A Supply Chain Innovation Maturity Model: A Case Study in Chemical Supply Chain

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Summary: By developing a conceptual framework to determine the maturity of supply chain innovations in organisations and successfully applying it to BASF as a case study, this research project enhances decision making process and assists organizations in their pursuit of becoming innovative.

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Key Insights

- The proposed conceptual framework can be effectively used to determine the maturity level of Supply Chain Innovations in the organization.
- Once the maturity level of Innovations in the firm has been determined, the framework can be used as guidance tool to advance to next level.
- As demonstrated by its application to case study, the proposed framework knowledge can be extended to other Supply Chain Innovations which are not considered for this study and to other firms in the Chemical Industry.

Introduction

When it comes to being competitive and sustainable in this Globalized World, organisations need to adopt 'Out-of-box' thinking and come up with innovative solutions to existing problems. The two most important factors which differentiates successful organizations from less successful ones are, use of cutting edge technologies and tools to deliver products efficiently and change in the mindset of organization and becoming more receptive to these new technologies. This research work is an attempt to provide an overview about relevant supply chain innovations and developing an evaluative framework to support decision

making for developing innovative supply chain strategy.

Supply Chain Innovation is important to companies of all sizes. It means looking at the way company applies its assets, resources and capabilities to develop new avenues to satisfy customer needs. However, each company has to concentrate on different areas for innovation relevant to its business. This research focused on around ten such relevant supply chain innovations, some of them are supply chain analytics, use of social media in supply chain, Innovative responses to supply chain sustainability and risk mitigation, 3D-Printing etc.

Classifying Supply Chain Innovations

Every supply chain has two integral parts. The first one is Development supply chain and the second one is Fulfillment supply chain (Simchi-Levi, Kaminsky, 2007). Development supply chain is the set of activities and processes associated with new product introduction, it includes the product design phase, the associated capabilities and knowledge that need to be developed internally, sourcing decisions, and production plans. Specifically, the development chain includes decisions such as product architecture, supplier selection and strategic partnerships. Whereas, Fulfillment supply chain involves processes associated with demand-supply balancing such as production, distribution and selling to customer.

Further, any innovation can be classified into Product, Process, Position and Paradigm - the 4 P's of Innovation (Tidd, and Bessant, 1997). Innovations related to Development supply chain are more of Paradigm and Position whereas innovations related to Fulfillment supply chain are more of Process and Product innovations.

Developing a Conceptual Framework

A Maturity framework is developed in such a way that, each Innovation consists of three phases of maturity. The first phase of maturity is related to and measures operational parameters of innovation; second phase gives an idea about tactical parameters and their performance and third phase of maturity gives an idea about, maturity of an innovation strategically. In general, the different levels can be depicted as:

