Sudan University of Science & Technology
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PREDICTORS OF PURCHASE INTENTION IN MASS CUSTOMIZATION: THE MEDIATING ROLE OF CO-DESIGN, THE EFFECT OF AWARENESS AND KNOWLEDGE

محدِّدات البنيَّة الشرائيَّة فى التخصيص الشامل: الدور الوسيط للتصمّيم المشترك للمنتج والأثر المعدِّل لإهتمام ومعرفة العميل

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ABSTRACT

Mass Customization (MC) is an advanced management tool in which product is designed and produced in close relationship and coordination with customer's expectations and desires. Therefore, this study investigates the predictors of intention in Mass Customization: the mediating role of co-design, and the effect of awareness and knowledge. However, there is a little knowledge about Mass Customization and its effect on customer satisfaction through the co- design. The methodology used in this study was descriptive analytical method using survey. This study has focused on individuals associated with customized products. Non probability sampling has been taken from painting industry. To test hypothesis, study used multiple and hierarchal regression analysis. No. of questionnaires distributed was 270 with response rate 70%. In all instances, four variables were considered as predictors of intention. Intention is considered as a mediator between the predictors and the behavior which is co- design which is itself mediator between intention and customer test hypothesis, satisfaction. Two moderators were included to have influence on the relation between co-design and customer satisfaction (Knowledge& Awareness). Therefore, these findings suggest that consumers' evaluations of mass customization are positively related to attitude and self- confidence and negatively related to the perceived usefulness and product aesthetics of the customized product. Furthermore, the evaluation is more positive when consumers have intention to co- design their product which increases the ability for self-expression increases and leads to customer satisfaction; this last construct being positively related to the public visibility of the mass customization outcome and the amount of customization. Finally, this study shows that as customization evaluations increase, so do behavioral intentions (e.g., co-design) toward the customized product.

مستخلص الدراسة

التخصيص الشامل هو أداة الإدارة المتقدمة التي فيها يتم تصميم المنتج في علاقة وثيقة وبالتنسيق مع العملاء لمقابلة توقعاتهم ورغباتهم. حيث ان المعرفة عن التخصيص الشامل وأثره على رضا الزبون عن طريق المشاركة فى التصميم، هذه الدراسة تقوم بالاجابة على التساؤلات حول تأثير استراتيجية التخصيص الشامل على رضا العملاء طريق المشاركة فى التصميم "سوق صناعة الطلاء." استخدمت هذه الدراسة المنهج الوصفى التحليلى في عينة غير احتمالية مناسبة حيث بلغت حجمها 270 بمعدل استجابة بلغ 70%.في جميع الحالات، اعتبرت أربعة متغيرات مسبقات للنية. وتعتبر نية الزبون لشراء المنتجات التى يقوم بتفصيلها كوسيط بين تنبؤات النية والسلوك الذي يتمثل هنا فى المشاركة في التصميم الذي هو في حد ذاته الوسيط بين النية ورضا الزبون. وأدرج عاملين معذلين للعلاقة بين المشاركة فى التصميم المشترك ورضا الزبون وهما (المعرفة والاهتمام). وتشير النتائج إلى أنلتقييمات المستهلكين للتخصيص الشامل ترتبط بشكل إيجابي في الموقف والثقة بالنفس وسلبا على بالفائدة المنظورة للمنتج وجماليات المنتج للمنتجات المفصلة حسب الطلب. وعلاوة على ذلك، فإن التقييم هو أكثر إيجابية عندما يكون المستهلكون لديه النية للاشترك في تصميم المنتج الذى يود شاراؤه مما يزيد من القدرة على زيادة التعبير عن الذات ويؤدي إلى رضا الزبون. هذا التصور الأخير يشكل منظور إيجابي في الرؤية العامة لنتائج التخصيص الشامل. وأخيرا، تبين لنا أنه مع زيادة تقييم التخصيص الشامل، النية الشرائية للمنتجات ذات التخصيص الشامل تزداد تبعاً لذلك.

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MC	Mass Customization
B2B	Business to Business
B2C	Business to Customer

CHAPTER ONE

1.1. Introduction

This chapter includes the background of the study, statement of problem, research questions, research objectives, significance of the study, definition of terms, and study organization

1.2. Background of the study

The objective of marketing is to identify wants and needs of target market consumers and to deliver products and services that satisfy these wants and needs more efficiently than competitors. A traditional marketing approach attempts to identify homogeneous market segments with similar wants and needs and deliver products or services that meet common requirements of the market segments. Instead of identifying homogeneous market segments, mass customization views the individual consumer as a base on which to segment the market (Bardakci & Whitelock, 2003).

However, this approach may no longer be sufficient to satisfy consumers as their wants and needs are rapidly changing and fragmented (Bardakci & Whitelock, 2003. Consumers now demand products and services that provide more precise and complete response to their needs (Kotha, 1995). Mass customization is quickly becoming a crucial business principle of the 21st century's competitive market (Apeagyei & Otieno, 2007). The basic structure of mass customization is similar to that of mass production with variety, but there are important differences. Instead of selecting one variety of a product, each customer provides unique information so that the product can be tailored to his or her requirements.

With the assistance of information technologies, a new marketing approach, mass customization, has been implemented to cope with the new requirements of products and services from the market. This is in contrast to the recent past where the key to success was believed to lie in standardization. In the era of industrial thinking, the goal of a company was to reap the advantages of mass production that inevitably led to standardization and the generalization of customer needs.

With increasing competition and greater customer self-awareness, companies have been forced to embark on market segmentation strategies. The question addressed is not – should product customization be used, but rather how it can be used. How can the production systems that are traditionally meant to capture mass efficiencies, cope with these kinds of fragmenting market pressures?

Kotler in the 1980s reported about mass customization in the Japanese housing industry, where customers could design new houses with computer-aided design and manufacturing tools. In the IT industry in the 1990s, the personal computer company Dell based its entire business model on the mass customization concept by offering build-to-order computers from modular components.

Mass production was born, and prioritized low cost production in order to reduce prices, to eventually initiate and stimulate mass consumption. Ford simply made cars available to people regardless of their social class, at a time when the car was considered a luxury toy for the upper class. Furthermore, mass production improved the consumption capacity altogether for the working class, by offering cheaper products that became universal consumer goods, shared by the elite and the working class between.

Although mass production made what was considered luxury goods available to any social class, quality was a recurring concern for especially the American manufacturing systems. Over time, manufacturing systems would develop and evolve, and particularly the Japanese automotive industry with Toyota as the frontrunner was capable of producing quality vehicles at remarkably lower cost than their American predecessors. To be concise, they adapted the Fordist model by having a more flexible and skilled workforce, and offering them life-long employment in order to increase their motivation.

Davis, 1987 first coined the term "mass customization" that is a combination of "mass production" and "customization." Contemporary business world has evolved considerably in the past few decades from focusing on mass production to focusing on mass customization (Shamsuzzoha, 2010). Pitta, (Franzak, and Laric, 2003) referred to mass customization as a variation of one-to-one marketing that refers to marketing activities toward individual customers. The scope of the term relates to customized products and services based on technologies in all steps of the production cycle including marketing. (Pine 1993) compared mass customization with mass production; the former assumes heterogeneous markets and the latter focuses on homogenous markets. Mass production was initiated to satisfy a large segment of consumers with standard products at low prices, whereas mass customization is focused on individuals and providing customized products maintaining the same level of low prices by means of mass production. Technological developments enable firms to reduce costs by shortening the process of product development and manufacturing cycles. (Gilmore and Pine, 1997) remarked that companies that employ customization methods should use a different marketing approach based on specific consumer values. From a marketing aspect, there are four methods by which companies can achieve mass customization.

The first one is Collaborative customizers. This method assists consumers in finding their preferences through dialogs to offer customized products and services. Next, Adaptive customizers provides altering options for a standard product presented by the firm. Cosmetic customizers refer to different marketing for a standard product to different consumers. Finally, transparent customizers mean recommendations of unique products and services to a specific consumer without direct interactions.

Over the last decade, mass customization has become an effective approach to customer centricity, i.e. to regard customers as individuals, proactively develop products and services according to the individual customer's preferences, and to efficiently produce and distribute these offerings. In other words, the objective of mass customization is to efficiently provide customers what they want, when they want it. Today's consumer markets are changing faster than before and consumers are becoming demanding more than ever. Thus, mass customization has become as a solution for addressing the new market realities while still enabling firms and companies to take the benefit of the efficiency advantages of mass-production (Pine, 1993, Tseng and Jiao, 2001, Piller, 2003).Until today, many scholars are arguing that mass customization is possible to be explicated because of the capabilities of modern manufacturing technologies like flexible manufacturing systems and modular product structures, reducing the tradeoff between variety and productivity (Ahlstrom and Westbrook 1999) as cited in paper by Raj Selladurai, 2004. On the other hand (Forza & Salvador, 2002) stated that flexible manufacturing systems are a necessary but not sufficient condition to offer customer variety without compromising on profitability. Whereas (Dietrich,A.J.,Timm,I. J., and Kirn, S., 2003) commented that manufacturing systems should be supplemented by information technologies and capable of handling the information flows and transaction costs of mass customization.

Compared to mass-production, mass customization is characterized by a high intensity of information (Piller 2002). Each and every transaction contains information about the customer-specific product design and is expressed through direct communication between the customer and the supplier. Here where (Zipkin 2001) is telling us that the specific customer order is delivered by the aid of the capabilities of the supplier's solution space, calls this process the 'elicitation' of a mass customization system. The supplier has to interact directly with the customer to help obtaining specific information in order to translate his needs and desires into a definite and final product specification. This elicitation process is in many cases can exceed the description of an exchange of information to be an act of joint cooperation and co-creation.

Customer integration is the result of elicitation in mass customization. Customer integration can be defined as a form of industrial value creation where 'the consumers take part in activities and processes which used to be seen as the domain of the companies (Wikstrom 1996).

Toffler, (1970), is talking about the customer who becomes a 'co-producer' respectively a 'prosumer. Co- creation system is the result i.e. a company–customer interaction (social exchange) and adaptation which has added value for both the supplier and the customer (Milgrom& Roberts 1990, Normann & Ramirez 1993). From a supplier's perspective, the customer in mass customization is a production factor fulfilling tasks were done internally in a mass production system (Ramirez, 1999). However, within mass customization co-production goes beyond traditional approaches. In a mass customization system, the main part of customer integration happens normally during the configuration or even design phase of a product.

Talking about customer experience in mass customization, experiences are distinct economic offerings, as distinct from services as services are from goods (Pine & Gilmore, 1999). Pine, (2003) indicated that mass customization could be an effective venue for companies to offer experiences because it automatically turns a transaction into an experience. In order to treat each consumer individually, mass customization integrates the consumer in product/service design and development, which used to be the domain of firms. Customers participate in a series of creative activities that are stimulating and exhilarating (Fiore, Lee, & Kunz, 2004).

Thus, mass customization provides an outlet for creative expression and becomes a source of memorable experience from which a consumer perceives value. Within highly competitive markets, product and service customization is considered to be one of the key success factors of companies. This research explores the relation between four individual difference variables and the customer intention to co-design customized products which could lead to his/ her satisfaction.

In this study, the satisfaction of the consumers will be examined may derive from mass customization and the influence of some factors on their intention towards mass customized products. Plus, the role of the co- design as a mediator between the customer intention and the customer satisfaction. In addition to the moderating role of the awareness and the knowledge on the relation between the co- design and the customer satisfaction. Customization requires that the consumer modify the product himself. In this way, the consumer is led to engage in an experience of mass customization, a concept that proposed to qualify the interaction between the object and the individual during the co-design phase, and to account for the individual experience during this process. The consumer may thus play a more active role in the

design of the products and in the production of their own consumption experiences (Addis and Holbrook, 2001). Both in practice and in research projects, the primary postulate is the idea that mass-customized Product necessarily creates value for the consumer (Peppers and Rogers, 1997; Wind and Mahajan, 1997). However, empirical assessment of these suppositions is rare (Franke and Schreier, 2006a); which leads Zipkin, (2001) to express doubts to its validity. The failure of certain programs would seem to confirm these uncertainties.

1.3. Statement of Problem

As online markets grow and become more competitive, customization is being recognized as an important tool to satisfy and retain customers. Markets have moved from a business environment where the supplier held the power to a situation where the customer is in charge. This situation forces organizations to be more flexible to changing customer requirements (Christopher, 2005). Related to these development concepts like agile manufacturing, focused factories, customer relationship management and mass customization have enjoyed increasing attention in the literature during the last decade (Piller, Moeslein and Stotko, 2004). These new concepts of industrial value creation share a common objective; to provide ways of enabling companies to increase cost efficiency while simultaneously increasing the ability to react to changing customers' needs. For companies it becomes more and more important to develop customer value into their products. Therefore companies should listen more carefully to their customers (Fournier, Dobscha and Mick, 1998).

From the business literature there seems to be an agreement that to operate effectively managers and marketers must understand the differences between their traditional standardization practices and the "new" ones (or mass

customization) that they will have to use in order to keep up with the pressures of new competition. For mass customization to be successful consumers need to desire customized products or services (Radder and Louw, 1999) in the first place.

That's why; understanding of the topic of customization from the consumer point of view is needed. In particular, it's needed to know how much consumers care for customized offerings and which customized products or services would be more wanted by consumers. Consumers may be inherently more or less inclined toward customization and toward different types of mass customized products and services.

Initial studies of MC focused on the supplier and its operational capabilities to engage in and carry out the MC process. The literature evolved to examine the consumer perspective and the role the process plays to influence how the user values MC (Wind & Rangaswamy, 2001; Fiore et al., 2004; Bardacki & Whitelock, 2004; Franke & Piller, 2004; Dellaert & Stremersch, 2005). With this expansion in MC research, scholars identified several important dynamics that motivate the individual to use MC and factors related to the value the process and outcome create for the user. While these factors could be classified in several ways, they are placed them into two categories: those related to the predictors of intention and those related to the perception of the experience.

From the other side, several scholars have acknowledged a void in studying MC from a consumers' perspective (Dellaert and Stremersch, 2005;Franke and Piller, 2004;Kaplan and Haenlein, 2006). Although there is a growing body of research regarding MC in general, there is a lack in clear understanding of consumer response to the MC. The present study fills some

of this identified void in the literature by investigating the factors that explain consumer responses to MC. Understanding the factors that affect consumers' evaluations of MC can help firms to more successfully implement MC strategies in new products.

Recently, researchers have paid more attention to the marketing strategy of customization as mentioned in the article "Mass customization has been the "next big thing" in product strategy for a very long time" 2011. In addition, as mentioned by Martin Stoetzel (2012) that with growing relevance for all B2C oriented businesses, the customer perspective should be taken into account: Yet, despite the intuitive strategic merits of MC, MC configurators are still scarce in the market place, which indicates that more research on customer decisions is needed (Hauser et al, 2006).

While previous studies focused on consumers' intention towards mass customized products. Some empirical studies in the businesses to consumers (B2C) context clarified the effectiveness of customization in consumers' positive responses (Ribbink, Van Riel, Liljander, & Streukens, 2004; Kamali & Loker, 2002) and implied the future acceptance of the customizing system. Also, Frances Turner, (2013) has presented the impact of the mass customization on the customer satisfaction with the moderating role of the customer experience.

Hence, successful mass customization highly depends on the attractiveness of the product range, good user experiences in the configuration and order process, short delivery times, and customer satisfaction in using the customized product. One key assumption is that customized products create higher advantages for customers than standard products because they deliver a closer preference fit. The prerequisite for this effect is the ability to obtain

precise information on what customers actually want. But are customers able to specify their preferences that precisely? A number of theoretical arguments raise doubts as to this point, thus implicitly challenging the value of customization. However, Lee and Lin (2005) found no significant influence of customization on satisfaction with the purchase. Whereas Huffman and Kahn (1998) pointed out potential problems of customization that may negatively affect consumers' positive responses, and ultimately the acceptance of a customizing system.

These different observations about consumer responses toward customization have stimulated further studies in order to seek answers regarding the success of a customizing system. Several studies regarding customer intention towards mass customization have applied the Theory of Reasoned Action/Planned Behavior to explain consumers' behaviors and intentions. Key outcome variables from empirical studies include attitude, perceived usefulness, self- confidence, product aesthetic and intention (Dellaert & Stremersch, 2005; Franke & Schreier, 2008; Franke, Keinz & Schreier, 2008; Franke & Schreier, 2009; Franke, Schreier & Kaiser, 2010). Key experience variables revealed by the empirical literature are process effort, enjoyment, and pride of authorship and control (Franke & Piller, 2004; Dellaert & Stremersch, 2005; Schreier, 2006; Dellaert & Dabholkar, 2009; Franke & Schreier, 2009; Franke, Schreier & Kaiser, 2010; Merle et al., 2010).
In this study, the satisfaction customers are measured derive from customized products and the factors which impact the intention to co- design a customized products. In recent years, researchers and practitioners have paid increasing attention to the marketing strategy of customization with perspective of customer: (Dellaert and Stremersch , 2005; Gilmore and Pine, 2000; Kotha, 1995; Syam, Ruan, and Hess, 2005; Varki and Rust, 1998). These efforts have been driven by both the supply side and the demand side

where they stated that technology facilitates individualization. (Duray, Rebecca, Peter T. Ward, Glenn W. Milligan, and William L. Berry 2000; Kahn, 1998); Peppers and Rogers, 1997 stated that the production costs for individualized offerings are declining. Ansari and Mela, (2003); Sheth, Sisodia, and Sharma, (2000), stated that internet has led to a decline in the costs of communication with customers. Alba, et al, (1997); found that there are ways to reduce the customer effort required. It assumes that near-term technological developments will offer consumers unparalleled opportunities to locate and compare product offerings.

At the same time, the customers' demand for individualized products has increased, as customer preferences have become increasingly heterogeneous in many markets Gilmore and Pine, (1997). Smith, (1956). Scholars and practitioners alike have developed high expectations regarding the promise of customization (Ansari and Mela 2003; Sheth and Sisodia 1999). As Simonson (2005) puts it, "It has been assumed in recent years that the age-old practice of targeting market segments is dominated and will be displaced by individual marketing". However, some scholars have questioned the merits of customization, as it requires extensive customer participation (e.g., Fang, 2008; Huffman and Kahn 1998; Zipkin 2001; Simonson 2005). Spectacular failures in customization such as Levi Strauss' "Original Spin" jeans and Mattel's "MyDesign Barbie" (see Franke and Piller 2004) appear to support these doubts. Moreover, it has been found that customers sometimes prefer the default configurations provided by the producer and fail to recognize the opportunities offered (Dellaert and Stremersch 2003; Hill 2003).

Delivering positive value to the customer is a prerequisite for the long-term success of any customization strategy. Therefore, a number of scholars have begun to analyze the benefits customization strategies create for customers.

However, empirical findings yield mixed results: Franke and Piller 2004, Schreier 2006, and Franke and Schreier (2008a and b) compared students' willingness to pay for both standard and customized products in different low-price consumer goods categories, and found a higher willingness to pay for the customized products. Schoder et al. (2006) measured consumer acceptance of traditional and customized newspapers using conjoint analysis and concluded that people prefer customized newspapers but are not willing to pay more for them than for traditional ones, thus questioning the benefits of customization. The stimuli provided in that study were relatively abstract (operationalized as verbal stimuli: "regular newspaper" vs. "personalized newspaper").

Also, Bardakci and Whitelock (2004) investigated consumer agreement or disagreement with statements relating to the benefits and disadvantages of customized cars. The results show that although people seem to be interested in customized products, only 58% of the participants claimed to be willing to pay a slight premium for an individualized car. Once again, "customization" was only given as an abstract representation, meaning that the subjects did not actually experience customized products, which casts doubt on the validity of the findings.

Hence, for the best of our knowledge; few empirical researches have measured the satisfaction resulted from customized products i.e. (Frances Turner, 2013) which proposes that mass customization leads to customer satisfaction through customer expertise. This calls for further systematic analysis of the benefits created by customization compared to other strategies and of the conditions under which those benefits take effect.

As a contribution of this study, Limited studies pointed out the importance of Co-design. (eg. HIRA CHO, 2007). Although there are many studies examine

customization intention; but limited studies went farther behind. (Soheila Khoddami, Hamid Moradi, Parviz Ahmadi, 2011). This study includes the intention and co- design as mediators. A mediator specifies how (or the mechanism by which) a given effect occurs (Baron & Kenny, 1986; James & Brett, 1984). (Baron and Kenny 1986) describes a mediator variable as the following:

The generative mechanism through which the focal independent variable is able to influence the dependent variable of interest (and) Mediation is best done in the case of a strong relation between the predictor and criterion variable. Shadish and Sweeney (1991) stated that "the independent variable causes the mediator which then causes the outcome". Also critical is the prerequisite that there be a significant association between the independent variable and the dependent variable before testing for a mediated effect. Intention leads to customer satisfaction through the co- design process.

It seems no empirical studies investigated the relationship between co-design and customer satisfaction. Our additions in this study; Awareness& Knowledge were measured in most of the previous studies as one variable. Whereas, that they are different starting from their definitions.

Awareness and knowledge affect the design of the product which if it passed smoothly and successfully, the customer will be satisfied from his product which had been designed by him.

Although, Awareness and knowledge have an impact on the relation between co-design and customer satisfaction, to the best of our knowledge no empirical studies have examined the impact of knowledge and awareness on the relation between co-design and customer satisfaction. In addition to the different results of adopting the MC strategy awareness and knowledge are used as moderators to explain these different views. (Baron and Kenny, 1986) described the moderator variable as "qualitative (e.g., sex, race, class)

or quantitative variable that affects the direction and/or strength of a relation between an independent or predictor variable and a dependent or criterion variable". In the same contest it was mentioned that "Moderator variables are typically introduced when there is an unexpectedly weak or inconsistent relation between a predictor and a criterion variable".

Furthermore, Ramayah, (2005) stated that "What it all boils down to is that lets say theory says that the IV and the DV are supposed to be related (either positively or negatively). When researches were carried out, it was found that the relationship is not consistent, i.e.; some found positive relationship, some found negative relationship whereas some found that there is no relationship at all. If the literature points towards this direction then it's concluded that there may be some contingent (moderator) variable that we have not investigated which could be the cause of this inconsistency". Thus, in this kind of situation awareness and knowledge will be introduced as moderator variables to see whether the relation changes between the co- design and the customer satisfaction with the presence of the moderator variables.

Generally, this study investigates the main role co- design plays in Mass Customization mass customization is the new frontier in business competition. In this new frontier, a wealth of variety and customization is available to consumers and business through the flexibility and responsiveness of companies practicing this new system of management. For mass customization to be successful, consumers first must desire customized products or services (Radder & Louw, 1999). Svensson and Jensen (2001) state that there is no value in customizing most consumer goods because, for these products, variation is of little value to the consumer. Clearly, a deeper understanding of customization from the consumer's point of view is needed.

1.4. Research Questions

2. What is the extent of the MC among Sudanese marketing companies?

3. Do predictors of intention have relation with customer satisfaction?

4. Do predictors of intention have relation with co- design?

5. Do predictors of intention have relation with to intention?

6. Does intention have relation with to co- design?

7. Does intention mediate the relation between predictors of intention and co-design?

8. Does co- design have a relation with customer satisfaction?

9. Does co- design mediate the relation between intention and customer satisfaction?

10. Does awareness and knowledge moderate the relation between co- design and customer satisfaction?

1.5. Research objectives

This study attempts to use a theoretical basis and empirical analysis to explore the factors that influence the customer intention to buy customized products which results customer satisfaction. Hence, the objectives of this study are:

- To examine the relation between predictors of Intention and customer satisfaction
- To examine the relation between predictors of Intention and co- design of the customized products
- To examine the relation between predictors of Intention and the customer intention to co- design the customized products
- To examine the relation between intention and co- design of the customized products
- To examine the mediating role of the intention between the predictors of intention and the co- design
- To examine the relation between co- design and customer satisfaction
- To examine the mediating role of the co- design between the intention and the customer satisfaction.
- To examine the moderating effect of the Awareness and knowledge between the co- design and the customer satisfaction.

1.6. Significance of the Study

Mass customization cannot be considered as a marketing strategy used in Sudan yet. It has the potential to offer individualized products at little additional cost. Extensive research exits on the manufacturing side of mass customization; however research on consumer attitudes to such products is sparse. This research addresses how customers perceive customized products. A conceptual model is developed and tested using a large sample of real-world consumers. We found two main motivators to pay for mass customized products. First, attitude of the customer customized products and the participation in the designing. Second, self confidence in designing the customized products is a way to reflect the customer personality and uniqueness to avoid the disadvantages of standardized, off-the-shelf products.

This study opens the gate for further researches to elaborate more in other factors related to choosing the mass customized products. In addition to introduction to motivating factors to adopt customized products which can be major change in companies' strategies that offer products and services able to be customized.

1.7. Definition of Terms:

- **Mass Customization (MC)**: Customer co-design process of products and services, which meet the needs of each individual customer with regard to certain product Mass Customization features. (Piller, 2004)
- **Attitude**: a person's perspective toward a specified target and way of saying and doing things. **.**G. Haddock, 2004

- **Perceived Usefulness**: the extent to which a consumer believes that customized products will result in positive and functional outcomes. (Mathwick et al., 2001)

- **Self Confidence**: the extent to which a consumer feels capable and assured with respect to his or her marketplace decisions and behaviors. (Bearden et al., 2001)

- **Product Aesthetics**: Aesthetics is defined as the level of significance that visual aesthetics hold for a particular consumer in his or her relationships with products. (Bloch et al., 2003)

- **Intention**: An individual's readiness to perform a certain action. Ajzen, (1985).

- **Co- design**: The active involvement of the customer in the design and delivery of products and services. (Bendapudi and Leone, 2003)

- **Awareness**: is the state or ability to perceive, to feel, or to be conscious of events, objects, or sensory patterns. (Frederic P. Miller et al., 2010).

- **Knowledge**: is a familiarity with someone or something, which can include facts, information, descriptions, or skills acquired through experience or education. (Paul Muljadi, 2011).

- **Customer Satisfaction**: the feeling of the customer about the extent to which his experiences with an organization have met their needs. (Nigel Hill et al., 2007).

1.8. Study Organization

This study is organized in five chapters:

Chapter I: Introduction. The first chapter includes the statement of the problem, Research questions and objectives, the definition of terms, and the organization of the study. **Chapter II**: Review of Literature. This chapter is composed of five parts. The first part is detailed explanation of the mass customization. The second part is the dependent variable which is the customer satisfaction and the performance in customization. The third part consists of the two moderators which are awareness and knowledge. The fourth part is the two mediators the intention and the co- design. While the fifth part and the last one consists of the independent variable which are the predictors of intention (attitude, perceived usefulness, self- confidence, and product aesthetics. **Chapter III**: Theoretical Framework. The purpose of this chapter is to discuss the theoretical framework used in this study. Describe the methodological procedure to test the research model. And also discusses the hypothesis of the study. **Chapter IV**: Results. This chapter reports the results of the empirical study. Data from the survey was analyzed using SPSS 11. **Chapter VI**: Discussion, Conclusions/Implications/Limitations & Future Research. The findings of the study provide conclusions, followed by implications to practitioners. Study limitations are reported with suggestions for future studies.

CHAPTER TWO

2.1 Introduction

2.1. This chapter reviews the literature relating to the topics of interest as the foundation for the development of a conceptual model and hypotheses that will help understand influencing factors to intention an the role of co- design in customer satisfaction.

2.2. Conceptualization of Mass Customization?

Mass customization was first proposed by Toffler in 1970 and then defined by Davis in 1987 in the book Future Perfect. This concept received further attention in the1990s paralleling the advances in information and manufacturing technologies, which support its actual implementation. The concept is gaining importance because the marketing literature is increasing focused in delivering superior customer service. (Pine, 1993) viewed mass customization as a hybrid of mass production and craft customization. He defined mass customization as the mass production of individually customized goods and services. Literature on mass customization is extensive, especially in the areas of production and management. Traditionally, these studies have taken a made-to-order approach where the seller or producer had to implement the customization (Ahlstrom & Westbrook, (1999); Duray & Milligan, 1999; Duray, Ward, Milligan, & William, 2000; Kotha, 1995; Feitzinger & Lee, 1997; Radder & Louw, 1999; Peters & Saidin, 2000).

Over the last decade, mass customization has emerged as an effective approach to customer centricity, i.e. to regard customers as individuals, to proactively develop products and services according to the individual customer's preferences, and to efficiently produce and distribute these offerings. In other

words, the goal of mass customization is to efficiently provide customers what they want, when they want it.

A traditional marketing approach attempts to identify homogeneous market segments with similar wants and needs and deliver products or services that meet common requirements of the market segments (Bardakci & Whitelock, 2003). However, this approach may no longer be sufficient to satisfy consumers as their wants and needs are rapidly changing and fragmented (Bardakci & Whitelock, (2003); (Kotha, 1995, 1996); (Pine, 1993). Consumers now demand products and services that provide more precise and complete response to their needs (Kotha, 1995). With the assistance of information technologies, a new marketing approach, mass customization, has been implemented to cope with the new requirements of products and services from the market.

Mass customization differs from product-centered mass production in that mass customization integrates the customer in product design so the customer acts as a designer or co-creator of the product Bardakci & Whitelock, (2003). In many forms of mass customization, the product is sold before it is produced, whereas mass production pushes what is already produced into the market. Mass customization differs from traditional craft customization in its rapidness and lower expense compared to craft customization (Boynton, Victor, & Pine, 1993). Another distinguishing element of mass customization is the application of advanced manufacturing technologies such as flexible manufacturing. These technologies make it possible to adjust production to the demand of individual customers and at the same time produce a large volume, so firms can maintain efficiency close to mass production.

The objective of mass customization is to produce goods and services meeting individual customer's needs with near mass production efficiency (Tseng and Jiao, 2001). Mass customization is a hybrid manufacturing concept existing to provide highly value added products. It is about delivering the desired product after the needs of an individual customer have been expressed Piller, (2004).

A standard product that bears certain flexibility, so that the retail or customers themselves can customize it, can be regarded as a mass customized product. In addition, providing a set of individual value added services around a standard product could also be regarded as a form of mass customization. On the other hand, a service can be constructed in a way where it is partly 'pure customization' and party mass customization, in which some of its components are standardized and some custom made for each customer (Blecker and Friedrich, 2006). It is important to note that in mass customization, where customers are presented with a variety of choice, they are not involved in the specification of that variety (Duray et al 2000).

Customers must first interact with the manufacturer, the retailer, or the product itself in order to configure the end solution. In order words, depending on the situation, customers can be involved in specifying features of the product during phases of design, fabrication, assembly, or use (Zipkin, 2001); (Broekhuizen and Alsem, 2002). More recently, with the advent of new technologies, an approach to mass customization has been made possible in which the manufacturer does not need to be the one producing the final item.

Instead of identifying homogeneous market segments, mass customization views the individual consumer as a base on which to segment the market (Bardakci & Whitelock, 2003). The implementation of mass customization is enabled by advancements in information and manufacturing technologies.

These technologies allow firms to provide customized products and services based on the needs and preferences of individual customers and produce on a large scale (Gilmore & Pine, 1997). Along with this market change, Pine and Gilmore (1999) asserted that Western societies are moving into an era of an experience economy. They illustrated Western societies have evolved from an agrarian economy, to an industrial economy, then to a service economy.

Today's consumer markets are changing faster and consumers are more demanding than ever (Cox and Alm 1998). Thus, mass customization has emerged in the last decade as a solution for addressing the new market realities while still enabling firms to capture the efficiency advantages of mass-production (Pine 1993), (Tseng and Jiao 2001), (Piller 2003). Until today, mass customization was argued to be possible explicitly due to the capabilities of modern manufacturing technologies like flexible manufacturing systems and modular product structures, reducing the tradeoff between variety and productivity Jiao and Tseng (1996), Ahlstrom and Westbrook (1999).

