and performance of business processes.

The combination of findings from work at ROCKWOOL and other case studies will result in a framework for industrial companies to reduce complexity within their products and processes, thus improving their profitability and overall business performance.

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Funded by:
Industrial PhD Programme, Ministry of Science, Innovation and Higher Education
ROCKWOOL International A/S

Start and completion date:
1 October 2015 to 30 September 2018