Fig: Levels of Innovation Maturity

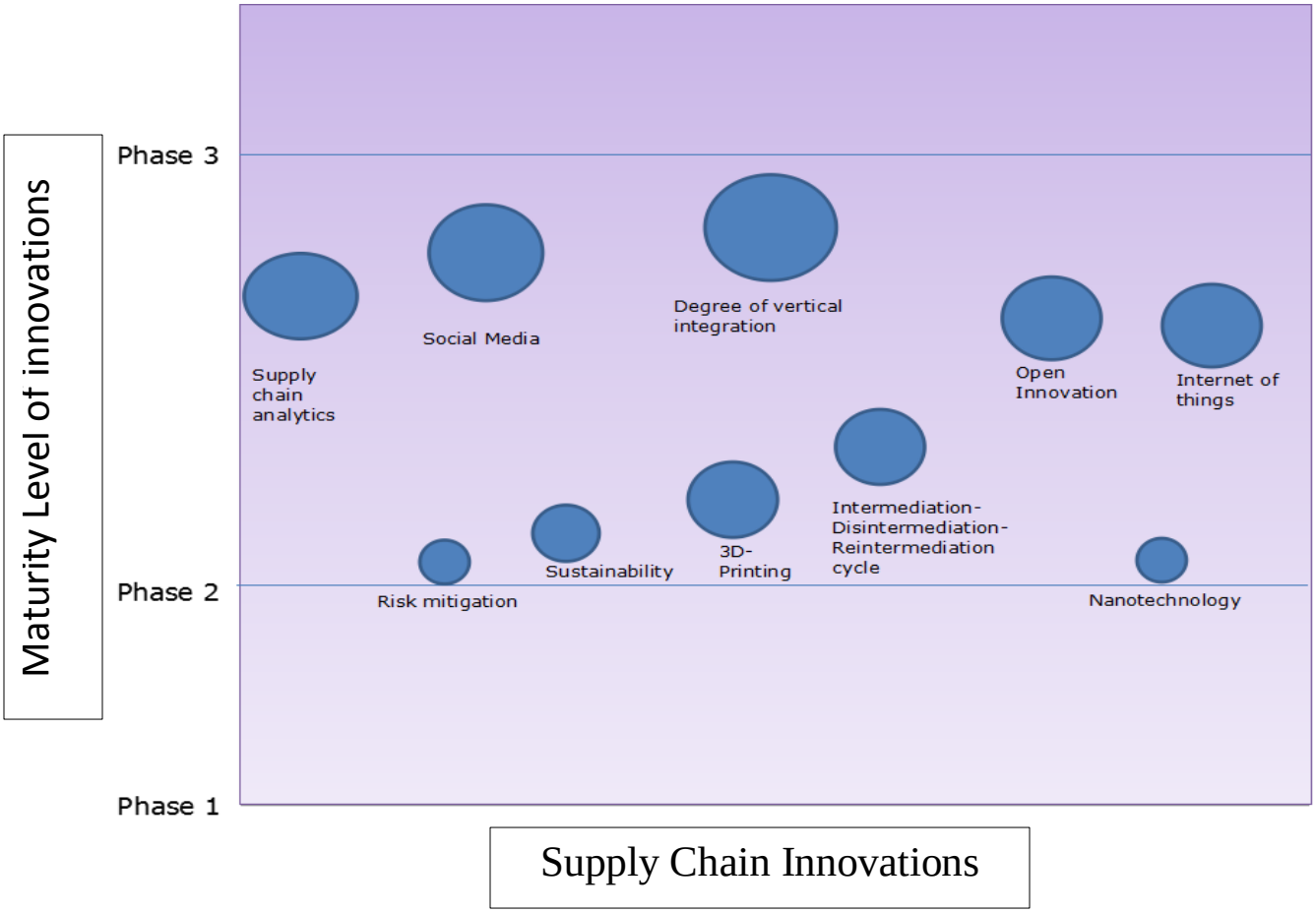
Gathering data through questionnaire

The data required, for successful application of Maturity framework to the BASF, was gathered through questionnaire and informal interviews and this is further validated through archival data.

Mapping the Supply Chain Maturity in BASF

It is always important for firms to know, where they stand with respect to maturity level of the innovation, this will help them to take required steps to progress to the next level assuming the

concept of 'Continuous Improvement' and they want to advance to next level. The data gathered through questionnaire and validated through informal interviews and archival data provided an idea about BASF maturity level, this can be graphically shown as below:



Conclusion

- The Conceptual Framework, which is developed for evaluating maturity of Supply Chain Innovations, is applied to BASF on case specific basis and assessed BASF in terms of Innovation maturity level.
- For Innovations like Supply Chain Analytics and Use of Social Media in Supply Chain which will help in efficient information flow, BASF is well in the second level of maturity. They need to design their own Predictive Models which will help in demand planning and forecasting, manufacturing products, predicting risks etc. They can utilize information from different social media such as Twitter, Facebook, YouTube and other social networking sites and can gain some insights, since they already have presence in all these media it is not very difficult to improve the maturity level.

- For Innovations such as Sustainability and Risk Management, BASF has just entered into the second level of maturity, they need to emphasize on collaboration among various supply chain partners, at the same time they need to look for new age solutions to deal with these challenges. Some of the solutions to these can be using renewable energy resources, bringing in the concept of 'Circular Economy', using 'Second Generation' energy resources and raw materials to deal with sustainability challenge, while in order to mitigate risk they can add flexibility and redundancy in their supply chain, they can use analytics for risk prediction.

- The innovations like 3D-Printing and Nanotechnology in the Supply Chain are in the nascent stages, considering these innovations have ability to disrupt the supply chain, BASF needs to be receptive towards these innovations, a culture which will help in nurturing these innovations need to be adopted, different products and processes need to be find out which will have application of these technologies, proper KPI's should be set to measure the performance.
- The innovation of 'Internet of Things', which is currently used in the form of Radio Frequency Identification (RFID), can be utilized to its full potential to firm's benefit. This innovation will also help in improving manufacturing operations with the help of automation; it can also play an important role in information flow and improve its efficiency.