

**POLITECNICO DI MILANO**

**Scuola di Ingegneria dei Sistemi**



**POLO TERRITORIALE DI COMO**

Master of Science in

Management, Economics and Industrial Engineering

**Mass Customization in footwear sector: guidelines  
to configure the Business Model after the  
introduction of a product configurator**

Supervisor: Eng. Donatella Corti

Assistant Supervisor: Eng. Federica Franchi

Master Graduation Thesis by: Francesca Bianchi 762786

Carlo Porta 762457

Academic Year 2011/2012

## SOMMARIO

Il progresso della tecnologia e il cambiamento nei gusti dei consumatori hanno recentemente costretto molte aziende appartenenti a svariati settori ad adottare la strategia di Mass Customization. Questo approccio consiste nel dare ai consumatori esattamente quello che essi desiderano, offrendo prodotti personalizzati di alta qualità realizzati su larga scala, con bassi costi di produzione e alti livelli di flessibilità.

Uno degli strumenti più importanti che permettono di implementare operativamente la Mass Customization è il configuratore di prodotto, il quale rende possibile agli utilizzatori di personalizzare un oggetto, in base alle loro preferenze, seguendo una procedura guidata e interattiva.

In particolare, la nostra tesi è incentrata sul settore calzaturiero, uno dei più importanti in cui la Mass Customization sta avendo un grande successo. Dal momento che la Mass Customization è un approccio relativamente innovativo, molte aziende sentono il bisogno di essere supportate da metodologie empiriche che possano essere di aiuto per l'introduzione di questa nuova strategia nei loro processi chiave.

Da qui la necessità di sviluppare una metodologia a supporto delle aziende operanti nel settore calzaturiero che vogliano iniziare ad offrire scarpe personalizzate: essa guida nella selezione del configuratore di prodotto più adatto in relazione ai bisogni e alle strategie aziendali e definisce come il Business Model verrà modificato in seguito all'introduzione dello strumento.

Come primo passo, è stata eseguita un'analisi della letteratura esistente sulla Mass Customization e sui Business Model, al fine di contestualizzare meglio il lavoro.

In seguito, prima dello sviluppo della metodologia, è stata condotta un'analisi preliminare su due tematiche chiave nell'ambito del lavoro: la prima riguarda il settore calzaturiero e evidenzia le principali differenze tra l'approccio tradizionale, adottato fino a pochi anni fa dalle aziende produttrici di scarpe, e l'approccio Mass Customization, adottato oggi da un gran numero di player. Vengono inoltre spiegati i fattori principali che hanno contribuito a questa evoluzione. La seconda tematica analizzata, invece, è incentrata sulla descrizione dei configuratori di prodotto, quali strumenti chiave nel permettere l'implementazione della Mass Customization. Dal momento che questa parte è costituita da concetti innovativi non presenti in letteratura, sono state necessarie due interviste con esperti in materia, al fine di raccogliere informazioni dettagliate sui configuratori di prodotto, sulla loro architettura, i vari tipi, le caratteristiche così come i costi e i tempi di implementazione.

Dopo aver condotto queste due analisi in parallelo, è stato possibile sviluppare la metodologia, che è costituita da quattro passi: il primo fornisce le linee guida per la selezione tra i tipi "online" e "in shop", il secondo per la selezione tra i modelli "premium" e "advanced". Il terzo passo è il più complesso, e consiste nella definizione dei quattro Business Model risultanti dalla combinazione delle alternative, evidenziando le loro differenze. Come ultimo passo, è necessario effettuare un'analisi economica al fine di verificare se l'investimento valga la pena di essere intrapreso.

Seguendo passo passo la metodologia, qualsiasi azienda operante nel settore calzaturiero avrà un'indicazione di quale sia il configuratore di prodotto più adatto in relazione ai bisogni e alle strategie aziendali e sarà in grado di definire come il Business Model cambierà in seguito all'introduzione dello strumento. A titolo esemplificativo è riportato il Business Model risultante dall'introduzione di un configuratore di tipo online - premium:

<b>ONLINE-PREMIUM CONFIGURATOR</b>	
<b>CUSTOMER SEGMENT</b>	<ul style="list-style-type: none"> <li>- Teenagers</li> <li>- Young adults</li> <li>- Children</li> </ul>
<b>CUSTOMER RELATIONSHIP</b>	<ul style="list-style-type: none"> <li>- Possibility of customization</li> <li>- Co-creation and fidelization</li> <li>- Long term relationship with customer</li> </ul>
<b>VALUE PROPOSITION</b>	<ul style="list-style-type: none"> <li>- High service level offered</li> <li>- Uniqueness and exclusiveness</li> <li>- Involvement in the creation process</li> <li>- Fashion and design of products offered</li> </ul>
<b>KEY PARTNERS</b>	<ul style="list-style-type: none"> <li>- Website manager</li> <li>- Carriers</li> <li>- Software house</li> <li>- Suppliers</li> <li>- Marketing agency</li> <li>- Designers of personalized line</li> </ul>
<b>KEY ACTIVITIES</b>	<ul style="list-style-type: none"> <li>- Design of personalized line</li> <li>- New cutting process</li> <li>- Orders management</li> <li>- Delivery</li> <li>- Monitor customer satisfaction</li> <li>- After sale services</li> </ul>
<b>KEY RESOURCES</b>	<ul style="list-style-type: none"> <li>- Configurator</li> <li>- Website</li> <li>- E-commerce module</li> <li>- Skilled workers</li> <li>- Design software</li> <li>- CAD expert</li> </ul>
<b>CHANNELS</b>	<ul style="list-style-type: none"> <li>- Direct channel</li> <li>- Easiness of selling abroad</li> </ul>
<b>REVENUE STREAM</b>	Revenues come from selling customized shoes
<b>COST STRUCTURE</b>	<ul style="list-style-type: none"> <li>- Configurator (medium-high cost)</li> <li>- CAD system</li> <li>- Website management costs</li> <li>- Differential labor, material, overhead and other fixed costs</li> </ul>

Infine, per passare dalla teoria alla pratica, la metodologia è stata applicata ad un caso reale, riguardante una piccola media impresa italiana produttrice di scarpe, il cui nome è stato cambiato

in “Tiger” per questioni inerenti la privacy. La validazione è stata utile per mostrare come ogni passo possa essere condotto usando dati reali.

In accordo con gli obiettivi, la metodologia si è rivelata un valido supporto per aziende del settore calzaturiero che vogliono iniziare ad offrire scarpe personalizzate: chiara e ben definita, ha guidato la ditta Tiger verso la selezione del configuratore di prodotto più adatto e ha definito i cambiamenti a livello di Business Model conseguenti all’introduzione dello strumento. L’analisi economica finale ha provato che sarebbe conveniente per l’azienda l’introduzione del configuratore, poiché l’investimento ha un Net Present Value (NPV) largamente positivo.

Nelle conclusioni è stato sottolineato il contributo che il lavoro ha dato sia alla letteratura che alle aziende del settore scarpe. Per quanto concerne la letteratura, al lavoro va riconosciuto il merito di aver ampliato la teoria dei configuratori, formalizzando delle classificazioni esistenti implicitamente nelle menti degli esperti. In aggiunta a ciò, un altro contributo risiede nell’applicazione della metodologia ad un caso reale.

Riguardo alle aziende operanti nel settore calzaturiero, l’utilità del lavoro consiste nell’aver fornito delle linee guida che possono essere seguite al fine di impostare correttamente il processo di selezione del configuratore di prodotto e per capire i cambiamenti necessari a livello di Business Model in seguito all’introduzione dello strumento. La metodologia può supportare sia aziende che stanno già implementando la Mass Customization, suggerendo loro come migliorare le practices correnti, e aziende che non hanno ancora introdotto l’approccio Mass Customization, velocizzando il processo di implementazione.

## ABSTRACT

The progression of technology and the change in customer tastes have recently forced many companies operating in different consuming goods sectors to adopt a Mass Customization strategy. This approach consists in giving customers exactly what they ask for, by offering customized high quality products realized on large scales, characterized by low production costs and high degrees of flexibility.

One of the most important tools that can be used to operatively implement Mass Customization is the product configurator, which is a device allowing customers to personalize a product according to their preferences, following a guided interactive procedure.

In particular, our thesis focuses on the footwear sector, one of the most important where Mass Customization is experiencing a great success. Since Mass Customization is a relatively new approach, however, many companies feel the necessity of being supported by empirical methods able to help them introduce this new strategy in their core business.

Hence, the need of developing a methodology to support shoe manufacturing companies to start offering customized shoes: it guides the selection of the most appropriate product configurator with respect to company's needs and strategies and it assesses how the Business Model will be modified following the introduction of the tool.

To begin with, a literature review about both Mass Customization and Business Model concepts have been made to better contextualize the work.

Then, before developing the methodology, a preliminary analysis on two main topics has been carried out: the first one concerns the footwear sector, highlighting the main differences between the traditional approach, adopted by shoe manufacturing companies until some years ago, and the Mass Customization approach, adopted nowadays by a large number of players. The main factors which contributed to this evolution are also explained. The second topic analyzed, instead, refers to the description of product configurators, as main tools enabling the implementation of Mass Customization. Since this part is constituted by innovative concepts not present in literature, two interviews with experts on this topic were required in order to collect detailed information about product configurators, concerning the architecture, types, features, as well as implementation time and costs.

By carrying out these two analysis in a parallel way, it has been possible to develop the methodology, constituted by four step: the first one provides guidelines about how to choose between "online" and "in shop" types then, as second step, how to choose between "premium" and "advanced" models. The third step is the most complex, as it defines the four possible TO BE Business Models, resulting from the combinations of the options, highlighting their differences. As last step, an economic analysis is carried out in order to check if the investment is worth undertaking.

Following the methodology step by step, whatever shoe manufacturing company will end up with an indication of the best product configurator which respects its needs and strategies and will be able to assess how the Business Model will change after the introduction of the tool.

An example of TO BE business model, corresponding to the introduction of an online-premium configurator is the following:

<b>ONLINE-PREMIUM CONFIGURATOR</b>	
<b>CUSTOMER SEGMENT</b>	<ul style="list-style-type: none"> <li>- Teenager</li> <li>- Young adults</li> <li>- Children</li> </ul>
<b>CUSTOMER RELATIONSHIP</b>	<ul style="list-style-type: none"> <li>- Possibility of customization</li> <li>- Co-creation and fidelization</li> <li>- Long term relationship with customer</li> </ul>
<b>VALUE PROPOSITION</b>	<ul style="list-style-type: none"> <li>- High service level offered</li> <li>- Uniqueness and exclusiveness</li> <li>- Involvement in the creation process</li> <li>- Fashion and design of products offered</li> </ul>
<b>KEY PARTNERS</b>	<ul style="list-style-type: none"> <li>- Website manager</li> <li>- Carriers</li> <li>- Software house</li> <li>- Suppliers</li> <li>- Marketing agency</li> <li>- Designers of personalized line</li> </ul>
<b>KEY ACTIVITIES</b>	<ul style="list-style-type: none"> <li>- Design of personalized line</li> <li>- New cutting process</li> <li>- Orders management</li> <li>- Delivery</li> <li>- Monitor customer satisfaction</li> <li>- After sale services</li> </ul>
<b>KEY RESOURCES</b>	<ul style="list-style-type: none"> <li>- Configurator</li> <li>- Website</li> <li>- E-commerce module</li> <li>- Skilled workers</li> <li>- Design software</li> <li>- CAD expert</li> </ul>
<b>CHANNELS</b>	<ul style="list-style-type: none"> <li>- Direct channel</li> <li>- Easiness of selling abroad</li> </ul>
<b>REVENUE STREAM</b>	Revenues come from selling customized shoes
<b>COST STRUCTURE</b>	<ul style="list-style-type: none"> <li>- Configurator (medium-high cost)</li> <li>- CAD system</li> <li>- Website management costs</li> <li>- Differential labor, material, overhead and other fixed costs</li> </ul>

At the end, to move from theory to practice, the methodology has been applied to a real case, related to a small medium Italian shoe manufacturer, whose name has been changed into “Tiger”

for privacy reasons. The validation was useful to show with real data how each step can be carried on.

According to the objectives, the methodology has turned out to be a real support for shoe manufacturing companies willing to start offering customized shoes: clear and well defined, it has guided Tiger company towards the selection of the most appropriate product configurator and it has assessed the changes at business model level following the introduction of the tool.

The final economic analysis has proved that it would be worth for the company to undertake the investment, since its Net Present Value (NPV) is largely positive.

As concluding remarks, it has been underlined the contribution of the work both to the literature and to enterprises operating in footwear sector. As far as literature is concerned, the work has the merit of having expanded a little bit the theory about configurators, by formalizing taxonomies implicitly existing within experts' minds. In addition to this, another contribution lies in the application of the methodology to a real case.

Talking about shoe manufacturing companies, the work's main strength is to be a collection of guidelines that can be followed in order to correctly set up the process of selection of a product configurator and to understand the changes needed at business model level following the introduction of the tool. The methodology can support both the companies which are already implementing Mass Customization, by suggesting how to improve their current practices, and companies which have not started the Mass Customization approach yet, by speeding up the process of implementation.

## TABLE OF CONTENTS

<b>CHAPTER 1 – INTRODUCTION.....</b>	<b>1</b>
1.1 Context.....	1
1.2 Objective of the work.....	1
1.3 Activities.....	1
1.4 Introduction to the report.....	1
<b>CHAPTER 2- MASS CUSTOMIZATION.....</b>	<b>4</b>
2.1 Introduction.....	4
2.2 Advantages and disadvantages.....	7
2.3 Levels of Mass Customization.....	8
2.4 Success factors of Mass Customization.....	11
2.4.1 Customer demand.....	11
2.4.2 Markets.....	12
2.4.3 Value chain.....	12
2.4.4 Technology.....	12
2.4.5 Customizable offer.....	12
2.4.6 Knowledge.....	13
2.5 Enablers of Mass Customization .....	13
2.5.1 Methodologies.....	13
○ Agile manufacturing.....	14
○ Supply chain management.....	14
○ Customer- driven design and manufacture.....	14
○ Lean manufacturing.....	14
2.5.2 Processes.....	15
○ Order elicitation.....	15
○ Design- postponement.....	15
○ Design- product platforms.....	15
○ Manufacturing.....	16
○ Supply chain coordination.....	16
2.5.3 Technologies.....	16
○ Manufacturing technologies.....	16
○ Information technologies.....	16
<b>CHAPTER 3 - BUSINESS MODEL.....</b>	<b>19</b>
3.1 Business Model concept.....	19
3.2 Business Model definitions.....	19
3.3 Business Model components.....	20
3.4 Business Model vs. strategy vs. tactics.....	21
3.5 Problems of Business Models.....	22



3.6 Osterwalder’s Canvas.....	23
3.6.1 Customer segments.....	25
3.6.2 Value proposition.....	25
3.6.3 Channels.....	26
3.6.4 Customer relationships.....	27
3.6.5 Revenue streams.....	27
3.6.6 Key resources.....	28
3.6.7 Key activities.....	28
3.6.8 Key partners.....	29
3.6.9 Cost structure.....	29
3.7 Applications of the Canvas.....	30
<b>CHAPTER 4 – EVOLUTION OF THE BUSINESS MODEL AFTER THE INTRODUCTION OF A PRODUCT CONFIGURATOR: PROPOSAL OF A METHODOLOGY FOR THE FOOTWEAR SECTOR.....</b>	<b>31</b>
4.1 Introduction.....	31
4.2 Analysis of footwear sector.....	32
4.2.1 Evolution of footwear sector.....	32
4.2.2 Enablers of the evolution.....	35
○ Technology innovation.....	35
○ New trend.....	37
○ Change in customer tastes.....	39
4.3 Description of product configurators.....	40
4.3.1 Introduction.....	40
4.3.2 Definition of product configurator.....	40
4.3.3 Time and Costs of product configurator.....	40
4.3.4 Types of product configurator.....	41
4.3.5 Architecture.....	46
4.3.6 Features of product configurator.....	48
4.3.7 Product configurators in footwear sector.....	48
4.4 Development of the methodology.....	49
4.4.1 Introduction.....	49
4.4.2 Steps of the methodology.....	49
○ “Online” vs. “In shop” .....	50
○ “Premium” vs. “Advanced” .....	52
○ Assess the TO BE Business Models.....	61
○ Economic analysis.....	76
<b>CHAPTER 5 - TIGER’S CASE.....</b>	<b>78</b>
5.1 Introduction.....	78
5.2 Description of the company.....	78

5.3 Internal analysis.....	79
5.4 External analysis.....	80
5.5 Application of the methodology.....	91
<b>CHAPTER 6 - CONCLUSIONS.....</b>	<b>106</b>
<b>REFERENCES.....</b>	<b>110</b>

## CHAPTER 1 - INTRODUCTION

### 1.1 Context

Seen the increasing importance that Mass Customization has reached over the last years and the success that its implementation has obtained within several companies belonging to many sectors, it seemed to be worth carrying out a thesis based on this topic with the purpose of studying it in deep.

