INVESTIGATIONS ON DEVELOPING AGILE SUPPLY CHAINS IN SHOE MANUFACTURING INDUSTRY

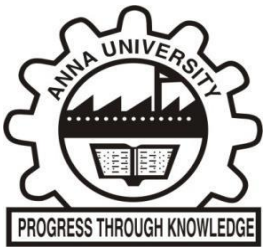
A THESIS

Submitted by

ABDUL KADAR U

in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY



FACULTY OF MECHANICAL ENGINEERING

ANNA UNIVERSITY

CHENNAI 600 025

MARCH 2020

ANNA UNIVERSITY

CHENNAI 600 025

CERTIFICATE

The research work embodied in the present Thesis entitled "**INVESTIGATIONS ON DEVELOPING AGILE SUPPLY CHAINS INSHOE MANUFACTURING INDUSTRY**"has been carried out in the Department of Production Engineering, PSG College of Technology, Coimbatore.The work reported herein is original and does not form part of any other thesis or dissertation on the basis of which a degree or award was conferred on an earlier occasion or to any other scholar.

I understand the University's policy on plagiarism and declare that the thesis and publications are my own work, except where specifically acknowledged and has not been copied from other sources or been previously submitted for award or assessment.

ABDUL KADAR U
RESEARCH SCHOLAR

DR. S.R. DEVADASAN
SUPERVISOR
Professor
Department of Production Engineering
PSG College of Technology
Coimbatore 641 004

ABSTRACT

During the past two decades, manufacturing companies have been experiencing the intensification of competition. The products produced by the manufacturing companies are sold with high difficulty in highly competitive global markets. Due to the entry of many sellers, the customer preferences have been dominating in global markets. Because of this situation, customers have been changing their preferences while demanding products from the manufacturing companies. While the manufacturing companies try to fulfill the demands of the customers, the preferences of the customers are also studied proactively. Hence, many

manufacturing companies have been developing capabilities to delight the customers by proactively meeting their demands. Today, in order to delight the customers, the developments that have been occurring in two fields namely 'agile manufacturing' and 'supply chain management' are being implemented intensively in manufacturing organizations.

Agile manufacturing is a paradigm that facilities an organization to quickly manufacture products and offer services in accordance with the dynamic demands of the customers by adopting appropriate manufacturing technologies and management models without compromising the profitability. According to supply chain management, suppliers are required to supply products with right quality at right time to the companies and customers with right quantities and at economical price. A critical study of the principles of these two fields would indicate that many of them superimpose with each other. For example, while implementing agile manufacturing, the products are to be supplied quickly to the customers. In the same line, while managing the supply chains, it is required to ensure that the suppliers supply the products quickly to the customers. Because of the superimposition of theprinciples of these two fields, a few researchers began to pursue researches under the terminology called 'agile supply chain management' (ASCM). Currently these researchers have been striving to develop the models that would facilitate the implementation of ASCM in companies belonging to different industrial sectors.

So far, researchers have brought out as many as ten models of ASCM which can be implemented in companies belonging to different industrial sectors. However, such ASCM models are yet to be developed for managing supply chains in an agile manner in companies belonging to many industrial sectors. Shoe manufacturing industry is one among them in which an exclusive model for carrying out ASCM is yet be contributed by the researchers. This is a concerning situation as the market share of shoe manufacturing industry in most of the countries has been significantly higher. The competition is also very intensive in shoe manufacturing industry.

Today the implementation of ASCM is required to be intensively studied in shoe manufacturing industry as this industry faces tough global competition. In the background of this observation, the doctoral work reported in this thesis was carried out. This doctoral work was carried out in three phases. During the first phase, the researches reported on ASCM and the activities hovering shoe manufacturing industry were studied. At the end of conducting this literature survey, it was inferred that an exclusive model for implementing ASCM in shoe manufacturing industry was a necessity. During the second phase of the doctoral work, by referring to the theoretical knowledge gathered by conducting literature survey, a model named as 'Agile supply chain for footwear industry' (ASFI) was designed.

The stiff competition faced by the shoe manufacturing industry indicates the need for facilitating abundant flow of innovative ideas not only from the designers but also from other main stakeholders namely distributor, customer and supplier. The manufacturer is required to channelize those innovative ideas into the production environment to make them practically compatible and feasible for getting the profit. All these actions are required to be carried out under the umbrella of ASCM system for making these activities to happen

effectively and efficiently in sustained manner. These aspects have been encapsulated in the ASFI model.

During the third phase, the practical implementation aspects of ASFI model were investigated in two shoe manufacturing companies. In these companies, shoes, boots, leather bags and gloves are manufactured. These products are exported to various countries in the world. The ASFI model has to be implemented in practice in 11 steps. In both these shoe manufacturing companies, four of these steps were fully implemented and seven of these steps were partially implemented. Two different web-portals suitable for gathering innovations from customers, designers and suppliers compatible for implementation in these two shoe manufacturing companies were developed. The overall experience of pursuing this doctoral work indicated that ASFI model possesses the capability to enable shoe manufacturing companies to implement ASCM and thereby acquire competitive strength to face the intensified competition.