Full Length Research Article

MASS CUSTOMIZATION IS NEW TREND FOR TEXTILE INDUSTRIES

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ARTICLE INFO	ABSTRACT
	An unstable economic climate, changing consumer needs, and emerging technology have challenged the existing manufacturing paradigm of mass production. Companies can no longer continue to do business without considering the impact of the turbulence in the marketplace. The driving force in this new marketplace is the consumer. The driving factor is technology. This paper discusses research to identify consumer wants, needs and interests in an emerging business opportunity in combining a mass production strategy with manufacturing and information technology to meet consumer desires with customized textile and apparel products.

INTRODUCTION

Mass customization is a futuristic concept for the fashion industry, there are already some initiators companies, which have started customized fashion but have not combined all the existing components. This is due to very high price implementations of this new technological equipment (Vignali, Vrontis, Vronti, 2004). Mass customization is a broadly based term encompassing vast changes in manufacturing, distribution and delivery of products. First identified in Future Perfect, Davis (1987) based the oxymoron on the mass production of customized goods (Anderson, Brannon and Ulrich, 2001). Mass Customization is the large-scale production of personalized goods and services. To succeed at it, companies must harness technologies that revamp their speed, flexibility and efficiency at minimum expense.

The Definitions of Mass Customization

- The term "mass customization" was first popularized by Joseph Pine, who defined it as "developing, producing, marketing and delivering affordable goods and services with enough variety and customization that nearly everyone finds exactly what they want."

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In other words, the goal is to provide customers what they want when they want it (Pine B.J. II, 1999).

- Mass Customization is the customization and personalization of products and services for individual customers at a mass production price (Dean, Tu., and Xue, 2007).
- Mass Customization is the ability to design and manufacture customized products tried to meet a customer needs at mass production costs and speed (Kotha, 1995).

Literature Review

The history of mass customization started over forty years ago (Toffler 1970, Davis 1987 and Pine 1993). In the mass customization management system, the goal is to develop, produce, market, and deliver affordable goods and services with enough variety and customization that nearly everyone finds exactly what they want (Pine, 1993). The reason why customized products are superior compared to standard products is the following (Pine, 1993). The company that better satisfies its customers' individual wants and needs will have greater sales. With higher profits as well as a better understanding of the customers' requirements, the company can provide even more variety and customization, which further fragments the market. Because it is outdistancing its competitors in variety and customization, market

fragmentation allows it's once again to better satisfy its customers' individual wants and needs, and so on.

Concept of Mass Customization

The concept of MC was first fully expounded by Pine (1993) who implied a view of MC as in some sense of a historically inevitable successor to mass production, the principal in which to complete in the future. It is essentially an oxymoron since it puts together seemingly contradictory notions of the production and the distribution of customized goods and service on a mass basis (Chen and Hao, 2010).

online computer might track how each customer uses its service and then suggest additional features that the customer may find useful. In a similar fashion, Amazon.com provides book recommendations based on information about past purchase (Pollard, Chuo and Lee, 2008).

Problem Formulation

Problem Statement: Mass customization is new to the apparel industry, and in its processes, following problems need

Table 1. Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.785	18.923	18.923	3.785	18.923	18.923	3.394	16.970	16.970
2	2.051	10.255	29.178	2.051	10.255	29.178	2.029	10.147	27.117
3	1.927	9.634	38.812	1.927	9.634	38.812	1.939	9.695	36.812
4	1.478	7.392	46.204	1.478	7.392	46.204	1.878	9.392	46.204
5	1.325	6.623	52.827						
6	1.205	6.025	58.852						
7	1.116	5.579	64.431						
8	.975	4.876	69.307						
9	.828	4.140	73.447						
10	.800	3.999	77.446						
11	.748	3.739	81.185						
12	.654	3.271	84.455						
13	.568	2.838	87.293						
14	.471	2.354	89.647						
15	.445	2.223	91.870						
16	.384	1.922	93.793						
17	.361	1.803	95.596						
18	.338	1.692	97.288						
19	.286	1.432	98.720						
20	.256	1.280	100.000						
21	.975	4.876	69.307						
22	.828	4.140	73.447						
23	.800	3.999	77.446						
24	.748	3.739	81.185						
25	.654	3.271	84.455						
26	.568	2.838	87.293						
27	.471	2.354	89.647						
28	.445	2.223	91.870						
29	.384	1.922	93.793						
30	.361	1.803	95.596						

Approaches to Mass Customization

- Collaborative customizers: these organizations establish a dialogue to help customers articulate their needs and then develop customized outputs to meet these needs. Levi's is an example of this approach.
- Adaptive customizers: customers buy a standard product but they can modify it by themselves based on their needs. For example, Microsoft offers a package of software designed to run all activities of small businesses. But if a buyer (a small business) wants, for instance, to add more accounting functions into the package.
- Cosmetic customizers: these companies produce a standard product but present it differently to different customers. For example, Planters packages it peanuts and mixed nuts in a variety of containers on the basis of specific needs of its retailing customers such as Wal-Mart, 7-Eleven, and Safeway.
- Transparent customizers: These companies provide custom products without the customers' knowing that a product has been customized for them. For example, an

to be resolved for the full implementation of mass customization toward consumers:

- Are customers willing to pay a premium for a customised product?
- Are customers willing to wait to receive their customised product?
- Are customers willing to invest time in "designing" the product?

Readiness may be defined through a positive response to all three questions. This is to say that, provided customers are willing to accept all three inconveniences of mass-customisation, they will be considered to be "ready" for customisation.