More and more companies, in fact, have recently started offering personalized products, by introducing a product configurator supporting the customization process.

Being Mass Customization a recent trend, however, not all the companies are still ready to approach it in the best way possible; therefore, there is the necessity of developing new models which can be practically applied to help companies implement operatively Mass Customization.

### 1.2 Objective of the work

The thesis focuses on the footwear sector, where Mass Customization has lately experienced a never ending success, being one of the most important key levers that companies are adopting in order to remain competitive in the market.

The purpose of the thesis is to develop a methodology assessing how the Business Model of a shoe manufacturing company changes after introducing a product configurator enabling customers to personalize shoes.

In particular, starting from the needs and the strategic decisions of the company, it has been defined a model suggesting the most appropriate product configurator to be selected and it has been explained how the Business Model of the company will be impacted as a consequence of its implementation.

### 1.3 Activities

The thesis is organized in three main parts.

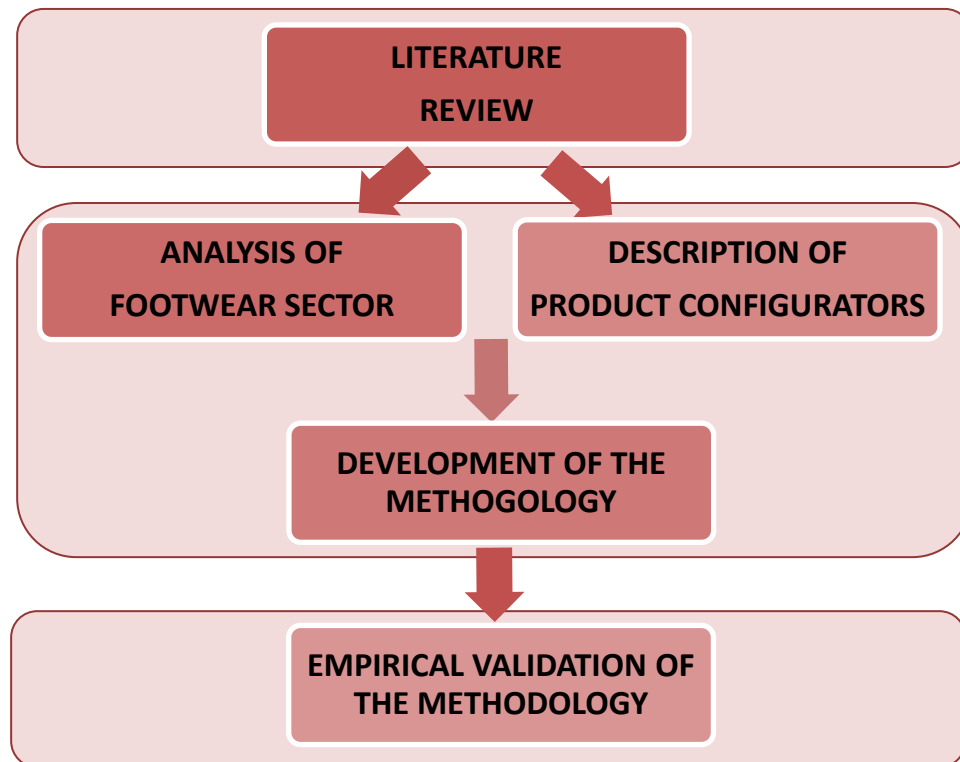
The initial one consists of a literature analysis on Mass Customization and Business Models, made to better contextualize the work.

The middle part constitutes the innovative contribution to the thesis and it is divided in two main parts:

- The first consists in a preliminary analysis of the context, needful in order to develop the methodology: in particular, it focuses on the footwear sector, which is the one this thesis is based on and, in a parallel way, on product configurators, being one of the most used tools enabling Mass Customization implementation;
- The second refers to the development of the methodology supporting shoe manufacturing companies in the choice of the most appropriate product configurator and in the assessment of the resulting “to-be” business model following its implementation;

The last part refers to the validation of the methodology through its application to a real case.

The following graph summarizes the main activities which have been carried out in each part:



#### 1.4 Introduction to the report

The first chapter refers to a literature review on Mass Customization: it defines the concept of Mass Customization by providing many definitions, the advantages and disadvantages of its implementation, its critical success factors and enablers.

The second chapter describes the theory about Business Models: definitions provided by various authors of what Business Models are, description of the main components they are based on and of the main problems they are affected by. In particular it is studied in deep the most famous model, which is also the one adopted during the thesis: the Osterwalder 's Canvas.

The third chapter represents the innovative contribution to the thesis and provides as output a methodology to support shoe manufacturing companies in implementing Mass Customization through a product configurator and in the assessment of the TO BE business model as result of its implementation.

It is divided in two main parts: the first refers to a preliminary analysis functional to the methodology which focuses, in a parallel way, on two main topic:

- the footwear sector, highlighting its evolution over years, the enablers of this evolution and the trends that companies are nowadays following in order to remain competitive in the market;
- the product configurators, defining at empirical level their role in Mass Customization implementation, the existing models, their architecture, features and costs.

The second, instead, refers to the development of the methodology itself which can be adopted by whatever shoe manufacturing company willing to start approaching Mass Customization: in particular the model provides guidelines to identify the most suitable alternative of product configurator, choosing between online-in shop and premium-advanced, it assesses how the introduction of the configurator will impact on the TO BE Business Model and it evaluates, through an economic analysis, whether the investment is worth undertaking.

The fourth chapter consists in the validation of the methodology on a real case.

First of all, an introduction was carried out to describe the “as-is” situation of the company, in terms of market share, market served, target customers, objectives and strategies. Secondly, an internal and external analysis were developed in order to highlight the needs to approach Mass Customization. Then, after describing the “as-is” Business Model, the above-mentioned methodology was applied, to identify the most suited configurator for the company, to assess the “to-be” Business Model and to evaluate, through an economic analysis, if the investment was worth or not.

Being this a real case, the availability of all necessary data allowed to carry out the analysis step by step and to finally obtain concrete results.

The last chapter draws the conclusions of the thesis: it highlights its main contributions to the literature and to enterprises operating in footwear sector and explain the future developments it might have.

## CHAPTER 2 – MASS CUSTOMIZATION

### 2.1 INTRODUCTION

Mass Customization can be defined as a strategy aiming at realizing individually- designed products or services in high volumes, at reasonable low costs (Da Silveira et al., 2001), through modularized product-service design , process agility, flexibility and integration between supply chain members (Pine et al., 1993).

It represents one of the many tools used by companies nowadays to increase the perceived value of a product by combining low price with high variation and adaptation (Svensson, 2002).

Mass Customization can be defined in a broadly or narrowly way.

The broad definition is the one firstly introduces by Davis (Davis et al., 1989) and later developed by Pine, who defined it as “developing, producing, marketing and delivering affordable goods and services with enough variety and customization that nearly everyone finds exactly what they want” (Pine et al., 1993). Companies can reach customers as in a mass market economy, but treat them individually, as in a pre- industrial economy where products were created ad- hoc for customers (Davis et al., 1989). In this way, companies can turn market uncertainties into sources of comparative advantage, by producing items that are meaningful to customers, more valuable than competitors’ offerings, and feasible to design, manufacture and delivery (Hart et al., 1995).

Other authors (Hart, 1995; Kay, 1993) on the other hand, provide a narrower definition of Mass Customization; in particular, it is defined as a system which uses information technology, flexible and agile processes and organizational structures with the aim of realizing high variety of products and services which meet customer’ request at a cost close to that of mass-produced items (Pine, 1993).

Table 1 outlines a list of definitions of Mass Customization proposed by the most important authors dealing with this topic.

AUTHOR	DEFINITION
Davis (1987)	“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”
Pine (1993)	“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”.
Kay (1993)	“Use information technology oriented production and delivery system to meet individual customer need efficiently at cost of mass production”
Lau (1995)	“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”
<b>Silveira et al.(2000)</b>	“Mass customization is an ability providing customized product or service by high volume flexible process and reasonably low cost”
<b>Tseng and Jiao (2001)</b>	“Mass customization corresponds to “the technologies and systems to deliver goods and services that meet individual customers’ needs with near mass production efficiency”
<b>Piller (2005)</b>	“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”

Table 1 – Definitions of Mass Customization

Customers are involved in the process as co-designer, since products are developed according to customer specifications and all operations are performed within a fixed solution space (Frank Piller, 2005). Both customer co-design and the concept of solution space need to be defined properly given their importance in a mass customized environment:

- **Customer co-design and integration:** they are key to Mass Customization (Kumar,2007), because differentiate it from other strategies, like lean management. Customers are involved in the value creation chain by defining, configuring or modifying a certain solution, so to translate their desire into concrete product specifications (Piller, 2004).  
By allowing customer to co-design, it is possible to establish an individual contact between manufacturer and customer, which represent a possibility to build up a long relationship. If the customer is satisfied, in fact, it awards the manufacturer with an increase in customer loyalty.  
Co-design activities can be carry on by making customer choose among a list of options and pre-defined components, which represents the solution space that the company wants to provide to its customers.  
Also integration plays a key role in Mass Customization strategy: it means getting the customer involved in the design or configuration of a product.
- **Stable solution space:** it means that customers are allowed to perform co-design activities only within a pre-defined list of options and components. A successful mass customization systems is characterized by a finite solution space able to satisfy customer needs and by flexible and responsive processes that provide a dynamic flow of products.  
The creation within a fixed solution space is what differentiate mass production from craft customization: while a crafted goods manufacturer re-invents both products and processes

for each individual order, a mass customized manufacturer uses fixed processes to deliver different goods (Pine et al., 1993).

Setting the solution space is one of the most important competitive challenges of a mass customizing company: as defined by von Hippel (2001), solution space is “the pre-existing capability and degrees of freedom built into a given manufacturer’s production system”.

Four main motivations contributed to the development of Mass Customization.

- More innovative manufacturing and information technologies allowed to delivery higher variety at lower cost. New interactive technologies support customer in product design, to create their unique custom product or service (Kotha et al., 1995);
- Consumers started appreciating the personalization and the opportunity of creating their own products, so to express their unique self- image. Nowadays the “one-size fits all” is out of date, people want to be treated as unique and they are willing to pay for it (de Boer et al., 2007);
- Willingness of customers to be involved in upper levels of supply chain, such as in the design phase; customer want to be felt important, actively participate in the creation of the products he/she is going to buy; customer does not want to be involved just in the purchasing phase, but consider their involvement as a unique experience (Piller, 2005);
- Finally, the reduction of product lifecycle and the increase of industrial competition contribute to focus on individual customers rather than to mass industry (Hart et al., 1995; Kotha et al., 1995).

Mass Customization impacts, therefore, on two main aspects, defined in figure 1:

**Functional aspects:** Mass Customization allow customer to modify product features which influence its usage and function like components, dimensions and fitting;

**Emotional aspects:** Mass Customization lets customer intervene on design and aesthetical aspects (i.e. colors, graphic, materials) to express own tastes or communicate something;

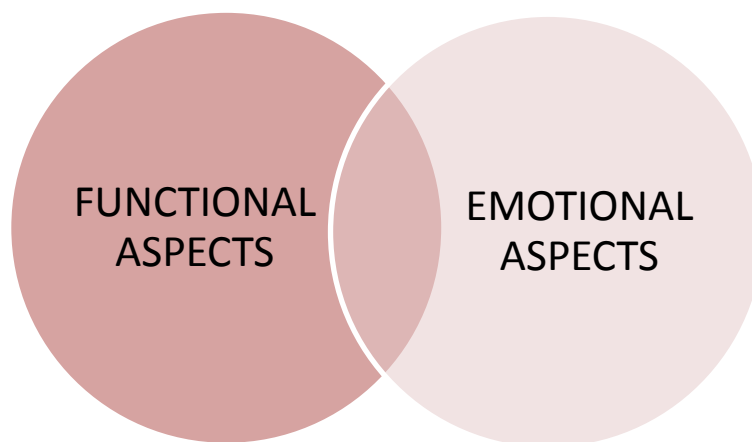


Figure 1 – Main aspects of Mass Customization  
(Piller and Tseng, 2010)



## 2.2 ADVANTAGES AND DISADVANTAGES:

Empirical evidence suggest that Mass Customization is not free and needs to be traded-off against lead time, costs and other factors (Squire et al., 2006); table 2 and 3 defines the advantages and disadvantages needed to be taken into account when implementing a Mass Customization system:

### ADVANTAGES

- Profits are supposed to increase, since customer can be willing to pay more for some exclusive and personalized;
- No longer the need of forecasting demand, since products are realized according to customer's desire;
- Customer loyalty is likely to increase, since they might be satisfied of receiving what exactly they want;
- Value Chain becomes more integrated, due to a stronger collaboration between manufacturer, supplier, retailers and customers;
- Mass Customization can bring a competitive advantage for companies, enabling them to survive in today's highly competitive environment;
- Customer involvement in the purchasing process increase, because considered as a unique experience;
- Reduction of overproduction, since company realized only what customer ask;
- Inventories of finished products and unsold products are supposed to disappear, as well as the obsolescence risk, with the consequence of reducing the waste level and increase the sustainability level.