However, flexible manufacturing systems are a necessary but not sufficient condition to offer customer variety without compromising on profitability (Forza and Salvador, 2002). Manufacturing systems should be supplemented by information technologies (Dietrich et al. 2003) capable of handling the information flows and transaction costs connected to mass customization.

Compared to mass-production, mass customization is characterized by a high intensity of information (Piller, 2002). Every transaction implies information and coordination about the customer-specific product design and is based on a direct communication between the customer and the supplier. Here, the capabilities of the supplier's solution space are turned into a specific customer order by using adequate configuration tools. Zipkin (2001) calls this process

the ‘elicitation’ of a mass customization system. The supplier has to interact with the customer to obtain specific information in order to define and translate the customers’ needs and desires into a definite product specification. This elicitation process is in many cases much more than an exchange of information but an act of joint cooperation and co-creation. Elicitation in mass customization systems is resulting in customer integration.

Customer integration can be defined as a form of industrial value creation where ‘the consumers take part in activities and processes which used to be seen as the domain of the companies’ (Wikstrom, 1996). The customer becomes a ‘co-producer’ respectively a ‘prosumer’ (Toffler, 1970). The result is a system of co-creation, i.e. a company–customer interaction (social exchange) and adaptation for the purpose of attaining added value for both the supplier and the customer (Normann and Ramirez, 1993). From a supplier’s perspective, the customer is seen as a production factor fulfilling tasks that in a mass production system are done internally (Ramirez, 1999).

However, within mass customization co-production goes beyond traditional approaches like getting clients to clean up their table in a fast-food restaurant or leaving the final assembly of goods up to the customer. In a mass customization system, the main part of customer integration happens during the configuration or even design phase of a product.

Customers participate in a series of creative activities that are stimulating and exhilarating (Fiore, Lee, & Kunz, 2004). Thus, mass customization provides an outlet for creative expression and becomes a source of memorable experience from which a consumer perceives value.

One may note that mass customization as a new marketing approach was created under the market realities and assumptions in Western societies, where

individual needs, rights, and preferences are emphasized. There has been little information regarding whether mass customization can be successfully implemented in a non-Western society, where a different value system exists. It is not known whether cultural uniqueness will influence the adoption of mass customization in other societies. (Kroeber and Parsons, 1958) defined culture as "transmitted and created content and patterns of values, ideas, and other symbolic-meaningful systems as factors in the shaping of human behavior and the artifacts produced through behavior". As implied in this definition, culture consists of patterns of values that shape human behavior within the culture. Moreover, conceptualization of MC began more than two decades ago; hence it has naturally evolved in its nature and execution.

Scholars pointed out that the ultimate success of mass customization depends on the superior value that consumers can perceive from mass customization compared to mass production (Broekhuizen & Alsem, 2002). However, aside from the theoretical prediction that mass customization will enhance perceived value, there have been few studies that empirically examined perceived value of mass customization (Fiore et al., 2004; Franke & Piller, 2004; Kamali & Loker, 2002; Squire, Readman, Brown, & Bessant, 2004). It has not been fully understood what aspects of perceived value will be enhanced by mass customization.

Today there are many businesses that utilize mass customization: sports shoes (Adidas and Nike); hockey sticks (Branches Hockey); notebook and desktop computers (Dell); industrial plastics (GE Plastics); clothing and footwear (Bivolino; Spreadshirt; Selve; Shoes of Prey); lighting systems (Lutron); breakfast cereals (My Muesli); chocolate bars and candies (Chocri; M&Ms by Masterfoods); vitamins (Mitamins); bicycles (National Bicycle); beauty care products (Procter & Gamble); golf clubs (Taylor-Made); messenger bags

(Timbuk2); and candles (Yankee Candle). This list is by no means complete, but it reflects the diversity of industries in which customization is gaining ground. More complete information on mass customization in practice is provided by Tseng and Piller (2003), and in the website edited by Piller since 1997 at http://www.mass- customization.de/.

The difference between mass customization definitions, presented in this study is that some are broader, more visionary Davis, (1987); Pine, (1993), while other scholars Kay, (1993); Silveira et al., (2001) use narrower, more practical concepts. They introduce specific tools, such as information technology and organizational structures that are essential building parts of MC system. However, almost every definition of mentions **individual customer needs** in one formulation or another. The focus appears to be on the dynamic demanding consumers.

2.3 Origins of mass customization

Mass customization is one strategy a firm has at its disposal to enhance the relationship with its customer and sow loyalty (Franke & Piller, 2003). Simply, MC utilizes flexible mass-production processes to deliver cost-efficient, individualized outcomes unique to each and every consumer, in the form of a product, service, experience, or other outcome Davis, (1987); Pine, (1993); Hart, (1995), Kotha, (1995); Tseng & Jiao, (1996). At its essence is collaboration between the consumer and the firm: the firm provides a product design template, options of features and design tools that the customer employs to select and devise the product uniquely specific to his preferences. Hereunder we will discuss some points and facts regarding the paradigm and the companies in relation to MC.

2.3.1 The paradigm

The system of Mass Production has supported industrial growth and economic strength of many economies between the eighteenth and twentieth century's. For many years it was the only production system practiced by large manufacturers and service providers, except for small craft-based shops. However, new forms of competition, society, markets, technologies and consumers have challenged the system. The breaking of mass production began in the 1960s, accelerated in 1970s and finally alerted the management in 1980s, when a "paradigm crisis" occurred. (Piller, 1993). In the 1990s it was no longer possible to ignore changes that had been accelerating during the past decades. So, in the 1990s, why were so many companies in various industries eager to enter or switch to another paradigm? It happened because many of these industries were undergoing a fundamental change and mass customization provided a solution to overcome these challenges (Piller and Schaller, 2002).

They were no longer focusing on standardized products or services for homogeneous markets. Mass Production, associated with efficiency through stability and control, was becoming neither stable nor under control, due to demanding consumers and opening markets, therefore efficiency was compromised. Emerging technology and new management methods have opened the door to variety and customization through flexibility and quick responsiveness, which is essential to Mass Customization (Pine, 1993a). While mass producers offering products and services at prices low enough, that nearly everyone can afford them, mass customizers advocate producing goods services with enough variety and customization so that everyone finds what they want. Leaders of mass customization, having in mind flaws associated with mass production, believed that a company, which better satisfied its customers' individual needs, would have greater sales, profits, and better

knowledge of market needs. This, in turn, would lead to even more variety and customization, which will fragment the market even further (Pine, 1993).
The justification for the development of mass customization systems is based on several central ideas Kotha, (1995); Pine, (1993a); Silveira et al., (2001):
Due to decreasing productivity in 1970s, the ability of Mass Production system to lower real costs and therefore prices inhibited its expansion across markets. More accessible international markets lead to a gradual change in consumers' needs and wants. What used to be a stable demand for standard goods has fragmented into a demand for differentiated goods.

Large, homogeneous markets have become heterogeneous due to the fragmenting demand. Therefore niche businesses are emerging, shifting power to buyers who prefer individualized higher quality goods. Companies realize new ways to generate profits; hence they enter niches to try to meet the changing needs. First it can be done through tailoring the end product after production, but this method being costly, customization during production becomes an option. Creating high levels of individualized production requires flexibility in manufacturing process, which is a challenge to mass production. Hence manufacturing processes and machinery need to change. Driven by markets and customers, high-quality customized products need to be produced at mass production capacity via short production runs and short changeover times.

As a result of better addressing customers' needs, a premium price can be charged. This additional margin covers for a loss of volume. After some experience is gained from MC processes, goods with many variations can be produced at the same costs or lower than MP. Due to the dynamic nature of new niche markets, continuous success can be achieved by quickly producing a greater variety of goods. As the rate of technology change increases sharply,

product development cycles must be shortened accordingly. Shorter product development cycles are followed by shorter product life cycles, which mean that products and technologies are constantly improved and/or replaced.

These results in demand fragmentation (less demand for each individual product), and a higher demand for the company and its products relative to the old system and to its competitors. Niche markets become attractive avenues due possibilities to fulfill ever-growing demand fragmentation Pine, (1993) as well as due to new distributions channels and information technologies that allow direct contact between customers and manufacturers.

In the same book Pine (1993) also lists the required enablers in order for mass customization to become a reality: (1) advances in the speed, capacity, effectiveness, efficiency, and usability of information and telecommunications technologies; (2) just-in-time strategies; reduction of setup and changeover times; (3) compression cycle times throughout all processes in the value chain; and (4) production upon receipt of an order (instead of forecasts only).
Several important contributions to the mass-customization literature have followed Pine's work e.g., Kotha, (1995); Lampel & Mintzberg, (1996); Pine, (1993).

These studies found that customization has been an aspiration and a challenge for producers and marketers for the duration of the last century (Radder & Louw, 1999). It is an aspiration because, according to the American Marketing Association, the aim of a marketer should be "to create exchanges that satisfy individual goals" (Bennett, 1988). It is a challenge because the concurrence and fulfillment of the wants and needs of individual customers has meant some kind of sacrifice in effectiveness, efficiency, or costs (Pine, 1993).

Mass customization is not just “continuous improvement plus” (Pine, Victor, & Boynton, 1993). As the failures and struggles of many companies (e.g., Toyota, Nissan, Mitsubishi, Mazda, Amdahl) attempting to achieve mass customization suggests, businesses have to be careful to notice that not all markets are appropriate for mass customization. At the same time, the concept of mass customization appeals to managers because it has made possible for some companies, which include among others Motorola, Bell Atlantic, and Hallmark (Pine et al., 1993), to achieve low costs, high quality, and the ability to make highly varied, often individually customized products.

Within the last two decades the gap between the theoretical notion of mass customized products and the reality has been reduced considerably, and it is expected that it will get narrower in the future Piller & Moslein, (2002). The bridging of the gap can be ascribed to the development of new technologies that have allowed the offering of mass customized products without sacrificing efficiency and effectiveness for producers and marketers or increasing cost for consumers. As Davis (1987) states, technology seems to be the key enabler of mass-customized products.

To sum up, mass customization originated because of external pressures and changes across industries. However, we acknowledge that many companies withstood the pressures and only some companies saw MC as a clear strategic alternative. First, increasing global competition puts pressure on cost structures. At the same time, customers increasingly demand for product variety and customized goods to fulfill their individual needs. These demands, though, are changing all the time, which makes them difficult to determine and difficult to rely on, therefore companies become reluctant to rely on mass production. In addition to all that, while technological changes are accelerating, product life cycles are shrinking.

These factors increase market turbulence, which in turn brings volatility, uncertainty and lack of control in the firms' operating environment. If businesses can no longer count on a stability of the demand, they can no longer realize the efficiencies and the economies of scale of mass production. At this stage and point, for some companies mass customization becomes a clear strategic alternative. (Pine, 1993)

2.3.2 The companies

These afore-mentioned arguments are explaining the origin of mass customization paradigm. While our research is not focusing MC in the companies, but we were curious in the nature of firms that decide to embark on this strategy just to complete the picture. Duray (2002) conducted an empirical study of 126 companies from different industries to examine the origins of mass customizing companies. It was discovered that these companies predominantly came from two alternative backgrounds:

Mass producing companies' side-stepping to MC because of market pressures and customer demand for a broader product portfolio (Blecker and Friedrich, 2006), and Craft producers (one-of-a-kind manufacturers) shifting to MC due to volume expansion and existing similarities between end products (Blecker and Friedrich, 2006).

If the same study was carried out today, almost ten years later, it can be speculated that the findings pointed out the other direction. Emerging technologies and boldness of consumer demand for individualized goods has encouraged new businesses, i.e. start-ups, to enter the mass customization market. Piller (2004), in fact, builds an argument for a third type of business, emerging in mass customization highly specialized companies adopting MC and targeting niche markets.

Zipkin (2001) also thinks that mass customization is still very much a niche business, dominated by highly specialized businesses that are small and often young. Only very selected number of mass production brands have moved to mass customization beyond pilot testing and niche markets. (Piller, 2004)

2.4. Definitions of Mass Customization

Recently, Kaplan and Haenlein (2006) defined mass customization as: "Mass customization is a strategy that creates value by some form of company-customer interaction at the fabrication/assembly stage of the operations level to create customized products with production cost and monetary price similar to those of mass-produced products."

Piller (2004) defined mass customization as "Customer co-design process of products and services, which meet the needs of each individual customer with regard to certain product features. All operations are performed within a fixed solution space, characterized by stable but still flexible and responsive processes. As a result, the costs associated with customization allow for a price level that does not imply a switch in an upper market segment."

Tu et al. (2001) defined mass customization as: "Businesses of mass customization must not only be able to design, produce and deliver products in a rapid and reliable fashion, but also to meet specific demands of the customer at the similar cost of mass production. If we take mass customization as a capability, its basic law would mean meeting customer's demand, cost effectiveness and mass production at the same time." focusing also on the demand of the customer and the low cost.

Tseng and Jiao (2001) defined mass customization as: Mass customization corresponds to "the technologies and systems to deliver goods and services that meet individual customers' needs with near mass production efficiency."

Silveira et al. (2001) defined mass customization as: "Mass customization is an ability providing customized product or service by high volume flexible process and reasonably low cost."

Joneja and Lee (1998) defined mass customization as: "The practice of mass customization by using information technology, flexible manufacturing and organizational structures in offering diversified yet individualized products and services at prices similar to that of mass production."

And Lau (1995) defined mass customization as: "Mass customization is a capability of rapid design, production and delivery of products that meet the customer's need at prices similar to mass production. Basically, mass customization is to meet customer's feedback, cost effectiveness and higher productivity by releasing scale production customized products without compromising effectiveness." Lau focused on customer's need, prices (customer's point of view) & cost effectiveness, higher productivity, and effectiveness (company's point of view)

Then Pine (1993a) defined mass customization as: "Providing tremendous variety and individual customization, at prices comparable to standard goods and services with enough variety and customization that nearly everyone finds exactly what they want". And he focused on the same point of Kotler.

When Kay (1993) defined mass customization as: "Use information technology oriented production and delivery system to meet individual customer need efficiently at cost of mass production."

Whereas Kotler (1989) defined mass customization as: "Mass customization is a kind of scope economies application, through single manufacturing process modularization, providing tremendous variety and individual customization, at prices comparable to standard goods and services."

Finally, Davis (1989) defined mass customization as: "When the same large number of customers can be reached as in mass markets of the industrial economy, and simultaneously treated individually as in the customized markets of pre-industrial economies".

2.5. Customer Satisfaction:

Customer satisfaction is the predominant metric that firms use for detecting and managing customers' likelihood. Everyone is aware of the importance of satisfying customers. We can't get away from the fact that reporters, authors, consultants, and everyone else is telling you that you must satisfy your customers in order to be competitive. And this has pushed us to build the main objective of our research to assess how mass customized products effect the customer satisfaction. A vital factor for the success of a mass customization application is user satisfaction. (Chiou, Droge and Hanvanich, 2002) look at satisfaction from the perspective of an aggregation of transaction experiences. It is defined by Oliver (1999) as "perception of pleasurable fulfilment".

As cited by Matti Eiden in his study Modular Product Development Literature Review And Case Study, (2013) "Since customer satisfaction plays a central role in mass customization, it is reasonable to push the target at higher customer satisfaction even at the price of increased product cost. According to Piller (2005) customers are willing to pay premium of up to 150% to gain the benefits of truly customizable product".

Different motivations exist for customization (Spring and Dalrymple, 2000). Typically a product is customized to fulfill customers' needs. A customer might need features that are considered as useless or even unattractive by other customers, or are simply not common standard features. Similarly, some customers require higher or lower performance, or the product is to be included as part of the customer's manufacturing process. Furthermore, customization can be a choice for its own sake. Åhlström and Westbrook (1999) studied the benefits, disadvantages, and difficulties of customization.

Increased customer satisfaction and increased market share are the most frequently mentioned benefits, while increased material and manufacturing costs are among the most notable disadvantages. Difficulties are most often related to understanding customer wants.

From the beginning of the "customer service revolution" almost 20 years ago, a body of business research has focused on customer satisfaction and customer-focused organizations (Ron Zemke and Dick Schaaf, 1989). Last decades have witnessed a number of studies on customer satisfaction. A key motivation for the growing assurance on customer satisfaction is that highly satisfied customers can lead to a stronger competitive position resulting in higher market share and profit (Fornell, 1992). As a result, there is great increasing attention among academics and business practitioners to customer satisfaction.

Martin Stoetzel in his recent article about mass customization (2012) cited clearly that successful mass customization depends on many factors including customer satisfaction of using customized products. There is a great deal of information being published today and discussed on the topic of total quality

management, continuous quality improvement, and customer service and customer satisfaction.

The definition of customer satisfaction has been debated as organizations increasingly attempt to measure it. Customer satisfaction can be experienced in different situations and connected to both goods and services. It is a highly personal rating that is greatly affected by customer expectations. Satisfaction also depends on the customer's experience of both contact with the organization (the "moment of truth" as it is called in business literature) and personal outcomes.

Some researchers define a satisfied customer as "one who receives significant added value" to his/her bottom line—a definition that may apply just as well to public services (Mack Hanan and Peter Karp, 1989). Customer satisfaction always differs depending on the situation and the product or service. A customer may be satisfied with a product or service, an experience, a purchase decision, a salesperson, store, service provider, or an attribute or any of these (Rodrigo A. Padilla, 1996)

Anton (1996) gave a more current approach. He defined customer satisfaction as a state of mind in which the customer's needs, wants, and expectations throughout the product of service life haven been met or exceeded, resulting in future repurchase and loyalty. Some researchers boost the idea that satisfaction can be measured from a perspective of performance evaluations, making the inclusion of the disconfirmation process needless.

Every marketing effort is to ensure the maximum customer satisfaction that leads to customer loyalty and continuation of the long-term relationship of the firm with the satisfied customers (Rust & Chung , 2006) that leads towards the an increase in market share and high firm performance (Morgan et al. 2005).

Moreover an increase in customer satisfaction also leads to an increase in word of mouth (Guo et al. 2009). According to Zeithmal et al. (1990) product quality is one of the most important factor to determine the customer satisfaction whereas "the outcome of an evaluation process where the consumer compares his expectations with the service he has received" (Gronroos 1982).

The thing that counts today is **customer satisfaction**. If the customer is not satisfied; he or she will stop doing business with this firm. All the things this firm to achieve quality and provide excellent service are not important at all if this firm doesn't work to satisfy the customer.

Just what is customer satisfaction? It's the customer perception that his or her expectations have been met or surpassed. He/ she buys something and expects it to work properly. If it does, he/ she is satisfied. If it doesn't he/ she is dissatisfied. Now, it is up to the seller to find a way to fix the problem so that his customer can become satisfied. When the fix occurs to the customer's approval, he is satisfied. When it doesn't he will "vote with his feet" and takes his business elsewhere.

Businesses have learned to collect data on a number of dimensions to create external data or customer satisfaction information. Usually strong sales mean customer satisfaction. Sometimes it means that a business has a unique product with little or no competition but typically sales and customer satisfaction are correlated.

The Influence of Mass Customization on Consumer Satisfaction

Several empirical studies evaluate the influence of MC on a variety of factors. However, to the best of our knowledge, few researches appear to exist on the influence of MC on consumer satisfaction. For example:

Two studies determined that customers highly value the self-design experience and desire uniqueness in the result of their customization efforts.

One study **Frances Turner, (2009)** with consumer expertise as a moderator factor on the relationship between Bundling options and Consumer satisfaction. Co-design is a key mass customization option, such that this option's process must include focus not only on the product, but also on the customer experience. Fiore, et al, (2004), op. cit).

Other study, **Schreier, M. (2006),** Given the marketing definition of utility as the want-satisfying power of a product or service, Schreier's test of MC utility for cell phones, t-shirts and scarves confirmed that consumers are willing to pay a premium of 100% above the price for a standard version of a product to mass customize that product.

Franke, Keinz & Steger (2009) concluded that the consumer's willingness to pay (WTP), purchase intention, and attitude toward the product is higher, especially when the customer knows what he wants, can express his preferences and is highly involved in the product. (Franke, N., Keinz, P., Steger, C., 2009). **Nikolaus Franke, Peter Keinz, Christoph J. Steger (2009)** argued that more satisfaction is identified in the customized products due to better preference fit as compared to standardized products.

Dennis Pollard, Shirley Chuo, Brian Lee, (2008) in their article Strategies for Mass Customization mentioned that mass customization approach brings many benefits to customers which customer satisfaction is one of these benefits.

Piller (2005) in his article Mass Customization: Reflections on the State of the Concept defined mass customization as "**Customer co-design process of products and services, which meet the needs of each individual customer with regard to certain product features. All operations are performed**

within a fixed solution space, characterized by stable but still flexible and responsive processes. As a result, the costs associated with customization allow for a price level that does not imply a switch in an upper market segment".

This definition shows clearly that the customer is completely involved in the design process to get the product that meets his needs. And that leads us to the main objective of our research that customized products lead to customer satisfaction.

In this article, Piller mentioned the satisfaction can be caused by customized products in many areas:

Mass customization is a strategy of differentiation. Chamberlin's (1950, 1962) theory of monopolistic competition, the increment of utility of a good that meets each customer needs is considered as a gain by the customer from the customization.

Several empirical studies summarized by American Demographics, a market research institute, indicate that consumers increasingly demand that products and services are tailored for them Frazier, (2001).

A number of market surveys by their own mass customization research center at the TUM Business School found that on an average, average ten to twenty percent of the overall market population (representing twenty to thirty percent of the market volume) seems to be interested in mass customized products (see EuroShoE Consortium, (2002); Franke and Piller, (2004); Jaeger, (2004); Kieserling, 1999; Piller and M¨uller, (2004); Piller et al., (2002); Reichwald, M¨uller, and Piller, (2005).

Bardacki & Whitelock,(**2004)** studied the British and Turkish car industries concluding that customers are ready for mass customization because they accept that mass customized products incur premium prices, have wait times for delivery and require time spent designing them.

Franke and von Hippel (2003) stated that as product features are designed by customers themselves so it's a common assumption that they may fit according to the customer preferences and thus creating greater value that definitely increasing the customer satisfaction. **Riemer and Totz (2003),** who stated that satisfaction with the co-production process impacts product satisfaction.

Ram and Sheth, (1989), imply that customers with high base category need satisfaction should be more likely to adopt a mass-customized product within this base category. The above opens the gate for our study to build our frame work to assess how the mass customized products satisfy the customer.

2.6. Co - design of customized products

Mass Customization is broadly defined as customer joining the design process as a co-designer, and it meet the needs of each individual customer with regards to certain product features. Communities for co-design became a new and concerned issue in business practice recent years (Wei-ping Pu et al. 2012).

When customers customize goods, they determine the final configuration of features, thereby altering the aesthetic, symbolic, and performance-related benefits provided by the product (Addis and Holbrook 2001). Customer co-design is a distinctive principle of mass customization (Piller, 2003) in which consumers can express their product requirements and implement product design process by mapping the requirements into the physical domain of the product (Khalid and Helander, 2003); (von Hippel, 1998).

Customers can partly design the product by choosing certain attributes in the product configurator that the manufacturer provides. Co-design process takes place at a specific interface for the joint creation of the goods between

customer and manufacturer, where the former can select from a set of options the individualized combination of attributes that suits him.

According to Piller et al. (2005), the idea of integrating users into a co-design process as part of a mass customization strategy is a promising approach for companies being forced to react to the growing individualization of demand. The term co-design is used with regard to cooperation between a manufacturer and its individual customers during the configuration process of a customized product (Franke and Schreier, (2002); (Franke and Piller, 2003, 2004). Co-production is another term that points out different levels of consumer contribution in production (Bendapudi and Leone, 2003). Co-design is also known self-design, user design, co-creation and adaptive customization.

In the configuration process, consumers participate in the value creation process as "co-producers" or "prosumers" (Toffler, 1980). However, the term co-designer rather than co-producer seems more representative for customer's role in the configuration process, since the main interaction among the customer and the firm concerns the design of a specific product. Piller and Müller (2004) mention that the customization experience and the configuration process are of great importance, as the offering is not a simple product any more but the joint production of an individual solution.

The customer becomes a co-designer by using company's capacities to create his own solution. It is evident that co-design is a customer centric strategy. The initiator is the manufacturer who provides the interface needed for the process, usually as a part of its website, but sometimes in a retail store as well. But the customer is the one whose role is the most active in the configuration process. As some of his unique needs remain displeased with the standard goods, he can design a product according to his own preferences without having to

communicate them, choosing from a set of options the combinations that best meet his desires and wishes.

Customer co-design is a particularly promising way of serving individual customers both individually and efficiently. The objective of mass customization is to deliver goods and services that meet individual customers' needs with near mass production efficiency (Pine, 1993); (Tseng and Jiao, 2001); (Piller, 2005). The term describes the process that allows customers to express their product requirements and carry out product realization processes by mapping the requirements into the physical domain of the product (von Hippel, 1998); (Khalid and Helander, 2003).

The co-design process of products and services covers the demands of each individual customer with regard to certain product features (Piller, 2004). All actions needed are executed within a fixed solution space, characterized by stable but still flexible and responsive processes. Thus, the customization costs permit pricing at a level that does not imply a switch in an upper market segment. He does not have to communicate his needs but only to map them. That makes customer's role active.

Mass customization enables customers to participate in the production process. Several empirical findings (e.g., Choy & Loker, 2004), (Kamali & Loker, 2002), (Ulrich et al., 2003) have identified consumers' high interest in and satisfaction with co-design involvement and the co-design process of mass customization. Instead, there is ample evidence that consumers seek to be involved in the creation and display of the symbolic meanings of the brands and products that they use (Ritson and Elliott, 1999). As such, mass customization, from the customer perspective, is an active form of value-

production through which consumers acquire mass produced goods that are more individualized than standard, off-the-shelf alternatives (Liechty, Venkatram and Cohen 2001).

As scholars continued to explore the transactional aspects of mass customization that reduced the consumer's price sensitivity (WTP and intention to use MC), they identified two sources of value for the consumer: benefits derived from the MC product or outcome, and those resulting from the MC experience Franke & Piller, (2004); Dellaert & Stremersch, (2005); Schreier, (2006); Franke & Schreier, (2008); Franke, Keinz & Schreier, (2008); Franke, Schreier & Kaiser, (2008); Dellaert & Dabholkar, (2009); Merle et al., (2010). So, we will discuss the value derived from the co-design experience. User experience needs to be considered for the entire interaction process and all customer interfaces, not limited to the purchasing process but rather accompanying the customers over their entire customer lifetime.

It is seen as a key enabler for intensifying the customer relationship, and also for differentiating from competitors with similar mass customization offers (Martin Stoetzel, 2012). The customer "creates an individualized product design from a company's style, fabric, color, surface design, and size alternatives" (Fiore, Lee & Kunz, 2004). Co-design involves a degree of creativity that helps provide that level of "experience" some consumers are looking for. For example, Vans shoes provided customers the chance to design their own shoes on their website.

Customers can combine any colors or patterns for the different parts of the shoes, such as the upper and the sole. According to Fiore, Lee and Kunz (2004), consumers engage in co-design to "fulfill the desire for experience" while at the same time obtaining a unique product. Hence, their willingness to engage in co-design depends largely on two desires: to create a unique product

and to have an exciting experience (Fiore, Lee& Kunz, 2004).A variety of research has addressed consumer desire for individualized product solutions and consumers as active agents in the co- individual difference production of value in consumer goods.

Co-design is challenging partly because customers and manufacturers have differing information, which needs to be reconciled for effective customization process (Von Hippel, 2005). Co-design can be categorized into manufacturer-centered or customer centered. In manufacturer-centered co-design, manufacturers analyze customer preferences, investigate demand flexibility, and then customize the product accordingly. As the field delved further into MC's product benefits, scholars revealed the importance of the MC toolkit as an essential, "success factor" (Franke & Piller, 2003) in generating value for the MC consumer. Given the toolkit is the mechanism or design interface enabling the MC user to collaborate with the MC firm and achieve a self-designed product or service, discovering its importance exposed the relevance of the co-design process itself.

In considering a definition for the MC co-design experience, we identify common themes reflected in the literature (Franke & Piller, (2004); (Arora, et al., 2008); (Franke & Schreier, 2008); (Franke & Schreier, 2009).

These shared characteristics are:

1. An interactive partnership exists between the consumer and the firm.
2. The MC process occurs at the individual level where the consumer exerts some element of control over the outcome, while simultaneously being involved with the firm.
3. The experience is enabled by the toolkit or design mechanism.

The consumer's perception of what she/ he experienced during the customization process was crucial to successful mass customization (Franke & Piller, 2004); (Schreier, 2006); (Dellaert & Dabholkar, 2009); (Franke, Schreier & Kaiser, 2010); (Merle et al., 2010). Although scholars' works identified the co-design experience as a critical source of value for the consumer, few studies focused on this source of value as unique to mass customization due to its experiential distinctiveness from other consumer marketing offers, such as personalization, one-to-one marketing and others (Arora et al., 2008). Zipkin (2001) identifies that a key challenge of manufacturer-centered co-design is the challenge to accurately obtain customer preferences. In customer-centered co-design, naturally, customization decisions are made by the customer. Even though a manufacturer can allocate less effort to sales, this co-design approach often involves a large number of options thus burdening customers with choices, which can be particularly straining when customers do not have enough knowledge of the product (Piller et al., 2004). To sum, various attempts have been made to exploit the value of demand and supply flexibility in solution co-design. Tools, such as design toolkits, sales automation systems, and product configurations have greatly reduced the complexity of customization decisions for both customers and manufacturers (Chen and Tseng, 2009).

Ruth Mugge et al. (2012) mentioned that in contrast to the traditional one-way relationship, in which consumers are offered standard products or services, firms can now also offer co-created products through mass customization (MC).

MC allows consumers to co-design and co-create products that match their individual needs and requirements, and therefore, consumers are willing to pay a premium price for these mass-customized products

Dallaert and Stremersch (2005) mentioned that customer enjoys the overall process of the customization. **Nikolaus Franke , Martin Schreier, (2010)** stated that process enjoyment has a significant impact on the customer satisfaction and amplified by the preference fit.

Franke and Shreier (2010) found that regardless of the outcome of the process customer gives higher value to the process if they enjoyed it. **Kaplan, Andreas, (2007)** concluded that it has frequently been stated that a customer's return from adopting a mass-customized product is influenced not only by the value of the product itself but also by the experience made during the customization process. **Frank T. Piller and Mitchell M. Tseng, (2003)** mentioned that effective product design can enable customers to achieve what they want, and at the same time provide them with a wonderful experience.

Customization also increases the involvement of the customers and employees and creating more intellectual input thus creating competitive edge (Safizadeh et al. 1996). Mass customization is one consideration for companies that wish to provide very personal service and potentially deeply satisfying experiences to their customers. Because mass customization programs require consumers to play an active role in the production of products, mass customization can be considered a type of customer co-production.

Co-production is the active involvement of the customer in the design and delivery of products and services (Bendapudi and Leone, 2003).When customers become part of the process in designing their own products or services, they also design their overall experiences with the product in question. They have done more than touch the product; they have made the product an integral part of them, experiencing it on a very deep level adding to

the consumer's overall experience in a deeply satisfying way is the greatest value any brand can deliver.

Mass customization by its very nature consists only of the customizable product offering, but of the co- design experience. This experience differs from purchasing a mass produced product as it requires engagement and participation in the creation process, it is this participation that changes the role of the customer from consumer of a product to a partner in a process of adding value (Reichwald R., Seifert S, Walcher D.,& Piller F. 2004). This study explores the relationship between the customer co- design for the customized product and the satisfaction results from this experience.

