

# A Model of Mass Customization for Engineering Production System Development in Textile and Apparel Industries in Thailand

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## Abstract

This paper presents a framework, aiming to develop the mass customization for textile and apparel industries in Thailand. The developed model as presented is the relationship of the connection pertaining to customers' needs at industrial levels, most of which are Original Design Manufacturer (OEM), a type of textile and apparel business. The outstanding of OEM is the presentation of newly created designs to customers with a variety of products. Importantly, in order to gain such effective production management, an appropriate administrative system with high flexibility, efficient production (Small Lot Size), and punctual delivery is crucially required. In relation to the framework for mass customization development, it concerns three main related involvements: customers, OEM industries, and suppliers, all of which will be assessed so as to be promptly employed in such firms manufacturing products in accordance with the productive systems of mass customization model. The conceptual from mass customization systems will facilitate the management in terms of the production designing in factories, aiming at clustering which is complex to the creation of platform from common parts, leading to the development of a variety of goods by the process of product family.

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*Keywords:* Mass Customization; Clustering; Common platform; Product family

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## 1. Introduction

Recently, a viewpoint of economy and technology development has been significantly changed due to some principle factors including the evolution of scientific and technological matters. When analyzing the world's reports, it can be seen that the growth of technology information and communication has dramatically increased and played a crucial role in everybody's life. As perceived, the spread of news as well as information has been done rapidly and easily because of such global networks. That is, the world's communication, in particular, can be seen as though each individual stayed close to one another. Owing to the glory of such global communication as mentioned above, human lives, ranging from daily routines, business management to society administration have also completely changed, especially, in the field of business errands, which majorly emphasize on customers' responses in order to

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make all clients as impressed as possible. In terms of technology, the changes that can be obviously seen are the widespread use of the internet. So far, computers have been variously improved and modified so as to serve consumers' desires. Besides, the development of mobile devices has been done along in order to, again, respond to consumers' life styles in different angles. As a result, particular creativity has been aroused, and this has, therefore, led to the invention of new innovation, on which systematic development has been focused; that is to say, a large number of data are able to be gathered and analyzed with no difficulty, which is beneficial to a dramatic increase of such new created innovation. In addition, the flexible production management and the efficient manufacturing process are also included in this instance. Importantly, this facilitates low-cost production and the quantity of goods produced throughout the supply chain process. With regard to Thailand's garment industries, the development has, so far so fourth, been being pursued. The status of most of the production viewed in factories is a mere hired manufacturer, called OEM (Original Equipment Manufacturer). The textile industries in Thailand are considered as weak in either research or development and lack the school of thoughts regarding innovation. The total number of research in terms of textile having been, up to the year of 2010, conducted in Thailand is only 371 studies excluding the 73 pieces of research on garments. Meanwhile, the national policy requires the sustainable growth and potential from the development of textile and garment industries by encouraging those that are still a hired manufacturer to become a self producer as well as to have their own brand names (OBM), which can be distributed to international markets and to propose their products to various groups of consumers (ODM). In consideration of factors in terms of apparels, preferences, comfort, protection, etc are also taken into account. As aforementioned, garment industries, therefore, can be perceived as one of the industries that apparently require an urgent change from Mass Production to Mass Customization. That is, a number of products manufactured are reduced according to the demands while a more focus is on a variety of goods and low-cost production management. As such, the systematic administration and flexible production are necessarily developed, which leads to the concept of "Common Platform Innovation" that can assist factories to create, evaluate and make a decision about their product presentation to customers along with the determination of the production consistent with product forms that can be varied under the low-cost and reasonable manufacturing. Mass customization aims to impressively respond to consumers' satisfaction by offering the effective production. This idea is, however, against the production that emphasizes on a variety of products and the management of low-cost and reasonable production. As all mentioned above, the researcher has been interested to create a model and to develop an innovation that can help Thailand's textile and garment industries categorize, assess, and determine their production administration, under the concept of Common Platform and in accordance with the strategy of Mass Customization, which focuses on a response to customers' desires as well as a flexible response to such production being able to manufacture as equally as a great deal of goods produced with a reasonable proposed price.

## 2. Review of the Related Literature

The concept of mass Customization was first proposed by Stan Davis in 1989 and published in *Future Perfect* in 1996. Davis studied Time, Space and Mass and mentioned about the business strategy that focused on quick response that was the origin of the concept "Any time and Any Place/Anywhere". Later, this concept was continued by B. Joseph Pine II and entitled *Forward by STAN DAVIS "Mass Customization" The New Frontier in Business Competition*, which was published in Harvard Business School Press in the year of 1993. Joseph Pine (1993) recommended a concept of perceiving two bipolar things between the large amount of production and the response to particular individuals. In the past, the large amount of production had to be dependent on quantity, time and quality; in contrast, according to Mass Customization, the creative production responding to consumers' needs related to both products and services was noticed. Consequently, it can be seen that, in comparison to Mass Customization, Mass Production cannot be all the answers of customers since it is not able to serve a variously different group of clients. Additionally, Joseph Pine proposed a management strategy for production development, successful delivery and management systems which were according to Mass Customization. In 1970, Alvin Toffler stated about flexible manufacture. He proposed Computer Integrated Manufacturing (CIM) as a means to help administer the firms. Furthermore, Product Family was presented into two aspects: Production Planning System and Made to Order. In 1980, according to Alvin Toffler's statement in "Third Wave" that in the next 20 years, what would be that advantageous to such production would be human creativity, the creativity here can be referred to the opportunity of consumers to select and design products from their hearts. Also, machine would be developed in

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