Table 2 – Advantages of Mass Customization  
(Kotha, 1995; Ahlstrom and Westbrook, 1999)

### DISADVANTAGES

- Getting information about customer is not an easy task;
- Solution space offered is limited, therefore customers cannot personalize everything;
- Customers may not be willing to wait for long to receive the customized item;
- Distributing the right product, to the right customer, at the right time and cost is really difficult to manage;
- In order to offer high variety and differentiation, material and manufacturing costs may increase;
- Huge initial investments may be required;
- Being a new trend, it can be difficult to forecast future revenues;
- Items may not be returned back, despite they do not fit well ;
- New suppliers may be needed, therefore the supply chain can be subjected to changes;
- An essential condition of Mass Customization is the process flexibility, but it cannot be reached in every production stages.

Table 3 – Disadvantages of Mass Customization  
(Kotha, 1995; Ahlstrom and Westbrook, 1999)

### 2.3 LEVELS OF MASS CUSTOMIZATION

A critical issue concerning Mass Customization is the definition of the right “level of customization” which characterize mass- customized products and services.

Some authors (Pine and Gilmore et al., 1997; Lampel and Mintzberg et al., 1996) declare that Mass Customization can occur at different points of the supply chain between the two extremes: from the adaptation of delivered products by customers to the total customization of products design, fabrication, assembly and delivery.

Pine and Gilmore (1997) defined four main approaches to Mass Customization, illustrated in figure 2:

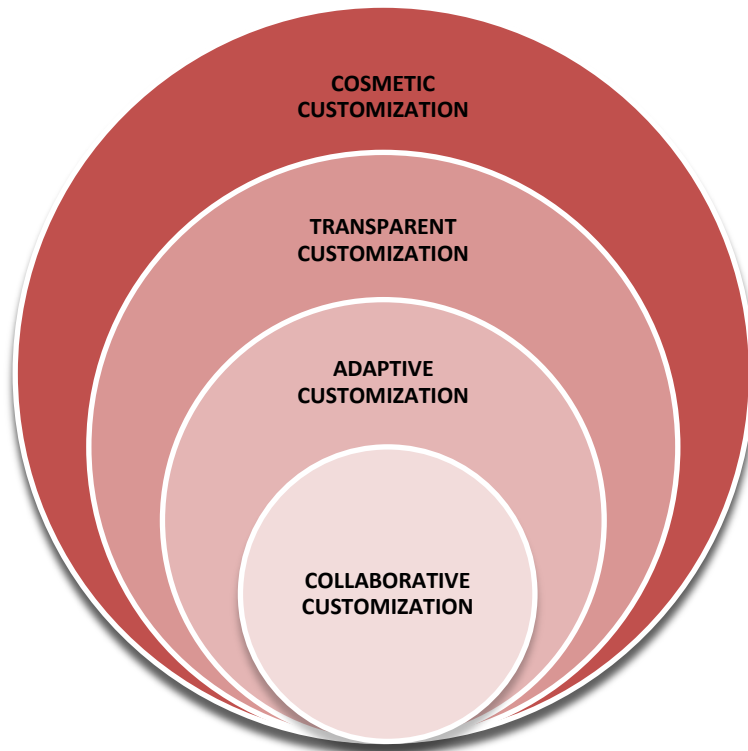


Figure 2 – Approaches to Mass Customization  
(James H. Gilmore and B. Joseph Pine II, 1997)

- **Collaborative:** this approach refers to the collaboration between designers and customers: customers are directly involved in the design, in order for the company to identify the exact offering that satisfies customer needs. Collaborative customization allows the customer to exchange ideas with the company already in the design phase, to let him decide among many available possibility until final choice can be made;
- **Adaptive:** standard products can be adapted by customers during the usage. This approach is used by companies which want to realize products performing in different ways on different occasions; this is possible thanks to the technology enabling customers to customize the product on their own;
- **Cosmetic:** this approach is proposed by companies whose products are already well appreciated by customers and only the product’s form or appearance must be customized. It can be described as the presentation of a standardized product differently to different customers: the usage of the product is the same; the only aspect that changes is the way it is presented. The focus is at the end of the value chain;

- **Transparent:** this approach is used when customer needs can be easily predicted, since products are realized according to them.

Lampel and Mintzberg (1996) identified, instead, five different levels of customization, involving various configurations of processes (from standard to customized), products (from commodities to unique) and customers transactions (from generic to personalized). It is possible to generate a model which identifies five levels of Mass Customization: Pure standardization, Segmented standardization, Customized standardization, Tailored Customization and Pure Customization. Each level differs from the degree of standardization and customization characterizing its processes. Figure 3 explains better this concept:

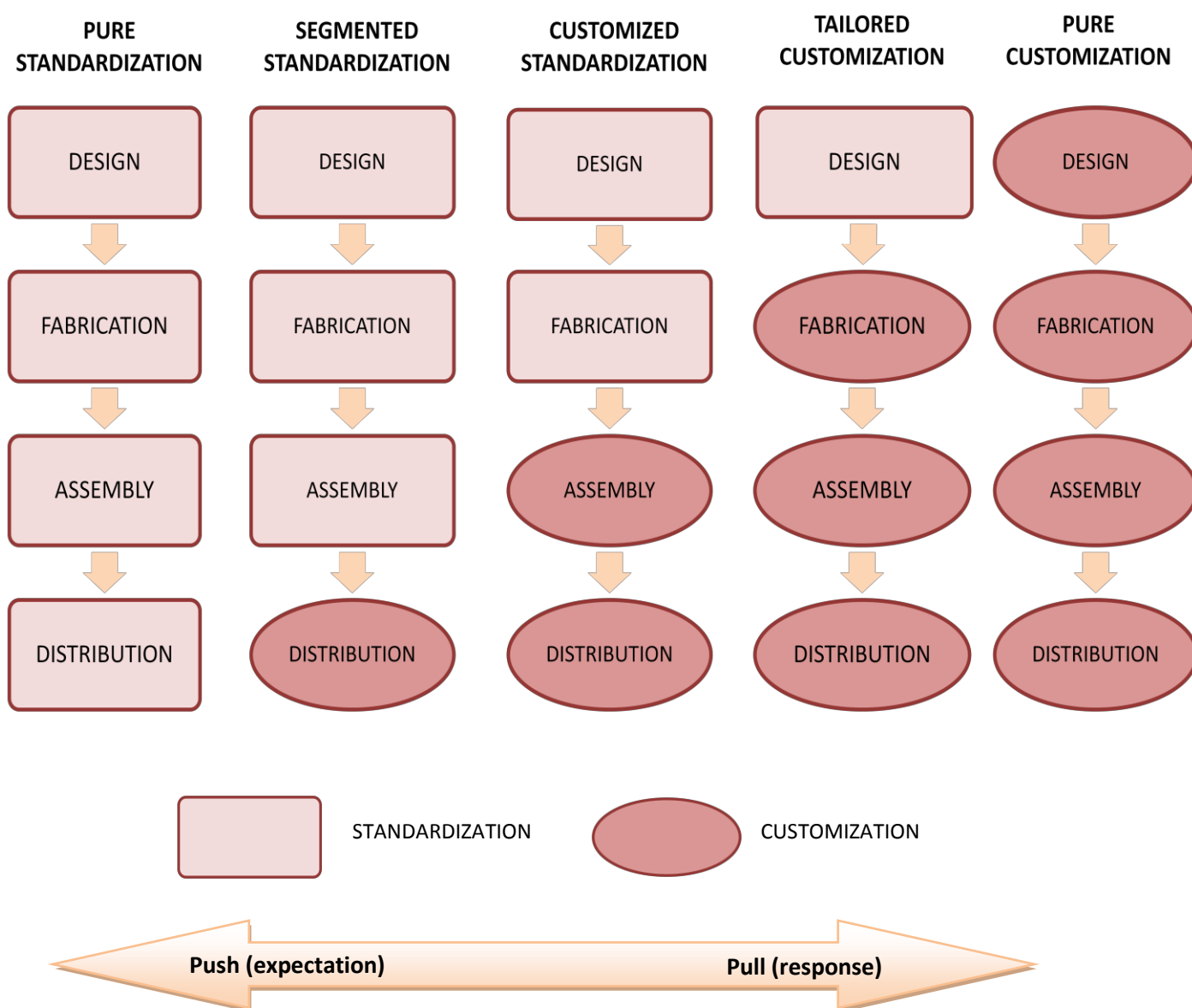


Figure 3 – Levels of Mass Customization (Lampel and Mintzberg, 1996)

**Pure standardization:** Products are standard, produced in advance in large scale without considering customer preferences., through standardized processes. Company pushes products in the market without making distinction between different customers, who have no influence over design, manufacturing, assembly and distribution stage (i.e. commodities).

**Segmented standardization:** Standards products are modified in different ways by varying some features (i.e. shape, color,...), but not at the request of individual buyer. Therefore, all processes but the delivery are standardized.

Individual choice is anticipated but not directly address to each customer.

Differently from the previous level, product variety increases, as well as the choices available for the customer, without increasing the direct influence of customer over design or production (i.e. cars). This is the level of shipment to order.

**Customized standardization:** Products are realized according to customer request starting from standardized components which are mass produced or by combining different pre-defined modules realized through modular production (Assembly to order).

All processes are standardized, but assembly and delivery: starting from a standard design, customer can create the preferred product configuration, constrained by the range of available components (i.e. hamburger).

**Tailored customization:** Products are realized according to customer specifications, starting from pre-defined design (Manufacturing to order). Therefore, a basic prototype realized in the unique standard process, the design, is adapted to individuals' needs (i.e. customized shoes).

**Pure customization:** Products and services are design, realized and delivered according to customer's request (Design to order); all processes can be adapted to customer request, with no presence of standardization.

For this reason it is necessary a collaboration with customer, in order to understand exactly what he/she desires. (i.e. private buildings).

Moving from pure standardization to pure customization:

- Pull strategy prevail over push strategy: products are no longer realized before order come (push), but need to wait for customer specification in order to be created exactly as customer wants (pull);
- Configuration of processes changes: from completely standard products, like commodities, to unique products, created ad-hoc for customers;
- Customer transaction changes: from generic transactions to extremely personalized ones, in which the collaboration company-customer plays a strategic role;
- Customer involvement increases: customers directly participate and contribute in the creation process.

## 2.4 SUCCESS FACTORS OF MASS CUSTOMIZATION

The success of Mass Customization depends mainly on six factors (see figure 4), which justify the use of MC as competitive strategy and explain the complexity behind MC implementation: demand for customized products and market turbulence, which are market-related factors and supply chain readiness, technology, customizable offer, knowledge, which are organization-based factors.



Figure 4 – Success Factors of Mass Customization  
(Lampel and Mintzberg, 1996)

### 2.4.1 Customer demand

According to Pine (1993) and Kotha (1996), Mass Customization should be justified by an increase in customer demand for customized and innovative products, because if the customer does not look for individual products and services the strategy will not have success. In particular, in order to understand if customer really needs and looks for customized products, Hart (1995) uses the concept of “customer customization sensitivity”, based on two factors:

- The uniqueness of customer’s need: it depends on the product of interest; for some products the customer may be indifferent in the variety offered, so, in this case, mass customization does not make sense; for other products, instead, customer may be interested in the level of individualization so, in this case, mass customization play a strategic role;

- The level of customer sacrifice: it is defined by Pine/Gilmore (2000) as the gap between what customer settles for and what he exactly wants;

Customer sensitivity increase as these two factors increase, so customer are ready to accept customized products.

#### **2.4.2 Markets**

According to Pine, the greater the market turbulence, the greater the probability for a company to adopt mass customization, in order to remain competitive.

Market conditions covers an important role in MC development: according to Kotha (1995), a company should try to be the first mover in order to obtain a competitive advantage over competitors, since it can be seen as the first willing to offer customized products. In this way, MC can be a way for companies to differentiate from others and this might avoid the strong competitiveness within a market, like it happens in mass market where economies of scale are usually exploited (Mendelson and Parlakturk, 2008b).

#### **2.4.3 Value chain**

Supply chain should be ready: it is a crucial point for the success of MC, because it depends on the readiness of all members of the value chain, from supplier to manufacturers, retailers and distributors, to satisfy customer demand (Kotha,1996; Feitziger, 1997). Nowadays competition takes place between supply chains rather than single companies (Christopher, 2005): more and more often, in fact, firm reduce the level of vertical integration to focus just on their core competences, therefore the role of suppliers becomes extremely important; the adoption of Mass Customization not only affect internal operations, but also the relationships between the company and its partners, which need to be as much integrated as possible in order to ensure high responsiveness.

#### **2.4.4 Technology**

The adoption of an advanced innovation and manufacturing technology is fundamental in order to develop MC systems; they allow to share information thanks to web-based systems to better integrate all members of the value chain and to improve and lean manufacturing processes ( PINE *et al.*, 1993; LAU, 1995; KOTHA, 1996b);

#### **2.4.5 Customizable offer**

Company's goal is to generate customized products, developed according to customer request, which must be frequently renewed and continuously innovated in order to reduce the product life cycle (Pine *et al.*, 1993; Lau,1995).

The success of MC depends on the ability of the company to create versatile and modular products, obtained by assembling independent units whose combination will generate high variety of final goods. Through modularization, which allows to lower manufacturing costs, company can become extremely efficient. (Feitziger, 1997).

## 2.4.6 Knowledge

In order for MC to be successful, it is necessary to share knowledge along the value chain, from customer and to customer, so obtain a knowledge-driven organization. Company has to create a culture which favors knowledge creation and share it within organization by introducing dynamic networks. (Wind and Rangaswamy, 2001; Claycomb et al., 2005).

## 2.5 ENABLERS OF MASS CUSTOMIZATION

Enablers of MC are methodologies, processes and technologies which support the development of organization-based factors described in the previous paragraph (see figure 5). In particular, MC methodologies are related to organizational- cultural aspects, differently from process technologies which refer to manufacturing aspects.

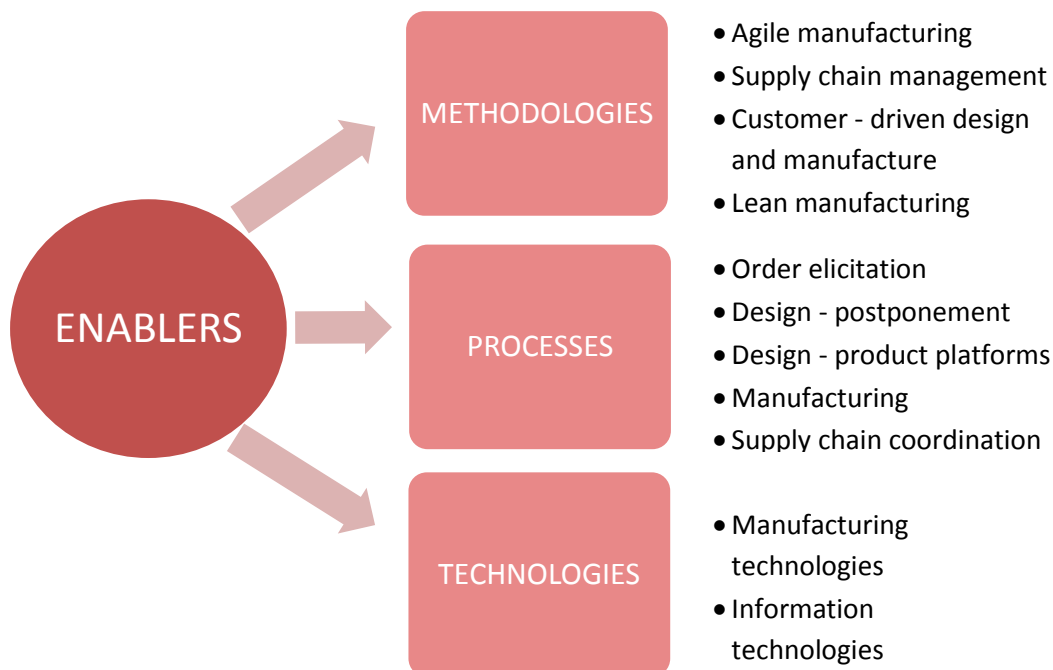


Figure 5 – Enablers of Mass Customization  
(Da Silveira et al., 2001)

### 2.5.1 Methodologies

There are four main methodologies used as tool enabling MC: agile manufacturing , supply chain management, customer-driven design and lean manufacturing.