Lampel and Mintzberg (1996) have identified five main customization strategies based on the stage of customer involvement. The strategies differ from each other depending on the part of the value chain in which the customization is made: pure standardization, segmented standardization, customized standardization, tailored customization, and pure customization. Pure standardization refers to a completely standard production in which all the pieces made are similar. In segmented standardization, customers are seen as a cluster of buyers, and each cluster is seen as a whole, as occurs when making different products for different market areas.

In customized standardization, a product is customized in an assembly phase using standard components. Tailored customization requires basic design that can be customized in a fabrication phase. In a pure customization strategy, a product can be customized from scratch. However, there has to be some standard configuration, otherwise this strategy should be called prototyping rather than customizing.

Mass customized goods are goods produced according to the design specifications of individual customers (Bendapudi and Leone 2003); (Liechty, Venkatram, and Cohen 2001); (Piller 2003). Here, we need to list the types of customization to see the stage in which the role of the customer starts:

1. **Adaptive customization** – means that standard goods can be modified to suit each customer's needs after the purchase, through use or application of the end product. Here the provider has created multiple variations into a standard, but customizable, offering; therefore each individual derives his or her own value from the product. This approach is appropriate when customers want the product to perform in differently on different occasions, and available technology makes it possible to customize the product on their own. The dialogue is rather between a customer and a product than between a customer and a provider.
2. **Cosmetic customization** – this approach is adopted when a standard product satisfies a customer and only its outward appearance or the way the service is presented needs to be customized. Cosmetic approach is appropriate when customers use a product the same way and are only interested in unique ways of how it should be presented. Rather than a product being customized, a standard offering is packaged individually for each customer. Cosmetic customization mostly happens at or near the end of the value chain. For instance, a simple tailoring process of including a customer's name to the product creates individualization without a dialogue associated with collaborative customization. Although it may seem that such personalization is merely cosmetic, it still adds value to customers.
3. **Collaborative customization** – this approach, also known as co-creation, involves customers already at the product design stage, and represents the essence of mass customization, because through "customer integration" a dialogue is created between the manufacturer and the end user. Mass customizers help customers to articulate their needs and influence the outcome

of the product based on the possibilities available to them. Collaborative customization is suitable when customers cannot easily express what they want and may become frustrated when presented with an overabundance of options. This approach also reduces the customer sacrifice, i.e. the gap between what the customer wants and what he or she settles for. The possibility to influence on the design of the product allows minimizing that gap (Broekhuizen and Alsem, 2002).

4. **Transparent customization** – provides customers with individualized goods or services in an unobvious way, without letting them know that customization ever took place. Such approach is appropriate for businesses whose customers' needs are predictable and especially when customers do not want to be bothered with direct collaboration. Instead of engaging into customer co-creation, transparent customizers observe behaviors over time, looking for predictable preferences and then discreetly customizing their offerings within a standard package. This approach is as deep into value chain as collaborative one, but the underlying difference is that there is no dialogue with the buyer and the provider, i.e. customer co-creation is non-existent.

There is room in the literature to address co-production issues with respect to products. Song and Adams (1993) suggest that marketers can differentiate themselves by adjusting the degree to which consumers participate in the production and delivery of goods.

Duray et al. (2000) examined four dimensions of mass customization: fabricators, Involvers, modularizers, and assemblers. First, fabricators engage individuals in creating unique designs and fabrications with high levels of the individuals' involvement. Second, involvers allow individuals to identify unique requirements during the design and fabrication of products. Third, modularizers identify requirements of the product in the design and fabrication stage. Finally, assemblers offer customization by providing a high range of

choices apart from the direct participation of individual consumers. The researchers also argued that consumers' involvement and modularity were the significant attributes that differentiated the firms from one another in terms of selection of processes, planning methods, implementation of technology, and variables related to business performance.

2.7. Factors Moderating The Relationship Between The Co- Design For The Customized Product And The Customer Satisfaction

2.7.1. Awareness

In this study we are including awareness as a moderator on the relation between the co- design of the customized product and the customer satisfaction. In this context we conclude different says below:

Frank T. Piller, Ralf Reichwald, Kathrin Möslein, (2000) "Explanations may be found in the tendency towards an experience economy, the growing number of single households, an orientation towards design and, most importantly, a new awareness of quality and functionality which demands durable and reliable products corresponding exactly to the specific needs of the purchaser".

Macdonald and Sharp, (2000). Recently, the increase of buyer awareness has made buyers want to pay for their recognizable and constructive product. Thus, it is important for businesses to create attraction in their products to be in better position than their competitors. This is evident that the consumers spread and always willing to acquire a product, so here the product awareness is always a vital factor to manipulate the buying decisions and purchase intensions Ou, Yingjie, M.S., 2011 has investigated the customer awareness in China regarding the mass customization. He found that Awareness of mass customization varied among the participants. Many were not aware of customization at all and asked for an explanation.

Teodora Stojanova et al., (2012) stated that awareness is one of the main factors to implement MC strategies successfully.

Profitability performance tends to have positive relationship with product awareness. Profitability performance is a pecuniary input of brand to the revenue of the retailer. The essential reason is that superior plane of responsiveness will direct to be elevated buying behavior. Customers having no knowledge of the product will have no intention of buying it either. High product awareness can influence the retailers or resellers purchase decision(Grewal, Monroe & Krishnan, 1998).

Though, only product alertness and professed quality does not pledge of purchase and specifically repurchase intentions. The importance of product loyalty cannot be ignored. Where product awareness and perceived quality is necessary for the purchase of the product, the loyalty is guarantee of purchase as according to Oliver (1997), product loyalty plays a vital role in purchase, repurchase and switching behavior. So all three are significant for the purchase and purchase intentions. Aaker and Jacobson, (1994) concluded that towering level of product loyalty considerably augment sales of a product as well as increase the economic value of the product. Loyal buyers are not as much of have an effect on them by price rivalry.

Aaker (1991) approaches product equity as a set of fundamental dimensions grouped into a complex system comprising mainly: product awareness, product perceived quality, product loyalty and product associations. Taking into consideration several factors among which product awareness is fundamental.

Farquhar (1990) considers that building a strong product within consumers' minds means creating a positive product evaluation, an accessible product

attitude, and a consistent brand image, the accessible product attitude actually referring to what the others term as awareness. As already mentioned, an important dimension of product equity is product awareness, very often an undervalued component. Not only that awareness is almost a prerequisite for a product to be included in the consideration set, but it also influences perceptions and attitudes, and can be a driver for loyalty (Aaker, 1991).

Reflecting the salience of the product in the customers mind, awareness can be assessed at several levels such as recognition, recall, top of mind, product dominance (the only product recalled), or, even more, product knowledge (what the product stands for is very well known by consumers) (Aaker, 1996). Product awareness is the first and prerequisite dimension of the entire product knowledge system in consumers' minds, reflecting their ability to identify the product under different conditions: the likelihood that a product will come to mind and the ease with which it does so (Keller, 1993).

Product awareness is essential in buying decision-making as it is important that consumers recall the product in the context of a given specific product category, awareness increasing the probability that the product will be a member of the consideration set. In low input decision settings, a minimum level of product awareness may be sufficient for the choice to be final. Awareness can also influence consumer decision making by affecting product associations that form the product image (Keller, 1998).

2.7.2. Knowledge

On the other hand, consumer product knowledge has been studied in a variety of different ways in recent years e.g. (Baker, Hunt and Scribner, 2002); (Alba and Hutchinson, 2000); (Brucks, 1986); (Park, Mothersbaugh and Feick, 1994); (Raju, Lonial and Mangold, 1995); (Rao and Monroe, 1988). It has

been recognized as a characteristic in consumer research that influences all phases in the decision process (Bettman and Park, 1980).

Thorsten Blecker, (2006) mentioned that to accommodate mass customization, the organization should create an atmosphere, in which knowledge can be shared smoothly. Since the strategy aims to fulfill individual requirements, the input of customers should be managed effectively and translated into products and services. Thus, before shifting to mass customization, companies have to ascertain if they have the required capabilities ensuring that customer knowledge adequately flows in the organization.

As customers become more accustomed with the product; their capabilities of making rational comparisons between options get better. Customers with good product knowledge can grasp the product functionalities and reduce the solution space to a manageable subset from which they make optimal choice. For instance, customers who already have used PCs or mobile phones would find it easier to choose the most suitable PC or mobile phone than those who never have used these products.

Effective product design gives customers the chance to achieve the creation of a product that fits exactly their needs, while going through a wonderful and interesting experience (Piller and Tseng, 2003). Users configuring their own products are provided with understandable design options and their combination possibilities and it is not required to have specific training or experience in order to be able to use them. But sometimes customers do not have complete knowledge of their needs or they cannot externalize them. In these cases they may experience uncertainty or perplexity during the co-design process.

Consumers with various levels of product knowledge differ in their perceptions of product attributes (Laroche, Bergeron and Goutaland, 2003); (Baker, Hunt and Scribner, 2002); (Blair and Innis, 1996). Marks and Olson, (1981) propose that consumers with higher levels of product knowledge have better developed and more complex, with well-formulated decision criteria. In the same vein, Kempf and Smith (1998) suggest that consumers with higher levels of product knowledge are more diagnostic and better informed than those who have lower levels of product knowledge.

The consumer's product knowledge has been the central issue of customer behavior study. In recent years there has been a substantial amount of research has focused on the role of product knowledge in various stages of consumer behavior. These studies concluding that the decision-making processes and strategies of consumers with significant product knowledge differ from those with less knowledge (Alba, J.W., 1983).

Therefore, the higher the level of product knowledge a consumer possesses, the less chance there is that he/she will generate evaluation bias. Given these findings, the current research argues that, in the context of non-deceptive counterfeiting, consumers with higher levels of product knowledge are more likely to be able to evaluate products more accurately, due to their higher cognitive capacity. Previous research concerning consumer behavior has emphasized the importance of the relationship between product involvement and product knowledge (Lin, L.Y. and C.S. Chen, 2006), (Park, C.W. and B.J. Moon, 2003). Another stream suggests that simply having less knowledge can influence evaluation. Consumers commonly make decisions with incomplete knowledge about alternatives, (Kivetz and Simonson, 2000)

This Research suggests that the relative product attributes and the co design experience can also be influenced by what a customer knows about alternatives. For instance, information- processing theories of choice e.g., Bettman (1979); Fishbein and Ajzen (1975) suggest that a consumer's evaluation of an alternative will depend on the content of the consumer's knowledge (i.e., information pertaining to how the alternative performs on decision-relevant attributes).

2.8. Intention

The twentieth century saw the rise of a new discipline that we might call scientific psychology. Practitioners of this new discipline develop detailed theories, conduct systematic experiments and publish their results in academic journals. But long before the rise of scientific psychology, people had ways of making sense of the goings-on in each other's minds. These ordinary ways of understanding the mind did not involve any detailed theories or systematic experiments, but they constituted a kind of psychology all the same.

One theory that refers to this correlation and has been relevant in the consumer behavior field is the hierarchy of effects model. In (1961), Lavidge and Steiner introduced what they called the "stair-step" model that explained consumer behavior toward intention to purchase. The rationale behind this model is that first, beliefs are formed about a brand or a product; secondly, influenced by those beliefs, attitudes toward the brand or the product are consequently formed; and finally, from these attitudes individuals will develop an intention to buy or not buy the particular brand or product.

Understanding intentions is foundational because it provides the interpretive matrix for deciding precisely what it is that someone is doing in the first place. Thus, the exact same physical movement may be seen as giving an object,

sharing it, loaning it, moving it, getting rid of it, returning it, trading it, selling it, and on and on – depending on the goals and intentions of the actor. Intention precedes action, and is itself preceded by emotions and motivations. It is defined as an individual's readiness to perform a certain action. Intention directly precedes behavior. The intention incorporates attitude toward behavior, subjective norm, and perceived behavioral control Ajzen, (1985, 1991, 2002).

Intentions can also be powerful. It is derived from the Latin root tendere, related to tensum, and therefore to tension and to "stretching toward", hence tendencies. It is also clearly related to tend, to tender, and therefore to taking care of and nurturing. These relationships are not linguistic accidents, but point to deeper species awareness of what intention involves. May conclude his argument "…that every meaning has within it a commitment". And we refer to commitment here of purchase.

Spiritual, philosophical, and psychological traditions seem to therefore converge on the idea that what we intend is what we know and create simultaneously. From this perspective, we can see how our intentions can create making decisions; consumers often make mental linkages that connect product or service features to underlying factors that drive consumer intentions to purchase the product or service.

In line with the previous literature on mass customization and the influencing factors on customer intention to co- design the product or, which in turn leads t customer satisfaction from the customized products. Eventually, when we talk about intention; we talk mainly about two theories:

1. **The theory of planned behavior:**

This theory is an extension of the theory of reasoned action (Ajzen & Fishbein, 1980); (Fishbein & Ajzen, 1975) made necessary by the original model's limitations in dealing with behaviors over which people have incomplete volitional control.

The theory of reasoned action (Fishbein, 1967); (Fishbein & Ajzen, 1975) is one of the most influential models in predicting human behavior and behavioral dispositions. The theory proposed that behavior is affected by behavioral intentions which, in turn, are affected by attitudes toward the act and by subjective norm. The first component, attitude toward the act, is a function of the perceived consequences people associate with the behavior. The second component, subjective norm, is a function of beliefs about the expectations of important referent others, and his/her motivation of complying with these referents. The model received a lot of support in empirical studies of consumer behavior and social psychology related literature (Ryan, 1982); (Sheppard, Hartwick, & Warshaw, 1988). It, however, has limitations in predicting behavioral intentions and behavior when consumers do not have volitional control over their behavior (Ajzen, 1991); (Taylor & Todd, 1995). Theory of planned behavior is the individual's intention to perform a given behavior. Intentions are assumed to capture the motivational factors that influence a behavior; they are indications of how hard people are willing to try, of how much of an effort they are planning to exert, in order to perform the behavior. The eventual goal of the Theory of Planned Behavior (T.P.B.) Ajzen, (1985, 1991) is to explain how consumers can change their behavior and to predict intentional and deliberate behavior because behavior can be intentional and planned. Theory of Reasoned Action can appropriately predict straightforward voluntary behaviors (Armitage & Conner, 2001). However, Ajzen (1985, 1991) discovered that behavior appeared not to be completely voluntary and under control. Thus, the T.P.B. is developed by three antecedents of intention to perform a behavior (BI): attitude toward the

behavior (A), subjective norm (SN), and perceived behavioral control (PBC). The three antecedents are associated with each other, with intention, and with actual behavior. Ajzen's three considerations are key to explaining how individuals' behaviors can be changed.

The theory of planned behavior was proposed to remedy these limitations Ajzen, (1985, 1991). It includes another source that will have influence on behavioral intentions and behavior, perceived behavioral control, in the model. For example, when purchasing an innovative product, consumers may need not only more resources (time, information, etc.), but also more self-confidence in making a proper decision. Therefore, perceived behavioral control becomes a salient factor in predicting a person's behavioral intention under this purchasing situation.

2. **The TAM** was first developed by Davis to explain user acceptance of technology in the workplace Davis, (1989); Davis et al., (1989). TAM adopts a causal chain of beliefs, attitudes, intention, and overt behavior that social psychologists Fishbein and Ajzen (Fishbein & Ajzen, (1975); Ajzen, (1991) have put forward, and that has become known as the Theory of Reasoned Action (TRA). Based on certain beliefs, a person forms an attitude about a certain object, on the basis of which he/she forms an intention to behave with respect to that object. The intention to behave is the prime determinant of the actual behavior. As a general rule, the stronger the intention to engage in a behavior, the more likely should be its performance. It should be clear, however, that a behavioral intention can find expression in behavior only if the behavior in question is under volitional control, i.e., if the person can decide at will to perform or not perform the behavior.

2.9. Predictors of intention

2.9.1 Attitude

Attitudes are an important aspect for understanding consumer behavior and consumer's intention to purchase certain products. Much information about the relationship between a person and an object can be gathered by expressing ones' attitudes. Following Allport's definition (1935), attitudes are defined as learned predispositions to respond to an object or class of objects in a consistently favorable or unfavorable way. In classical attitudinal theory, the importance of studying attitudes rests on the connection between the attitude toward the particular object and the consequent behavior toward the object that this attitude will produce (Allport, 1935); (Eagly & Chaiken, 1993); (Fishbein & Ajzen, 1975); (Rosenberg, Hovland, Abelson, McGuire & Brehm, 1960); (Staw & Ross, 1985). If attitudes and behavior are highly correlated, then the behavior of a person can be predicted once his/ her attitude has been established (Ajzen & Fishbein, 1977). Davis suggests that an individual's attitude toward using a new system leads to the individual's behavioral intention to use that system. Moreover, the theory of diffusion of innovations Rogers, (1962) indicates that the positive or negative attitude toward the innovation would result in the more permanent adoption or rejection of the innovation.

In consumer behavior area, Ajzen and Fishbein's attitude's model has been widely accepted. Their model proposed two main factors which influence purchase intention, attitude and subjective norm. Attitude is defined as 'overall evaluations that can be measured by a procedure which locates respondents on a bipolar evaluative dimension'. Subjective norm would be 'the subject's perception that most people who are important to him think he should or should not perform that behavior in question'. In Ajzen and Fishbein's model,

only attitude and subjective norm have direct impact on purchase intention, all the other factors (including culture) have indirect impact on purchase intention through these two factors.

This theory is important because it provides a basis for defining key elements that influence consumer behavior (Assael, 1998). For this research, the key part of this theory lies in the idea that attitudes are formed first and those will influence how consumers act consequently with regard to the particular brand or product. Theoretical research on mass customization of consumer products/services has emphasized the importance of consumers embracing customized products as a prerequisite for this strategy to be successful. It seems obvious that if final consumers are not interested in customization there is no need to pursue customization strategies.

Although an important part of literature on mass customization has recently emerged, there is a need to know more about customization from the consumer's point of view. In that sense, this research examines consumers' attitudes toward the intention to buy mass customized products/services.
As our research is studying the relationship between variables predicting the intention and the behavior caused from this intention; we had referred to the theory of planned behavior which is an extension of the theory of reasoned action Ajzen & Fishbein, (1980); Fishbein & Ajzen, (1975) made necessary by the original models limitations in dealing with behaviors over which people have incomplete volitional control. As in the original theory of reasoned action, a central factor in the theory of planned behavior is the individual's intention to perform a given behavior. Intentions are assumed to grasp the motivational factors that influence a behavior; they are indications of how hard people are willing to try, of how much of an effort they are planning to exert, in order to perform the behavior.

To date, and to our best of knowledge, very little scientific work examines consumer behavior and attitudes toward customized products and due to the novelty of the topic, our research will study the effect of the attitude on the intention to co- design customized products.

2.9.2 Perceived Usefulness:

The importance of the perceived usefulness and perceived ease of use of different types of systems has been well documented and studied. Different items have been used to capture the nature of these constructs or similar ones. For instance, Schultz and Slevin (1975) referred to performance in a similar way as what is today considered perceived usefulness.

We include perceived usefulness, defined as the extent to which a consumer believes that customized products will result in positive and functional outcomes. The Expectancy Theory by Vroom (1964) stresses the nature of human conduction with behavioral choices based, in part, on perceived consequences associated with the choices. The motivation to participate in volunteer activities would be associated with expectation that participatory behavior would result in personal and perhaps environmental rewards (Vroom, 1964). Attitude toward a target behavior may be based on anticipated positive or negative outcomes of performing the behavior.

According to Davis et al. (1992), perceived usefulness refers to consumers' perceptions regarding the outcome of the experience. Davis (1993) defined perceived usefulness as the individual's perception that using the new technology will enhance or improve her/his performance. Similarly, Mathwick et al., (2001) defined perceived usefulness as the extent to which a person deems a particular system to boost his or her job performance. Based on his definition, Adams, D.A., Nelson, R.R., and Todd, P.A. and Davis, F.D., Bagozzi, R.P., and Warshaw, P.R. (1992) found PU a major determinant of

usage behavior and intention. These studies established the theoretical and practical importance of perceived usefulness.

As seen from Davis's definitions, perceived usefulness has perceptions in the tradition of work using belief constructs. In traditional perceptual theory, perception is explained as a complex method of attaining information about our surrounding world, specifically through our senses, and apprehending this information as beliefs (Noe, 2002). In marketing, Assael (1998) adapted this concept and defined perception as the "selection, organization and interpretation of marketing and environment stimuli into a coherent picture. Perception is important for marketers because it is how the consumer first becomes aware of a product and its relative value.

Previous studies have supported the importance of perceived usefulness in interactive shopping. Perceived usefulness refers to "the degree to which a person believes that using a particular system would enhance his or her job performance" (Davis, 1989). They found that perceived usefulness was a much more significant factor in enhancing consumers' attitudes and behavioral intentions toward an online retailer than perceived ease of use. They also showed that consumers need to believe that the product would be easy to use and useful in order for them to develop an interest in using it.

In addition, results showed that a product's customization capabilities seem to have an impact on the perception of how easy to use that product is. At the same time, if a product is perceived as being very customizable it would also be perceived as very useful. There are extensive evidences proving the significance of effect of perceived usefulness on adaptation intention (Chen and Barnes, 2007); (Guriting and Ndubisi, 2006); (Jaruwachirathanakul and Fink, 2005); (Eriksson et al., 2005); (Hu et al., 1999); (Venkatesh, 2000); (Venkatesh and Davis, 1996); (Venkatesh and Morris, 2003). Tan and Teo

(2000) suggested that the perceived usefulness is an important factor in determining adaptation of innovations.

Davis and his colleagues Davis (1989); Davis et al, (1989) observed that if users perceive a system to be useful, they are more likely to use it. Other studies Adams et al. (1992); Igbaria et al. (1995); Moore and Benbasat (1995); Subramanian (1994) found further support for the impact of perceived usefulness on system use. These studies established the theoretical and practical importance of perceived usefulness.

2.9.3. Self- confidence:

The socio-psychological concept of self-confidence is related to self-assuredness in one's personal judgment, ability, power, etc., sometimes manifested excessively. Being confident in yourself is infectious if you present yourself well, others will want to follow in your foot steps towards success.

Perceived behavioral control reflects beliefs regarding the access to resources and opportunities needed to perform a behavior. It may encompass two components (Ajzen, 1991); (Taylor & Todd, 1995). The first component reflects the availability of resources needed to engage in the behavior. This may include access to money, time, and other resources. The second component reflects the focal person’s self-confidence in the ability to conduct the behavior.

Bearden et al. (2001) introduced consumer self-confidence, defined as the extent to which a consumer feels capable and assured with respect to his or her marketplace decisions and behaviors. Self-confidence reflects two dimensions: One: decision-making self-confidence is the perception of the consumer of her or his/her ability to obtain and use information and to make good purchasing decisions. Another reflects a perceived ability of the consumer to protect him or her from being deceived or unfairly treated in a marketplace and is referred to as consumer protection. Before purchasing customized product, consumers

undertake detailed analysis of their needs and translate it into specific solutions without any assistance from the vendor. Consequently, this research focused on the first dimension. The decision-making self-confidence (self-confidence) in this research refers to the degree of a consumer's belief in his/her capability to make an effective decision to purchase a customized product.

Past research has demonstrated that consumers appreciate MC because it allows them to obtain a product that better fits their own unique preferences (Dellaert and Stremersch, 2005) ;(Franke and Piller, 2004); (Schreier, 2006). Ajzen (1985) defined perceived behavioral control as an individual's perception of presence or absence of requisite resources or opportunities necessary for performing a target behavior. The requisite resources or opportunities may include an inner component from an individual and an external component from the outside world. Some researchers argue for separating perceived behavioral control into two or more components e.g.,(Armitage et al., 1999). In respect its definition, self-confidence is one ingredient of perceived behavioral control, the inner component for making a confident decision to purchase a customized product. TPB suggests that perceived behavioral control has a positive effect on behavioral intention.

2.9.4. Product Aesthetics:

Aesthetics is defined as the level of significance that visual aesthetics hold for a particular consumer in his or her relationships with products. Past research has demonstrated that consumers appreciate MC because it allows them to obtain a product that better fits their own unique preferences (Franke& Piller, 2004; Dellaert &Stremersch, 2005; Schreier, 2006). Because mass customized products offer consumers control over both symbolic and functional aspects of a product, we are examining here whether product aesthetics has a relation

with the customer intention to co- design customized products. High levels of product involvement have been linked to high levels of pre-purchase information search (Bloch and Richins, 1983); (Zaichkowsky, 1985).

Ruth Mugge et al., (2012), stated that Aesthetic MC provides a means to address these unique aesthetic preferences. Due to the connection to individual differences, a mass-customized product that closely fits unique aesthetic preferences may help consumers to build an identity that is markedly different from others and thus to support their identity projects.

Mass customized goods allow consumers to determine the configuration of product attributes that ultimately shape both the performance-related utilitarian benefits and appearance-related symbolic benefits of a product. By specifying a product's assortment of attributes, consumers can more closely align a product's final configuration with their own desires for utilitarian and symbolic benefits.

Some mass customization programs focus primarily on one aspect or the other—either allowing consumers to customize only performance-related attributes or only appearance-related attributes. For instance, Dell computers allows its customers great input into the performance-related attributes but no input on the aesthetic attributes. In contrast, Nike ID allows customer specification of stylistic attributes such as color and personalized logos, but it does not allow specification of performance-related attributes. Other mass customization programs allow consumers to specify both utilitarian and symbolic properties of products. Klein, a bicycle manufacturer, allows consumers to specify the color of their frame and the performance level of every component part on the bicycle. Here below we would list some scholars' sayings about product aesthetics in relation to the product and the customer:

Piller (2003) Mass customization programs offer consumers a product solution that is more unique and give consumers control over functional and stylistic benefits they receive from mass customized products, with greater regularity and across an increasingly diverse group of product categories. Although both aesthetic and functional MC will result in a greater fit to consumers' individual preferences, it is likely that the particular benefits that are offered to consumers differ. Specifically, functional MC allows consumers to obtain products that better fit their technical requirements, and will thus deliver functional benefits. However, when consumers engage in the design of their own products, they often do not want to optimize just the core functional features of these products or services.

Addis and Holbrook (2001) By allowing consumers to specify performance and stylistic attributes, mass customized goods offer product solutions that are closely aligned with personal desires for both utilitarian and symbolic benefits. It is well established that consumers value solutions that are congruent with perceptions of their own needs and desires. This idea, taken to the extreme, suggests that the value of a good cannot be fully realized until a consumer has aligned the properties of the good with his/her unique needs and desires.

Ostergaard, Fitchett, and Christian (1999) articulate the desire for unique product solutions by suggesting that "even though individual consumers buy mass produced goods and consume them 'en masse', their longings and interests are not directed towards mass commodities but towards having, using and interacting with distinct goods which they may call 'their own'." As such, mass customized product solutions can be seen as a means by which consumers can, prior to acquisition, align a product's utilitarian and symbolic benefits with their own needs and desires. Instead, there is ample evidence that consumers seek to be involved in the creation and display of the symbolic

meanings of the brands and products that they use **Ritson and Elliott, (1999)**, and that these symbolic meanings are critical components of the identity projects that are on-going in most consumers' lives **Arnould & Thompson, (2005)**.

Holbrook, 1986; Yamamoto & Lambert, (1994), mentioned that due to its unique aspects, aesthetic MC is especially valuable for supporting consumers' identity projects. First, aesthetic preferences are found to be much more heterogeneous than functional ones, which are more uniformed within segments of consumers. A striking example of the way in which companies feed these preferences is the availability of thousands of different watches on the market that differ in their appearance, but hardly in their functionality.

Belk, (1988), aesthetic MC provides a means to address these unique aesthetic preferences. Due to individual differences, a mass-customized product that closely fits unique aesthetic preferences may help consumers to build an identity that is markedly different from others and thus to support their identity projects. Second, aesthetic MC is subjective and generally visible to others. As a result, we believe that an aesthetically mass-customized product will thus result in an enhanced expression of one's sense of self and identity. This is consistent with previous research, which has shown that consumers may use products, of which they have partly created or modified the appearance, to communicate their individuality, and that such products are perceived as more self-expressive of one's identity **Blom and Monk, (2003); Kiesler & Kiesler, (2005); Mugge et al., (2009). Postrel (2003)**, attractive visual aesthetics generate favorable responses and impact product expectations. We propose that attractiveness generates affective expectations. **Bloch (1995); Holbrook (1986)** Mass customized goods offer consumers the opportunity to tailor the

purely aesthetic properties of a consumer product. A product's visual aesthetic qualities are a source of value to consumers.

Bloch, Brunel, and Arnold (2003) suggest that consumers differ in the degree to which visual product aesthetics are important and that those differences influence product category attitudes. These differences are captured in the concept of centrality of visual product aesthetics (CVPA). CVPA is defined as the level of significance that visual aesthetics hold for a particular consumer in his or her relationships with products. Consumers high in CVPA value the distinction of design, they express acumen in recognizing superior design, and they are particularly moved by products with pleasing design elements (Bloch, Brunel, and Arnold 2003). Given the control over visual design elements provided by mass customized goods, it is reasonable to expect purely stylistic pursuits to drive attitudes toward mass customized products. (Bloch, Brunel, and Arnold 2003), centrality of visual product aesthetic (CVPA) is the "…overall level of significance that visual aesthetics hold for a particular consumer in his/her relationship with products"

CHAPTER THREE

RESEARCH FRAMEWORK AND METHODOLOGY

3.1 Introduction

This chapter presents the research framework and hypotheses to be tested. The section on methodology highlights the sampling procedure, the measurement of the variables, the development of the research instrument and the administration of data collection. The statistical techniques used to test the hypotheses are also discussed.

3.2Conceptual Framework

The growing number of studies citing the importance of Mass Customization and the influencing factors on the intention of the customer by several authors Ajzen & Fishbein, (1980); Fishbein & Ajzen, (1975), Piller and Muller (2004), Schreier (2006), Bardakci and Whitelock (2005) provides legitimacy to this research. Most of the studies in this field were concerned with identifying different factors and dimensions influencing the customer intention, and explores how these dimensions interact (The Impact of Three Dimensions of the Value of the Mass-customized Product on the Overall Perceived Value of MC and the Purchase Intention, 2011) and (Antecedents of intention to purchase customized products, 2011).

Few studies had further examined the relationship between the intention and satisfaction i.e. (The Influence of Mass Customization on Consumer Satisfaction and Its Implications for the U.S. IPTV Television Market: An Exploratory Study, 2009). And another study examined the relationship

between intention and actual system use in apparel industry (Consumer Acceptance Of Online Customization For Apparel By Hira Cho, 2007)

These studies revealed the effect of the different variables on the intention of the customer to buy mass customized products. As such, the only study that empirically examined the relation between the intention to buy the mass customized products and the customer satisfaction through the experience itself is (The Influence of Mass Customization on Consumer Satisfaction and Its Implications for the U.S. IPTV Television Market: An Exploratory Study, 2009).