MATERIALS AND METHODS

Questionnaire: Make a research questionnaire for capturing readiness of companies for adopting mass customization. In this direction this questionnaire is a tool that will enable us to accessing the status of readiness of Indian industries for mass

customization. These questionnaires have two sections one only for the demographic information and other related to services and facilities. Questionnaire has thirty questions; all has same options Strongly Agree (1), Agree (2), neither Agree nor Disagree (3), Disagree (4), Strongly Disagree (5), Not Applicable (6); based on Likert scale. With the help of questionnaire we can also find customer buying behavior, needs and wants, market turbulence, company's production capability, company infrastructure, production technology, product demand predictability etc.

Analysis

The first step is description of research; according to questionnaire we take all important information about company, customer and market. These all data help us to find the readiness of textile companies for adopting mass customization. Second step is a visual examination of the factor analysis identifying those that are statistically significant. We used Varimax rotation method with Kaiser Normalization. Through SPSS we apply KMO & Bartlett's test for sampling adequacy and sphericity respectively. Result of KMO is 0.651 that is acceptable and in Bartlett's result value of chi- square is 567.760, value of freedom (df) is 190, and significance is 0; these all values are considerable. These all calculation completed in 6 iterations. Take all 30 variables for analysis and then find that this analysis provides 4 variances according to SPSS software; theoretically we also make same groups of variables.

Conclusion

Although clothes are a basic need of the customers providing comfort and hygiene, they also depend greatly upon customers' personalities and preferences. The general premise comes from the fact that customers expect different value from various clothes. Therefore the manufacturer has to provide clothes with obvious attributes or features in order to respond to the customer's value. There are many factors that a customer can choose for clothes. These features are body size (grade size or customized size); gender (ladies' wear, men's wear or children's wear); age; design, style or model (formal wear, casual wear or sportswear); material; colour or pattern; accessory (embroidery, printing, etc.); and finishing. Each clothing company must be aware of selecting these features as its unique characteristics. Clothes can be considered as basic products or fashion products. The basic products have distinct cycles in their selling over the years which follow seasonal changes. For fashion products, the rate of change in customer needs and demands are very high in this industry. Products end not to be repeatable and customers tend not to have repeatable demand. According to Survey, 36% of consumers are willing to pay up to 15% more for customized apparel and footwear, and will wait up to three weeks to receive their customized product.

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Questionnaire

Mewar University, Gangrar, Chittorgarh, Rajasthan

Department of Mechanical Engineering,
Research Questionnaire for capturing readiness of companies for adopting mass customization

Dear participant,

I am Kailash Rai, PhD. research scholar of Mewar University, Chittorgarh . I am carrying out research work in the area of Mass Customization in selected textile industries in India. Mass Customization is the ability to design and manufacture customized products to meet customer needs at mass scale at reasonable costs. In this direction this questionnaire is a tool that will enable us to accessing the status of readiness and other factors of Indian industries for mass customization. Kindly spare a few minutes of your valuable time and provide your expert opinion by filling this questionnaire. This shall help me in completing my PhD. work. Your responses and details shall be kept confidential and will be used for academic purpose only

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Section- A

Socio – Demographic Factors

1. Name…………………………………………………………………….........
2. Company Name ………………………………………………………….....
3. Designation……………………………………………………………….......
4. Age……………………………………………………………………….....
5. Years of Service (Total Experience)………………………………………………

Section B

Please tick (√) following services/facilities based on your personal experience

Likert Scale: - Strongly Agree (1), Agree (2), neither Agree nor Disagree (3), Disagree (4), Strongly Disagree (5), Not Applicable (6)

1	Variety of product is increased today compare with that of decade ago	1	2	3	4	5	6
2	Product variety will increase in future	1	2	3	4	5	6
3	Today is it more important to respond quickly to customer demand for changes with new or modified products	1	2	3	4	5	6
4	Your products fill complete luxuries in mind of your customers	1	2	3	4	5	6
5	Your products fill very basic needs of your customers	1	2	3	4	5	6
6	Your product development process shorter then a decade ago	1	2	3	4	5	6
7	Product technology is changing rapidly in your business units	1	2	3	4	5	6
8	Your product development cycle is short	1	2	3	4	5	6
9	Your company production capabilities are automated	1	2	3	4	5	6
10	Are the needs and wants of your customers changing constantly	1	2	3	4	5	6
11	The demand of your product is highly unpredictable	1	2	3	4	5	6
12	Your customers needs and wants are easily understood	1	2	3	4	5	6
13	Your customers needs and wants are changing very quickly	1	2	3	4	5	6
14	Customer's buying capacity has increased in recent time	1	2	3	4	5	6
15	Your customers desire always same product	1	2	3	4	5	6
16	MC as more investment intensive strategy as opposed to mass production	1	2	3	4	5	6
17	For MC, market turbulent is a major factor	1	2	3	4	5	6
18	do you see the future of your sector in terms of MC	1	2	3	4	5	6
19	Your business units sales is affected by economic cycles	1	2	3	4	5	6
20	You and your competitors battle for market share in the market	1	2	3	4	5	6
21	Fashion and style influence your customers in their decisions to buy	1	2	3	4	5	6
22	Customers want customized products and services anyway	1	2	3	4	5	6
23	Customer are willing to pay a premium for customized products	1	2	3	4	5	6
24	In future company can go with Mass Customization	1	2	3	4	5	6
25	Your industry is based on new and flexible technologies	1	2	3	4	5	6
26	You have ability to communicate directly with customers	1	2	3	4	5	6
27	Your customers are able to know about your products	1	2	3	4	5	6
28	MC is your next step for customers as well as your company	1	2	3	4	5	6
29	Any time you received negative feedback from customers about product features or variety	1	2	3	4	5	6
30	Can you identify technologies that would improve your operations	1	2	3	4	5	6

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