- **Agile manufacturing:** it refers to the ability of the company to organize processes so to quickly respond to customer needs and market changes, still focusing on efficiency and effectiveness (L. Goldman, R.L. Nagel and K Preiss,1995). In order to implement it, companies should share a common database of parts and products among value chain members and adopt a proactive, rather than reactive, behavior (Gutman, R., Graves,R.,1995).

DeVor (1997) identified the most important dimensions of agile manufacturing:

1. Value-based strategies that enrich customers, focusing on delivering value;
2. Cooperating to enhance competitiveness;
3. Organizing to master change and uncertainty;
4. Leveraging the impact of people and information;

They contribute to differentiate between internal and external agility:

*INTERNAL AGILITY*: refers to the ability of the company to respond to market and customer demand of products/services or product features; this requires a re-programmable , re-configurable and continuously changeable production system, able to operate economically and manage small lot sizes (Jagdev, H., Browne ,J., 1998.);

*EXTERNAL AGILITY*: it refers to the concept of virtual enterprise, which can be defined as a group of individual companies collaborating all together in order to deliver high quality and customized products, by focusing on product orientation, flexibility, team collaboration allowed by the so advanced and innovative information technologies and information systems (Powell, S., Gallegos, F., 1998).

- **Supply chain management**: in order for the company to obtain a competitive advantage, co-operation and collaboration among resources and optimization of activities along the supply chain are fundamental (Boyton, A., Victor,B., Pine,J., 1993).  
According to Feitinger (1997), Lau (1995) and Kotha (1995), to improve supply chain integration it is required an organizational coordination which can be obtained through:
  - Introduction of an information network, in charge of favor communication along the supply chain;
  - Balance between low stock level and high service level, in terms of frequent delivery;
  - Creation of original and innovative products, thanks to the collaboration of supplier in the design phase;
  - Deliver the right product to the right customer, at the right time and cost.
- **Customer-driven design and manufacture**: according to Jagdev and Browne (1998), this approach deals with the fact that both design and manufacturing should be carried on continuously focusing on customer and it aims at:
  - Create the right conditions for the customer, so to start the design process of a product;
  - Create an infrastructure to develop new products, according to the market requests;
- **Lean manufacturing**: also called lean production, it represents an industrial philosophy aiming at minimizing the waste as much as possible, in order to improve process efficiency and obtain a comparative advantage (Storch, R., Lim, S., 1999).  
The four main activities characterizing lean manufacturing are: product development, the chain of supply, shop floor management and after sale services.

The main activities which characterize the lean production are:



- Identify the needs and what represents value for the customer, in order to understand what customer is willing to pay for;
- Identify and remove non value added- activities and all wastes;
- Re-organize value added activities in efficient processes ;
- Reduce time and total costs;
- Improve quality in order to increase customer satisfaction;

## 2.5.2 Processes

Processes at the base of Mass Customization implementation can be divided in four main steps: order elicitation, design- postponement, design-product platform, manufacturing and supply chain coordination:

- **Order elicitation:** in order for the company to realize customized products, created on the bases of customer needs, it is necessary to collect customer specification to communicate them to design (Helms et al., 2008; Ninan and Siddique, 2006).

Order elicitation does not consist just in asking what customer wants, as a simple information gathering would mean, because the risk is to lose information and forget hidden needs; for this reason, many tools have been developed to support customers involved in the design phase, to support the collaboration between the customer and the system, the to support the order configuration. Such tools are, for example, data mining techniques, in particular clustering procedures which aims, by grouping customers with the same preferences, at better analyze and organize customer requirements (Christel, M., and Kyo C. Kang , 1992).

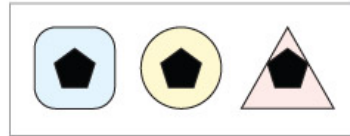
- **Design - postponement:** as seen before in the description f Mass Customization levels, customers can influence the design and manufacturing phase at different stages along the value chain; by moving the decoupling point, different levels of customization can be obtained: mass production (at customer level), minor customization (at retailer level), partial customization (at assembler level), mass customization (at manufacturer level) and real-time customization (at supplier level).

By properly designing the product structure and the supply chain processes, it is possible to delay the point to configure the final personalization of a product, in order to increase the flexibility to manage any changes in demand (Wikner and Rudberg, 2005).

- **Design - product platforms:** to implement mass customization, companies are utilizing product families and platform-based products development to increase variety and reduce the lead time and costs. The reason of a successful product family is the product platform from which is derived either by adding, removing, or substituting one or more modules to the platform itself or by adapting the platform to target specific market niches (Simpson,W., 2004).

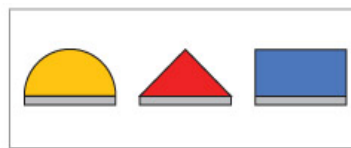
The realization of standardized modules, used to create customized products, is known as modularity. According to Pine (1993) and Duray (2000), there are six different modularity strategies, which can be used individually on products or mixed together:

- Component-sharing modularity: enables customization of products by reusing a functional module across a variety of products. This can be obtained making a core module that can be used across all of the companies' individual products. Value is created by reducing complexity in the supply chain which provides time and margins to introduce more products;



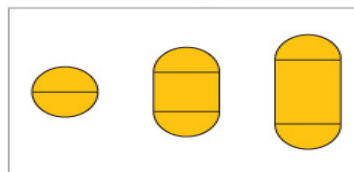
Component-sharing modularity

- Component-swapping modularity: it occurs when two or more alternative types of a component can be paired with the same basic product creating different product variants belonging to the same product family;



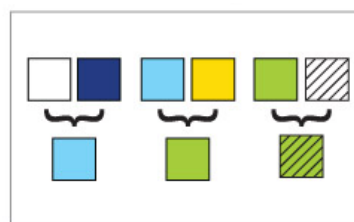
Component-swapping modularity

- Cut-to-fit modularity: product variation is achieved through the use of one or more standard components with one or more variable add-on components. Most frequently, the variation is associated with the physical dimensions that can be modified (i.e. length);



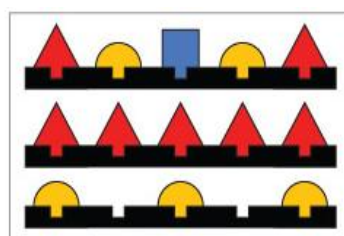
Cut-to-fit modularity

- Mix modularity: it occurs when components are mixed together and form completely different products;



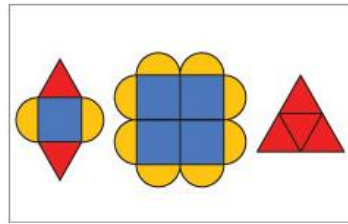
Mix modularity

- Bus modularity: it occurs when a module can be matched with any number of basic components, thanks to a supporting architecture which allows the number and the location of basic components in a product to vary.



Bus modularity

- Sectional modularity: it provides the greatest degree of variety and customization, since it allows the configuration of different types of components in arbitrary ways- as long as each component is connected to another at standard interfaces.



Sectional modularity

- **Manufacturing:** Mass customization manufacturing system is of central significance in MC strategy; flexibility is the most important feature characterizing manufacturing operations, in order to be able to re-configure resources to efficiently produce different products of acceptable quality and quickly respond to market changes. A successful manufacturing system requires the adoption of modern methods to manage changes, still providing a fast and flexible response; moreover, it should be able to rapidly reconfigure operations and processes and integrating new functions to manage the dynamic manufacturing demand. (Qiao et al., 2001).
- **Supply chain coordination:** coordination among value chain members is a key issues in MC system; to improve operational efficiency it is necessary to favor the exchange of physical and information flows from customer to supplier and promote their collaboration.

### 2.5.3 Technologies

The most important enabling technologies supporting Mass Customization implementation can be divided in due main groups, depending if they refer to manufacture or informative purpose:

- **Manufacturing technologies:** they refer to the so called AMTs (Advanced Manufacturing Technologies), a set of modern technologies characterized by highly automated and sophisticated computerized design and operational systems. The purpose of ATM is the realization of high quality products, at low costs, within the shortest delivery time. Example of ATMs are computer numeric control (CNC), flexible manufacturing system (FMS) and communication and network technologies like computer- aided design (CAD) and computer- aided manufacturing (CAM) These technologies contribute to make companies exploit many benefits, such as processes more flexible and agile. (Ninan and Siddique, 2006; Nielsen and Cox, 2008);
- **Information technologies:** they refer to all those technologies which allow to store, retrieve and transmit information. They contribute to correctly fulfill customer order thanks to the integration of information flows and also allow to monitor the configuration process by using a database of customer demand and preferences (Dietrich et al.,2007);

The success of a Mass Customization program depends on the efficiency in information transfer from customer to manufacturer (K. Turowski,1999). In particular, the customer requirements regarding a certain product are gathered and transmitted to a production unit, where this product will be realized with respect to customer desire. Information is transferred from manufacturer to customer, to communicate the solution space within which it is possible to customized the order , and vice versa, from customer to manufacturer, to give the feedback about the choices of design elements.

The four main steps which are part of the communication customer- manufacturer are:

- Definition of a catalogue of options to be offered to customer: it defines the degree of customization of a product. The wider the catalogue offered, the more products are highly customized.
- Collect and store information about customer choice: information from customer can be gather in different ways, by a store employee, sales representative or, the most used, by using a computer interface and then they are stored on order sheets or electronically, using a computer system.
- Transferring data from store to manufacturer: data are generally transferred by computer or fax, which enter in a computer system that labels products with an univocal ID, with the purpose to track the products throughout the manufacturing stages.
- Translating customer choice into product design features and manufacturing instructions: requirements about product design are generally put in CAD/CAM systems and converted on instructions used to physically realize the product.

## CHAPTER 3 – BUSINESS MODEL

### 3.1 BUSINESS MODEL CONCEPT

The concept of Business Model has been around in management vocabulary since a few decades. One would expect that, over this long time frame, a unique and shared definition of what a Business Model is has been consolidated. The truth is that, while it has become more and more “trendy” to talk about Business Models, still a lot of confusion is present about the concept.

Zott et al. (2010) suggest that this lack of consensus may be, at least partially, explained by the fact that researchers develop idiosyncratic definitions that, if suited for the sake of their studies, are difficult to connect one with another. As a consequence, literature about Business Models is developing vertically, according to the phenomena of interest of the respective researchers. The three main research areas that have emerged are: e-business, strategic issues and innovation and technology management. It is intuitively clear that, if one thinks of Business Models in each of these perspective, he/she will come up with several different definitions, each of them focusing on different aspects. Also other authors, like Teece (2009) or Johnson et al.(2009) stated that the Business Model concept still lacks of a standard definition as well as of a strong theoretical background.

The lack of a shared definition about what a Business Model is, for sure is not a positive aspect, because it promotes dispersion rather than convergence; this fact prevents cumulative resource progress in the field of Business Model literature from happening.

### 3.2 BUSINESS MODEL DEFINITIONS

By analyzing existing literature, one can find plenty of definitions of what a Business Model is. These definitions are different in the sense that they reflect the particular perspective the author has adopted in carrying out the research work. Nevertheless, from most of them, one can grasp the idea that Business Models are a sort of “portrait” depicting the levers that the company uses (or would intend to use) to pursue a particular strategy. A collection of definitions, proposed by influential authors is provided here.

- Arufah (2004), sees a Business Model as the combination of “business”, which is the way in which a firm creates value and capture returns from that value and “model”, which is a simplified (but not simplistic) representation of reality. By blending together these two concepts, the resulting definition of Business Model is *“the representation of a firm’s underlying core logic and strategic choices for creating and capturing value within a value network”*. The four main key terms stemming from this definition are:
  - Core logic, meaning that a Business Model must be related with company’s strategy;
  - Strategic choices: a Business Model is, after all, a collection of decisions;
  - Creating and capturing value: besides offering products/services to its customers, a firm must be also able to get returns from them, if it wants to ensure long term survival;
  - Value network, which underlines the fact that nowadays companies success strongly depends on the relationships they are able to put in place with external actors like suppliers, partners and distribution channels.

- Magretta (2002), discusses the Business Models in literature adopting a strategic perspective. His definition is the following: *“Business Models are stories that explain how enterprises work.[...] A Business Model answers the fundamental questions every manager must ask: How do we make money in this business? What is the underlying economic logic that explains how we can deliver value to customers at an appropriate cost?”*. As one can note, this definition focuses on economic sustainability aspect of Business Models, by stressing the idea that the value the company generates must be delivered to customers without compromising predefined levels of profitability.
- Another recent definition that is quite representative is the one given by Osterwalder (2004). In his book he states that *“A Business Model is a conceptual tool that contains a set of elements and their relationships and allows expressing a company's logic of earning money. It is a description of the value a company offers to one or several segments of customers and the architecture of the firm and its network of partners for creating, marketing and delivering this value and relationship capital, in order to generate profitable and sustainable revenue streams”*.

### 3.3 BUSINESS MODELS COMPONENTS

Shafer et al. (2005), carried out an exhaustive literary review about Business Models. Among the definitions they scanned, one can count forty-two different “building blocks”, which in jargon are the basic elements that constitute a Business Model. Most of these building blocks are shared among various definitions, meaning that, somehow, a certain degree of alignment in opinions is present. Nevertheless, a few other building blocks are stand-alone objects, proving that researchers analyzed the concept of Business Model under different lights. To make things clearer, the three authors developed an affinity diagram in order to cluster the building blocks. As output of the affinity diagram, four main clusters were identified: strategic choices, creating value, capturing value and the value network.

Osterwalder and Pigneur (2010), after giving their definition of Business Models, developed a framework, called “Business Model Canvas”, which groups together all the macro-components (“building blocks”) that, according to their view, a Business Model must have. These macro-components belong to the four main areas of concern of a company, namely customer, offer, infrastructure and financial viability.

As one can see from Fig. 1, most of the components identified by Osterwalder and Pigneur appear also in the classification proposed by Shafer et al. (2005). Two elements mark a discordance between the two models:

- Osterwalder talks about “Key Partners” whereas Shafer consider just “Suppliers”. The classification proposed by the former appears much wider and complete than the one proposed by the latter. In fact, “Key Partners” is not just limited to suppliers, but it includes also Joint Ventures and strategic alliances that a company may establish with other Business entities (e.g. non competitors/competitors). Shafer’s view, considering just suppliers, risks of neglecting other important forms of relationships which are commonly adopted nowadays;
- Osterwalder, unlike Shafer, forgets to talk about “Competitors”. It is important, indeed, to contextualize the state of the competition characterizing the sectors in which companies

nowadays operate, because this can be useful for finding differentiation levers unused by competitors as well as anticipating their possible future moves.