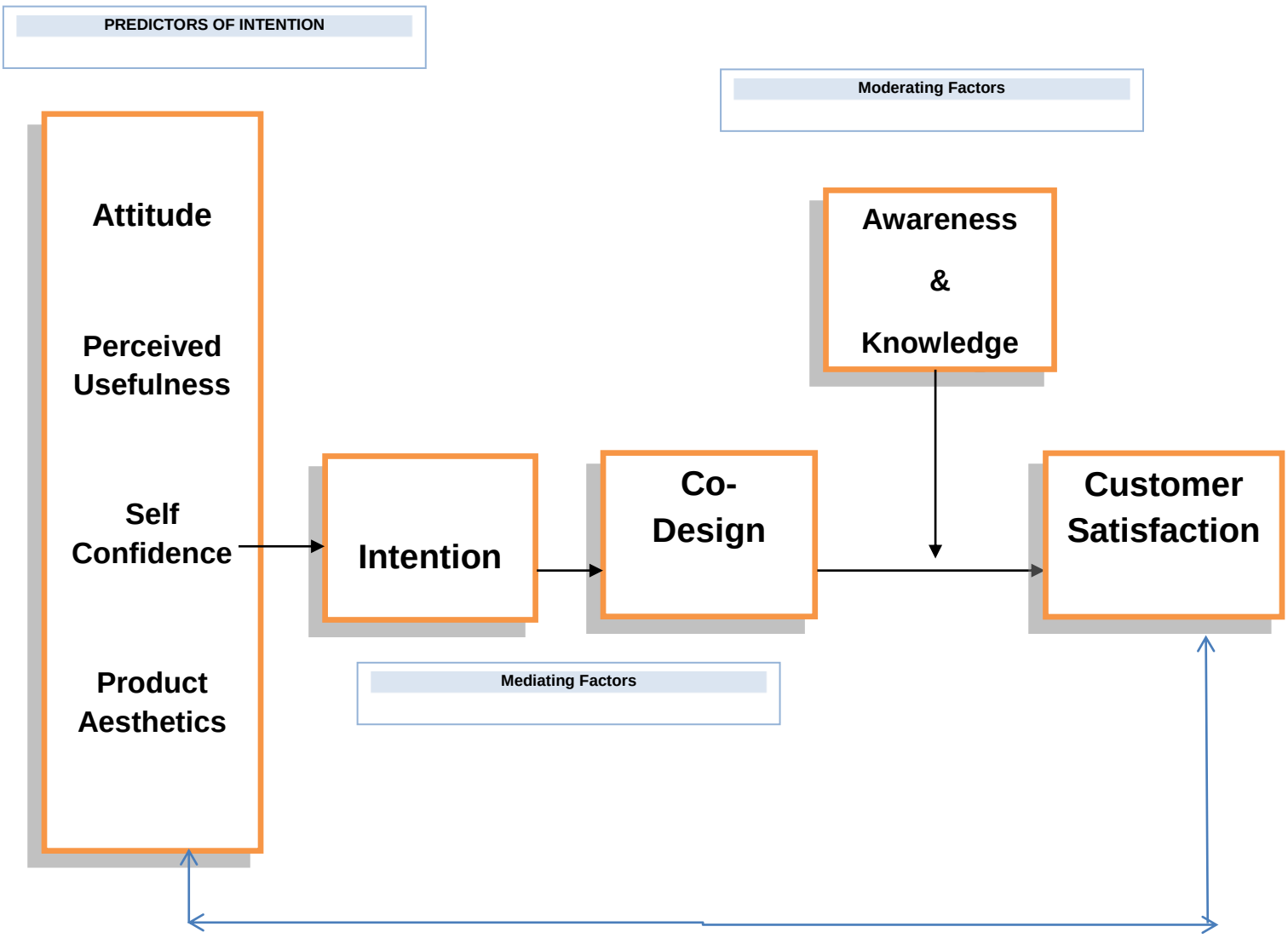
Based on the literature review, the integrative framework of this study is anchored on the Relationship between the co- design of the customized products and the customer satisfaction. The influence of the factors chosen on the intention is justified on the bases of the Planned Behavior theory and other previous studies.

The framework demonstrates the influence of the attitude, perceived usefulness, self- confidence, and product aesthetics variables on intention. Also, demonstrates the influence of the intention on the co- design plus the influence of the co- design on customer satisfaction with two moderators, awareness and knowledge presented in Figure 3.1 consists of the following:

- Independent variable which is the factors influencing intention consisting of four constructs (attitude, perceived usefulness, self-confidence, and product aesthetics)
- Mediating variable is the intention.
- Mediating variable is the co- design
- Moderators are awareness and knowledge
- Dependent variable is customer satisfaction

The succeeding section discusses the hypotheses development that is backed by the theoretical justifications.

Figure 3.1 **The research conceptual framework**



3.3 Research Hypothesis

In this study, ten main hypotheses were developed to test the relationship between factors influencing the intention variables, with customer intention. It also includes the relationship between customer intention to buy mass customized products and actual purchase. Furthermore, the intervening effect of awareness and knowledge on the relationship between the purchase of the mass customized products and the customer satisfaction.

The theory used to build our model is the theory of the planned behavior (Icek Ajzen 1985). The theory of planned behavior was proposed by Icek Ajzen in (1985) through his article "From intentions to actions: A theory of planned behavior. The theory was developed from the theory of reasoned action, which was proposed by Martin Fishbein together with Icek Ajzen in (1975). The theory of reasoned action was in turn grounded in various theories of attitude such as learning theories, expectancy-value theories, consistency theories (such as Heider's Balance Theory, Osgood and Tannenbaum's Congruity Theory, and Festinger's Dissonance Theory) and attribution theory.

The theory of planned behavior model is thus a very powerful and predictive model for explaining human behavior. That is why we are using it in our research model to explain the customer behavior towards mass customization strategy.

3.3.1 Hypothesis 1: Predictors of Intention have positive relation with customer satisfaction

Customer satisfaction is the predominant metric that firms use for detecting and managing customers' likelihood. Everyone is aware of the importance of satisfying customers. A vital factor for the success of a mass customization application is user satisfaction. Chiou, Droge and Hanvanich,(2002) look at satisfaction from the perspective of an aggregation of transaction experiences. It is defined by Oliver (1999) as "perception of pleasurable fulfilment".

Different motivations exist for customization (Spring and Dalrymple, 2000). Typically a product is customized to fulfill customers' needs. A customer might need features that are considered as useless or even unattractive by other customers, or are simply not common standard features. Similarly, some customers require higher or lower performance, or the product is to be included as part of the customer's manufacturing process. Furthermore, customization can be a choice for its own sake.

As cited by Matti Eiden in his study Modular Product Development Literature Review And Case Study, (2013) "Since customer satisfaction plays a central role in mass customization, it is reasonable to push the target at higher customer satisfaction even at the price of increased product cost. According to Piller (2005) customers are willing to pay premium of up to 150% to gain the benefits of truly customizable product".

An initial product survey validates the relationship between attractive aesthetics and product expectations. Then three experimental studies test propositions regarding the relationship between expectations set by packaging and consumer perceptions. The studies investigate the effect packaging aesthetics have on actual consumer beliefs and consumption evaluations and examine whether these effects carry through to purchase intentions. To create a context for contrast and assimilative effects, product quality and consumer affective expectations were varied across conditions.

Also, Ruth Mugge et al. (2012) found that Aesthetic MC provides a means to address these unique aesthetic preferences. Due to the connection to individual differences, a mass-customized product that closely fits unique aesthetic preferences may help consumers to build an identity that is markedly different from others and thus to support their identity projects. Customizing a product's aesthetic features enhances its self-expressive value, which on its turn positively affects consumers' evaluations of MC and the behavioral intentions.

Last decades have witnessed a number of studies on customer satisfaction. A key motivation for the growing assurance on customer satisfaction is that highly satisfied customers can lead to a stronger competitive position resulting in higher market share and profit Fornell, (1992). As a result, there is great increasing attention among academics and business practitioners to customer satisfaction.

Therefore, based on the above about customer satisfaction towards mass customization, the following hypothesis is proposed:

H1: Predictors of intention have positive relation with customer satisfaction

H1.1 : Attitude has positive relation with customer satisfaction

H1.2.: Perceived usefulness has positive relation with customer satisfaction

H1.3. : Self- confidence has positive relation with customer satisfaction

H1.4.: product aesthetics has positive relation with customer satisfaction

3.3.2 Hypothesis 2: Predictors of intention have positive relation with the co-design

Davis et al. defined PU as 'the prospective user's subjective probability that using a specific application system will increase his or her job performance within an organizational context'. Based on his definition, it's found PU a major determinant of usage behavior and intention. The importance of the perceived usefulness and perceived ease of use of different types of systems has been well documented and studied. Different items have been used to capture the nature of these constructs or similar ones. For instance, Schultz and Slevin (1975) referred to performance in a similar way as what is today considered perceived usefulness.

The theory of planned behavior proposes that perceived behavioral control of the focal person in a decision making situation may affect his/her behavioral intentions. Perceived behavioral control is more important in influencing a person's behavioral intention particularly when the behavior is not wholly under volitional control. For example, when purchasing an innovative product, consumers may need not only more resources (time, information, etc.), but also more self-confidence in making a proper decision. Therefore, perceived behavioral control becomes a salient factor in predicting a person's behavioral intention under this purchasing situation.

According to Davis et al. (1992), perceived usefulness refers to consumers' perceptions regarding the outcome of the experience. Davis (1993) defined perceived usefulness as the individual's perception that using the new technology will enhance or improve her/his performance. Similarly, Mathwick et al., (2001)

defined perceived usefulness as the extent to which a person deems a particular system to boost his or her job performance. Based on his definition, Adams, D.A., Nelson, R.R., and Todd, P.A. and Davis, F.D., Bagozzi, R.P., and Warshaw, P.R. found PU a major determinant of usage behavior and intention. These studies established the theoretical and practical importance of perceived usefulness.

Aesthetics is defined as the level of significance that visual aesthetics hold for a particular consumer in his or her relationships with products. Mass customized goods allow consumers to specify the configuration of product attributes that ultimately shape both the performance-related utilitarian benefits and appearance-related symbolic benefits of a product. By specifying a product's assortment of attributes, consumers can more closely align a product's final configuration with their own desires for utilitarian and symbolic benefits. Some mass customization programs focus primarily on one aspect or the other—either allowing consumers to customize only performance-related attributes or only appearance-related attributes.

By allowing consumers to specify performance and stylistic attributes, mass customized goods offer product solutions that are closely aligned with personal desires for both utilitarian and symbolic benefits. It is well established that consumers value solutions that are congruent with perceptions of their own needs and desires Addis and Holbrook (2001). This idea, taken to the extreme, suggests that the value of a good cannot be fully realized until a consumer has aligned the properties of the good with his/her unique needs and desires.

Ostergaard, Fitchett, and Christian (1999) articulate the desire for unique product solutions by suggesting that "even though individual consumers buy mass produced goods and consume them 'en masse', their longings and interests are not

directed towards mass commodities but towards having, using and interacting with distinct goods which they may call 'their own'." As such, mass customized product solutions can be seen as a means by which consumers can, prior to acquisition, align a product's utilitarian and symbolic benefits with their own needs and desires.

When consumers do not have prior knowledge of a product's qualities, a product's visual aesthetic is a marketing action that serves to set consumers' expectations. Attractive visual aesthetics generate favorable responses and impact product expectations Postrel (2003). We propose that attractiveness generates affective expectations (beliefs about the pleasure or positivity associated with a consumption experience). In the case of hedonic products, where the benefit of the product is primarily determined by the affect experienced during consumption, affective expectations driven by product packaging may be contrasted to or assimilated into actual consumption beliefs and experiences.

Mass customized goods offer consumers the opportunity to tailor the purely aesthetic properties of a consumer product. A product's visual aesthetic qualities are a source of value to consumers Bloch (1995); Holbrook (1986). Bloch, Brunel, and Arnold (2003) suggest that consumers differ in the degree to which visual product aesthetics are important and that those differences influence product category attitudes. These differences are captured in the concept of centrality of visual product aesthetics (CVPA). CVPA is defined as the level of significance that visual aesthetics hold for a particular consumer in his or her relationships with products.

According to the above, we can hypothesize the following:

H1: Predictors of intention have positive relation with customer satisfaction

H2.1.: Attitude has positive relation with the co- design of the customized product.

H.2.2.: Perceived usefulness has positive relation with the co- design of the customized product.

H.2.3.: Self- confidence has positive relation with the co- design of the customized product.

H.2.4.: product aesthetics has positive relation with the co- design of the customized product.

3.3.3 Hypothesis 3: Predictors of intention have positive relation with intention to co design

Attitude has long been identified as a cause of intention. According to Ajzen and Fishbein's model, (1977) attitude has direct impact on purchase intention. This theory is important because it provides a basis for defining key elements that influence consumer behavior Assael, (1998). For this research, the key part of this theory lies in the idea that attitudes are formed first and those will influence how consumers act consequently with regard to the particular brand or product.

As our research is studying the relationship between attitude and intention; we had referred to the theory of planned behavior is an extension of the theory of reasoned action Ajzen & Fishbein, (1980; Fishbein & Ajzen, (1975) made necessary by the original models limitations in dealing with behaviors over which people have incomplete volitional control.

Davis suggests that an individual's attitude toward using a new system leads to the individual's behavioral intention to use that system. Moreover, the theory of diffusion of innovations Rogers, (1962) indicates that the positive or negative attitude toward the innovation would result in the more permanent adoption or rejection of the innovation.

There are extensive evidences proving the significance of effect of perceived usefulness on adaptation intention Zhongjun, Jianghong Luo, and Juan Xiao, (2011); TangChen and Barnes, (2007); Guriting and Ndubisi, (2006); Jaruwachirathanakul and Fink, (2005); Eriksson et al., (2005); Hu et al., (1999); Venkatesh, 2000; Venkatesh and Davis, (1996); Venkatesh and Morris, (1996). Tan and Teo (2000) suggested that the perceived usefulness is an important factor in determining adaptation of innovations.

The theory of reasoned action Fishbein, (1967); Fishbein & Ajzen, (1975) is one of the most influential models in predicting human behavior and behavioral dispositions. The theory proposed that behavior is affected by behavioral intentions which, in turn, are affected by attitudes toward the act and by subjective norm. The first component, attitude toward the act, is a function of the perceived consequences people associate with the behavior. The second component, subjective norm, is a function of beliefs about the expectations of important referent others, and his/her motivation of complying with these referents. The model received a lot of support in empirical studies of consumer behavior and social psychology related literature Ryan, (1982; Sheppard, Hartwick, & Warshaw, (1988).

It, however, has limitations in predicting behavioral intentions and behavior when consumers do not have volitional control over their behavior Ajzen, (1991); Taylor & Todd, (1995). The theory of planned behavior was proposed to remedy these limitations Ajzen, (1985), (1991). It includes another source that will have influence on behavioral intentions and behavior, perceived behavioral control, in the model.

Perceived behavioral control reflects beliefs regarding the access to resources and opportunities needed to perform a behavior. It may encompass two components Ajzen, (1991); Taylor & Todd, (1995). The first component reflects the availability of resources needed to engage in the behavior. This may include access to money, time, and other resources. The second component reflects the focal person's self-confidence in the ability to conduct the behavior.

The purpose of this research is to investigate whether predictors of intention have positive effect on the customer's intention to co design mass customized products or not. Extending from the research, we can argue that:

H3: Predictors of intention have positive relation with customer intention

H.3.1.: Attitude has positive relation with the customer intention
H.3.2.: Perceived usefulness has positive relation with customer intention
H.3.3.: Self- confidence has positive relation with customer intention
H.3.4.: Product aesthetics has positive relation with customer intention

3.3.4 Hypothesis 4: Intention has positive relation with co- design of the customized products

3.3.5. Hypothesis 5: Intention mediates the relation between the predictors of intention and the co- design

Intention precedes action, and is itself preceded by emotions and motivations. It is defined as an individual's readiness to perform a certain action. Intention directly precedes behavior. The intention incorporates attitude toward behavior, subjective norm, and perceived behavioral control Ajzen, (1985, 1991, 2002).

Intentions can also be powerful. Intention is derived from the Latin root tendere, related to tensum, and therefore to tension and to "stretching toward", hence tendencies. It is also clearly related to tend, to tender, and therefore to taking care of and nurturing. These relationships are not linguistic accidents, but point to deeper species awareness of what intention involves. May conclude his argument "…that every meaning has within it a commitment". And we refer to commitment here of purchase.

Spiritual, philosophical, and psychological traditions seem to therefore converge on the idea that what we intend is what we know and create simultaneously. From this perspective, we can see how our intentions can create making decisions; consumers often make mental linkages that connect product or service features to underlying factors that drive consumer intentions to purchase the product or service. In line with the previous literature on mass customization and the influencing factors on customer intention to purchase the product or service, which in turn affect consumer intentions to purchase mass customized products.

Eventually, when we talk about intention; we talk mainly about two theories:

3. **The theory of planned behavior:**

Theory of planned behavior is the individual's intention to perform a given behavior. Intentions are assumed to capture the motivational factors that influence a behavior; they are indications of how hard people are willing to try, of how much of an effort they are planning to exert, in order to perform the behavior. As a general rule, the stronger the intention to engage in a behavior, the more likely should be its performance. The eventual goal of the Theory of Planned Behavior (T.P.B.) Ajzen, (1985, 1991) is to explain how consumers can change their behavior and to predict intentional and deliberate behavior because behavior can be intentional and planned.

4. **The TAM** was first developed by Davis to explain user acceptance of technology in the workplace Davis, (1989); Davis et al., 1989). TAM adopts a causal chain of beliefs, attitudes, intention, and overt behavior that social psychologists Fishbein and Ajzen Fishbein & Ajzen, (1975); Ajzen, (1991) have put forward, and that has become known as the Theory of Reasoned Action (TRA). Based on certain beliefs, a person forms an attitude about a certain object, on the basis of which he/she forms an intention to behave with respect to that object. The intention to behave is the prime determinant of the actual behavior. Based on the above; we hypothesize that:

H4: Customer intention has positive relation with co-design of the customized products

H5: Intention mediates the relation between predictors of intention and the co- design.

3.3.6 Hypothesis 6: Awareness moderates the relation between the co- design and the customer satisfaction

In mass customization, the increasing importance of market niche exploration and customer need awareness is embodied in the capacity of the product repositories. In recent times, the increase of buyer awareness has made buyers want to pay for their recognizable and constructive brand. Thus, it is important for businesses to create attraction in their brands to be in better position than their competitors. This is evident that the consumers disseminate and always willing to acquire a product, so here the brand awareness is always a vital factor to manipulate the buying decisions and purchase intensions Macdonald and Sharp, (2000).

Aaker (1991) approaches product equity as a set of fundamental dimensions grouped into a complex system comprising mainly: brand awareness, brand perceived quality, brand loyalty and brand associations. Awareness is essential in buying decision-making as it is important that consumers recall the brand in the context of a given specific product category, awareness increasing the probability that the brand will be a member of the consideration set.

Awareness also affects decisions about products in the consideration set, even in the absence of any product associations in consumers' minds. In low involvement decision settings, a minimum level of brand awareness may be sufficient for the choice to be final. Awareness can also influence consumer decision making by affecting brand associations that form the brand image (Keller, 1998).

Other authors Laurent, Kapferer and Roussel, (1995) suggest three classical measures of product awareness in a given product category: spontaneous (unaided) awareness(consumers are asked, without any prompting, to name the brands they know in the product category – in this case the unaided awareness of a brand is the

percentage of interviewees indicating they know that brand), top of mind awareness (using the same question, the percentage of interviewees who name the brand first is considered) and, respectively, aided awareness (brand names are presented to interviewees – in this case the aided awareness of a brand is the percentage of interviewees who indicate they know that brand).

Awareness of the co- designed product will moderate the relation between the co-design and the customer satisfaction

H6: Awareness of customized product moderates the relation between co-design and customer satisfaction

3.3.7 Hypothesis 7: Knowledge moderates the relation between the co-design and the customer satisfaction.

Consumer product knowledge has been studied in a variety of different ways in recent years e.g. Baker, Hunt and Scribner, (2002); Alba and Hutchinson, (2000); Brucks, (1986); Park, Mothersbaugh and Feick, (1994); Raju, Lonial and Mangold, (1995); Rao and Monroe, (1988). It has been recognized as a characteristic in consumer research that influences all phases in the decision process Bettman and Park, (1980).

Consumers with various levels of product knowledge differ in their perceptions of product attributes Laroche, Bergeron and Goutaland (2003; Baker, Hunt and Scribner (2002); Blair and Innis (1996). Marks and Olson (1981) propose that consumers with higher levels of product knowledge have better developed and more complex schemata, with well-formulated decision criteria. In the same vein,

Kempf and Smith (1998) suggest that consumers with higher levels of product knowledge are more diagnostic and better informed than those who have lower levels of product knowledge.

Previous research concerning consumer behavior has emphasized the importance of the relationship between product involvement and product knowledge Lin, L.Y. and C.S. Chen, (2006), Park, C.W. and B.J. Moon, (2003)

This Research suggests that the relative product attributes and purchase can also be influenced by what a customer knows about alternatives. For instance, information- processing theories of choice e.g., Bettman (1979); Fishbein and Ajzen (1975) suggest that a consumer's evaluation of an alternative will depend on the content of the consumer's knowledge (i.e., information pertaining to how the alternative performs on decision-relevant attributes).

Another stream suggests that simply having less knowledge can influence evaluation. Consumers commonly make decisions with incomplete knowledge about alternatives Kivetz and Simonson (2000). Most research has examined the situation where consumers are missing information about a single attribute. Under these conditions, consumers may infer a value for the missing attribute based on (1) the average value of the attribute across other competitors Ross and Creyer (1992), (2) the overall evaluation of the product based on known common attributes Kivetz and Simonson (2000), or (3) the value of a known attribute of the alternative that is perceived to be related to the missing attribute Broniarczyk and Alba (1994). The amount of "missing" information about alternatives at time of choice will be substantially influenced by how much the customer knows (objective knowledge) about alternatives at initiation of pre-purchase search. This prior knowledge, which reflects the history of the customer's experience with,

passive exposure to, and prior investigation of alternatives, is a base on which pre purchase search will build. The larger this base, the less there is to learn about alternatives (Brucks 1985); (Moorthy, Ratchford, and Talukdar, 1997); (Punj and Staelin, 1983). In addition, customers with more prior knowledge more tightly focus their search on gathering information that is decision relevant (Alba and Hutchinson, 1987); (Johnson and Russo, 1984). Having less to learn about alternatives, and more strongly focused on gathering information relevant to evaluating alternatives, customers with more objective knowledge about alternatives at initiation of pre purchase search should be "missing" less decision-relevant information about alternatives at time of choice and therefore more likely to defect.

Knowledge about co- designed product will moderate the relation between the co-design and the customer satisfaction:

H7: Knowledge moderates the relation between the co- design and the customer satisfaction

3.3.8 Hypothesis 8: Co-design in mass customization has positive relation with customer satisfaction

3.3.9. Hypothesis 9: Co- design mediates the relation between the intention and the customer satisfaction

When purchasing mass customized goods, consumers determine the final configuration of features, thereby altering the aesthetic, symbolic, and performance-related benefits provided by the product (Addis and Holbrook, 2001). As such, mass customization, from the consumer perspective, is an active form of value-production through which consumers acquire mass produced goods that are more individualized than standard, off-the-shelf alternatives (Liechty, Venkatram and Cohen, 2001). In this customer-centric economy, more and more customers desire the opportunity to design their own product.

Bateson (1985) asserted that customers might have the propensity to choose the "do-it-themselves" approach across many services, even when the service that might be more expensive or less convenient than traditional services. In most recent review, customers can play an active role in mass customizing process. They should not be viewed as just passive receptacles, but a source of productivity gains in service industry (Fitzsimmons, 1985); (Lovelock & Young, 1979).

In some cases, when customers are highly involved in the design or development process, it is difficult to differentiate between producer and customer. Since the design and production is initiated by the customer, they become "prosumers" Moffat, (1990), or "co-designers". In particular, consumers with great purchasing power are increasingly attempting to express their personality by means of an individual product choice, and mass customization economies are the result of the

integration of customer information into value creation, and the on-demand manufacturing approach of mass customization Piller & Müller, (2004). Further, Piller et al. (2005) said that individuality does not always mean one-to-one. On the contrary, collaboration among customers in online communities (and not directly with the online merchant) can help to overcome the mass confusion phenomenon of customized products.

A variety of research has addressed consumer desire for individualized product solutions and consumers as active agents in the co- individual difference production of value in consumer goods. Mass customization programs offer consumers a product solution that is more unique and give consumers control over functional and stylistic benefits they receive from mass customized products. With greater regularity and across an increasingly diverse group of product categories

Piller (2003), consumers are being offered the choice of purchasing standard, mass marketed goods or mass customized alternatives. Embedded within markets that offer both mass customized products and standard, mass marketed products are a set of attitudes that supports a comparison and evaluation of the value of owning a customized product to owning a mass marketed alternative.

Active involvement where leads to dissatisfaction, quite contradictory could be the motivator for the customers to design their own products as it creates fun (Huffman and Kahn, 1998). If involved voluntarily and deriving benefits from the overall process involve fun that shows the positive attitude of the customers and thus increase the satisfaction (Hertel et al., 2003); (Franke and Shah, 2003).

Designing own products requires the active involvement of the customers in the process. According to Huffman and Kahn (1998) customer takes it as fun while learning their own preferences in the process and also experience positive

emotions. Customer enjoys the overall process of the customization (Dallaert and Stremersch),2005). Process enjoyment has a significant impact on the customer satisfaction and amplified by the preference fit (Nikolaus Franke, 2006) , (Martin Schreier, 2010). Franke and Shreier (2010) found that regardless of the outcome of the process customer gives higher value to the process if they enjoyed it. Customer who prefer customization products are also increasing, numbers of

studies showed satisfaction could be raise if customer join the design process of product or service, and the product or service will more fit for customer s' need Wei-ping Pu et al. (2012). Thus following hypothesis may be concluded and accordingly, we would hypothesize that:

H8: Co-design of customized products has positive relation with the customer satisfaction

H9: Co- design mediates the relation between the intention and the customer satisfaction.

3.4Research Design

This section is designed to discuss in detail the data collection procedure, sampling technique, questionnaire design and development, administration of questionnaire as well as the data analysis techniques. Hair, Anderson, Tatham & Black (1998) defined data as those facts that are related to any issue or subject of the study. In marketing research, the two basic methods for data collection are primary and secondary. The primary method includes data that are collected for the purpose of the investigation, while the secondary method includes the data that are collected for other purposes of the study. The main difference between primary and secondary data is not based on how these data are collected but on its purpose.

3.4.1 Sampling Procedure

The precise selection of the target population is necessary in considering the research project. The target population for the study is the customers that have already purchased mass customized products. And because the topic is new and not having great base; we've chosen the painting industry as it is offering customized paints and has many customers.

3.4.2 Development of Questionnaire

According to Kumar, Aker and Day (2001), there are five steps in developing a questionnaire. These steps includes: planning what to measure, developing the questionnaire, question wording, questionnaire layout, pre-testing, correcting problems and its implementations. These steps are discussed in detail, in the subsequent sections of the chapter.

Step 1: Planning what to measure

This step is based on the research objectives, problem statement, and the research issues. The survey questions were designed precisely to give clear ideas about the problems for the target respondents to answer. The questions on the research instrument were divided into the following: (1) questions on influence of antecedents of mass customization on the intention (2) questions covered intention and its influence on the co- design. (3) Questions covered the effect of the co-design on the customer satisfaction (4) Questions for the effect of the moderators. All the responses were elicited on a 5 points scale, 1=strongly agree 5= strongly disagree. Likert scale had been chosen for its clarity and ease of use Malhotra, (2004).

Step 2: Formatting of the questionnaire

This step involves the conversion of the research objectives into information required to obtain the necessary output of the questionnaire. All the research constructs in this study had been converted into the relevant questions and clearly stated. Most of the respondents were not familiar with English language since it is not a common language in business world. Therefore, the instrument required translation to Arabic language.

Step 3: Question wording

This step examines whether the questions are clearly understandable to all respondents. Thus it is necessary to uses simple terminologies to avoid unclear or elusiveness in the meaning. It is important to avoid double-barreled or misleading and confusing questions. Beside the phrasing and length of questions, it is also designed to solicit ideas and answers from target respondents. Simple statements were framed so that the questionnaire could be easily understood. In the process,

the instrument was revised by Professor Abdelhafiez Ali from the College of Business Administration, Sudan University for Science and Technology. Dr. Mohamed Salih, Sudan University for Science and Technology. Dr. Arafa Gibreel, Sudan University for Science and Technology. Dr. Mohammed Nour Gezira University. Moreover, to be sure that the questionnaire will be clear for the respondents, four colleagues were requested to review the wording of the questionnaire. The final version of the instrument was simplified by erasing or replacing some questions to reduce the time required in answering the questionnaire. The test of the time required to answer the questionnaire was done with the help of 30 customers, answering the questionnaire was estimated to take approximately ten to fifteen minutes.

Step 4: Sequence and layout decisions

This step concerns the sequence and flow of the statements for achieving the respondent's cooperation. The instrument should start with easy questions flow containing from general to specific questions. The sensitive or difficult questions must be avoided or not placed at the beginning. Moreover, an attractive layout of the questionnaire is considered for clarity of the items presented.

Step 5: Pre-testing and correcting problems

This step involves conducting a pilot test on the questionnaire to ensure that the questions meet the researcher's expectations with no ambiguities, appropriateness in the length of the questions, and clearing the double-barreled questions. The objective of the pilot test is to eliminate confusing statements and checking the reliability of the variables.

To fulfill steps 2 to 5, 100 customers were selected for the pilot study. The result of the pilot test is presented in Table 3.1 indicating that the values of Cronbach's alpha on the items were good and acceptable except two to three items but it was because the scale was small. They showed better results in the bigger scale. The result showed high reliabilities index of the items included in the questionnaire.

Table 3.1

Reliability Test of the Pilot Study

Variables	Cronbach's alpha
Attitude	.692
Perceived usefulness	.762
Self- confidence	.457
Product aesthetics	.799
Intention	.667
Co- design	.683
Knowledge	.422
Awareness	.421
Customer satisfaction	.895

3.5 Administrative of the Field Works

Most of the studies using mailed questionnaires suffer from low response rate. Hence, to generate higher response, a careful administration of fielding the questionnaire is to be considered.

The cover letter attached to the first part of the questionnaire explains the objectives of the study and ensured the confidentiality of the information. A total of 400 copies of questionnaire were sent to the target respondents. In addition, telephone calls and E-mail were used to encourage participation among the target respondents.

3.6 Measurement of the Variables

In the following sub sections, the measurements of the variables used in this study are discussed in detail.

Predictors of Intention (IV)

3.6.1 Attitude

Understanding individual differences in attitudes toward mass customized goods is important for two reasons. First, mass customization programs are becoming an increasingly important way for manufacturers to meet individualized demand at near mass production efficiency. While the strategy of mass customization has been present in marketing for many years, (e.g. furniture manufacturers have a long history of offering mass customized goods), only recently have technological advances in production systems and in customer interface solutions allowed the strategy to be applied in broader categories of consumer products.

These technological advances offer firms the potential for increased profits and reduced costs by substituting consumer labor for employee labor Tseng and Piller (2003). Consumer attitudes toward mass customized products should be measured in terms of attitude toward the incremental costs associated with a customized product alternative and attitude toward the time and effort of co-producing a mass-customized product Bardakci and Whitelock, (2003). The measurement of attitude in this study was adopted from Robinson, et al., (2005). 11 items were adopted to measure the customer attitude towards the customized products.

3.6.2 Perceived usefulness (PU)

In the past, researchers e.g. Koufaris, (2002) have validated the construct of PU and they were found to influence the intention. Horton et al. (2002) asserted the existence of a positive influence of PU on intention in Intranet media. Additionally, Agarwal and Prasad (1999); Chau and Hu (2002); Davis, et al. (1989); Hu et al. (1999); Igbaria et al. (1995); Igbaria (1993); Mathieson (1991); Mathieson et al. (2001); Moon and Kim (2001); Ramayah et al. (2002); Venkatesh and Davis (2000) also reported that PU is significant and positively influences the behavioral intent. Perceived Usefulness measurement was adopted from Davis, (1989); Gefen et al., (2003). 8 items were included in the questionnaire to measure the influence of the perceived usefulness on the customer intention.