All the other elements are common to both classifications proposed by the two authors; some blocks are even called with the same name across the two models, whereas others are called with different names (e.g. Product/Service flow vs. Channels). Shafer adds also other blocks, like “Strategy, Branding, Differentiation, Mission”, which, if useful to expand knowledge about the company, don’t seem to be so relevant for the sake of classification, being them related to the whole organization rather than to the specific Business Model under analysis.

<b>COMPONENTS OF A BUSINESS MODEL</b>	
<b>SHAFER</b>	<b>OSTERWALDER</b>
<p><b>STRATEGIC CHOICES</b></p> <ul style="list-style-type: none"> <li>• Customer segments</li> <li>• Value proposition</li> <li>• Capabilities</li> <li>• Revenues/pricing</li> <li>• Competitor</li> <li>• Offering</li> <li>• Strategy</li> <li>• Branding</li> <li>• Differentiation</li> <li>• Mission</li> </ul>	<p><b>CUSTOMER</b></p> <ul style="list-style-type: none"> <li>• Customer segments</li> <li>• Customer relationships</li> </ul>
<p><b>CREATE VALUE</b></p> <ul style="list-style-type: none"> <li>• Resources/ assets</li> <li>• Processes/ activities</li> </ul>	<p><b>OFFER</b></p> <ul style="list-style-type: none"> <li>• Value proposition</li> </ul>
<p><b>CAPTURE VALUE</b></p> <ul style="list-style-type: none"> <li>• Cost</li> <li>• Financial aspects</li> <li>• Profits</li> </ul>	<p><b>INFRASTRUCTURE</b></p> <ul style="list-style-type: none"> <li>• Key partners</li> <li>• Key activities</li> <li>• Key resources</li> <li>• Channels</li> </ul>
<p><b>VALUE NETWORK</b></p> <ul style="list-style-type: none"> <li>• Suppliers</li> <li>• Customer information</li> <li>• Customer relationships</li> <li>• Information flow</li> <li>• Product/ service flow</li> </ul>	<p><b>FINANCIAL VIABILITY</b></p> <ul style="list-style-type: none"> <li>• Cost structure</li> <li>• Revenue streams</li> </ul>

Figure 6 - Components of a Business Model (adapted from Shafer et al. (2005) and Osterwalder and Pigneur (2010))

### 3.4 BUSINESS MODEL STRATEGY VS. TACTICS

Even if confusion is present about what a Business Model really is, one can say, for certain, what a Business Model is not: it is neither a strategy nor a tactic. As stated by Casadesus - Masanell and Ricart (2011), of course the three concepts of Strategy, Business Model and Tactics are interrelated, but it would be inappropriate to use them as synonyms. The three concepts, in fact, occupy different logical levels within the company and therefore must be managed and thought of in

different ways. One can say that strategy lies at corporate level, Business Model at managerial level and tactics at operational level. Let's analyze the three concepts in a deeper way:

**Strategy:** As Mintzberg (1994) notes, strategy can be seen in a backward-looking or in a forward-looking context. The ones who adopt the former approach normally consider strategy as a pattern of choices taken by the company overtime. Those who, instead, adopt the latter approach see strategy as a plan, as a position or as a perspective. "As a plan" conveys the idea that strategy is a view which will be reached through a set of choices; "as a position" recalls the aspect that strategy is about product/service positioning and "as a perspective" links strategy with the choices about how the business is conceptualized. All those definitions relate strategy with building competitive advantage. Moreover, strategies are contingent, meaning that they contain provisions about future events (e.g. competitors moves), which is not said will take place.

**Business model:** A Business Model can be seen as a collection of choices that allow to reach the strategy. According to this definition, different Business Models can be developed to address the same strategy. While every organization has a Business Model, it is not said every organization has a strategy. Business Models facilitate the analysis and validation of the cause-effects relationships that flow from the set of strategic choices. In other words, they are useful to check if the strategic choices designed are internally and externally coherent as well as self-reinforcing; if this doesn't happen, one or more strategic choices need redesigning.

**Tactics:** Changing strategic choices often requires a lot of efforts by the company. Nevertheless, companies, by virtue of the particular Business Model they are adopting, have still some residual choices to compete on that can be implemented easily, without additional costs. These choices are called tactics; every Business Model provides room for its own tactics to be deployed. Examples of tactics can be decisions about price/product features.

### 3.5 PROBLEMS OF BUSINESS MODELS

Provided it is properly designed, a Business Model can be an excellent tool in the hand of the company to analyze and communicate strategic choices to address company's vision defined at corporate level. Misusing the concept of Business Model can bring dangerous consequences for the company. Shafer et al. (2005), identified four main problems connected with Business Models, which stem directly from the definition of Business Model they give. They are:

- **Erroneous assumption about the future:** a robust Business Model cannot be based on untested assumptions about the future. Even if cleverly designed, in fact, the Business Model will be unlikely to work in the future context if its core logic is based on one or more assumptions which have not come true. Therefore, the first step to do after the design phase is to verify that cause and effects relationships resulting from the blocks are well-grounded. A second check will be related to prove internal consistency and mutual support of strategic choices. For example, a Business Model whose core logic is based on the assumption that, in the future, there will be a national standard network across wireless providers, will encounter serious implementation problems if this doesn't prove to be true.



For the assumption to be well-grounded, there must be signals confirming that it will effectively turn out reality (e.g. a governmental plan stating it).

- Limitations in the strategic choices considered: during the design phase, each single macro area of the Business Model (see fig.1) must be carefully defined. Should companies neglect to define one or more building blocks, unplanned constraints may arise which could also prevent the implementation of the whole Business Model. This is what happened to “Toys” in 1999 when it started selling its products online. The company just focused on customer acquisition and forgot to carefully plan the distribution channel. When the order placed online boomed, the company encountered serious problems of order backlogs, which damaged strongly the image of the company. This happened because not all the parts of the Business Model had been addressed.
- Misunderstanding about Value Creation and Value Capture: the concepts of Value Creation and Value Capture are distinct and companies have to treat them separately in order to survive. Sometimes it happens that executives just focus on the Value Creation side, neglecting the Value Capture; when this happens, companies are not able to reach the desired level of profitability even if their offer is very valuable. A problem of Value Capture happened to website “Yahoo”. The portal, in fact, has always offered a large range of services, including search engine, e-mail accounts, financial information, maps, etc; nevertheless, this value offered didn’t translate into creation of value for the company. The problem was that all of these services were offered free of charge; a strategy to increase the value captured had been that of adding “premium” services, like extra storage capacity for e-mail accounts or musical contents, for which customers have to pay in case of use. Those services yielded one third of total Revenues for fiscal 2003.
- Erroneous assumptions about the Value Network: the context in which companies operate nowadays is characterized by high levels of turbulence and unpredictability. As a consequence of this, Business Models which assume that the existing value network will continue unchanged in the future are likely to make a wrong assumption. Famous British oil company “BP” provided a good example of capability to adapt to changes in the context when supermarket chains started distributing fuel with their own brands. Unlike its competitors, which, as a reaction, started selling food within their gas pumps, BP locked up partnerships with the best supermarket chains under the premise that the oil company would manage gas retailing and the grocery company the food retailing along all the outlets in their joint network. This decision allowed BP to continue to survive in a sector whose dynamics were undergoing drastic changes.

### **3.6 OSTERWALDER’S CANVAS**

In Business Models literature, two authors surely worth mentioning are Alexander Osterwalder and Yves Pigneur. In their famous book “Business Model Generation” (2010), they provide their own interpretation of what Business Models are. Core aspects of the book are both the “Business Model Canvas”, a framework for describing, analyzing and designing Business Models and the “Business Model Patterns”, archetypes of Business Models adaptable to various business contexts.

The choice of following the framework proposed by these two authors as starting point of our research work was driven by various factors:

- It is the most widespread methodology about Business Model design and plenty of literature exist about it. This is symptomatic of the fact that the Canvas is effectively a robust framework;
- It is a very simple and straightforward approach to describe and assess Business Models.

The Canvas is for sure the most complete framework as it takes into account, directly or indirectly, all the building blocks that can be found in the methodologies proposed by other authors. According to the authors, whatever Business Model can be described using nine basic components, called “Building Blocks”, which explain how the company runs its business. Using the Building Blocks, one is sure to give a complete and exhaustive representation of the company, since they cover all the four paramount areas of a business: customer, offer, infrastructure and financial viability. The “Business Model Canvas” is nothing but a graphical representation of the collection of the Building Blocks; due to its user-friendly structure it represents the starting point for whatever analysis and/or change of a company’s Business Model. A typical representation of the canvas is shown in figure 7.

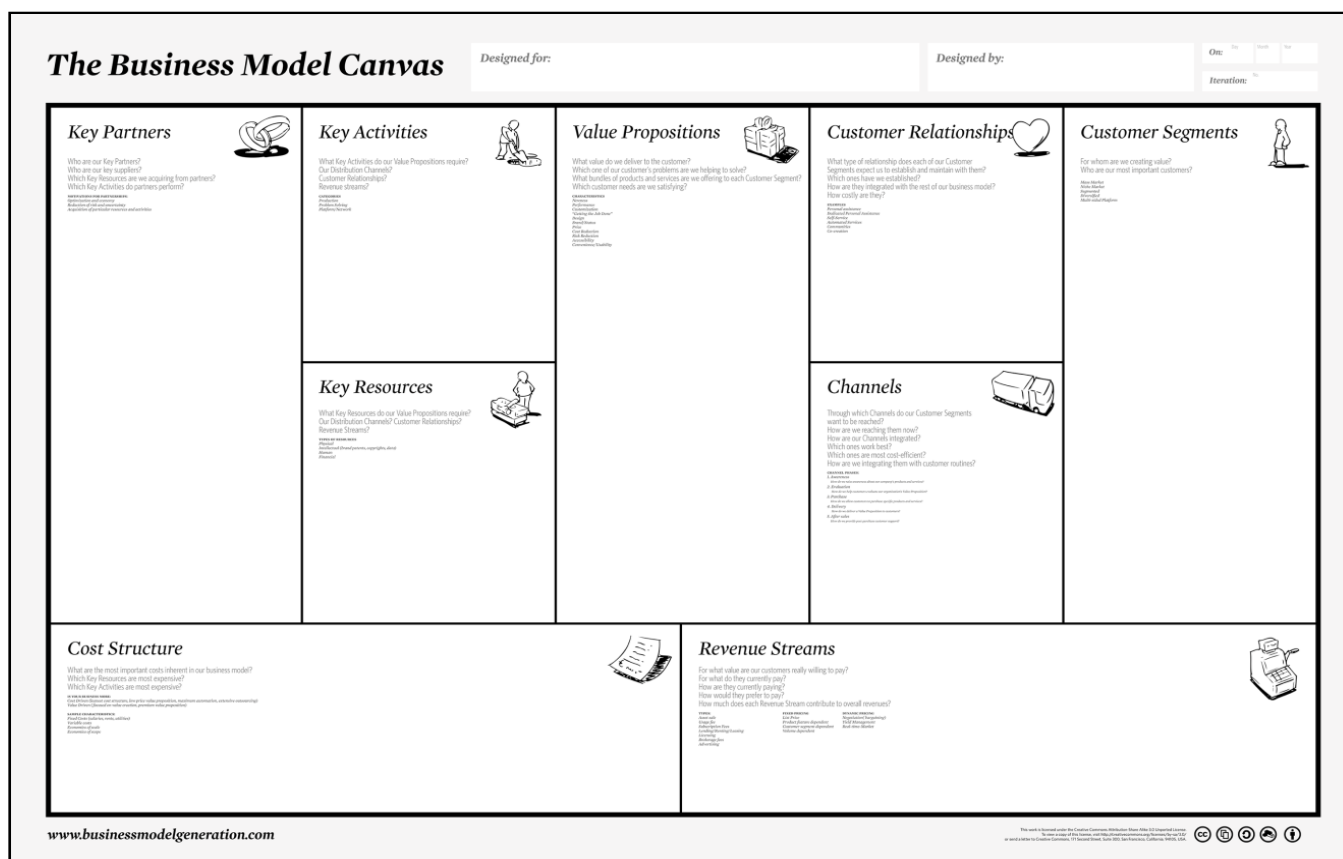


Figure 7 - The Business Model Canvas (Osterwalder and Pigneur, 2010)

The Canvas is divided in three macro areas:

- Left-side area, where all the blocks connected with the development of the product/service are located;
- Right-side area, containing the blocks concerning the management of the customer;
- Lower-side area, focused on company’s inflows and outflows of money.

The nine Building Blocks which constitute the Canvas are represented in figure 8:

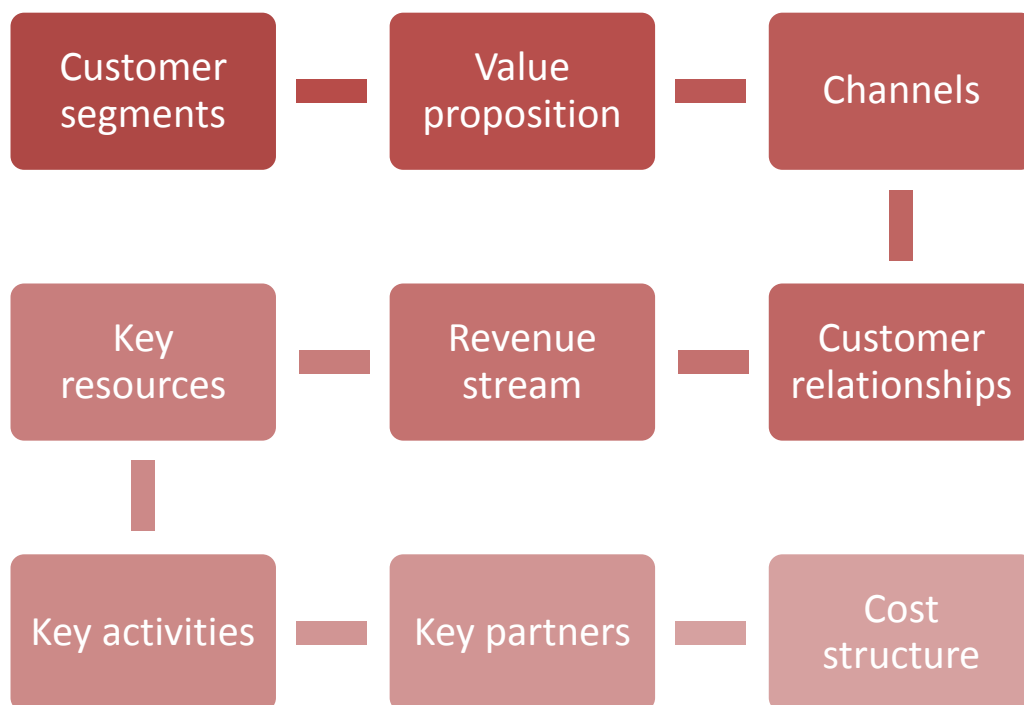


Figure 8 – Canvas' Building Blocks  
(Osterwalder and Pigneur, 2010)

### 3.6.1 Customer segments – for whom are we creating value?

This block specifies who are the target customers of the company. Customers are the direct recipients of the offer of the company as well as the source of profitability. They can be seen as the heart of any Business Model; in fact, should the company fail in understanding specific customer needs, it will encounter problems in capturing value from the product/service offered. Normally, at this stage, customers are grouped into macro-segments, which are collections of customers sharing the same needs, that can be satisfied by the same product/service.

The authors also provide examples of recurrent customer segments. These include:

- *Mass market*: in this case, company's offer is directed towards the whole market;
- *Niche market*: sub-segment with slightly different characteristics with respect to the segment in which it is contained;
- *Diversified*: very complex case, where the company serves two (or more) unrelated segments with totally different features;
- *Multi-sided platforms*: particular case, where the company serves two (or more) interdependent segments.

### 3.6.2 Value proposition – which value are we offering to customer?

This block defines what is the object of the offer that the company intends to deliver to its customer. It is the "promise" made to the customer, expressed in customer's language, without technical concepts.

Companies are to define a stable value proposition and ensure consistency in its delivery, in order to reach high customer satisfaction and retention rates.

Factors which can enhance customer value are:

- *Newness*: it happens when a company launch on the market a product/service which satisfy a need that, until then, had not even been expressed by the customer;
- *Performance*: it is related to the improvement in the performance of an already existing product/service;
- *Customization*: it is the lucky case in which a company is able to obtain the magical blend of internal efficiency and external effectiveness;
- *Design*: enhancement of value can also come from superior design of the product offered;
- *Brand/status*: these are two aspects coming from strategic positioning decisions of the company; once a desired level has been reached, efforts are to be spent in order to maintain it;
- *Price*: this is an important lever for contributing to value creation of customers; it is important the price strategy be coherent with price-sensitiveness level of customers;
- *Cost/risk reduction*: it is the case in which the company succeed in helping customers reduce the cost/risk connected with the purchases of the product/service;
- *Accessibility*: it is related to the breaking up of barriers (monetary, geographical, etc...) that previously prevented the product/service to reach a particular customer segment;
- *Convenience/usability*: value can be increased by improving convenience/easiness in using the product/service offered by the company.

### **3.6.3 Channels – through which channels do our Customer Segments want to be reached?**

This block describes what are the channels the company currently adopts to deliver its Value Proposition to customers. Channels constitute a very important block, since decisions taken at this stage will have impact on KPI of effectiveness (towards customers) like, for example, Delivery Time, Service Level (e.g. measured as accessibility of the purchase) and Customer Satisfaction (e.g. measured as quality of post-purchase support).

Since channels represent touch points with customers, strategies could be implemented to use channels as means to enhance customer experience.

The authors present two main taxonomies of channels:

- *Direct vs. Indirect channels*: it refers to the presence of intermediaries between the company and the customer;
- *Owned vs. Partner channels*: it refers to the claim of company's ownership rights on the channel.

Choices made at this level are not mutually exclusive; a company can choose to reach its customers using a direct channel, an indirect channel or a mix of both. Again, the channel(s) can be owned, partner or a mix of the two.

The choice of the optimal configuration is influenced by drivers like: margin levels (higher in owned channel), amount of fixed costs (generally higher in owned channel) and market served (generally broader in partner channel, even if the possibility of purchasing via web will probably make companies less dependent on partner locations).

#### **3.6.4 Customer relationships – what type of relationship do customers expect us to establish with them?**

This block states the types of relationships the company has put in place with its customers. Different customer segments require different kinds of relationships; therefore, the company should develop ad-hoc tailored relationships with each of the segments it serves, in order to enhance customer satisfaction and overall experience.

The main motivations pushing a company to establish such relationships are the need to acquire customers, the need to retain them and the need to boost sales.

Examples of ways a company can adopt to put in place relationships are:

- *Personal assistance*: it is the type of relationship where the customer can communicate with a real customer representative in case of need. The communication can happen face to face as well as through telephone, e-mail or other means;
- *Dedicated personal assistance*: it is a kind of very intimate relationship, where a customer representative is specifically dedicated to an individual client. Usually this client is a key one;
- *Self-service*: in this case, the company doesn't maintain direct relationships with customers, and it lets customers help themselves providing all necessary means;
- *Automated services*: this relationship is a mix of customer self-service and automated processes. Automated services recognize customer tastes and give them advice about product/services;
- *Communities*: Tools allowing customers to exchange opinions and solve problems related to products/services offered.  
This stream of knowledge can be used by the company to improve the level of understanding of customer needs;
- *Co-creation*: It is a new kind of relationship, made possible thanks to the use of internet. It is about involving customers in the design and/or advertising of a product/service.

#### **3.6.5 Revenue streams – for what value are our customers really willing to pay?**

This block represents the revenues the company is able to get from offering the product/service to its customers. The essence of this stage is to define the proper price level, which is the one allowing the company to capture the highest value from the product/service offered. The price can be fixed (list price) or dynamic (e.g. auctions, negotiation, yield management). Revenue Streams can be divided into transaction revenues (resulting from one-time payments) and recurring revenues (resulting from on-going payments or post-purchase support).

The authors provide a list of ways to generate revenues:

- *Asset sale*: it is the most classical revenue stream and it derives from transferring to the customer the ownership rights on a product;
- *Usage fee*: it is the revenue stream coming from the usage of a particular service;
- *Subscription fees*: they are similar to usage fee, but here customers have to pay, periodically, a forfeit amount to use the service;
- *Lending/renting/leasing*: revenue stream coming from the fees a customer has to pay by virtue of having exclusive right to use a particular asset for a particular time frame;
- *Licensing*: revenue stream coming from granting a customer the possibility to use an asset (usually intangible) protected by patent;
- *Brokerage fees*: revenue stream coming from offering intermediation services performed on behalf of two parties (e.g. real-estate brokers);
- *Advertising*: revenue stream deriving from advertising a particular product/service in a space (physical or also temporal) which belong to another entity.

### **3.6.6 Key resources – what key resources do our business require?**

This block provides a description of the most important resources a company relies on to run its business in a profitable way. In particular, the key resources accomplish the function of developing and offering the Value Proposition to customers, as well as maintaining stable relationships with them, reaching the market and capturing value from it.

A common classification of key resources divide them into:

- *Physical*: these assets are mainly capital intensive in nature, and include manufacturing facilities, buildings, fleet of vehicles, machines, points-of-sales (POS) and distribution network;
- *Intellectual*: this group of resources is very crucial for a company, because it is difficult to develop; nevertheless, once fully created, it can contribute to increase company's source of value. Intellectual resources are rarely object of spillover from competition; among all, we can name Brands, Customer databases, Patents and Proprietary knowledge as the most relevant ones;
- *Human*: every company needs an endowment of human resources to run its daily activities. There are industry sectors, like the knowledge-intensive ones, where human resources are particularly crucial because they have to provide high skills and creativity and need constant formation. In other sectors, instead, like in the labor-intensive ones, workforce is less important and easily interchangeable;
- *Financial*: these resources include cash, lines of credit or stock options for hiring key employee. A company can borrow financial resources from banks or other institutions with the aim of offering leases to customers, thus ensuring that orders are placed with the company rather than with competitors.

### **3.6.7 Key activities – what key activities do our business require?**

This block focuses on the definition of the core operations the company must do in order to survive in the business environment maintaining its competitive advantage. As for key resources, key

activities are connected with the development and offer of the Value Proposition, the establishment of relationships with customers and the capture of value from the market. Key activities require different levels of skills to be carried out, according to the industry sector: in knowledge-intensive sectors, key activities require the use of intellect, whereas in labor-intensive sectors, key activities are very standardized and easy to carry out also from less specialized workers.

Key activities can be categorized as follows:

- Production: activities related to development, production and delivery of products, typical of manufacturing firms; normally, they can be easily traced back to standard procedures;
- Problem solving: activities which require a certain degree of knowledge and skills to be carried out. These are difficult to standardize, because they are related with finding solutions to individual customer problems;
- Platform/network: activities that need to be done by companies which are designed with a platform. These activities relate to platform management, service provisioning and platform promotion.

### **3.6.8 Key partnerships – *who are our Key Partners?***

This block defines who are all the suppliers and partners the company relies on to run its business. Suppliers are an important category, as they provide the company with all necessary inputs to start and carry on production activities; subcontractors are a particular kind of suppliers helping the company when additional production is needed to satisfy demand. For what concern partnership, instead, we can distinguish between:

- Strategic alliances between non-competitors;
- Strategic alliances between competitors (coopetition);
- Joint ventures: to develop new products;
- Buyer-supplier relationships;

It is vital for companies to engage in relationships with partners, as this allow to optimize their business model (e.g. exploitation of economies of scale), reduce the supply risk (on both customer and supplier's side) and benefit from particular resources typical of the other party. In order for a partnership to work, both parties must be willing to share their knowledge and relevant information; normally these relationships last for a medium-long (3-5 years) time span.

### **3.6.9 Cost structure – *what are the most important costs inherent in our business model?***

This block details all the costs the company has to bear to run its business model. Creating and delivering the Value Proposition, establishing and maintaining relationships with customers and generating revenues are all activities the company has to pay for. We can distinguish between business contexts where it is essential to minimize costs wherever possible, and other where this necessity is not so paramount. This leads, respectively, to two types of Business Models: Cost driven and Value driven.

- Cost-driven Business Models: they are focused on cutting costs wherever possible. This can be achieved by massive automation, reducing expectation about the Value Proposition and extensive outsourcing;
- Value-driven Business Models: they concentrate on deliver “Premium” Value Propositions rather than keeping low the cost implications of the strategic choices. Normally, these business models are characterized by offering highly personalized products/services where exclusivity is the common denominator.

### **3.7 APPLICATIONS OF THE CANVAS**

The Canvas is a very a flexible instrument with an user-friendly interface. Due to these characteristics, it has been applied to a lot of Business sectors, proving to be very useful for:

- Easily illustrating how some counter-intuitive paradigms used nowadays (e.g. Freemium model) have, indeed, financial sense;
- Planning the exit process of business owners from their companies in a way that ensures future success;
- Showing to members involved in a project the “big picture” (strategy), their roles in it and their interdependencies;
- Translating Business Plans into Business processes;
- Reminding teams to think holistically about their business and not to get stuck on details;
- Making the move from a budget driven governmental institution to an entrepreneurial value-adding organizations;
- Conducting reality checks for new startup companies.

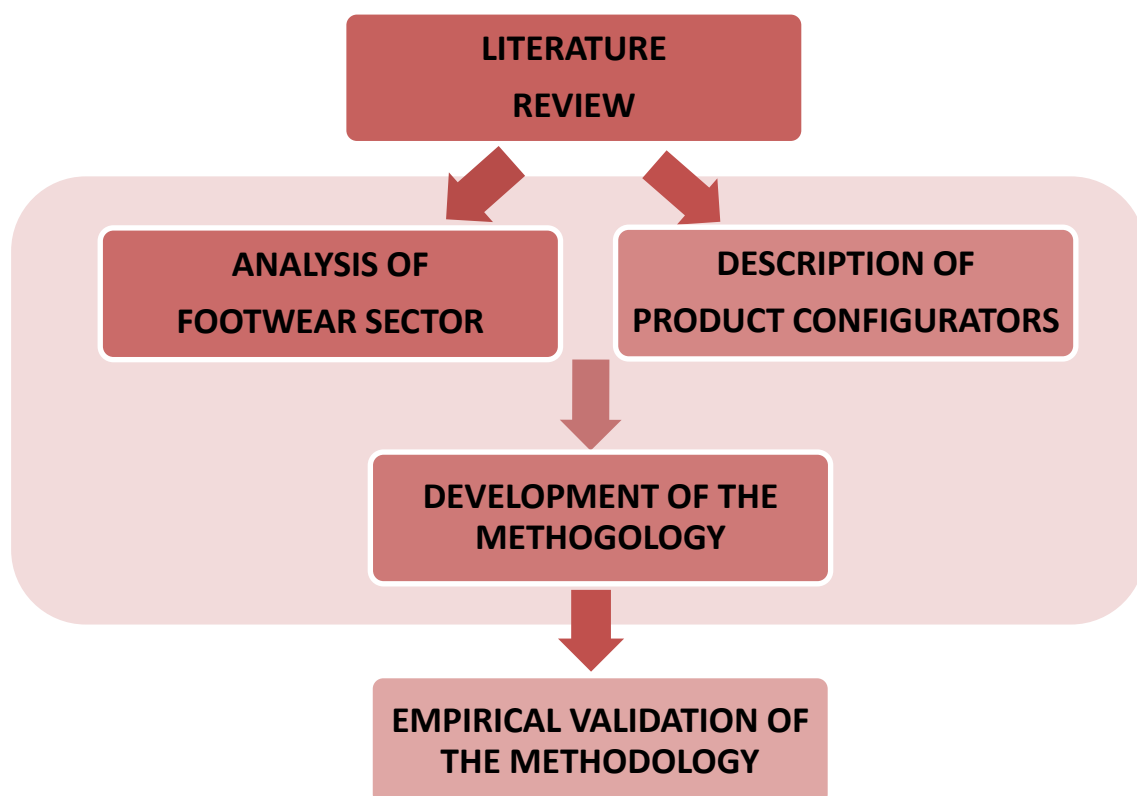


## CHAPTER 4 - EVOLUTION OF THE BUSINESS MODEL AFTER THE INTRODUCTION OF A PRODUCT CONFIGURATOR: PROPOSAL OF A METHODOLOGY FOR THE FOOTWEAR SECTOR

### 4.1 Introduction

This chapter constitutes the innovative part of the thesis, whose output is the definition of a methodology to support enterprises operating in footwear sector to approach Mass Customization through a product configurator, and assess the impacts on Business Model after its implementation.

The steps needed to developed the methodology can be summarized in following schema:



After a literature review made in the previous chapter to introduce the concepts of Mass Customization and Business Model, the innovative part of the work has been developed, structured in two main steps:

- The first step is a preliminary analysis concerning the main concepts the methodology is based on; it is constituted by two parts, carried out in a parallel way:
  - the first, related to the chapter 4.1, focuses on the footwear sector, which is the one this thesis is based on; information have been collected from reliable documents and reports published on the websites of enterprises operating in footwear sector (i.e. [www.rightshoes.ch](http://www.rightshoes.ch), [www.valuelab.it](http://www.valuelab.it), etc.);
  - the second, related to the chapter 4.2, focuses on product configurators, being one of the most used tools enabling Mass Customization implementation.

Being the theory of product configurator recently developed and not yet consolidated in literature, two interviews with experts in this fields were necessary to collect detailed information useful to define the methodology.

The first was organized with Marco Lotti, computer Engineer and General Manager at “Configuratori.it”, a company developing configurator solutions.

The guidelines followed to carry out the interview were:

- Definition of product configurator;
- Description of product configurator functions;
- Classifications of product configurators;
- Features of each type of product configurator;
- Analysis of product configurator in footwear sector;
- Drivers influencing shoe manufacturing companies in the selection of a product configurator rather than another one.

The second interview, instead, was carried out via e-mail with Eng. Gian Angelo Gemignani, computer engineer specialized in the field of configurators and was mainly focused on the definition of the architecture of product configurators.