3.6.3 Self- confidence

In this study, self- confidence is the third variable among the antecedents of mass customization. Previous studies have found that the intention is positively affected by the self- confidence Zhongjun Tang, Jianghong Luo, Juan Xiao, (2011). Measurement of self- confidence was adopted from Ajzen, (1991); Ajzen & Fishbein, (1980) with 7 items to measure the effect of the self- confidence on the customer intention.

3.6.4 Product aesthetics

Consumers who place a great deal of emphasis on the visual aesthetics of goods value mass customized goods for their ability to align the aesthetic properties of goods with their own specific tastes and preferences. This is consistent with Bloch, Brunel, and Arnold's (2003) research that suggests that the visual aesthetics of goods serve a symbolic function that facilitates consumers' interpretation of the product's symbolic qualities. The measurement of product aesthetics was adopted from Bloch, Brunel, and Arnold's (2003) with 8 items to measure the effect of the product aesthetics on the customer intention.

3.6.5 Intention (Mediator)

Understanding intentions is foundational because it provides the interpretive matrix for deciding precisely what it is that someone is doing in the first place. Thus, the exact same physical movement may be seen as giving an object, sharing it, loaning it, moving it, getting rid of it, returning it, trading it, selling it, and on and on – depending on the goals and intentions of the actor. Intention precedes action, and is itself preceded by emotions and motivations.

It is defined as an individual's readiness to perform a certain action. Intention directly precedes behavior. The eight items measured intention in this study was adopted from Venkatesh et al., (2002); Wang et al., (2006) to measure the customer intention towards the customized items.

3.6.6 Co- design (Mediator)

Scholars' works identified the co-design experience as a critical source of value for the consumer. The co-design configurator "… allows the individual customer to design a product which suits her individual preferences and is then produced exclusively for her." Franke & Schreier, (2009). That's why it is included in our framework to influence the customer satisfaction. The measurement of co- design was adopted from Noelin, (1999); Shim et al., 1989; Summers et al., (2006) with 7 items to measure the influence of the co- design on the customer satisfaction.

3.6.7 Knowledge (Moderator)

A review of the literature shows that the essential reason is that superior plane of responsiveness will direct to be elevated buying behavior. Customers having no knowledge of the product will have no intention of buying it either, Grewal, Monroe & Krishnan, (1998).

Previous research concerning consumer behavior has emphasized the importance of the relationship between product involvement and product knowledge Lin, L.Y. and C.S. Chen, (2006), Park, C.W. and B.J. Moon, (2003). Another stream suggests that simply having less knowledge can influence evaluation. Consumers commonly make decisions with incomplete knowledge about alternatives, Kivetz and Simonson (2000). Measurement of knowledge was adopted from Bogan and Kromrey (1996) with 4 items to measure the moderation of the knowledge on the relation between co- design and customer satisfaction.

3.6.8. Awareness (Moderator)

Recently, the increase of buyer awareness has made buyers want to pay for their recognizable and constructive product. Thus, it is important for businesses to create attraction in their brands to be in better position than their competitors. This is evident that the consumers spread and always willing to acquire a product, so here the product awareness is always a vital factor to manipulate the buying decisions and purchase intensions Macdonald and Sharp, (2000). Also awareness here is included as a moderator on the relation between the co- design and the customer satisfaction. Measurement was adopted from Ernesto Lasso De Lavega (2004).

3.7 Data Analysis Techniques

To analyze the data and test the hypotheses, several statistical tools were employed. Statistical Package for Social Science (SPSS) Version 16.0 was used instead of AMOS because of the small number of the respondents in addition to the inclusion of moderator variables.

The following techniques were used:

1. Factor analysis (Principal component) used to validate and ensure the goodness of measures using the following guidelines:

- Eigenvalue of 1 or greater
- VARIMAX rotation method
- The cut-off point for significant factor loading is > 0.35 (Hair et. al., 1998)

2. Cronbach alpha for Reliability to measure the internal consistency.

3. Descriptive statistics was used to describe the respondent's characteristics.

4. Pearson correlation was used to see the degree of correlation between the variables

5. Multiple Liner Regression was used to test the hypothesis.

3.8 Summary

The chapter presented the research framework which was derived from the literature review. It also presented the research methodology which covered the research design, sampling procedure, development and design of the research instrument and administration of the field work. Furthermore, the chapter highlighted the measurement of the variables and presented the statistical techniques used in testing the hypothesis. The succeeding chapter presents the result of the findings and hypotheses testing.

CHAPTER FOUR

DATA ANALYSIS AND FINDINGS

4.1Introduction

The previous chapter detailed the research methodology adopted to test the proposed theoretical model, and to answer the research questions of the study. The purpose of this chapter is to present the findings of the data analysis and it is presented in three sections. The first section presents the normality test, response rate, demographic information, followed by descriptive analysis of main variables. The third section discusses the reliability, and validity measures of the data, the fourth focuses on detailed discussion about the hypotheses tested using different statistical techniques such as one sample t-test, Bivariate correlation, and multiple regression analysis.

4.2 Response Rate

The data collected for this dissertation were obtained through primary research. A survey was created in January 2013, and it was distributed manually with help of some professionals from newspapers offices to the targeted painting centers.

The researcher distributed 270 questionnaires across three main painting centers across greater Khartoum. The decision was to distribute more than the sample in case of some will not be returned and some will not be completely filled. Two hundred Thirty Four questionnaires were returned. Forty Five were completed partially. Thirty Seven were visiting these centers but they don't customize their product, they leave the customization to the experts working in these centers.

Thirty Six questionnaires were not returned. Thus, the researcher analyzed 152 questionnaires. The questionnaires had been left in the centers to be distributed to the customers. The response rate was 70% percent including the questionnaires of the customers who didn't customize, and this response rate can be considered as enough for two main reasons:

1. The sample population is already unknown; as this concept is new to Sudanese people
2. The offered customized products are limited as mentioned at the beginning of our study.

Table 4-1: Response rate

Total Questionnaires distributed	270
Completed questionnaire received from respondents	152
Returned questionnaires (partially answered)	45
Questionnaires not returned	36
Customers didn't customize products before	37
Response Rate	**70 %**

4.3: Respondents Data

This section investigated the demographic profile of customers concept about mass customization participated the survey. This was in the light of the growing customization needs in today markets. And as Sudan is one of the growing markets; it was necessary to sense the Sudanese customers view towards the customization. The data collected was analyzed descriptive statistics using frequency analysis. This part presents the results of the demographic and business

profile analysis. The respondents were asked to answer following questions; which age group is the respondent; their gender to know which gender is more interested in customization to be targeted by managers in regards to the offered product to be customized; income to know which category can afford the customization; living area to determine the standard of living; marital status to know the interests of the customer; and finally the profession to determine the targeted category for the customization market.

According to table 4-2, gender, the frequency of female were 28 with percentage of 18.4% while male frequency were 124 with percentage 81.6%. This result shows that men are more involved in the products customization mainly because the study market was the painting. Marital status, the frequency of the single were 119 with percentage of 78.3%, married frequency were 22 with percentage of 14.5%,This result showed that the majority of interested respondents in product customization are single due to their little responsibilities and high interest in customizing their own products. Conversely, the widows and the divorcees just are losing interest in such type of customization. They don't venture as single respondents do, while number of divorced respondents were 9 with percentage of 5.9%. Widows were 2 with percentage 1.3%

In terms income as appeared in the below table, the most and clustered area of the whole respondents were in the level average income which shows that the number of respondents with average income were 110 which results 72.4%, the second respondents with high level of income were 9 which results 5.9%. This indicates the customizing products cannot be done or even interesting with the low income. And this is supported in the profession where employed respondents were 100

representing 65.8% from the total sample. Students were 37 which results 24.3% while entrepreneurs were 3 which results 2%, and unemployed were 12 which results 7.9%. And the last category, as mentioned by them, they depend on their parents financially. According to the area of study, 61.8% of the respondents were from painting center in Khartoum; Twenty nine respondents were from center in Khartoum North which is 19.1% while twenty nine respondents were from center in Omdurman which represents 19.1%.

Table 4.2. Respondents Profile

Demographic Profile	**Frequency**	**Percent**
Sex		
Male	28	18.4
Female	124	81.6
Total	152	100.0
Marital status		
Single	119	78.3
Married	22	14.5
Widow	2	1.3
Divorced	9	5.9
Total	152	100.0
Income		
Low (Less than 500 SDG)	33	21.7
Average (1000 SDG)	110	72.4
High (Above 1000 SDG)	9	5.9

Demographic Profile	Frequency	Percent
Total	152	100.0
Profession		
Student	37	24.3
Employee	100	65.8
Entrepreneur	3	2
Unemployed	12	7.9
Total	152	100.0
Area		
Khartoum	94	61.8
Omdurman	29	19.1
Khartoum North	29	19.1
Total	152	100.0

Source: Researcher , 2013

4.4: Validity Test Using Factor Analysis

In order to achieve this objective and ensure the validity of the measures, exploratory factor analysis (EFA) were conducted for the EO, Firm performance and environmental Determinants construct by using principle components (PC) with Varimax rotation. PC is widely used and it is most appropriate when the data reduction is the major concern for the researcher (Hair, Black, Babin, & Anderson, 2010).

4.4.1. Predictors of Intention

Before proceeding to the analysis, it has been checked for suitability of the sample size for running factor analysis. Measure of sampling adequacy (MSA) and Bartlett's test of sphericity, which is about whether there is sufficient correlations exist, were used to test the basic assumptions of factor analysis (Hair et al, 2010). MSA should be greater than 0.50, while Bartlett's test should be significant at 0.05.

In order to determine the factor structure, the loadings should be greater than .50, indicating practical and statistical significance. For the communalities, it should be greater than .50 in order to show that the item contributes to the factor structure. However, if the sample is very large, a value of .40 is acceptable. The recommended variance explained in social science is above 60%, in some cases, 50% and above is acceptable, while the Eigenvalue should be greater than one (Hair et al, 2010).

The 7 items of product aesthetics, 5 items of attitude, 5 items of self- confidence, and 5 items of perceived usefulness were subjected to principal components analysis (PCA) using SPSS version 16. Prior to performing PCA, the suitability of data for factor analysis was assessed. Inspection of the correlation matrix revealed the presence of many coefficients of .3 and above. The Kaiser- Meyer-Olkin value was .907, exceeding the recommended value of .6 (Kaiser 1970, 1974) and Bartlett's Test of Sphericity (Bartlett 1954) reached statistical significance (p=.000) with Chi square of 3393183 (df= 231). Based on these figures, the sample size is sufficient to use factor analysis. There are sufficient correlations among the items for the intention and co- design supporting the factorability of the correlation matrix.

There were 10 items for product aesthetics, three items were deleted because they were found less than .5. Attitude had 10 items 5 were deleted also below .5. Self-confidence had 7 items 2 items were deleted, while perceived usefulness had 6 items 1 item was deleted. These items were adopted from previous studies, representing the antecedents of mass customization. All the items were involved in the process of factor analysis. Table 4.7 displays the process of exploratory factor analysis, Eigenvalues, communalities, loadings, Alpha, and variance explained.

The communalities in the Independent Variables are greater than 0.5 with 5 items. The higher in product aesthetics was 0.863 and the least was 0.735. While the higher in attitude was 0.800 and the least was 0.620. The higher in the self-confidence was .773 and the least was .676. And the higher in the perceived usefulness was .834 and the least was .651. Eigenvalues were 54.189, 12.494, 5.933, and 3.851 respectively.

A reliability test was conducted to assess the internal consist of the items by using Cronbach‟s alpha. A variable is reliable and internally consistent when the alpha is .70 and above (Hair, Black, Babin, & Anderson, 2010). However, Bowling (2009) suggests that alpha of .50 and above is an indication of internal consistency. Based on the literature, all the Cronbach‟s alpha scores for the variables were greater than .60. The highest alpha was obtained by product aesthetics (α=.964), followed by attitude (α=.898), while self- confidence and perceived usefulness were sharing the same alpha (a=893).

Table 4.3. Exploratory Factor analysis for Predictors of intention

	Rotated Component Matrix[a]				
		Component			
Factors	Items	F1	F2	F3	F4
F1: Product Aesthetics	Buying a customized product that has a superior design is important	**.883**	-.124	-.154	-.106
	Buying a customized product that is "me" is important	**.872**	-.233	-.158	-.153
	Having a customized product with the right features is essential	**.860**	-.239	-.283	-.086
	Using a customized product that has superior design is of concern	**.853**	-.155	-.201	-.238
	Owning a customized product with a style that pleases me is of concern	**.836**	-.181	-.211	-.254
	The freedom to choose the color, style, and features for a product seems like the best way to make sure a consumer's needs are met.	**.834**	-.222	-.198	-.217
	Owning a customized product that leaves people with a favorable impression of me does matter	**.833**	-.122	-.152	-.058

F2: Attitude	The more common place a product is among the general population, the less interested I am in buying it.	-.188	**.825**	.252	.144
	I am willing to spend an additional waiting time until receipt	-.153	**.802**	.255	.233
	When it comes to the selection of products on the market, there are not enough choices	-.173	**.734**	.315	.264
	I want to differ from the mass	-.283	**.713**	.187	.306
	I plan to buy a customized product at some point.	-.315	**.594**	.135	.387
F3: Self Confidence	I often combine possessions in such a way that I create a personal image for myself that can't be duplicated.	-.217	.266	**.804**	.099
	No matter what I do, I have the highest standards for myself.	-.186	.245	**.739**	.188
	I never settle for second best.	-.300	.246	**.725**	.264
	I am confident that if I wanted to, I could co-design my products.	-.300	.301	**.646**	.410
	When I see a product that has a really great design, I feel a strong urge to buy it.	-.255	.116	**.594**	.501
F4:	I like to customize all my products	-.053	.269	.260	**.713**

Perceived Usefulness	Mass customization provides a better fit.	-.220	.530	.145	**.696**
	Customized products can be used in different needs	-.309	.264	.377	**.637**
	Mass customization provides perceived usefulness.	-.209	.510	.177	**.629**
	Customizing products creates a relationship with the supplier	-.407	.312	.419	**.563**
	Percentage Variance Explained	27.475	18.395	15.833	14.764
	Cumulative				76.466
	Eigenvalues	54.189	12.494	5.933	3.851
	KMO	.865	.873	.856	.799
	Bartlett's Test	548.155	857.351	531.178	513.944

Table 4.4. Reliability Test of Predictors of intention

Variable	No. of Items	Cronbach's Alpha
Product Aesthetics	7	.964
Attitude	5	.898
Self Confidence	5	.893
Perceived Usefulness	5	.893

4.4.1.: Intention and Co- Design (Mediating Variables)

The 12 items of intention and co- design were subjected to principal components analysis (PCA) using SPSS version 16. Prior to performing PCA, the suitability of data for factor analysis was assessed. Inspection of the correlation matrix revealed the presence of many coefficients of .3 and above. The Kaiser- Meyer-Olkin value was .915, exceeding the recommended value of .6 (Kaiser 1970, 1974) and Bartlett's Test of Sphericity (Bartlett 1954) reached statistical significance (p=.000) with Chi square of 1610.877 (df= 66). Based on these figures, the sample size is sufficient to use factor analysis. There are sufficient correlations among the items for the intention and co- design supporting the factorability of the correlation matrix.

There were 7 items for intention; one item was deleted because it was found below .5. And 6 items for the co-design, which were adopted from previous studies, representing customer intention to co- design the product. All the items were involved in the process of factor analysis. Table 4.9 displays the process of exploratory factor analysis, Eigenvalues, communalities, loadings, Alpha, and variance explained.

The communalities in the mediating variables are greater than 0.5 with 6 items for intention and 6 items for co- design. The higher in intention was 0.727 and the least was 0.610. While the higher in co- design was 0.843 and the least was 0.744. The Eigenvalues were 1.228 and 7.681 respectively.

A reliability test was conducted to assess the internal consist of the items by using Cronbach‟s alpha. A variable is reliable and internally consistent when the alpha is .70 and above (Hair, Black, Babin, & Anderson, 2010). However, Bowling (2009) suggests that alpha of .50 and above is an indication of internal consistency. Based

on the literature, all the Cronbach‟s alpha scores for the variables were greater than .60. The highest alpha was obtained by co- design (α=.951), followed by intention (α=.749).

Table 4.5. Exploratory Factor analysis for the mediators

FACTORS	ITEMS	F1	F2
F1: **Intention**	I like to try new products and services before others do.	**.778**	.249
	I enjoy having things that others do not.	**.777**	.303
	I am more likely to buy a product if it is scarce.	**.761**	.400
	I rarely pass up the opportunity to order custom features on the products I buy.	**.760**	.186
	I would prefer to have products custom-made rather than ready-made.	**.714**	.466
	I am very attracted to rare objects.	**.589**	.513
F2: **Co- Design**	Co-design provides a variety of fabric and color choices.	.348	**.850**
	A variety of style choices is important in the co-design process.	.346	**.847**
	Mass customization provides a quick and convenient co- design process.	.211	**.836**
	Co-design provides enjoyment.	.325	**.830**
	The usefulness of the co-design process is important.	.411	**.820**
	Co-design provides a variety of unique style choices.	.368	**.813**

	Percentage Variance Explained	**32.647**	**41.598**
	Eigenvalues	**1.228**	**7.681**
	Reliability	**.749**	**.951**
	KMO	**.870**	**.905**
	Bartlett's Test	**526.950**	**922.560**

Table 4.6. Reliability Test of Mediators

Variable	**No. of Items**	**Cronbach's Alpha**
Intention	6	.749
Co- Design	6	.951

4.4.2.: Knowledge and Awareness (Moderating Variables)

The 9 items of knowledge and awareness were subjected to principal components analysis (PCA) using SPSS version 16. Prior to performing PCA, the suitability of data for factor analysis was assessed. Inspection of the correlation matrix revealed the presence of many coefficients of .3 and above. The Kaiser- Meyer-Olkin value was .854, exceeding the recommended value of .6 (Kaiser 1970, 1974) and Bartlett's Test of Sphericity (Bartlett 1954) reached statistical significance (p=.000) with Chi square of 748.421 (df= 36). Based on these figures, the sample size is sufficient to use factor analysis. There are sufficient correlations among the items for the intention and co- design supporting the factorability of the correlation matrix.

There were 9 items for knowledge and awareness, which were adopted from previous studies, representing customer knowledge and awareness during the co-design process. All the items were involved in the process of factor analysis. Tables 4.11 displays the process of exploratory factor analysis with Eigenvalues, communalities, loadings, Alpha, and variance explained.

The communalities in the moderating variables are greater than 0.5 with 5 items for knowledge and 4 items for awareness. The higher in knowledge was 0.867 and the least was 0.513. While the higher in awareness was 0.698 and the least was 0.568. The Eigenvalues were 4.578 and 1.515 respectively.

A reliability test was conducted to assess the internal consist of the items by using Cronbach‟s alpha. A variable is reliable and internally consistent when the alpha is .70 and above (Hair, Black, Babin, & Anderson, 2010). However, Bowling (2009) suggests that alpha of .50 and above is an indication of internal consistency. Based on the literature, all the Cronbach‟s alpha scores for the variables were greater than .60. The highest alpha was obtained by knowledge (α=.869), followed by awareness (α=.791).

Table 4.7. Exploratory Factor analysis for the moderators

FACTORS	ITEMS	F1	F2
F1: **Knowledge**	Information about customized product is essential	**.919**	.148
	Conversation with customers in MC is important	**.882**	.229
	Knowledge helps me to co-design my product	**.862**	.058
	I could know more and would like to be able to find out more	**.679**	.326

	I know a lot about my customized product	**.575**	.427
F2: Awareness	I don't know much and am not interested	-.014	**.836**
	I could know more but I don't feel I need to	.165	**.797**
	I feel well informed about my customized product	.366	**.689**
	Mass customization overall use is improving	.366	**.682**
	Percentage Variance Explained	**38.364**	**29.343**
	Eigenvalues	**4.578**	**1.515**
	Reliability	**.869**	**.791**
	KMO	**.795**	**.755**
	Bartlett's Test	**391.747**	**331.576**

Table 4.8. Reliability Test of Moderators

Variable	No. of Items	Cronbach's Alpha
Knowledge	5	.869
Awareness	4	.791

4.4.3.: Customer Satisfaction (DV)

The 4 items of customer satisfaction were subjected to principal components analysis (PCA) using SPSS version 16. Prior to performing PCA, the suitability of data for factor analysis was assessed. Inspection of the correlation matrix revealed the presence of many coefficients of .3 and above. The Kaiser- Meyer-Olkin value was .851, exceeding the recommended value of .6 (Kaiser 1970, 1974) and Bartlett's Test of Sphericity (Bartlett 1954) reached statistical significance (p=.000) with Chi square of 674.769 (df= 6). Based on these figures, the sample size is sufficient to use factor analysis. There are sufficient correlations among the items for the intention and co- design supporting the factorability of the correlation matrix.

There were 4 items for customer satisfaction adopted from previous studies; representing customer satisfaction resulted from the co- design of the customized products. All the items were involved in the process of factor analysis. Table 4.13 displays the process of exploratory factor analysis with Eigenvalues, communalities, loadings, Alpha, and variance explained. The communalities in the dependent variable are greater than 0.5. The higher in customer satisfaction items was 0.909 and the least was 0.852. The Eigenvalues were 3.540.

A reliability test was conducted to assess the internal consist of the items by using Cronbach‟s alpha. A variable is reliable and internally consistent when the alpha is .70 and above (Hair, Black, Babin, & Anderson, 2010). However, Bowling (2009) suggests that alpha of .50 and above is an indication of internal consistency. Based on the literature, all the Cronbach‟s alpha scores for the variables were greater than .60 (α=.957).

Table 4.9 Exploratory Factor analysis for the DV

FACTORS	ITEMS	F1
F1: **Customer Satisfaction**	My performance in customization was satisfactory	**.953**
	My performance in customization was successful	**.949**
	The customized product has met my expectations	**.937**
	Overall, I am satisfied with my customized product	**.923**
	Percentage Variance Explained	**88.498**
	Eigenvalues	**3.54**
	Reliability	**.957**
	KMO	**.851**
	Bartlett's Test	**674.769**

Table 4.10. Reliability Test of DV

Variable	No. of Items	Cronbach's Alpha
Customer Satisfaction	4	.957

4.5 Descriptive Analysis

4.1.3.1. Descriptive Analysis Predictors of intention

In this section, the researcher will present result of predictors of intention using descriptive statistics especially mean and standard deviation. In the table 4.3, the mean 1.74 with std. deviation 1.070 shows that respondents strongly agreed that the more common place a product is among the general population, the less interested they are in buying it. While the mean 1.59 with std. deviation .972 shows that the respondents strongly agreed that when it comes to the selection of products on the market, there are not enough choices. Also, the mean 1.71 with std. deviation 1.012 shows that the respondents strongly agreed that they are willing to spend an additional waiting time until receipt. And the mean 1.72 with std. deviation 1.011 shows that the respondents strongly agreed that they want to differ from the mass.

Regarding perceived usefulness; with the mean 1.67 with std. deviation 1.060 shows that the respondents fully agreed that mass customization provides perceived usefulness. And mean 1.63 with std. deviation 1.060 shows that the respondents fully agreed that mass customization provides a better fit. The mean 1.76 with std. deviation 1.067 shows that the respondents strongly agreed that they like to customize all their products. The mean 1.57 with std. deviation .903 shows that the respondents strongly agreed that the customized products can be used in different needs. The mean 1.46 with std. deviation .829 shows that the respondents strongly agreed that customizing products creates a relationship with the supplier.

In self- confidence; the mean 1.65 with std. deviation 1.111 shows that the respondents strongly agreed that when products or brands they like become extremely popular, they lose interest in them. The mean 1.60 with std. deviation 1.056 shows that the respondents strongly agreed that when they see a product that has a really great design, they feel a strong urge to buy it. The mean 1.62 with std. deviation 1.048 shows that the respondents strongly agreed that they never settle for second best. The mean 1.70 with std. deviation 1.178 shows that the respondents strongly agreed that they often combine possessions in such a way that they create a personal image for themselves that can't be duplicated. The mean 1.61 with std. deviation 1.006 shows that the respondents strongly agreed that they are confident that if they wanted to, they could co-design their products.

And in product aesthetics; the mean 4.50 with std. deviation.928 shows that the respondents strongly disagreed that owning a customized product that leaves people with a favorable impression of them does not matter. The mean 4.48 with std. deviation.891 shows that the respondents strongly disagreed that buying a customized product that has a superior design is not important to them. The mean 4.49 with std. deviation.853 shows that the respondents strongly disagreed that the freedom to choose the color, style, and features for a product seems like the best way to make sure a consumer's needs are met. The mean 4.49 with std. deviation.891 shows that the respondents strongly disagreed that buying a customized product that fits my image is not essential. The mean 4.49 with std. deviation .963 shows that the respondents strongly disagreed that owning a customized product with a style that pleases them is of no concern. The mean 4.52 with std. deviation .942 shows that the respondents strongly disagreed that having a customized product with the right features is not essential. And finally, the mean

4.52 with std. deviation .963 shows that the respondents strongly disagreed that using a customized product that has superior design is of no concern.

4.5.2 Descriptive analysis Customer Satisfaction

The mean 1.57 with std. deviation.932 shows that the respondents strongly agreed that their performance in customization is satisfactory. The mean 1.57 with std. deviation.940 shows that the respondents strongly agreed that their performance in customization was successful. The mean 1.61 with std. deviation.964 shows that the respondents strongly agreed that the customized product has met their expectations. The mean 1.47 with std. deviation.898 shows that the respondents strongly agreed that Overall, they are satisfied with their customized product.

4.5.3. Descriptive analysis Intention and co- design

The mean 1.61 with std. deviation.885 shows that the respondents strongly agreed that they are very attracted to rare objects. The mean 1.61 with std. deviation.878 shows that the respondents strongly agreed that they are more likely to buy a product if it is scarce. The mean 1.61 with std. deviation.907 shows that the respondents strongly agreed that they would prefer to have products custom-made rather than ready-made. The mean 1.64 with std. deviation.939 shows that the respondents strongly agreed that they enjoy having things that others do not. The mean 1.75 with std. deviation1.050 shows that the respondents strongly agreed that they rarely pass up the opportunity to order custom features on the products they buy. The mean 1.62 with std. deviation .948 shows that the respondents strongly agreed that they like to try new products and services before others do.

For Co- design; the mean 1.44 with std. deviation .844 shows that the respondents strongly agreed that co-design provides a variety of unique style choices. The mean 1.46 with std. deviation .876 shows that the respondents strongly agreed that Co-design provides a variety of fabric and color choices. The mean 1.50 with std. deviation .891 shows that the respondents strongly agreed that co-design provides enjoyment. The mean 1.49 with std. deviation 1.029 shows that the respondents strongly agreed that a variety of style choices is important in the co-design process. The mean 1.43 with std. deviation 835 shows that the respondents strongly agreed that mass customization provides a quick and convenient co- design process. The mean 1.39 with std. deviation 814 shows that the respondents strongly agreed that the co-design process is important.

4.5.4. Descriptive analysis Awareness and Knowledge

The mean 2.07 with std. deviation 1.232 shows that the respondents agreed that they feel well informed about their customized product. The mean 1.89 with std. deviation 1.125 shows that the respondents agreed that mass customization overall use is improving. The mean 1.70 with std. deviation 1.004 shows that the respondents strongly agreed that they could know more and would like to be able to find out more. The mean 2.20 with std. deviation 1.433 shows that the respondents agreed that they could know more but they don't feel they need to. The mean 1.83 with std. deviation 1.144 shows that the respondents agreed that they don't know much but know where to go to get advice. The mean 2.57 with std. deviation 1.620 shows that the respondents agreed that they don't know much and are not interested.

Regarding Knowledge; the mean 1.51 with std. deviation.838 shows that the respondents strongly agreed that conversation with customers in MC is important. The mean 1.49 with std. deviation.861 shows that the respondents strongly agreed that information about customized product is essential. The mean 1.82 with std. deviation 1.157 shows that the respondents agreed that they know a lot about their customized product. The mean 1.47 with std. deviation.891 shows that the respondents strongly agreed that knowledge helps them to co- design their product.

Table 4.11. Descriptive analysis for all variables

Items	Mean	Std. Deviation	Interpretation
Attitude	1.65	.845	Agree
Perceived usefulness	1.61	.809	Agree
Self- confidence	1.63	.905	Strongly agree
Product Aesthetics	4.49	.834	Strongly disagree
Intention	1.63	.757	Agree
Co- design	1.45	.791	Agree
Awareness	2.03	.919	Strongly agree
Knowledge	1.57	.801	Strongly agree
Customer satisfaction	1.55	.878	Agree

4.6. Correlation Analysis

4.6.1 Predictors of Intention

The below table shows the correlation between the variables DV with IV, mediators and moderators. Product aesthetics has showed correlation with attitude (r=-.526, p=.000), with self- confidence (r=-.573, p=.000), with perceived usefulness (r=-.553, p=.000), with customer satisfaction (r=-.530, p=.000) with intention (r=-.502, p=.000), with co- design (r=-.523, p-.000), with awareness (r= -.267, p=.000), with knowledge (r=-.450, p= .000).

While attitude also showed correlation with other variables; self- confidence (r=.653, p=.000), perceived usefulness (r=.777, p=.000), customer satisfaction (r= .569, p=.000), intention (r= .331, p=.000), co- design (r=.618, p=.000), awareness (r=.477, p=.000) knowledge (r=.595, p=.000).

Also, self- confidence showed correlation with other variables; perceived usefulness (r=.731, p=.000), customer satisfaction (r=.623, p=.000), intention (r=.658, p=.000), co design (r=.681, p=.000), awareness (r=.521, p=.000), and knowledge (r=.687, p=.000).

Perceived usefulness also showed correlation with other variables; customer satisfaction (r=.625, p=.000), intention (r=.622, p=.000), co- design (r=.682, p=.000), awareness (r=.511, p=.000), and knowledge (r=.693, p=.000).

Customer satisfaction showed correlation with other variables; intention (r=.740, p=.000), co design (r=.770, p=.000), awareness (r=.572, p=.000), and knowledge (r=.798, p=.000).

Intention showed correlation with other variables; co- design (r=.726, p=.000), awareness (r=.657, p=.000), and knowledge (r=.730, p=.000).

Co- design showed correlation with other variables; awareness (r=.526, p=.000), (r=.847, p=.000), and knowledge. And finally, Awareness also showed correlation, knowledge (r=.603, p=.000).

Table 4.12. Pearson's correlation of variables

No.	Variables	1	2	3	4	5	6	7	8	9
1	Product Aesthetics	1								
2	Attitude	-.526**	1							
3	Self Confidence	-.573**	.653**	1						
4	Perceived Usefulness	-.553**	.777**	.731**	1					
5	Customer Satisfaction	-.530**	.569**	.623**	.652**	1				
6	Intention	-.502**	.331**	.658**	.622**	.740**	1			
7	Co- design	-.523**	.618**	.681**	.682**	.770**	.726**	1		
8	Awareness	-.267**	.477**	.521**	.511**	.572**	.657**	.526**	1	
9	Knowledge	-.450**	.595**	.687**	.693**	.798**	.730**	.847**	.603**	1

** p < .01 * p < .05

4.7. Hypotheses Test

The analysis of the predictors of intention, intention and co- design relationship via multiple and moderated regression analysis stands at the core of this research.

The regression assumptions were checked before proceeding to further analysis. The dependent variable in this study (firm performance) was normally distributed across all independent variables. The linearity, Collinearity, and outliers were also checked. Therefore, no violations were observed.

4.7.1. Predictors of Intention Customer Satisfaction

This section thought to investigate the effect of antecedents of mass customization namely; attitude, perceived usefulness, self- confidence, and product aesthetics the customer intention to co- design the customized products. Four hypotheses were developed based on the literature. In order to test these hypotheses, a linear multiple regression analysis was conducted to get the best predictor.