- The second step, related to the chapter 3.3, refers to the development of the methodology supporting shoe manufacturing companies in Mass Customization implementation: it provides guidelines to choose the most appropriate product configurator, with respects to company’ strategies needs and it assesses the resulting “to-be” business model following its implementation;

Finally, in the next chapter, the methodology will be applied on a real case to be empirically validated.

## **4.2 ANALYSIS OF FOOTWEAR SECTOR**

### **4.2.1 Evolution of footwear sector: from mass production to mass customization**

During years the footwear sector has deeply changed: traditionally, during the time of craftsmanship, the main role was covered by the manufacturer; supply chain was entirely in his hand, since he was in charge of designing, manufacturing, selling and distributing shoes. He was able to realize high product variety but in small quantity.

Later, the supply chain started extending and changing: new figures arose, like retailers and distributors, and the first manufacturing companies were built, as demand of shoes started increasing. In order to satisfy higher volumes, product variety needed to be reduced. It was the epoch of mass production.

The retailer has always had a paramount role. Being the one in charge of determining what to sell and at which price, he was the only one covering an active role in the transactions. Customers, therefore, had no bargaining power and were obliged to passively accept the conditions defined by the vendor and to choose among pre-defined models, without possibility of personalization.

Customers were considered as a whole group, constituted by many anonymous individuals, without any identity. Transactions costs associated to them were minimum, since customers were easy replaceable; for this reason, the objective was trying to maximize the number of single transaction rather than creating stable relationships based on collaboration with customers.

In recent years the scenario has changed again: people have started appreciating the uniqueness and exclusiveness and the “one size fits all” model has become out of date. Shoe manufacturing companies were forced to adapt to this change by offering the possibility of creating customized shoes.

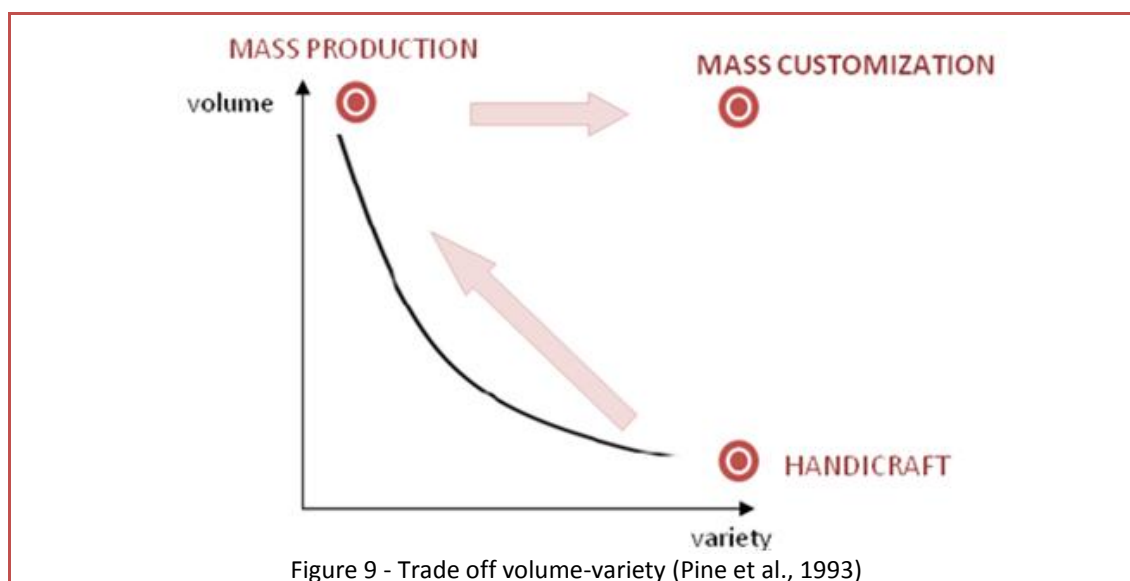
This idea was possible to achieve thanks to mass customization, which tried to solve the trade off volume- variety: no longer small volume like in handicraft market or low variety like in mass production; mass customization aims at realizing high volume in high variety, in order to satisfy as many customers as possible, by allowing them to create shoes according to their preferences. Differently from handmade products, which are characterized by high production costs due to the lack of technologies, mass customization allows to realize customized shoes at low prices, low volume and high variety, thanks to the *flexible industrial production* it is based on.

The management policy had to change, too: from *make to stock*, as it was in the traditional approach, to *make to order*, which means producing after customer order has been received, so to be customer oriented.

The evolution which took place in the footwear sector brought many changes: from simple passive subject, customer started acquiring an active role, becoming the so called *prosumer*, and he was given the possibility of influencing the production process, by allowing him to collaborate with the company and express preferences about the product he was going to buy.

Thanks to mass customization, customers can create shoes according to their preferences: in this way, customers feel themselves important since they will buy an exclusive product, personally created according to own preferences. Each transaction is considered therefore as unique, based on collaboration with customers, with the aim at assuring customer satisfaction and fidelization.

This evolution can be represented in figure 9:



In the table 4.1 and 4.2, the main differences between the traditional and the Mass Customization approach are summarized:

<b>TRADITIONAL approach</b>
<ul style="list-style-type: none"> <li>- Focus on single transaction transactions;</li> <li>- The retailer only plays an active role in the transaction; customer are passive, without bargaining power;</li> <li>- No customer relationship: customer are obliged to accept the conditions defined by the vendor;</li> <li>- Shoes models are pre-defined, without possibility of personalization;</li> <li>- Object is to maximize the number of transactions rather than creating stable and long term relationships;</li> <li>- Feedback after sales are not relevant and customer satisfaction is not monitored;</li> <li>- Customer loyalty/fidelization are not relevant since customer are easily replaceable</li> <li>- Market is constituted by many anonymous and replaceable customers, with very few transaction costs associated;</li> <li>- Focus on selling as much as possible to whatever customers, to increase market share;</li> <li>- <i>Make to stock</i> management policy;</li> </ul>

Table 4.1 – Features of traditional approach

<b>MASS CUSTOMIZATION approach</b>
<ul style="list-style-type: none"> <li>- Focus on customer relationships</li> <li>- Customer plays an active role in the purchasing process: no longer passive but proactive actor, the so called <i>prosumer</i> ;</li> <li>- Customer relationships are established, in order to favor the collaboration between company and customer over time;</li> <li>- Shoes can be personalized according to customer need;</li> <li>- Each transaction is treated as unique, since every customer contributes to generate value for the company;</li> <li>- Company cares of the feedback after sales, in order to monitor customer satisfaction;</li> <li>- Object is to reach customer loyalty and fidelization for company's success;</li> <li>- The purpose is to satisfy a precise customer, whose identikit and preferences are well defined;</li> <li>- Focus on selling as much as possible to a loyal customer, to increase <i>customer- share</i> rather than <i>market share</i>;</li> <li>- <i>Make to order</i> management policy;</li> </ul>

Table 4.1 – Features of Mass Customization approach

#### 4.2.2 Enablers of the evolution

This evolution was mainly influenced by three main factors, defined in figure 10:

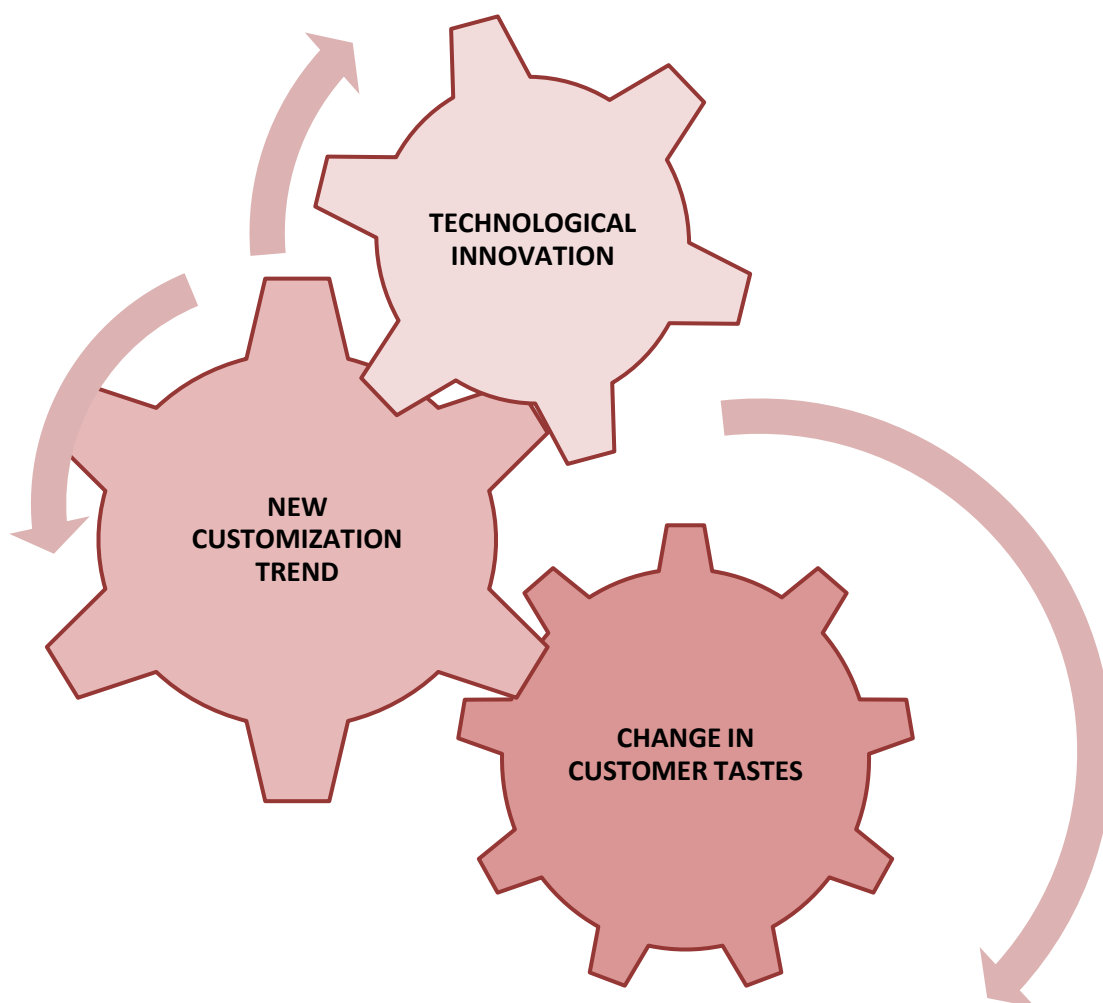


Figure 10 – Enablers of the evolution

- **TECHNOLOGY INNOVATION**

Thanks to the technology innovation customers are more digitalized: Internet can be easily accessed from many devices, like computers, cell phones and tablet (see figure 11), wherever and whenever; people can communicate and receive information from every part of the world, in a very cheap and quick way. Life has become easier and faster: this reflects the development in technology.

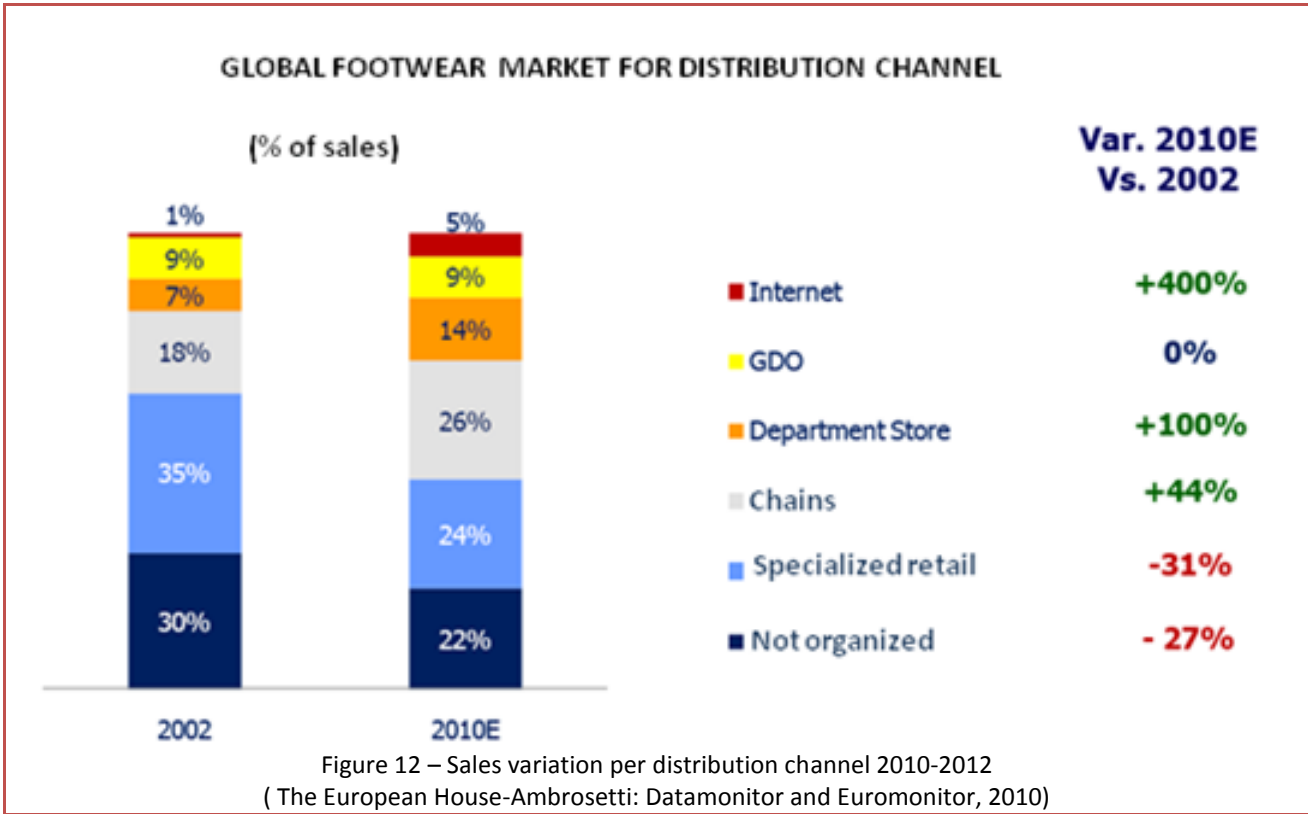
Technological innovation combined with its relative cost reduction allowed informative system to become a source of companies' competitive advantages.

Communication and information technologies, in fact, by increasing the flexibility of production systems, allowed to implement *mass customization*: this is the reason why customers can purchase personalized products, created according to their preferences at relative low costs, differently from what happened in the past, where customized products were expensive and not affordable by the majority of people.



Figure 11 – Example of nowadays technological devices

This fact contributed to increase the web sales, even in footwear sector. As shown by figure 12, from 2010 to 2012 web sales have increased by 400% and Internet has become the most accessed distributional channel. This is the reason why many companies located the shoe customization process online.



Moreover, also the diffusion of blogs (see figure 13) and social networks (see figure 14) allowed companies to better communicate with customers, to know how many fans the brand has, to address specific advertisements to the right target, to share information and to promote new collections. Also the online communities have become a fundamental source of information, where

it is possible to directly read customers' opinions and collect their suggestions, feedback after sales and complaints.