H1. Predictors of Intention have positive relation with customer satisfaction

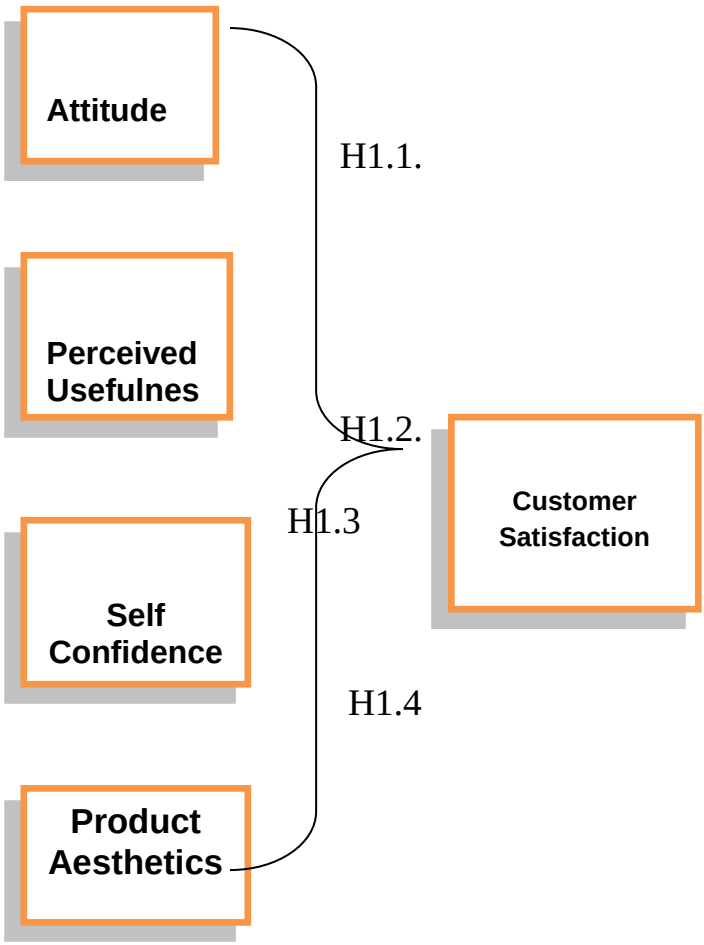
H1.1 : Attitude has positive relation with customer satisfaction

H1.2.: Perceived usefulness has positive relation with customer satisfaction

H1.3. : Self- confidence has positive relation with customer satisfaction

H1.4.: Product aesthetics has positive relation with customer satisfaction

Figure 4.2.Predictors of intention with Customer Satisfaction



Regression analysis was used to test the relation between attitude and customer satisfaction **H1.1**, the regression analysis result in Table 4.16 indicates that attitude has no significant influence on customer satisfaction (p=.524), therefore, these findings result rejection of **H1.1**. Also, the below table shows that **H1.2**. Perceived usefulness has significant influence on customer satisfaction (p=.003). So, H1.2 is accepted. Regarding H1.3 self- confidence has positive effect on customer satisfaction; the results show that self- confidence has significant influence on co-design (p=.009). Therefore, H1.3 is accepted. H1.4 product aesthetics has positive influence on customer satisfaction; results show that product aesthetics has no significant influence on customer satisfaction (p=.020). So, H1.4 is rejected.)

Table 4.13 Regression of Predictors with Customer Satisfaction

Predictors	**Customer Satisfaction B**
Attitude	-.188
Perceived usefulness	.064**
Self- confidence	.235**
Product aesthetics	.357*
R2	.493
Adjusted R2	.479
R2 Change	.493
F Change	35.430***

P>.000=*, P> .001= **, P>.01=***

4.7.2. Predictors of intention with Co- design

Four hypotheses were developed. In order to test these hypotheses, a linear multiple regression analysis was conducted to get the best predictor.

H2: Predictors of intention have positive relation with the co- design

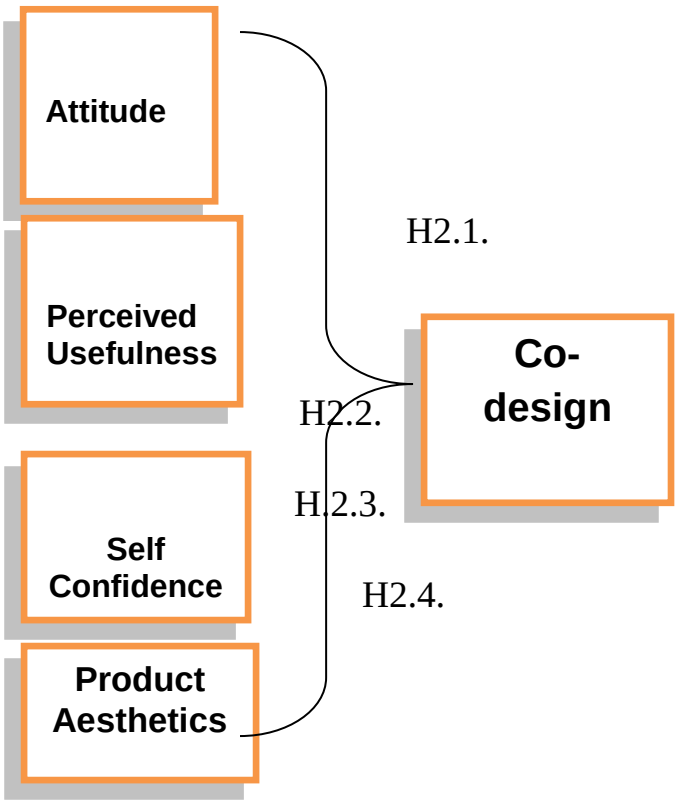
H2.1.: Attitude has positive relation with the co- design of the customized product.

H.2.2.: Perceived usefulness has positive relation with the co- design of the customized product.

H.2.3.: Self- confidence has positive relation with the co- design of the customized product.

H.2.4.: product aesthetics has positive relation with the co- design of the customized product.

Figure 4.3. Predictors of intention With Co- Design



Regression analysis was used to test the relation between attitude and co- design H2.1, the regression analysis result in Table 4.17 indicates that attitude has no significant influence on co- design (p=.199), therefore, this findings result rejection of H2.1 Also the below table shows that H 2.2 Perceived usefulness has significant influence on co- design (p=.005). So, H 2.2 is accepted. Regarding H 2.3 self-confidence has positive effect on co- design; the results show that self- confidence has significant influence on co- design (p=.000). Therefore, H2.3 is accepted. H 2.4 product aesthetics has positive influence on co- design; results show that product aesthetics has no significant influence on co- design (p=.086). So, H2.4 is rejected.

Table 4.14 Regression of Predictors with co- design

Predictors	**Co- design B**
Attitude	-.117
Perceived usefulness	.110**
Self- confidence	.283***
Product aesthetics	.284*
R2	.554
Adjusted R2	.542
R2 Change	.554
F Change	45.335

P>.000=*, P> .001= **, P>.01=***

4.7.3. Predictors with Intention

Four hypotheses were developed. In order to test these hypotheses, a linear multiple regression analysis was conducted to get the best predictor.

H3: Predictors of Intention have positive relation with the customer intention to co- design a customized product

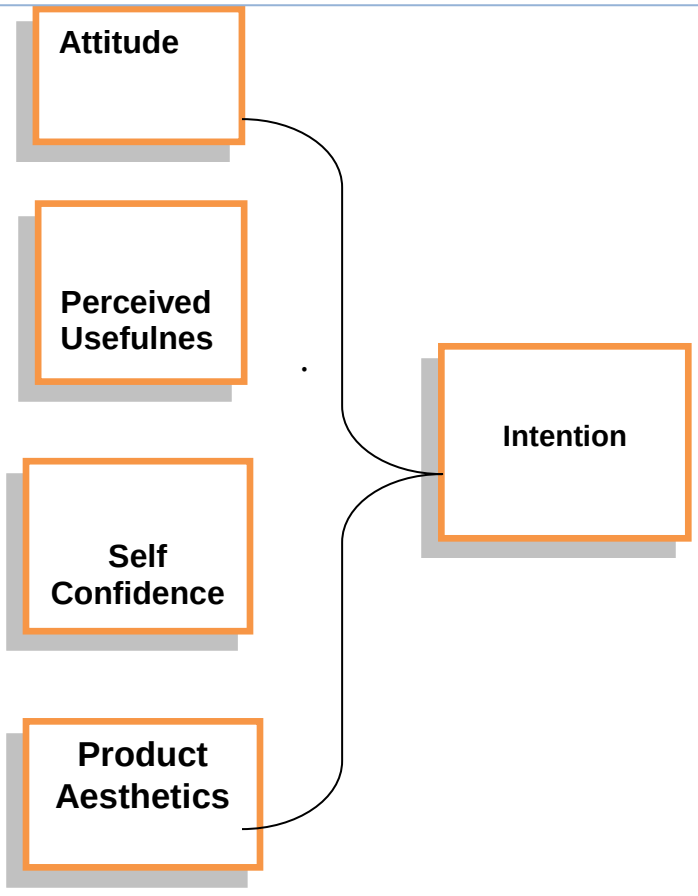
H3.1.: Attitude has positive relation with the customer intention to co- design a customized product

H3.2.: Perceived usefulness has positive relation with the customer intention to co-design a customized product

H.3.3: Self- confidence has positive relation with the customer intention to co-design a customized product.

H3.4.: product aesthetics has positive relation with the customer intention to co-design a customized product.

Figure 4.4 ANTECEDENTS OF MASS CUSTOMIZATION WITH INTENTION



Regression analysis was used to test the relation between attitude and customer intention 3.1 the regression analysis result in Table 4.19 indicates that attitude has positive and significant influence on customer intention (p=.005), therefore, this findings supports H 3.1. Also the below table shows that H 3.2 Perceived usefulness has no significant influence on customer intention (p=.366). So, H 3.2 is rejected. Regarding H 3.3 self- confidence has positive effect on customer intention; the results show that self- confidence has significant influence on customer intention (p=.000). Therefore, H 3.3 is accepted. H 3.4 product aesthetics has positive influence on customer intention; results show that product aesthetics has no significant influence on customer intention (p=.168). So, H 3.4 is rejected.)

Table 4.15 Regression of Predictors with Intention

Predictors	**Intention B**
Attitude	-.093**
Perceived usefulness	.244
Self- confidence	.295***
Product aesthetics	.089
R2	.513
Adjusted R2	.500
R2 Change	.513
F Change	38.496***

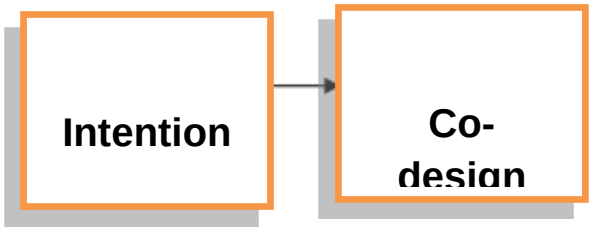
P>.000=*, P> .001= **, P>.01=***

4.7.4. Intention with co- design

One hypothesis was developed. In order to test this hypothesis, a linear multiple regression analysis was conducted to get the best predictor.

H4: Intention has positive relation with the co- design.

Figure 4.5. Intention with co- design



Regression analysis was used to test the relation between intention and co- design H 4, the regression analysis result in Table 4.20 indicates that intention has significant influence on co- design (p=.000), therefore, these findings result acceptance of H 4.

Table 4.16 Regression of Intention with co- design

Predictors	Co- Design B
Intention	.759***
R2	.527
Adjusted R2	.524
R2 Change	.527
F Change	167.087***

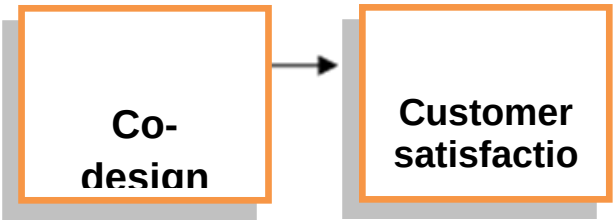
P>.000=***, P> .001= **, P>.01=*

4.7.6. Co- design with Customer Satisfaction

One hypothesis was developed. In order to test this hypothesis, a linear multiple regression analysis was conducted to get the best predictor.

H6: Co- design has positive relation customer satisfaction.

Figure 4.6. Co- design with customer satisfaction



Regression analysis was used to test the relation between co- design and customer satisfaction (H 6), the regression analysis result in Table 4.22 indicates that co-design has significant influence on customer satisfaction (p=.000), therefore, H 6 is supported.

Table 4.17 Regression of co- design with customer satisfaction

Predictors	Customer Satisfaction B
Co- design	.854***
R2	.593
Adjusted R2	.590
R2 Change	.593
F Change	218.715

P>.000=***, P> .001= **, P>.01=*

4.8 Mediation Test For Intention and Co- design

A mediator specifies how (or the mechanism by which) a given effect occurs (Baronc& Kenny, 1986; James & Brett, 1984). Baron and Kenny (1986, pp. 1173, 1178) describe a moderator variable as the following:

The generative mechanism through which the focal independent variable is able to influence the dependent variable of interest . . . (and) Mediation . . . is best done in the case of a strong relation between the predictor and criterion variable.

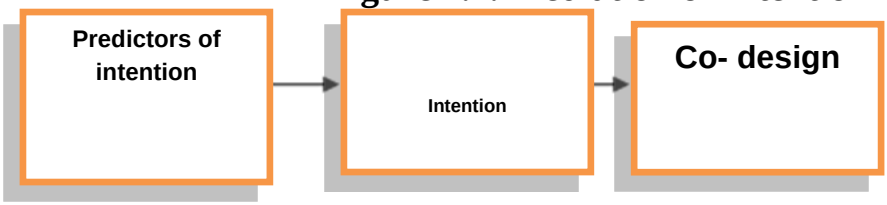
Shadish and Sweeney (1991) stated that "the independent variable causes the mediator which then causes the outcome". Also critical is the prerequisite that there be a significant association between the independent variable and the dependent variable before testing for a mediated effect.

Sekaran (2003) stated that an intervening variable is one that surfaces between the time the independent variables operate to influence the dependent variable and their impact on the dependent variable. This connotes that there is a temporal quality or time dimension to the intervening variable. She further stated that the intervening variable surfaces as a function of the independent variable(s) operating in any situation, and helps to conceptualize and explain the influence of the independent varaiable(s) on the dependent variable.

4.8.1. Mediation effect of Intention between predictors of intention and Co-design

H7: Intention mediates the relation between predictors of intention and the co- design

Figure 4.7. Mediation of Intention



From table 4.23 we can see that the antecedents are significantly related to the co-design (DV) ($\beta = 0.656$, $p < 0.01$), which indicates **Step 1** was fulfilled.

It also shows that the antecedents are significantly related to the intention (MV) ($\beta = 0.635$, $p < 0.01$), which indicates **Step 2** was fulfilled.

Next in **Step 3,** the effect of the antecedents must be controlled; as such the IV and MV are regressed together against the DV. The results shows that the intention ($\beta = 0.410$, $p < 0.000$), is significant which indicates Step 3 was fulfilled only with self-confidence and perceived usefulness while intention is not mediating Attitude and product aesthetics because they didn't fulfill the mediating conditions.

Next as suggested by Baron and Kenny (1986), and, Judd and Kenny (1981), **Step 4** is to ascertain whether full mediation has occurred or partial mediation has occurred. The antecedents which are the independent variables attitude and perceived usefulness ($\beta = 0.026$ and .009 respectively) was still significant but the beta value has decreased as such the conclusion that we can draw is that a partial mediation has taken place. Hence, H 7 is supported.

Table 4.18. Co- efficient mediation intention

Model	Coefficients	Co- design
Antecedents	Beta 1	Beta 2
P. Usefulness	.282***	.242***
Self Confidence	.327***	.185**
Intention	-	.410***
F Value	112.272***	106.616***
R2	0.548	0.658
Adjusted R2	0.545	0.658
R2 Change	0.548	0.115
F Change	181.682***	146.211***

P>.000=*, P> .001= **, P>.01=***

4.8.2 Mediation effect of Co- design between Intention and Customer Satisfaction

H8: Co- design mediates the relation between the customer intention and the customer satisfaction

Figure 4.8. Mediation of Co- design

From table 4.23 below we can see that the intention is significantly related to the customer satisfaction (DV) ($\beta = 0.740$, $p < 0.01$), which indicates **Step 1** was fulfilled. Intention is significantly related to the co- design (MV) ($\beta = 0.726$, $p < 0.01$), which indicates **Step 2** was fulfilled.Next in **Step 3**, the effect of the co-design must be controlled; as such the IV and MV are regressed together against the DV. The results shows that the intention ($\beta = 0.383$, $p < 0.01$), is significant which indicates **Step 3** was fulfilled. Next as suggested by Baron and Kenny (1986), and, Judd and Kenny (1981), **Step 4** is to ascertain whether full mediation has occurred or partial mediation has occurred. The intention which is the independent variable ($\beta = 0.383$, $p < 0.01$) was still significant but the beta value has decreased as such the conclusion that we can draw is that a partial mediation has taken place. Therefore, H 8 is accepted.

Table 4.1 9Co- efficient mediation co- design

Model	**Coefficients**	**Customer Satisfaction**
	Beta 1	Beta 2
Intention	0.858***	0.444***
Co- design	-	0.546***
F Value	181.682***	146.211***
R2	.548	.662
Adjusted R2	.545	.658
R2 Change	.548	.115
F Change	181.682***	50.629***

P>.000=*, P> .001= **, P>.01=***

4.9 Moderating Test for Awareness and Knowledge

A moderator variable is one that affects the relationship between two variables, so that the nature of the impact of the predictor on the criterion varies according to the level or value of the moderator (Holmbeck, 1997). A moderator interacts with the predictor variable in such a way as to have an impact on the level of the dependent variable.

A moderator variable is a variable that changes the relationship between the independent and the dependent variable. Sekaran (2003) terms it as one that has a strong contingent effect on the independent-dependent variable relationship. It can be in 2 forms, first is it changes the strength of the relationship, second it changes the form of the relationship. It is also called as a contingent variable, which points to the fact that the relationship between the independent (IV) and the dependent (DV) variable is contingent on the moderator variable (MV).

Baron and Kenny (1986, pp. 1174, 1178) describe a moderator variable as the following:"A qualitative (e.g., sex, race, class) or quantitative variable . . . that affects the direction and/or strength of a relation between an independent or predictor variable and a dependent or criterion variable . . . a basic moderator effect can be presented as an interaction between a focal independent variable and a factor (the moderator) that specifies the appropriate conditions for its operation."

In this current study we proposed two moderating variable will influence the relationship between independent variable and dependent variable.

4.9.1 Moderating effect of Awareness between co- design and Customer Satisfaction

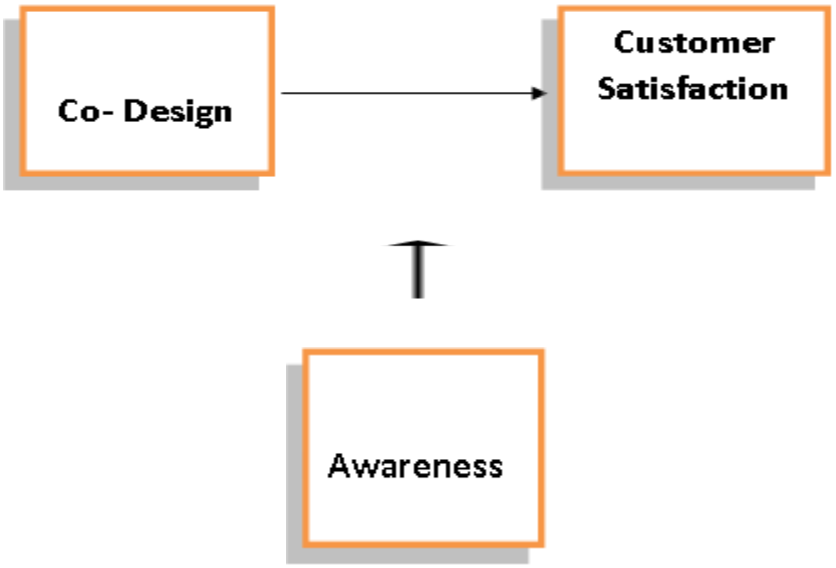
To test the moderator effect model a **hierarchical regression** is used to determine what proportion of the variance in a particular variable is explained by other variables when these variables are entered into the regression analysis in a certain order and whether these proportions are significantly greater than would be expected by chance (Cramer, 2003). Hierarchical regression has been advocated as a more appropriate method for determining whether a quantitative variable has a moderating effect on the relationship between two other quantitative variables (Baron and Kenny, 1986). A moderator specifies the conditions under which a given effect occurs, as well as the conditions under which the direction or strength of an effect vary.

For testing purposes, a 3 step hierarchical regression will be conducted.

In the first step the direct effect of the independent variables will be gauged, in the second step the moderator variable will be entered to gauge whether the moderator has a significant direct impact on the dependent variable and in the third step the interaction terms (the product of the independent variable and the moderator variable) will be entered to see the additional variance explained. For moderator influence to be presented in the Step 3 must show significant R2 increase with a significant F change value. Once Step 3 shows a significant R2 increase then we can conclude that there is moderation effect.

H9: Awareness moderates the relation between co- design and customer satisfaction

Figure 4.9. Moderation of Awareness



Awareness is explained here as the awareness of the customers about the mass customization. Customer must have awareness about the product he/ she is customizing. The degree of awareness influences the co- design of the customer to the product.

To test the indication that there is a moderating effect of awareness on the relation between co- design and customer satisfaction; we had to test this hypothesis. So, we employed hierarchical regression to see if there is moderation or not. One of the important criteria for assessment of the moderation is the amount of additional variance explained by the interaction terms.

Table 4.20 Model Summary Awareness with co- design and customer satisfaction

Model	Standardized Coefficients	Standardized Coefficients	Standardized Coefficients
	Beta 1	Beta 2	Beta 3
Co- design	0.770***	0.649***	0.360**
Awareness	-	0.231***	0.090
Co- design* Awareness	-	-	0.395**
F Value	215.799***	126.130***	87.133***
R2	.593	.632	.642
Adjusted R2	.590	.627	.634
R2 Change	.593	.039	.010
F Change	215.799***	15.426***	3.997**

P>.000=*, P> .001= **, P>.01=***

The 1st model gives the results of the impact of co- design (IV) on customer satisfaction (DV), the 2nd model gives the results of the impact of the awareness (moderator) on the customer satisfaction (as if it is a predictor variable) and the 3rd model gives us the results of the impact of the interaction terms. The **R2 change** must be significant and to ascertain this we look at the "Sig. F Change" this will tell us if the R2 change is sufficient, the p value should be less than 0.05 to be significant. Here the p-value 0.042< 0.05 as such there is indication of moderation effect.

The results of the model 1 are consistent with previous studies, showing a positive effect of co- design on the customer satisfaction (β =0.770, p =0.000), and co-

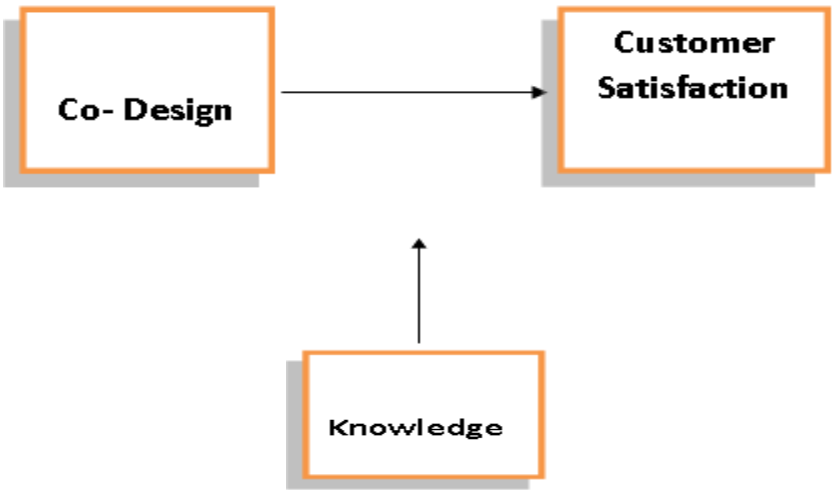
design variable explains the additional variance ($\Delta R2 = 0.593$, $p < 0.05$). When proposed awareness in Model 2 the relation between co- design and customer decreased, and this indication when customer has awareness with the product he is customizing; the co- design will affect less the customer satisfaction. In Model 3, adding the awareness variable increases the variance explained ($\Delta R2 = 0.039$, $p < 0.05$), suggesting that this factor moderates the relation between co- design and customer satisfaction. So there is a moderation effect.

The hypothesis H 9 in this study predicts a moderating effect of Awareness on the relation between co- design and customer satisfaction. To test this hypothesis, the interaction effect between co- design and awareness was added. Model 3 reveals a positive and significant interaction effect of awareness on the relation between co-design and customer satisfaction ($\beta = 0.395$, $p < 0.05$), which is supporting the hypothesis of the investigation.

4.9.2 Moderating effect of Knowledge on co- design and Customer Satisfaction

H10: Knowledge moderates the relation on co- design and customer satisfaction

Figure 4.10. Moderation of Knowledge



Knowledge is explained here as the knowledge of the customers about the mass customization. Customer must have knowledge about the product he/ she is customizing. The degree of knowledge influences the co- design of the customer to the product. To test the indication that there is a moderating effect of knowledge on the relation between co- design and customer satisfaction; we had to test this hypothesis. So, we employed hierarchical regression to see if there is moderation or not. One of the important criteria for assessment of the moderation is the amount of additional variance explained by the interaction terms

Table 4.21 Results of the regression analysis (Coefficients)

Model	Standardized Coefficients	Standardized Coefficients	Standardized Coefficients
	Beta 1	Beta 2	Beta 3
Co- design	0.770***	0.333***	0.148
Knowledge	-	0.517***	0.409***
Co- design* Knowledge	-	-	0.292
F Value	218.715***	150.400***	102.224***
R2	.593	.669	.674
Adjusted R2	.590	.664	.668
R2 Change	.593	.076	.006
F Change	218.715***	33.987***	2.614

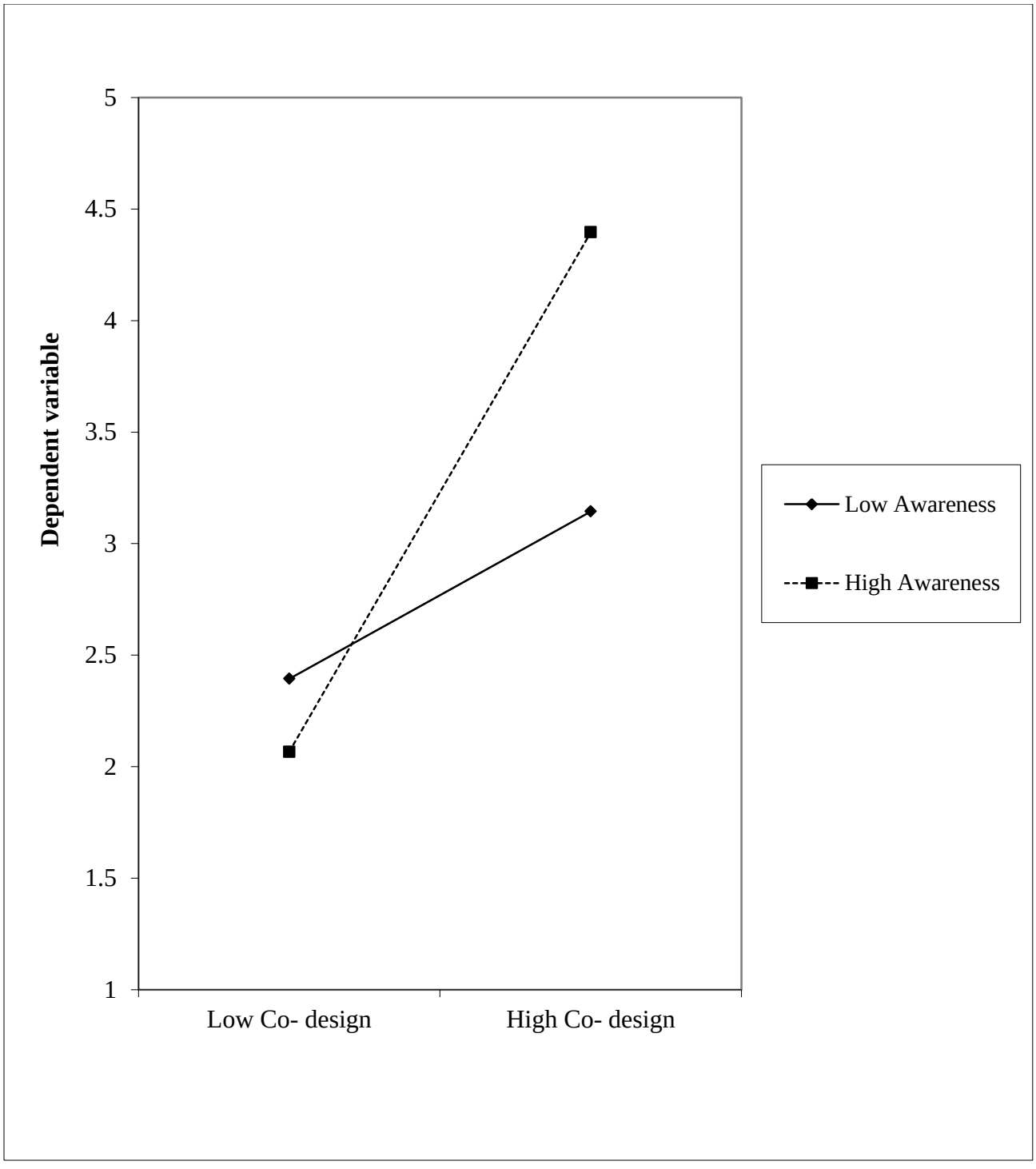
P>.000=*, P> .001= **, P>.01=***

The 1st model gives the results of the impact of co- design (IV) on customer satisfaction (DV), the 2nd model gives the results of the impact of the knowledge (moderator) on the customer satisfaction (as if it is a predictor variable) and the 3rd model gives us the results of the impact of the interaction terms. The **R2 change** must be significant and to ascertain this we look at the "Sig. F Change" this will tell us if the R2 change is sufficient, the p value should be less than 0.05 to be significant. Here the p-value 0.292 >0.05 as such there is no indication of moderation effect.

The results of the model 1 are showing a positive effect of co- design on the customer satisfaction (β =0.770, p =0.000), and co- design variable explains the additional variance ($\Delta R2 = 0.590$, $p< 0.05$). When proposed knowledge in Model 2 the relation between co- design and customer decreased, and this indication when customer has knowledge with the product he is customizing; the co- design will affect less the customer satisfaction. In Model 3, adding the knowledge variable increases the variance explained ($\Delta R2 = 0.669$, $p = 0.108$), suggesting that this factor does not affect the customer satisfaction, because it doesn't show significance.

The hypothesis H 10 in this study predicts a positive moderating effect of knowledge on the relation between co- design and customer satisfaction. To test this hypothesis, the interaction effect between co- design and knowledge was added. Model 3 reveals a positive but not significant interaction effect of knowledge on the relation between co- design and customer satisfaction (β = 0.292, $p > 0.05$), which is not supporting the hypothesis of the investigation.

Figure 4.11. Graph Moderation of Awareness



4.10: SUMMARY OF HYPOTHESIS

Table 4.26 shows the summary of the hypotheses related to the antecedents of mass customization, the mediation of intention and co- design, and the moderating effect of knowledge and awareness. We tested seventeen hypotheses in four different models; first model was the relation between independent variables such as attitude, perceived usefulness, self- confidence, and product aesthetics (H1, H2, H3, H4) with dependent variable which was intention. Hypothesis 1& 3 were accepted, while hypothesis 2& 4 of this model were rejected. It was found that attitude & self- confidence have influence on customer intention to co- design the customized products, while perceived usefulness& product aesthetics have no influence on customer intention to co- design the customized products.

The second model to test the relation between the antecedents of mass customization and co- design which in this model was dependent variable, this model had four hypotheses Hypothesis 5& 8 were rejected, but hypothesis 6& 7 were accepted. Here, it was found that attitude& product aesthetics have no influence on the co- design of the customized products while perceived usefulness have influence on the co- design of the customized products.

The third model was to test the relation between the antecedents of mass customization and the customer satisfaction as dependent variable. Four hypotheses were proposed; hypothesis 9& 12 were rejected but hypothesis 10& 11 were accepted. We found that attitude& product aesthetics have no influence on customer satisfaction while perceived usefulness& self- confidence have influence on customer satisfaction.

The fourth model was to test the influence of intention on co- design, Hypothesis 13 which was accepted. It was found that intention influences the co- design. The fifth model was to test the influence of intention on the customer satisfaction hypothesis 14 which was also accepted. It was found the intention influences the customer satisfaction. The sixth model was to test the influence of the co- design on the customer satisfaction hypothesis 15 which was accepted. We found that the co- design influences that customer satisfaction.

The seventh model was to test the mediation role of the intention and the co design hypothesis 16& 17. Both of them were accepted showing that there is a mediation effect of intention on the relation between the antecedents of mass customization and the co- design of the customized products. And also, there is a mediation effect of the co- design on the relation between the intention and the customer satisfaction.

The eighth model and the last one was to test the moderation effect of the awareness and the knowledge on the relation between co- design and customer satisfaction, hypothesis 18& 19. Hypothesis 18 was accepted whereas hypothesis 19 was rejected. It was found that awareness moderates the relation between co-design and customer satisfaction while knowledge doesn’t moderate this relation.

Table 4-22: Summery of hypothesis		
H. No	**Statement of hypothesis**	**Results**
H 1.1	Attitude has positive relation with customer satisfaction	Not supported
H 1.2	Perceived usefulness has positive relation with customer satisfaction	Supported
H 1.3	Self- confidence has positive relation with customer satisfaction	Supported
H 1.4	Product aesthetics has positive relation with customer satisfaction	Not supported
H 2.1	Attitude has positive relation with the co- design of the customized product.	Not supported
H 2.2	Perceived usefulness has positive relation with the co- design of the customized product.	Supported
H 2.3	Self- confidence has positive relation with the co- design of the customized product.	Supported
H 2.4	Product aesthetics has positive relation with the co- design of the customized product.	Not supported
H 3.1	Attitude has positive relation with customer intention to co- design a customized product.	Supported
H 3.2	Perceived usefulness has positive relation with customer intention to co- design a customized product..	Not supported
H 3.3	Self- confidence has positive relation with customer intention to co- design a customized product..	Supported
H 3.4	Product aesthetics has positive relation with customer intention to co- design a customized product.	Not supported
H 4	Intention has positive relation with co- design.	Supported
H 5	Co- design has positive relation with customer satisfaction	Supported
H 6	Intention mediates the relation between the antecedents of mass customization and the co- design	Supported

H 7	Co- design mediates the relation between the customer intention and the customer satisfaction	Supported
H 8	Awareness moderates the relation between co- design and customer satisfaction	Supported
H 9	Knowledge moderates the relation between co- design and customer satisfaction	Not supported

4.11: Chapter Summary

The Data of this thesis collected from different respondents around greater Khartoum. The data was generated from 152 respondents; the respondent rate was 57%. The researcher considered the questionnaires distributed to the customers who have not customized products before as a port of the response rate because it gave an indicator about the sample size of the customization population which is still not known in Sudan due to the novelty of the concept itself. First we tested the normal distribution of data using different measurements such as Skewness and Kurtosis and result did not show any seriousness of normality distribution of data. Respondents were where strongly agreeing or strongly disagreeing. Different Data analysis techniques was used, first the factor analysis showed that the data was appropriate for factor analysis and suggested some items to remove and risk taking dimension was also removed. To test the reliability and consistent of variables, Cronbach alpha was tested and indicated the all variables are internally consistent and reliable. Further analysis has taken place, to test the relationship between the variable, researcher utilized Bivarate correlations to determine the interrelationships of the variables. The researcher developed nineteen hypotheses to test the linear relationships; no hypotheses were removed.

Regression analysis was done to test the remaining research hypotheses. The results of the tested hypotheses illustrated that (H1, H3, H6, H7, H10, H11, H13, H14, H15, H16, H17, H18) were fully supported; Furthermore, the results of the hierarchical regression analysis confirmed negative moderating effect of knowledge on the relation between co- design and customer satisfaction. On the other hand, the results confirmed the mediation effect of intention on the relation between antecedents of mass customization and intention plus the effect of co-design on the relation between intention and customer satisfaction.

CHAPTER FIVE

DISCUSSION AND CONCLUSIONS

5.1 Introduction

The purpose of this study was to explain consumers' acceptance of mass customization in Sudan by identifying factors that influence the intention to co-design a customized product and to investigate the relations between the factors. This chapter will present the conclusion of the findings from the empirical study and provide implications to retail markets. Several limitations are addressed as well as suggestions for future studies.

5.2: Recapitulation of the Major Findings

The research model was constructed based on the model of TPB (Theory of Planned Behavior) which is widely applied in academics. The TPB was used to explain the major determinants of consumer acceptance of mass customization with the role of the co- design.

The research objectives were segmented to examine the relation between predictors of intention with the customer satisfaction, co- design, and customer intention to co-design the customized products. In addition to the relation between intention and co- design, plus the relation between co- design and customer satisfaction. Also the mediating role of the two variables intention and co- design and the moderating effect of awareness and knowledge on the relation between co-design and customer satisfaction have been examined.

The study results clarified that several factors, such as attitude and self- confidence are the key determinants of consumer intention to adopt a customized product. Identification of the relations between variables of the model presented how consumers positively respond toward the customizing of the products. While co-design is clearly playing the main role towards the customer satisfaction from the mass customization.

5.3: Discussion

The discussion of the findings begins by addressing the mass customization and the existence of this concept in Sudan. Next is to explore the Correlation between variables and finally the tackling mediating and moderating effect of intention, co-design, Knowledge, and awareness.

The Extent of Mass Customization Concept in Sudan

Contemporary business world has evolved considerably in the past few decades from focusing on mass production to focusing on mass customization (Shamssuzuha, 2010). Many companies today are being pushed by tough competition to compete on smaller market segments which in turn have raised the need for more specialized and tailored products to meet the customers' requirements. This has caused mass production to become less profitable and competitive in these specialized market segments.

5.3.1. Predictors of intention

The first objective of this study was to investigate the influence of the predictors of intention with the customer satisfaction. Because mass customization is still new to the respondents, they might have had relatively little knowledge of and no clear expectations about mass customization. After they tried the process, they might

have become less uncertain and more positive about mass customization. This finding is consistent with innovation and diffusion theory (Rogers, 1995), in which trial ability is one way of increasing adoption of an innovation and results in less uncertainty about the innovation.

On the other hand perceived usefulness and self- confidence showed positive relation with customer satisfaction. While product aesthetics showed no positive relation with customer satisfaction. (Schreier, 2006; Merle et al., 2010), focused on the benefits consumers perceive during the MC experience, and on how this value influences satisfaction with the experience. That's why this study has included the co- design as a main variable influencing the customer satisfaction

The second objective was to investigate the influence of predictors of intention on the co- design. Results show that attitude and product aesthetics has no positive relation with co- design. While perceived usefulness and self- confidence showed positive relation with co- design. When the customer goes to participate in product co- design; he/ she believes that a benefit will be resulted from this participation. Plus the self- confidence is giving the courage to participate in the co- design process and get the desired final product.

The third objective was to investigate the relation between attitude and the customer intention. Attitude means what we like or dislike and it is used to determine intentions. Holding favourable attitudes toward one product will let you feel likely to have intentional to perform certain behaviour. In relation to mass customization, research objective was to measure whether there is relation between attitude and customer intentions to co- design the customized product. General attitude have been assessed with respect to customer intention and it was found that attitude influences the customer intention to co- design the customized products.

They became preferring the customized product than the ready produced one. They expressed that they are less interested in the products available for the common. As they have expressed about the suffering to find different choices in the market. They also declared that they are ready to spend more time to customize their favourable product, because they would like to differ from the mass.

So, it was clearly noticed that attitude influences the customer intention to co-design the customized product. In which this study agrees with the TPB itself, Zhongjun Tang, Jianghong Luo, Juan Xiao, (2011), and Margarita B. Guilabert (2005), Ju Young Kang (2008), and finally with Japanese study done in (2012) under the name "Consumers' Attitudes toward Customization: The Importance of Providing Experiential Value in Customization Strategy". Results showed that perceived usefulness has no impact on customer intention. They concluded that perceived usefulness is not one of the motivating factors to their intention towards mass customization.

In this, the present study agrees with Kaplan, Andrean, (2007), where perceived usefulness was measured among base category (perceived ease of use and perceived usefulness) and perceived usefulness didn't show impact on intention as their study results, and with T. Ramayah et al, (2003). While, we disagree with Margarita B. Guilabert, (2005), and Norazah Mohd Suki (2011). Hence, perceived usefulness is not considered as influencer to customer intention to co- design the customized products. Overall, it seems likely that newspapers belong to a low-involvement product category. Therefore, using this example might have led to conclusions that are different from those that might be obtained when researching a high-involvement product such as, for example, cars, fragrances, or fashion items.

Results showed that self- confidence has influence on customer intention. Respondents show that they have high standards for themselves. They like to have products with unique design, and they never settle for the second. They like to create a personal image for themselves that can't be duplicated. Here it can be concluded based on the results of our study that self- confidence has influence on customer intention to co- design the customized products in which this study agrees with the TPB, and Zhongjun Tang et al., 2011. Results showed that product aesthetics has no influence on customer intention. People do not search for a superior design, or impressing products, or products that express their image, or product with nice styles. Product aesthetics is not considered as a motivational factor to the customer intention in the customized products.

Here it can be concluded that the product aesthetics cannot be considered as influential factor on the customer intention to go for the customized products. Piller 2004 stated that aesthetic design relates to modifications aiming at sensual or optical senses, i.e. selecting colours, styles, applications, cuts, or flavours. Many mass customization offerings are based on the possibility to co-design the outer appearance of a product.

This kind of customization is often rather easy to implement in manufacturing, demanding a late degree of postponement (Duray, 2002). But he is questioning whether custom style really provides value? . The desire for a particular outer appearance is often inspired by fashion, peers, role models, etc.; and the individuals' desire is to cope and adapt to these trends, but often not to create them. In the psychological marketing literature, the construct of consumers' need for uniqueness is discussed. Consumers acquire and display material possessions for

the purpose of feeling differentiated from other people or by actions that consumers perform explicitly to be recognized by others (counter conformity motivation; Nail, 1986; Schreier, 2004; Tepper, Bearter, and Hunter, 2001). Some consumers express their desire for uniqueness by selecting material objects (fashion) that are ahead of the average trend, by purchasing handcrafted items, or vintage goods from non-traditional outlets. Customer co-design could be a further means to express their uniqueness, when consumers can design products to own personal specification in order to look different than the rest. Where Piller has mentioned that according to his survey; it shows that a rather small numbers of consumers want to be unique in this understanding. Customer co-design also establishes an individual contact between the manufacturer and customer, which offers possibilities for building up a lasting relationship. Once the customer has successfully purchased an individual item, the knowledge acquired by the manufacturer represents a considerable barrier against switching suppliers.

On the other hand, Holbrook (1986) demonstrated that consumers' high variance in aesthetic demands cannot be explained by random differences or noise, but is the result of individual differences between consumers. Aesthetic MC provides a means to address these unique aesthetic preferences. Second, Aesthetic MC is subjective. In which here, this study disagrees with Ruth Mugge et al, 2012, and Soheila Khoddami et al, 2011 in which they stated that centrality of visual product aesthetic is one of the main factors influencing the customer intention towards the mass customization.

5.3.2. Influence of Intention on Co- design

Customer intention is considered as the main element that concern. Intention precedes action, and is itself preceded by emotions and motivations. It is defined as an individual's readiness to perform a certain action. Intention directly precedes behavior. Understanding intentions is foundational because it provides the interpretive matrix for deciding precisely what it is that someone is doing in the first place. Thus, the exact same physical movement may be seen as giving an object, sharing it, loaning it, moving it, getting rid of it, returning it, trading it, selling it, and on and on – depending on the goals and intentions of the actor. Intention precedes action, and is itself preceded by emotions and motivations. It is defined as an individual's readiness to perform a certain action. Intention directly precedes behavior. The intention incorporates attitude toward behavior, subjective norm, and perceived behavioral control Ajzen, (1985, 1991, 2002).

Customers were found interested in co- designing their products. And that was supporting the investigation on the fourth objective that there is positive relation between intention and co- design. The respondents declared that they like to try new products and services, and they enjoy having things others do not. And they prefer the products that are scarce. And they grab every opportunity to order custom features because they prefer to have product custom made rather than ready made.

As a general rule, the stronger the intention to engage in a behavior, the more likely should be its performance. It should be clear, however, that a behavioral intention can find expression in behavior only if the behavior in question is under volitional control, i.e., if the person can decide at will to perform or not perform the behavior.

5.3.3. Mediating Factors (Intention and Co- design)

The fifth and seventh objective of this study was to investigate the mediating role of the intention and the co- design. To understand customers' purchase intention is important because customers' behavior usually be leaded by their intention.Intention in our structural frame work is mediating the relation between the antecedents of mass customization and the co- design.

In the mediation test, predictors of intention were measured as an independent factor. While the dependent factor was the co- design. Mediation test has supported our hypothesis which shows the intention is mediating this relation and also results showed that intention has influence on co- design to conclude that intention is a mediator between antecedents and co- design and also, once the customer has the intention will go towards the customized products and participate in the designing.

As this area is one of main contributions in this study, we concluded that intention as expected mediates the relation between the antecedents of the mass customization and the co- design. And also, when the customer intention influences the co- design of the customized product. And for the mediation of the co- design, the mediation test also showed that co- design mediates the relation between intention and customer satisfaction. In addition, results showed the co-design influences the customer satisfaction in which this study does agree with Frances Turner, 2013, and Wei-ping Pu 2008.

5.3.4: Influence of Co- Design on Customer Satisfaction

The sixth objective of this study was to investigate the influence of the co- design on the customer satisfaction. This thesis has concluded that customer co-design is a distinctive principle of mass customization and the source of its competitive advantage.

Results of this study showed that the co- design has influence on customer satisfaction. The customer is satisfied with the customized product during the co-design process. So, if the customer enjoys the co- designing of the product he will be satisfied by the mass customization in general.

Traditional marketing often views the customer as a passive participant in the exchange process until the time of the sale. Customers are still far from being a "creative customer", until people tend to discuss on mass customization more than a decade. Customization sees the customer as an active participant at every stage of the product development, purchase and consumption process and as the co-producer of the product and service offering Wind & Rangaswamy, (2001).

Customer co-design and integration are the keys to mass customization. This is the core element that differentiates mass customization from other strategies like lean management or agile manufacturing (Piller, F.T., 2004). In mass customization, communication between the customers and supplier is necessary.

Customers express their individual needs, which enable the mass customizer to manufacture the custom-made product. To relate customers' needs to the information need and supply model, customers' needs are considered from two perspectives, namely as the information the customers should know or actually know about their own needs. This interaction can only be filled through the co-design process which enables the customers to express their needs and desires that fulfill their satisfaction.

Customer satisfaction can be defined as customers' evaluations of product or service with regard to their needs and expectations (Oliver, 1980). A great number of studies have been discussed and made an understanding of this concept in varied field. The co- design in this study is considered as the experience of the customer during the product customization the experience during the customization process, several authors have discussed potential drawbacks of the customer's integration into the value creation process. It has frequently been stated that a customer's return from adopting a mass-customized product is influenced not only by the value of the product itself but also by the experience made during the customization process.

Mass Customization is broadly defined as customer joining the design process as a co-designer, and it meet the needs of each individual customer with regards to certain product features. Communities for co-design became a new and concerned issue in business practice recent years. Customer who prefer customization products are also increasing, numbers of studies showed satisfaction could be raise if customer join the design process of product or service, and the product or service will more fit for customer s' need.

Many companies provide users for communicate and interact electronically, the characteristics of synchronous and interactive allow designers or enterprises enhance to discover customer s' demands. Yet the interaction and communication also improve understanding of customer s' thought and ideas.

In this customer-centric economy, more and more customers desire the opportunity to design their own product. Bateson (1985) asserted that customers might have the propensity to choose the "do-it-themselves" approach across many services, even when the service that might be more expensive or less convenient than traditional services. In most recent review, customer s can play an active role in mass customizing process. They should not be viewed as just passive receptacles, but a source of productivity gains in service industry Fitzsimmons, (1985); Lovelock & Young, (1979).

In some cases, when customers are highly involved in the design or development process, it is difficult to differentiate between producer and customer. Since the design and production is initiated by the customer, they become "prosumers" (Moffat, 1990), or "co-designers".

In particular, consumers with great purchasing power are increasingly attempting to express their personality by means of an individual product choice, and mass customization economies are the result of the integration of customer information into value creation, and the on-demand manufacturing approach of mass customization (Piller & Müller, 2004). Further, Piller et al. (2005) said that individuality does not always mean one-to-one.

About this kind activity of customer, it was represented in the pass researches by the different terms. For instance, Customer Co-design Piller et al., (2005); Khalid & Helander, (2003); co-producer Wind & Rangaswamy, (2001); customer participation (Dabholkar, (1990); Fitzsimmons, (1985); prosumers Moffat, (1990); Toffler, (1980); do-it-themselves Bateson, (1985). Dabholkar (1990) defined customer participation as the extent to which customers are involved in producing and delivering the product in previous study; and the participation of the consumers is required.

Wei-ping Pu et al. (2012) indicated that there are positive correlations between customer co-design and customer satisfaction. Andreas M. Kaplan et al, 2007 have stated the importance of the role of the co- design in the mass customization and they confirmed the influence of the co- design on the customer satisfaction. Also, Frances Turner, 2013 and Teodora STOJANOVA, 2013 confirmed that co- design influences the customer satisfaction.

5.3.5.: Moderating Factors

The seventh and eighth objectives of this study were to investigate the moderating role of the awareness and knowledge on the relation between co- design and customer satisfaction. Proposing that customer should have awareness and knowledge related to the product he is co- designing in order to be successful co-designing and leads to customer satisfaction.

Awareness is included as a moderator in the relation between the co- design of the customized product and the customer satisfaction. To the best of our knowledge; no studies have included awareness in relation to the customer satisfaction in the mass customization.

Results show that awareness is moderating the relation between co- design and customer satisfaction. Respondents feel that they are well informed about the product they are co- designing as they can feel the improvement of the use of the mass customization. Also, they showed great interest in mass customization. In which we agree with Teodora Stojanova et al., (2012) where she stated that awareness is one of the main factors to implement MC strategies successfully

Knowledge also was included as a moderator. Customer knowledge becomes important strategic resources of enterprises, it is an urgent problem for academia and business community that deeply studying of customer knowledge of mass customization enterprises and effective manage.

Effective product design gives customers the chance to achieve the creation of a product that fits exactly their needs, while going through a wonderful and interesting experience (Piller and Tseng, 2003). Users configuring their own products are provided with understandable design options and their combination possibilities and it is not required to have specific training or experience in order to be able to use them. But sometimes customers do not have complete knowledge of their needs or they cannot externalize them. In these cases they may experience uncertainty or perplexity during the co-design process.

Thomas Aichner, 2012 in his article "The Zero Moment of Truth" stated that the zero moment of truth in Mass Customization is when a customer searches online or a product and shows a certain degree of product knowledge and/or product involvement. Whenever this happens, MC companies must be ready to present their MC product range to these customers. If a customer shows a certain degree of product knowledge and/or product involvement, there is a higher probability that

he or she is going to customize the product rather than buying a standardized version. Customers with high product knowledge are usually aware of the product price, purpose, functionality and quality characteristics, while customers with high product involvement are committed to the product and interested in knowing more about it.

In recent years there has been a substantial amount of research has focused on the role of product knowledge in various stages of consumer behavior. These studies concluding that the decision-making processes and strategies of consumers with significant product knowledge differ from those with less knowledge. Researchers have proposed that consumers with higher levels of product knowledge have better developed and more complex schemata, with well-formulated decision criteria. In the same vein, others (1998) have suggested that consumers with higher levels of product knowledge are more diagnostic and better informed than those who have lower levels of product knowledge Results of this study show that knowledge is not moderating the relation between co- design and customer satisfaction.

Respondents don't consider conversation between customer and supplier is important in MC. They don't feel that they need to know more about their products, and it doesn't help them in the co- designing. This result may be because the chosen products were simple and not complicated in the co- design i.e. painting. So we conclude that knowledge has no moderating effect on the relation between co- design and customer satisfaction as it didn't show any significance during interaction but according to Sharma, (1981) in his article Identification and analysis of Moderator Variable, he stated that when the moderator doesn't show significance during interaction; the variable is referred to antecedent to the DV. So, in this case, Knowledge can be considered as antecedent to the customer satisfaction.

5.3.6: Customer Satisfaction

In early research, scholars who have focused on discussion mass customization (MacCarthy and Brabazon, 2003; Tseng and Jiao, 1997) more interested in how to implement it as an efficient strategy to companies. Only little research discusses the role of the customer within the co-design process (Piller and Müller, 2004; Piller et al. (2005). However, the more and more indication showed that customization product is the trend that could not be ignored and not only products but also the process should be considered. There is room in the literature to address co-production issues with respect to products.

Song and Adams (1993) suggest that marketers can differentiate themselves by adjusting the degree to which consumers participate in the production and delivery of goods. The present study helps expand the domain of co-production research by examining the perceived value of customized products. In recently research studies have appeared that tackle the issue of customization. Because mass customization programs require consumers to play an active role in the production of products, mass customization can be considered a type of customer coproduction.

The study results clarified that several factors, such as Attitude and self-confidence have direct influence on intention, and intention is influencing the co-design and mediating the relation between antecedents of mass customization and the co- design of the products. Co- design which is the core of this study influences the customer satisfaction and mediates the relation between intention and customer satisfaction.

5.4: Theoretical Implications

This research is using the construct has typically focused on very specific aspects. They include, e.g. customer satisfaction in the context of the product co- design. As an important contribution to theory, this study synthesizes the opinions of the customers towards the mass customization. More specific, this study examines the mass customization empirically from the customer point of view.

The few empirical-statistical studies on mass customization can be divided into two groups Kaplan and Haenlein, 2006: (1) surveys and experiments with end customers, addressing questions such as how customers handle choice complexity and experience the integration into the value creation process (e.g., Dellaert and Dabholkar 2009; Franke et al. 2010; Merle et al. 2010); and (2) large-scale empirical studies that approach mass customization from a company perspective, analyzing primarily the effectiveness of various practices (e.g., modularity, flexible manufacturing, quality management) in enhancing mass customization capability (e.g., Tu et al. 2004a; Squire et al. 2006b; Kristal et al. 2010).

This study has examined the relations between the predictors of intention with the intention, the relation of the intention with the co- design, and the relation of the co- design with the customer satisfaction. Also it has examined the mediating role of the intention and co- design, the moderating role of the awareness and the knowledge, as results of the regression analysis reported that attitude and self-confidence was found to be significant with intention, while perceived usefulness and product aesthetics were not.

The important finding is that product aesthetics is not influencing the intention which is contrary to previous studies. This can be referred to the African culture in general and to the Sudanese culture in specific. Study supporting this concept was found about Outlines of African Aesthetics by Godfrey Ozumba, 2012 "We see in African works of art very ugly creations, but yet the artist is lost in his appreciation of his work. The Africans are natural in the aesthetic creation contemplation (reflection) appreciation and expression.

These maybe so because the African are still, in spite of contemporary attempts at the bastardization of nature at the expense of technological development and sophistication, very close to nature. The natural environment is still intact in most African countries".

The intention was found influencing the co- design. And the co- design is influencing the customer satisfaction. Both of these variables were found as mediations agreeing with our conceptual framework. The idea of integrating users into the design and production process is a promising strategy for companies being forced to react to the growing individualization of demand.

For the moderators, awareness and knowledge the first one was empirically proved as a moderator, while the latter was not found significantly affecting the relation between co- design and customer satisfaction.

While the concept of customer satisfaction is emerging as an important research area of marketing, there have been very few empirical studies that investigate customer satisfaction in the context of the co- design. The purified measurement items of this study will provide a valuable guidance to the future empirical research concerning satisfaction and its relation to other constructs.

5.5: Managerial Implications

The last decades have spawned a number of studies on customer satisfaction. A key motivation for the growing emphasis on customer satisfaction is that highly satisfied customers can lead to a stronger competitive position resulting in higher market share and profit Fornell, (1992). Customer satisfaction is also generally assumed to be a significant determinant of repeat sales, positive word-of-mouth, and customer loyalty (Bearden and Teel, 1983; Fornell et al., 1996). As a result, there is increasing attention among academics and business practitioners to customer satisfaction as a corporate goal (e.g. Bolton and Drew, 1991; Crosby, 1991; Oliva et al., 1992).

Increasing customer satisfaction is an important goal in business practice today, and measurement of satisfaction is becoming increasingly common. Against this background, our research has several implications for industrial managers. The present study also holds implications for marketing practitioners interested in pursuing a mass customization strategy. First, results of this study suggest that involvement is a potential way to meaningfully segment markets for mass customized goods. Involvement is widely recognized by marketing researchers and practitioners alike as an effective means by which to segment consumer markets.

Specifically, managers may use this study to more effectively target marketing communications to customers who are more inclined to value mass customized products.

Individuals highly involved in a product category tend to engage in a great deal of non-purchase search behavior (Bloch and Richins 1983; Zaichkowsky 1985). This behavior often includes reading product related specialty magazines, joining product related clubs, participating in product related discussion groups, etc. Given

the relative ease of identifying individuals engaged in product related activities, involvement offers a meaningful way to delineate a market by those who are likely to find value in a mass customized product and those who are less likely to find such value.

Further, high levels of involvement have been shown to result in heightened motivation to process detailed product information across a variety of types of persuasive communications (Petty, Cacioppo, and Schumann 1983). There is no doubt concerning the benefit of mass customization as a strategic concept, which enables companies to outpace competitors. However, merely recognizing the benefit need not necessarily mean a successful implementation of the strategy.

Many customers are still reluctant to buy customized products and companies are also skeptical about the feasibility of the strategy in practice. From a strategic management perspective, mass customization is a strategy of differentiation. Referring to Chamberlin's (1950, 1962) theory of monopolistic competition, customers gain from customization, the increment of utility of a good that fits their needs better than the best standard product attainable. The larger the heterogeneity of all customers' preferences, the larger is this gain in utility.

A finding that is particularly relevant to marketing practitioners involves the importance of the customer intention which is affected by the customer attitude and the self- confidence. These two variables have shown significant influence on the customer intention towards the mass customization.

5.6: Major Outcomes of Research

- Mass customization concept is still new to Sudan, and it needs more time to be adopted. So, it is highly recommended to start with products that the customer is highly involved in the designing.
- The perceived usefulness and the product aesthetics are not dominant factors towards the customer intention for the mass customization.
- The concept of the MC is growing among the customers, so companies of products that involve the customer in the designing are highly encouraged to start mass customization strategy.
- 19% of the respondents declared that they have not customized any product before. This is an indicator that still the mass customization concept is new to Sudan.
- Although, knowledge has not showed significant role in the mass customization; awareness has showed it. So, keeping the customer aware about the product and encouraging them to co- design their preferred one will definitely add value.
- "Design by Customers is taken as an approach for companies to communicate to customers about what the company can offer to them, to find out customer needs and wants, to help out customers in making choices and to negotiate for agreements" Mitchell M. Tseng and Xuehong Du, (1996).
- We argue that more satisfaction is identified in the customized products due to better preference fit as compared to standardized products. They, however, further doubt on the knowledge of customers and their understanding of knowing their own preferences.

- MC strategy is a basic requirement if the requirement is to apply mass customization. The competition on differentiation must be intensive. Individual demands may be very different from each other, so mass customization means that we can differentiate our products to changing demands. Also, in the view of industry, if competition among companies is the try to meet needs of each person, in that context a mass customization company owns a competitive edge, since it is capable of providing wider options of products to customers than its competitors.
- Reality proves that, definitely, mass customization just happens to be most effective based on highly differentiated products like paints, cosmetics, computers, electronic machines, clothing, shoes, etc. Some products whose competitive advantage does not base on high differentiation are not able to apply mass customization; they are, for examples, electricity supply, commodities such as gas, wheat, and most other non-differentiated products.

5.7: Limitations of the Study and Suggestions for Future Research

The major limitations of this study are; the scope of study is limited to 152 potential respondents at the three cities of Khartoum only, different regions of Sudan might change the percentages and the results. If the targeted population was definite the researcher could have chosen corresponding sample to the target population, but several factors such as novelty of the concept, no records related to the targeted population could not allow for finding exact number of people adopting the strategy or used to customize their products.

The second limitation is that since same study was not carried out in Sudan before, it was difficult to get contextual secondary data. The researcher has solved this problem by searching any secondary data that has relevance to the study.

The third limitation is that the questionnaire for this study is developed in English language whereby most of respondents were not familiar with the language. If the respondents know English the interpretation time could not be wasted to develop the questionnaire in Arabic. This gave the researcher to do double job in transferring the questionnaire into Arabic language and testing to ensure the validity and reliability. There are also other instruments such as interview, experiment and observation that were not used.

Fourth limitation, this study was confined to certain typologies (paints) another typologies might offer different results.

Fifth, the scope of the study was limited to three cities of Khartoum. Some of the respondents refused to take part in this study, while others claimed not having a time to fill in the questionnaires.

Sixth, the current study limited to moderating effect of awareness and knowledge on relation between co- design and customer satisfaction, future research should include other variables. The current research suggests the need to go beyond simple linear models to more complex contingency and configurationally models.

Seventh limitation was considered percentage of the participants had no experience with mass customization, thus their responses regarding mass customization might be limited by their lack of awareness.

Finally, by Looking at future, this research topic needs to take a comprehensive approach to incorporate in detail all influencing factors on MC adoption, and to study their link with other determinants of the customer satisfaction.

5.8: Conclusion

The opportunities of mass customization are acknowledged as fundamentally positive by theoretical and empirical studies for many years. Many companies are already operating on this new business model successfully. But most of them are rather small start-ups which utilize the novelty effect of mass customization to enter mature markets. Large scale mass customization operations are still limited to a few examples.

Mass customization is still very much a niche business (Piller and Ihl, 2002; Zipkin, 2001), dominated by highly specialized businesses that are small and often young. From this study, it was obvious that the genus of mass customization is customer co-design. Customers are integrated into value creation by defining, configuring, matching, or modifying an individual solution. Customization demands that the recipients of the customized good transfer their needs and desires into a concrete product specification.

Co-design activities are performed in an act of company-to-customer interaction and cooperation (Franke and Piller, 2003a, 2004; Khalid and Helander, 2003; Toffler, 1980; Tseng, Kjellberg, and Lu, 2003; von Hippel, 1998;Wikstr¨om, 1996). This is the core element that differentiates mass customization from other strategies like lean management or agile manufacturing. Customer co-design also establishes an individual contact between the manufacturer and customer, which offers possibilities for building up a lasting relationship.

The purpose of this study was to provide a general understating of the mass customization concept in Sudan by examining the influencing factors on the customer intention towards the product customization. Also, to examine the influence of the intention on the co- design and the influence of the co- design on the customer satisfaction and their mediation roles.

In addition to the examination of the moderating role of awareness and knowledge on the relation between the co- design and customer satisfaction. An empirical investigation was undertaken, using the correlation analytical technique, specifically the Pearson product movement correlation coefficient (PPMC) to test relations between the variables, linear and hierarchal regression analysis, one sample T-test, factor analysis, Cronbach Alpha and Descriptive Statistics.

One of the objectives of this study was to find out the factors influencing the customer intention. The most two factors influencing the customer intention were attitude and self- confidence. Whereas, perceived usefulness and product aesthetics didn’t show significance with intention. Other objective of the study was to explore the influence of the intention on the co- design; to obtain this objective researcher found that intention is completely influencing the co- design. Which means that once the customer has the intention; will be interested to co- design his product.

And other objective of the study was to investigate the relation between co- design and customer satisfaction. This was to measure the role of the co- design on the customer satisfaction. It was found, that co- design is totally influencing the customer satisfaction due to his participation/ involvement in the designing process.

Also the mediating role of the intention between the antecedents of Mass Customization and the co- design which was supported by the analysis results. And also the mediation role of the co- design between intention and customer satisfaction. And regarding the moderators awareness and knowledge in the relation between co- design and customer satisfaction; most participants were interested in mass customization. However, their level of awareness about mass customization options was very low. Awareness was supported as a moderator while knowledge was not. This might be because the products customized by our respondents were simple and not complicated. Other products surveyed might result with different findings.

This study has contributed to both theoretical and practical aspects of Mass Customization. If we can achieve a better understanding of the important factors affecting the customer satisfaction and the importance of the co- design, this will have implications for MC strategy adoption and investors to broaden their business successfully in this globalized environment. Future studies are necessary to investigate the variables depicted in the theoretical framework. It is also interesting to compare the findings with other variables and products using the comprehensive framework developed.

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Dear Respected Respondent,

Participation in the research of Does Mass Customization Create Customer Satisfaction?

You are one of the potential respondents that we hope to seek assistance in completing the survey which is designed for a Ph.D thesis. I am inviting you to participate in this research study by completing the attached survey.

The following questionnaire will require approximately **10 minutes** completing. There is no compensation for responding nor is there any known risk. In order to ensure that all information will remain confidential, please *do not* include your name.

If you choose to participate in this project, please answer all questions as honestly as possible and return the completed questionnaires promptly and directly to me. Participation is strictly voluntary and you may refuse to participate at any time.

Thank you for taking the time to assist me in my educational endeavors. The data collected will provide useful information regarding <**Mass Customization in relation to customer satisfaction**>. If you would like a summary copy of this study please complete and detach the Request for Information Form and return it to me in a separate envelope. Completion and return of the questionnaire will indicate your willingness to participate in this study. If you require additional information or have questions, please contact me at the number listed below.

Yours sincerely,

Nelly G. Karma

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APPENDIX A

PLEASE ANSWER THE FOLLOWING QUESTIONS BY CROSSING (x) THE RELEVANT BLOCK OR WRITING DOWN YOUR ANSWER IN THE SPACE PROVIDED.

Section A – Background information

This section of the questionnaire refers to background or biographical information. Although we are aware of the sensitivity of the questions in this section, the information will allow us to compare groups of respondents. Once again, we assure you that your response will remain anonymous. Your cooperation is appreciated.

1. Gender

Male	
Female	

2. What is your income standard?

Low	
Average	
High	

3. Where do you live?

Khartoum	
Umdurman	
Khartoum North	

4. Marital Status:

Single	
Married	
Widow	
Divorced	

5. Occupation:

Student	Employee
Business man	Unemployed

6. Introductive questions:

A. Have you ever bought a customized product?

Yes	
No	

What was the product?

B. If not, have you ever thought about buying a customized product?

Yes

No

C. I consider myself informed about Mass Customization

Yes

No

Section B- Factors Influencing Customer Intention

To what extent would you agree with the following statements?

	Attitude	**Strongly Agree**		**Neutral**		**Strongly Disagree**
1	I plan to buy a customized product at some point.	1	2	3	4	5
2	The next time I shop for any product, I will look for a customized one.	1	2	3	4	5
3	The additional effort required to buy a Customized product seems not worth it	1	2	3	4	5
4	When it comes to buying products, finding what I am looking for is typically very difficult	1	2	3	4	5
5	At the places I shop, I usually do not find what I am looking for	1	2	3	4	5
6	Whenever I am faced with a choice, I try to imagine what all the other possibilities are, even ones that are not present at the moment.	1	2	3	4	5
7	The more common place a product is among the general population, the less interested I am in buying it.	1	2	3	4	5
8	When it comes to the selection of products on the market, there are not enough choices	1	2	3	4	5
9	I am willing to spend an additional waiting time until receipt	1	2	3	4	5
10	I want to differ from the mass	1	2	3	4	5
11	I am willing to invest additional time to design my own customized product	1	2	3	4	5

	Perceived Usefulness	**Strongly Agree**		**Neutral**		**Strongly Disagree**
1	The additional days required to receive a customized product seems not worth it	1	2	3	4	5
2	Mass customization provides perceived usefulness.	1	2	3	4	5
3	Mass customization provides a better fit.	1	2	3	4	5
4	I like to customize all my products	1	2	3	4	5
5	Customized products can be used in different needs	1	2	3	4	5
6	Customizing products creates a relationship with the supplier	1	2	3	4	5
7	Customizing products enhances my capabilities	1	2	3	4	5
8	I am interested in customizing my product	1	2	3	4	5

	Self Confidence	**Strongly Agree**		**Neutral**		**Strongly Disagree**
1	Owning a customized product that I am confident using in public is of no concern	1	2	3	4	5
2	No matter what I do, I have the highest standards for myself.	1	2	3	4	5
3	When products or brands I like become extremely popular, I lose interest in them.	1	2	3	4	5
4	When I see a product that has a really great design, I feel a strong urge to buy it.	1	2	3	4	5
5	I never settle for second best.	1	2	3	4	5
6	I often combine possessions in such a way that I create a personal image for	1	2	3	4	5

	myself that can't be duplicated.					
7	I am confident that if I wanted to, I could co-design my products.	1	2	3	4	5
	Product aesthetics	**Strongly Agree**		**Neutral**		**Strongly Disagree**
1	The freedom to choose the color, style, and features for a product seems like the best way to make sure a consumer's needs are met.	1	2	3	4	5
2	Finding a product made with superior Construction does not matter	1	2	3	4	5
3	Owning a customized product that leaves people with a favorable impression of me does not matter	1	2	3	4	5
4	Buying a customized product that has a superior design is not important	1	2	3	4	5
5	Buying a customized product that is "me" is not important	1	2	3	4	5
6	Buying a customized product that fits my image Is not essential	1	2	3	4	5
7	Owning a customized product with a style that pleases me is of no concern	1	2	3	4	5
8	Having a customized product with the right features is not essential	1	2	3	4	5
9	Using a customized product that has superior design is of no concern	1	2	3	4	5
10	I often look for one-of-a-kind products or brands so that I create a style that is all my own.	1	2	3	4	5
	Intention	**Strongly Agree**		**Neutral**		**Strongly Disagree**
1	I am very attracted to rare objects.	1	2	3	4	5
2	I tend to be a fashion leader rather than a fashion follower.	1	2	3	4	5
3	I am more likely to buy a product if it is scarce.	1	2	3	4	5
4	I would prefer to have products custom-made rather than ready-made.	1	2	3	4	5

5	I enjoy having things that others do not.	1	2	3	4	5
6	I rarely pass up the opportunity to order custom features on the products I buy.	1	2	3	4	5
7	I like to try new products and services before others do.	1	2	3	4	5
8	I enjoy shopping at stores that carry merchandise that is different and unusual.	1	2	3	4	5

Section C: Factors influencing the relationship between customer intention and satisfaction

	Awareness	**Strongly Agree**		**Neutral**		**Strongly Disagree**
1	I feel well informed about my customized product	1	2	3	4	5
2	Mass customization overall use is improving	1	2	3	4	5
3	I could know more and would like to be able to find out more	1	2	3	4	5
4	I could know more but I don't feel I need to	1	2	3	4	5
5	I don't know much but know where to go to get advice	1	2	3	4	5
6	I don't know much and am not interested	1	2	3	4	5
	Knowledge	1	2	3	4	5
1	Conversation with customers in MC is important	1	2	3	4	5
2	Information about customized product is essential	1	2	3	4	5
3	I know a lot about my customized product	1	2	3	4	5
4	Knowledge helps me to co- design my product	1	2	3	4	5

	Section D: Co- design	**Strongly Agree**		**Neutral**		**Strongly Disagree**
1	Co-design provides a variety of unique style choices.	1	2	3	4	5
2	Co-design provides a variety of fabric and color choices.	1	2	3	4	5
3	Co-design provides enjoyment.	1	2	3	4	5
4	Mass customization provides a quick and convenient co- design process.	1	2	3	4	5
5	A variety of style choices is important in the co-design process.	1	2	3	4	5
6	The co-design process is important.	1	2	3	4	5
7	Availability of a consultant is important in the co-design process.	1	2	3	4	5

Section E Customer Satisfaction

	Satisfaction	**Strongly Agree**		**Neutral**		**Strongly Disagree**
1	My performance in customization is satisfactory	1	2	3	4	5
2	My performance in customization was successful	1	2	3	4	5
3	The customized product has met my expectations	1	2	3	4	5
4	Overall, I am satisfied with my customized product	1	2	3	4	5

Comments:

_____
_____
_____
_____
_____
_____

Thanks for your time!

APPENDIX B

Regression

Notes

Output Created		20-Mar-2014 11:36:42
Comments		
Input	Data	
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	152
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on cases with no missing values for any variable used.
Syntax		REGRESSION /MISSING LISTWISE /STATISTICS COEFF OUTS R ANOVA CHANGE /CRITERIA=PIN(.05) POUT(.10) /NOORIGIN /DEPENDENT Cust_Satis /METHOD=ENTER Co_Design /METHOD=ENTER Knowledge /METHOD=ENTER Co_Des_Knowledge.
Resources	Processor Time	00:00:00.125
	Elapsed Time	00:00:00.087
	Memory Required	3604 bytes
	Additional Memory Required for Residual Plots	0 bytes

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	Co_Design[a]	.	Enter
2	Knowledge[a]	.	Enter
3	Co_Des_Knowledge[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: Cust_Satis

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.770[a]	.593	.590	.56208	.593	218.715	1	150	.000
2	.818[b]	.669	.664	.50890	.076	33.987	1	149	.000
3	.821[c]	.674	.668	.50617	.006	2.614	1	148	.108

a. Predictors: (Constant), Co_Design

b. Predictors: (Constant), Co_Design, Knowledge

c. Predictors: (Constant), Co_Design, Knowledge, Co_Des_Knowledge

ANOVA[d]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	69.100	1	69.100	218.715	.000[a]
	Residual	47.390	150	.316		
	Total	116.490	151			
2	Regression	77.902	2	38.951	150.400	.000[b]
	Residual	38.588	149	.259		
	Total	116.490	151			
3	Regression	78.571	3	26.190	102.224	.000[c]
	Residual	37.918	148	.256		
	Total	116.490	151			

a. Predictors: (Constant), Co_Design

b. Predictors: (Constant), Co_Design, Knowledge

c. Predictors: (Constant), Co_Design, Knowledge, Co_Des_Knowledge

d. Dependent Variable: Cust_Satis

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.313	.096		3.279	.001
	Co_Design	.854	.058	.770	14.789	.000
2	(Constant)	.128	.092		1.392	.166
	Co_Design	.369	.098	.333	3.753	.000
	Knowledge	.566	.097	.517	5.830	.000
3	(Constant)	.443	.215		2.059	.041
	Co_Design	.164	.160	.148	1.022	.308
	Knowledge	.448	.121	.409	3.705	.000
	Co_Des_Knowledge	.060	.037	.292	1.617	.108

a. Dependent Variable: Cust_Satis

Excluded Variables[c]

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
						Tolerance
1	Knowledge	.517[a]	5.830	.000	.431	.283
	Co_Des_Knowledge	.695[a]	4.628	.000	.354	.106
2	Co_Des_Knowledge	.292[b]	1.617	.108	.132	.067

a. Predictors in the Model: (Constant), Co_Design

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.313	.096		3.279	.001
	Co_Design	.854	.058	.770	14.789	.000
2	(Constant)	.128	.092		1.392	.166
	Co_Design	.369	.098	.333	3.753	.000
	Knowledge	.566	.097	.517	5.830	.000
3	(Constant)	.443	.215		2.059	.041
	Co_Design	.164	.160	.148	1.022	.308
	Knowledge	.448	.121	.409	3.705	.000
	Co_Des_Knowledge	.060	.037	.292	1.617	.108

b. Predictors in the Model: (Constant), Co_Design, Knowledge

c. Dependent Variable: Cust_Satis

Regression

Notes

Output Created		13-May-2014 21:31:21
Comments		
Input	Data	D:\PhD Research\Reasearch\Research Chapters\Chapters\Analysis\PhD Data-Final.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	152
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on cases with no missing values for any variable used.
Syntax		REGRESSION /MISSING LISTWISE /STATISTICS COEFF OUTS R ANOVA COLLIN TOL CHANGE /CRITERIA=PIN(.05) POUT(.10) /NOORIGIN /DEPENDENT Co_Design /METHOD=ENTER Intention /METHOD=ENTER Intention.
Resources	Processor Time	00:00:00.063
	Elapsed Time	00:00:00.241
	Memory Required	3052 bytes
	Additional Memory Required for Residual Plots	0 bytes

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	Intention[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: Co_Design

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.726[a]	.527	.524	.54647	.527	167.087	1	150	.000

a. Predictors: (Constant), Intention

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	49.896	1	49.896	167.087	.000[a]
	Residual	44.794	150	.299		
	Total	94.690	151			

a. Predictors: (Constant), Intention

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	49.896	1	49.896	167.087	.000[a]
	Residual	44.794	150	.299		
	Total	94.690	151			

b. Dependent Variable: Co_Design

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.209	.106		1.971	.051		
	Intention	.759	.059	.726	12.926	.000	1.000	1.000

a. Dependent Variable: Co_Design

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions	
				(Constant)	Intention
1	1	1.908	1.000	.05	.05
	2	.092	4.562	.95	.95

a. Dependent Variable: Co_Design

Regression

Notes

Output Created		20-Mar-2014 11:01:08
Comments		
Input	Data	
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	152
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on cases with no missing values for any variable used.
Syntax		REGRESSION /MISSING LISTWISE /STATISTICS COEFF OUTS R ANOVA CHANGE /CRITERIA=PIN(.05) POUT(.10) /NOORIGIN /DEPENDENT Co_Design /METHOD=ENTER Antecendence.
Resources	Processor Time	00:00:00.109
	Elapsed Time	00:00:00.108
	Memory Required	2892 bytes
	Additional Memory Required for Residual Plots	0 bytes

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	Antecendence[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: Co_Design

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.656[a]	.430	.426	.60187	.430	112.272	1	149	.000

a. Predictors: (Constant), Antecendence

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	40.670	1	40.670	112.272	.000[a]
	Residual	53.974	149	.362		
	Total	94.644	150			

a. Predictors: (Constant), Antecendence

b. Dependent Variable: Co_Design

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-1.102	.246		-4.480	.000
	Antecendence	1.085	.102	.656	10.596	.000

a. Dependent Variable: Co_Design

Regression

Notes

Output Created		20-Mar-2014 11:02:13
Comments		
Input	Data	E:\Nancy\Nelly Data.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	152
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on cases with no missing values for any variable used.
Syntax		REGRESSION /MISSING LISTWISE /STATISTICS COEFF OUTS R ANOVA CHANGE /CRITERIA=PIN(.05) POUT(.10) /NOORIGIN /DEPENDENT Intention /METHOD=ENTER Antecendence.
Resources	Processor Time	00:00:00.281
	Elapsed Time	00:00:00.194
	Memory Required	2892 bytes
	Additional Memory Required for Residual Plots	0 bytes

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	Antecendence[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: Intention

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.635[a]	.404	.400	.58794	.404	100.818	1	149	.000

a. Predictors: (Constant), Antecendence

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	34.850	1	34.850	100.818	.000[a]
	Residual	51.506	149	.346		
	Total	86.356	150			

a. Predictors: (Constant), Antecendence

b. Dependent Variable: Intention

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	-.728	.240		-3.029	.003
Antecendence	1.004	.100	.635	10.041	.000

a. Dependent Variable: Intention

Regression

Notes

Output Created		20-Mar-2014 11:03:22
Comments		
Input	Data	
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	152
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on cases with no missing values for any variable used.
Syntax		REGRESSION /MISSING LISTWISE /STATISTICS COEFF OUTS R ANOVA CHANGE /CRITERIA=PIN(.05) POUT(.10) /NOORIGIN /DEPENDENT Co_Design /METHOD=ENTER Antecendence Intention.
Resources	Processor Time	00:00:00.328
	Elapsed Time	00:00:00.183
	Memory Required	3148 bytes
	Additional Memory Required for Residual Plots	0 bytes

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	Intention, Antecendence[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: Co_Design

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.768[a]	.590	.585	.51180	.590	106.660	2	148	.000

a. Predictors: (Constant), Intention, Antecendence

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	55.877	2	27.938	106.660	.000[a]
	Residual	38.767	148	.262		
	Total	94.644	150			

a. Predictors: (Constant), Intention, Antecendence

b. Dependent Variable: Co_Design

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.706	.215		-3.278	.001
	Antecendence	.539	.113	.326	4.783	.000
	Intention	.543	.071	.519	7.620	.000

a. Dependent Variable: Co_Design

Regression

Notes

Output Created		20-Mar-2014 11:30:36
Comments		
Input	Data	E:\Nancy\Nelly Data.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	152
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on cases with no missing values for any variable used.
Syntax		REGRESSION /MISSING LISTWISE /STATISTICS COEFF OUTS R ANOVA CHANGE /CRITERIA=PIN(.05) POUT(.10) /NOORIGIN /DEPENDENT Cust_Satis /METHOD=ENTER Co_Design /METHOD=ENTER Aweraness /METHOD=ENTER Co_Des_Awareness.
Resources	Processor Time	00:00:00.109
	Elapsed Time	00:00:00.075
	Memory Required	3604 bytes
	Additional Memory Required for Residual Plots	0 bytes

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	Co_Design[a]	.	Enter
2	Aweraness[a]	.	Enter
3	Co_Des_Awareness[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: Cust_Satis

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.769[a]	.592	.589	.56569	.592	214.439	1	148	.000
2	.794[b]	.631	.626	.53992	.039	15.469	1	147	.000
3	.801[c]	.641	.634	.53409	.010	4.225	1	146	.042

a. Predictors: (Constant), Co_Design

b. Predictors: (Constant), Co_Design, Aweraness

c. Predictors: (Constant), Co_Design, Aweraness, Co_Des_Awareness

ANOVA[d]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	68.622	1	68.622	214.439	.000[a]
	Residual	47.361	148	.320		
	Total	115.984	149			
2	Regression	73.132	2	36.566	125.435	.000[b]
	Residual	42.852	147	.292		
	Total	115.984	149			
3	Regression	74.337	3	24.779	86.867	.000[c]
	Residual	41.647	146	.285		
	Total	115.984	149			

a. Predictors: (Constant), Co_Design

b. Predictors: (Constant), Co_Design, Aweraness

c. Predictors: (Constant), Co_Design, Aweraness, Co_Des_Awareness

d. Dependent Variable: Cust_Satis

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.315	.096		3.271	.001
	Co_Design	.854	.058	.769	14.644	.000
2	(Constant)	.059	.113		.521	.603
	Co_Design	.718	.065	.647	10.982	.000
	Aweraness	.222	.057	.232	3.933	.000
3	(Constant)	.528	.254		2.078	.039
	Co_Design	.389	.173	.350	2.250	.026
	Aweraness	.083	.088	.086	.941	.348
	Co_Des_Awareness	.088	.043	.406	2.056	.042

a. Dependent Variable: Cust_Satis

Excluded Variables[c]

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
						Tolerance
1	Aweraness	.232[a]	3.933	.000	.309	.723
	Co_Des_Awareness	.550[a]	4.377	.000	.340	.156
2	Co_Des_Awareness	.406[b]	2.056	.042	.168	.063

a. Predictors in the Model: (Constant), Co_Design

b. Predictors in the Model: (Constant), Co_Design, Aweraness

c. Dependent Variable: Cust_Satis

Regression

Notes

Output Created		13-May-2014 21:42:15
Comments		
Input	Data	D:\PhD Research\Reasearch\Research Chapters\Chapters\Analysis\PhD Data-Final.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	152
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on cases with no missing values for any variable used.
Syntax		REGRESSION /MISSING LISTWISE /STATISTICS COEFF OUTS R ANOVA COLLIN TOL CHANGE /CRITERIA=PIN(.05) POUT(.10) /NOORIGIN /DEPENDENT Cust_Satis /METHOD=ENTER Intention /METHOD=ENTER Intention.
Resources	Processor Time	00:00:00.000
	Elapsed Time	00:00:00.250
	Memory Required	3052 bytes
	Additional Memory Required for Residual Plots	0 bytes

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	Intention[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: Cust_Satis

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.740[a]	.548	.545	.59263	.548	181.682	1	150	.000

a. Predictors: (Constant), Intention

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	63.808	1	63.808	181.682	.000[a]
	Residual	52.681	150	.351		
	Total	116.490	151			

a. Predictors: (Constant), Intention

b. Dependent Variable: Cust_Satis

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.147	.115		1.283	.201		
	Intention	.858	.064	.740	13.479	.000	1.000	1.000

a. Dependent Variable: Cust_Satis

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions	
				(Constant)	Intention
1	1	1.908	1.000	.05	.05
	2	.092	4.562	.95	.95

a. Dependent Variable: Cust_Satis

Regression

Notes

Output Created		20-Mar-2014 10:44:55
Comments		
Input	Data	E:\Nancy\Nelly Data.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	152
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on cases with no missing values for any variable used.
Syntax		REGRESSION /MISSING LISTWISE /STATISTICS COEFF OUTS R ANOVA COLLIN TOL CHANGE /CRITERIA=PIN(.05) POUT(.10) /NOORIGIN /DEPENDENT Cust_Satis /METHOD=ENTER Product_Eas Attitude Self_Confi Percived_usefulness.
Resources	Processor Time	00:00:00.281
	Elapsed Time	00:00:00.184
	Memory Required	3740 bytes
	Additional Memory Required for Residual Plots	0 bytes

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	Percived_usefulness, Product_Eas, Self_Confi, Attitude[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: Cust_Satis

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.702[a]	.493	.479	.63497	.493	35.430	4	146	.000

a. Predictors: (Constant), Percived_usefulness, Product_Eas, Self_Confi, Attitude

ANOVA[b]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	57.138	4	14.285	35.430	.000[a]
	Residual	58.864	146	.403		
	Total	116.002	150			

a. Predictors: (Constant), Percived_usefulness, Product_Eas, Self_Confi, Attitude

b. Dependent Variable: Cust_Satis

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	1.333	.461		2.892	.004		
	Product_Eas	-.188	.080	-.176	-2.358	.020	.621	1.609
	Attitude	.064	.101	.062	.639	.524	.369	2.709
	Self_Confi	.235	.089	.242	2.637	.009	.414	2.416
	Percived_usefulness	.357	.116	.329	3.072	.003	.304	3.291

a. Dependent Variable: Cust_Satis

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions				
				(Constant)	Product_Eas	Attitude	Self_Confi	Percived_usefulness
1	1	4.579	1.000	.00	.00	.00	.00	.00
	2	.294	3.946	.01	.03	.03	.05	.02
	3	.078	7.666	.00	.00	.37	.72	.03
	4	.042	10.465	.00	.00	.56	.13	.92
	5	.008	24.320	.99	.97	.04	.10	.02

a. Dependent Variable: Cust_Satis

Regression

Notes

Output Created		20-Mar-2014 11:05:19
Comments		
Input	Data	E:\Nancy\Nelly Data.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	152
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on cases with no missing values for any variable used.
Syntax		REGRESSION /MISSING LISTWISE /STATISTICS COEFF OUTS R ANOVA CHANGE /CRITERIA=PIN(.05) POUT(.10) /NOORIGIN /DEPENDENT Cust_Satis /METHOD=ENTER Intention.
Resources	Processor Time	00:00:00.125
	Elapsed Time	00:00:00.181
	Memory Required	2892 bytes
	Additional Memory Required for Residual Plots	0 bytes

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	Intention[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: Cust_Satis

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.740[a]	.548	.545	.59263	.548	181.682	1	150	.000

a. Predictors: (Constant), Intention

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	63.808	1	63.808	181.682	.000[a]
	Residual	52.681	150	.351		
	Total	116.490	151			

a. Predictors: (Constant), Intention

b. Dependent Variable: Cust_Satis

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.147	.115		1.283	.201
	Intention	.858	.064	.740	13.479	.000

a. Dependent Variable: Cust_Satis

Regression

Notes

Output Created		20-Mar-2014 11:05:51
Comments		
Input	Data	E:\Nancy\Nelly Data.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	152
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on cases with no missing values for any variable used.
Syntax		REGRESSION /MISSING LISTWISE /STATISTICS COEFF OUTS R ANOVA CHANGE /CRITERIA=PIN(.05) POUT(.10) /NOORIGIN /DEPENDENT Co_Design /METHOD=ENTER Intention.
Resources	Processor Time	00:00:00.187
	Elapsed Time	00:00:00.160
	Memory Required	2892 bytes
	Additional Memory Required for Residual Plots	0 bytes

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	Intention[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: Co_Design

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.726[a]	.527	.524	.54647	.527	167.087	1	150	.000

a. Predictors: (Constant), Intention

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	49.896	1	49.896	167.087	.000[a]
	Residual	44.794	150	.299		
	Total	94.690	151			

a. Predictors: (Constant), Intention

b. Dependent Variable: Co_Design

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.209	.106		1.971	.051
	Intention	.759	.059	.726	12.926	.000

a. Dependent Variable: Co_Design

Regression

Notes

Output Created		20-Mar-2014 11:06:13
Comments		
Input	Data	E:\Nancy\Nelly Data.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	152
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on cases with no missing values for any variable used.
Syntax		REGRESSION /MISSING LISTWISE /STATISTICS COEFF OUTS R ANOVA CHANGE /CRITERIA=PIN(.05) POUT(.10) /NOORIGIN /DEPENDENT Cust_Satis /METHOD=ENTER Intention Co_Design.
Resources	Processor Time	00:00:00.468
	Elapsed Time	00:00:00.293
	Memory Required	3148 bytes
	Additional Memory Required for Residual Plots	0 bytes

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	Co_Design, Intention[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: Cust_Satis

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.814[a]	.662	.658	.51371	.662	146.211	2	149	.000

a. Predictors: (Constant), Co_Design, Intention

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	77.169	2	38.585	146.211	.000[a]
	Residual	39.321	149	.264		
	Total	116.490	151			

a. Predictors: (Constant), Co_Design, Intention

b. Dependent Variable: Cust_Satis

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.033	.101		.331	.741
	Intention	.444	.080	.383	5.530	.000
	Co_Design	.546	.077	.492	7.115	.000

a. Dependent Variable: Cust_Satis

Regression

Output Created		20-Mar-2014 10:41:38
Comments		
Input	Data	
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	152
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on cases with no missing values for any variable used.
Syntax		REGRESSION /MISSING LISTWISE /STATISTICS COEFF OUTS R ANOVA COLLIN TOL CHANGE /CRITERIA=PIN(.05) POUT(.10) /NOORIGIN /DEPENDENT Co_Design /METHOD=ENTER Product_Eas Attitude Self_Confi Percived_usefulness.
Resources	Processor Time	00:00:00.125
	Elapsed Time	00:00:00.111
	Memory Required	3740 bytes
	Additional Memory Required for Residual Plots	0 bytes

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	Percived_usefulness, Product_Eas, Self_Confi, Attitude[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: Co_Design

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.744[a]	.554	.542	.53771	.554	45.335	4	146	.000

a. Predictors: (Constant), Percived_usefulness, Product_Eas, Self_Confi, Attitude

ANOVA[b]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	52.431	4	13.108	45.335	.000[a]
	Residual	42.213	146	.289		
	Total	94.644	150			

a. Predictors: (Constant), Percived_usefulness, Product_Eas, Self_Confi, Attitude

b. Dependent Variable: Co_Design

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.876	.390		2.245	.026		
	Product_Eas	-.117	.068	-.121	-1.730	.086	.621	1.609
	Attitude	.110	.085	.117	1.290	.199	.369	2.709
	Self_Confi	.283	.075	.323	3.760	.000	.414	2.416
	Percived_usefulness	.284	.098	.289	2.884	.005	.304	3.291

ANOVA[b]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	52.431	4	13.108	45.335	.000[a]
	Residual	42.213	146	.289		
	Total	94.644	150			

a. Predictors: (Constant), Percived_usefulness, Product_Eas, Self_Confi, Attitude

a. Dependent Variable: Co_Design

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions				
				(Constant)	Product_Eas	Attitude	Self_Confi	Percived_usefulness
	1	4.579	1.000	.00	.00	.00	.00	.00
	2	.294	3.946	.01	.03	.03	.05	.02
	3	.078	7.666	.00	.00	.37	.72	.03
	4	.042	10.465	.00	.00	.56	.13	.92
	5	.008	24.320	.99	.97	.04	.10	.02

a. Dependent Variable: Co_Design

Regression

Notes

Output Created		20-Mar-2014 10:37:06
Comments		
Input	Data	E:\Nancy\Nelly Data.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	152
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on cases with no missing values for any variable used.
Syntax		REGRESSION /MISSING LISTWISE /STATISTICS COEFF OUTS R ANOVA COLLIN TOL CHANGE /CRITERIA=PIN(.05) POUT(.10) /NOORIGIN /DEPENDENT Intention /METHOD=ENTER Product_Eas Attitude Self_Confi Percived_usefulness.
Resources	Processor Time	00:00:00.110
	Elapsed Time	00:00:00.111
	Memory Required	3740 bytes
	Additional Memory Required for Residual Plots	0 bytes

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	Percived_usefulness, Product_Eas, Self_Confi, Attitude[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: Intention

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.716[a]	.513	.500	.53653	.513	38.496	4	146	.000

a. Predictors: (Constant), Percived_usefulness, Product_Eas, Self_Confi, Attitude

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	44.327	4	11.082	38.496	.000[a]
	Residual	42.029	146	.288		
	Total	86.356	150			

a. Predictors: (Constant), Percived_usefulness, Product_Eas, Self_Confi, Attitude

b. Dependent Variable: Intention

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	1.028	.389		2.639	.009		
	Product_Eas	-.093	.067	-.102	-1.386	.168	.621	1.609
	Attitude	.244	.085	.273	2.873	.005	.369	2.709
	Self_Confi	.295	.075	.352	3.919	.000	.414	2.416
	Percived_usefulness	.089	.098	.095	.907	.366	.304	3.291

a. Dependent Variable: Intention

Ilinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions				
				(Constant)	Product_Eas	Attitude	Self_Confi	Percived_usefulness
1	1	4.579	1.000	.00	.00	.00	.00	.00
	2	.294	3.946	.01	.03	.03	.05	.02
	3	.078	7.666	.00	.00	.37	.72	.03
	4	.042	10.465	.00	.00	.56	.13	.92
	5	.008	24.320	.99	.97	.04	.10	.02

a. Dependent Variable: Intention