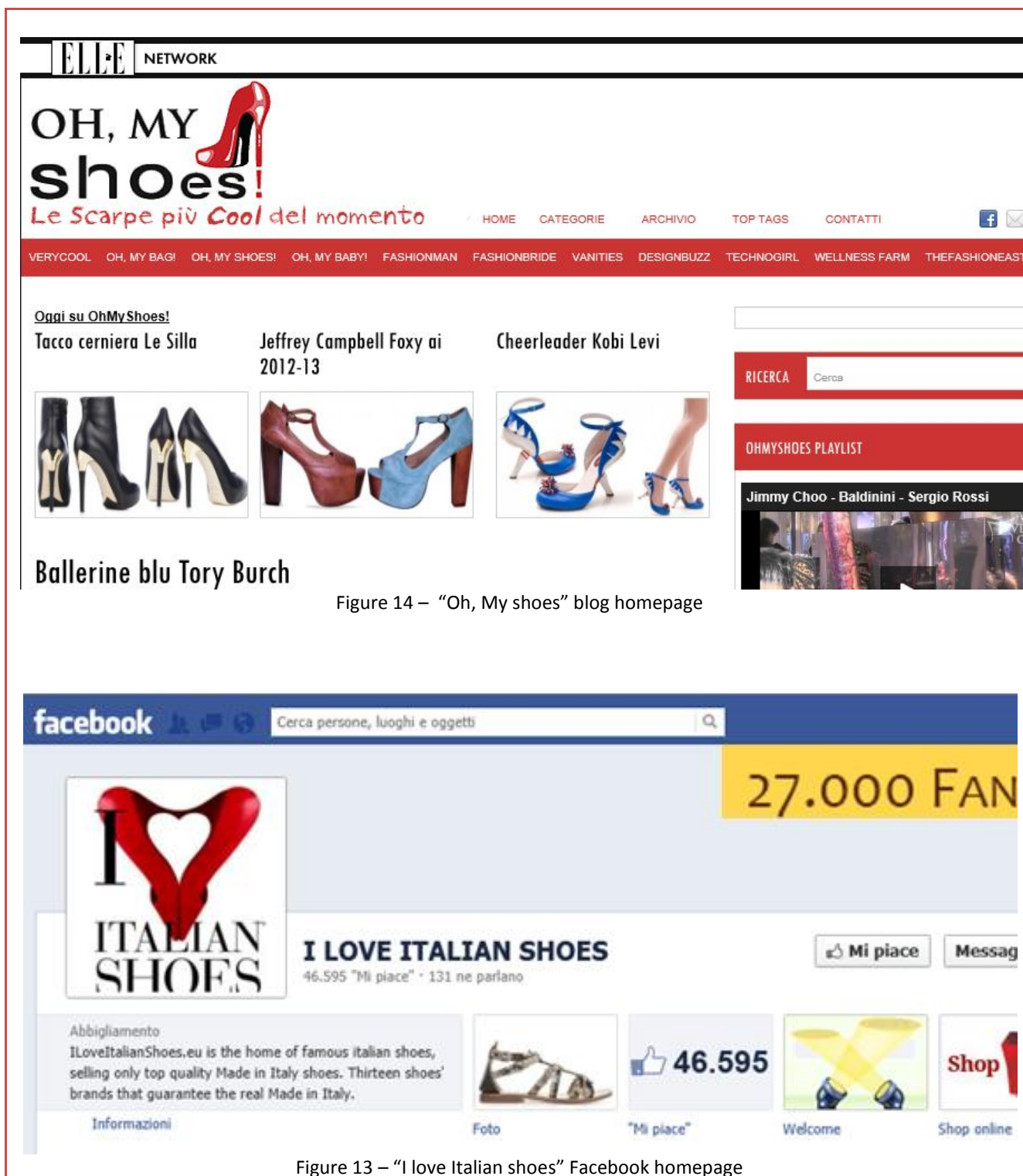


Figure 14 – “Oh, My shoes” blog homepage

Figure 13 – “I love Italian shoes” Facebook homepage

- **NEW CUSTOMIZATION TREND**

More and more companies have recently started offering the possibility of customized product, and this trend has affected many sectors. Figure 15 shows some of the customizable products, taken from the relative websites, which have been recently offered in the market:

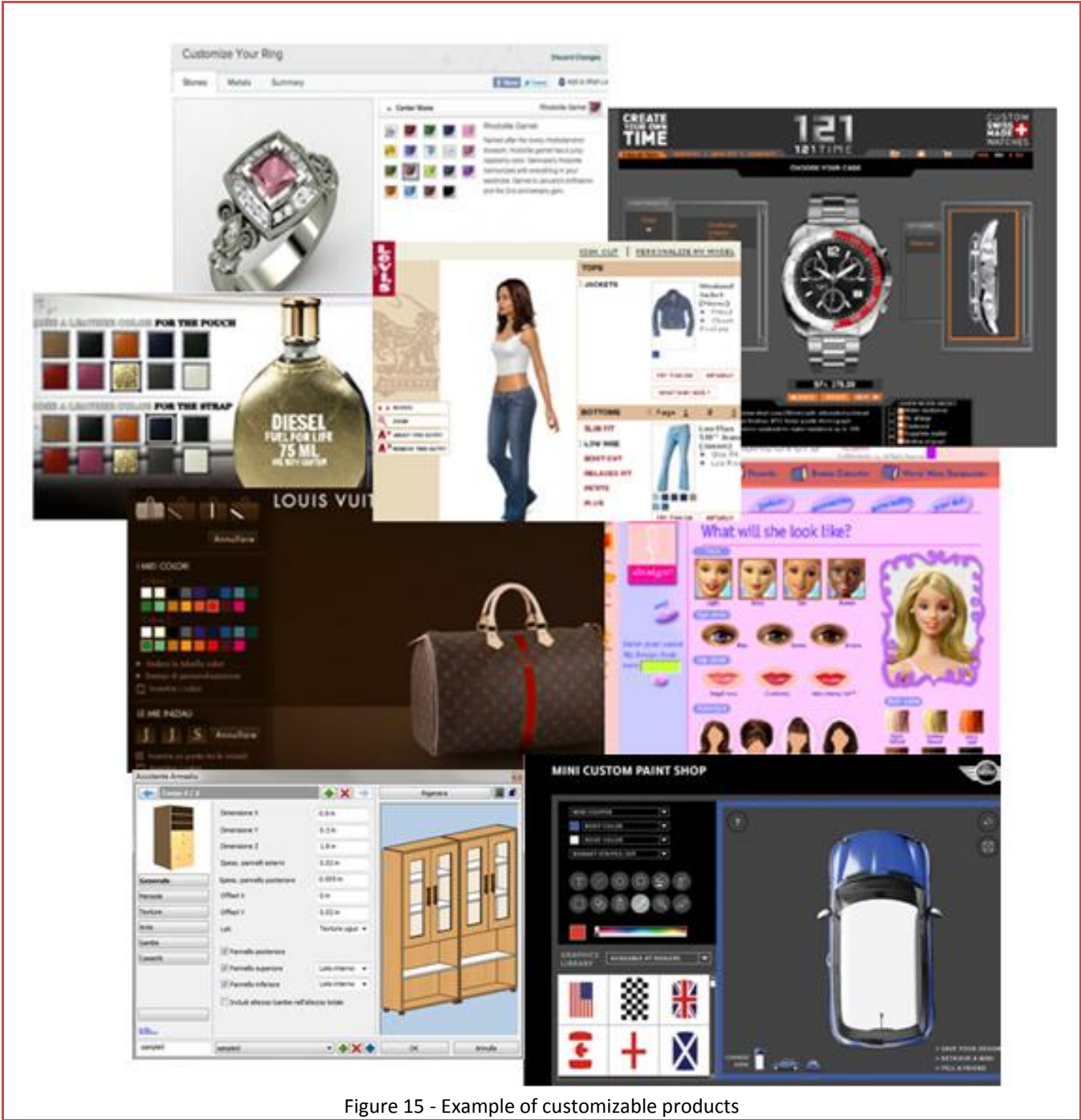


Figure 15 - Example of customizable products

In particular, this trend affected also the footwear sector, where the competition started increasing first of all among the most-known shoe manufacturing multinational companies (i.e. Nike, Adidas, Converse) and, later, it pushes also small-medium companies all over the world to adapt to this trend in order to remain competitive.

Nowadays, it is possible to purchase several models of customized shoes, for all ages and whatever occasions.

Some examples are shown in figure 16:



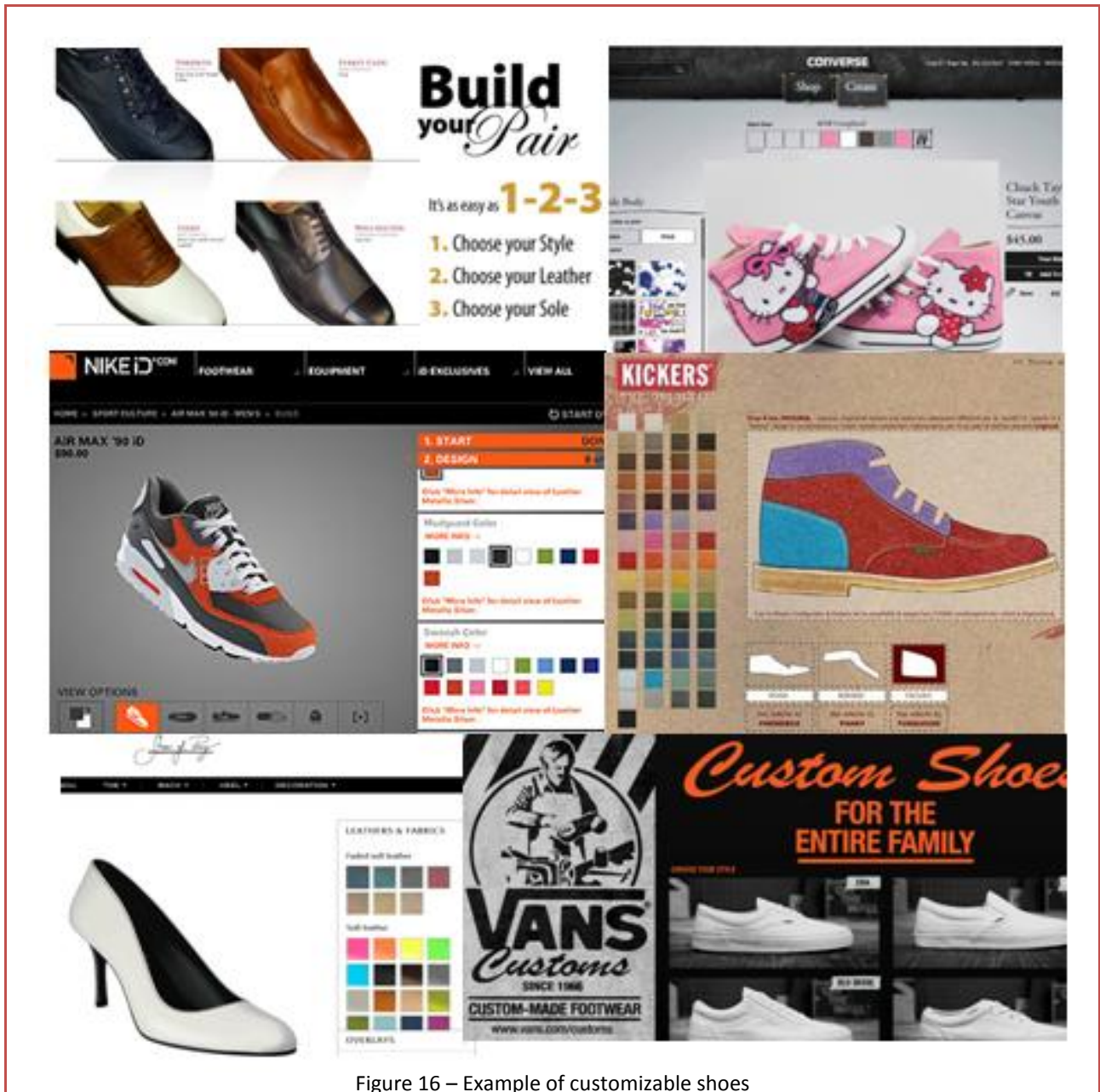


Figure 16 – Example of customizable shoes

- **CHANGE IN CUSTOMER TASTES**

The failure of the "one size fits all" model that became out-of-date; customers nowadays are more informed and diversified, they are looking for exclusiveness and variety in order to differentiate themselves from the others. They want to be treated as unique and they are willing to pay for this. This the reason why also the footwear sector had to adapt to this change in customers' mind and tastes; shoes are no longer seen as a simple item to wear, common to everyone. Conversely, they are now considered to be something special, one of the first things people look at, able to describe the personality and tastes of people.

For these reasons, people are nowadays given the possibility of personalizing shoes, on the basis of their preferences and what they want to communicate to others: in this way, purchase is no longer a passive process, but becomes an unique shopping experience.

## **4.3 DESCRIPTION OF PRODUCT CONFIGURATORS**

### **4.3.1 Introduction**

One key competitive variable of nowadays' markets is the capability to offer customers exactly what they require. As a consequence of this, companies' focus can no longer be "what" to produce, but it should be "how" to make the customization of the offer a viable reality.

The main result of this tendency is *Mass Customization*, which is a collection of practices allowing the company to increase the variety of products offered keeping high levels of efficiency (low costs) and effectiveness (time, quality, etc.).

Among all the tools which contribute to a practical implementation of Mass Customization, information systems and, in particular, configuration systems turned out to be the most useful technologies.

Configurators are relatively new tools. As a consequence of this, no exhaustive literature exists yet about this topic. Most of the information provided here come from an interview with Eng. Marco Lotti, general Manager at "Configuratori.it", a company which develops configuration solutions in both B2B and B2C environment. Another important source of information was the blog edited by Gian Angelo Gemignani, computer engineer expert in the field of configurators.

### **4.3.2 Definition of product configurator**

The product configurator is a particular software belonging to the family of tools supporting the management of product varieties which allow, according to established criteria, to define a product which is the result of a given combination of components, characteristics or functions selected by the user.

The configuration process is usually a guided procedure constituted by different steps, because various are the features of the product which can be customized. The product configurator is a highly interactive tool where users can customize product visually; every time a change in one or more features occurs, the result should immediately be displayed. Usually, users start from a basic model that will be personalized during the following phases.

This interaction that customer has with the product is highly involving and offers the certainty of having a unique and exclusive product.

### **4.3.3 Time and costs for a product configurator**

Since the development of each configuration solution is tailored on specific company's needs, it is almost impossible to generalize about the amount of time required and the costs to be committed in order to get a configurator.

The time required for the implementation of a configurator normally depends on the "complexity" of the solution required by the company and on the state of the art of company's informative system. Intuitively, the higher the complexity of the requests the software house needs to translate into functionalities of the configurator, the higher will be the time needed to develop the software. Similarly, if company's informative system is quite obsolete and low integration exists among modules, the time required to develop the configurator will expand. As a guideline, one can say

that the lead time for the implementation of a configurator may take from three up to eighteen months.

The costs that a company has to bear when introducing a product configurator are detailed in table 5:

<b>Software development</b>	<ul style="list-style-type: none"> <li>• depends strongly on the functionalities offered by the configurator</li> <li>• doesn't depend on the number of machines where the software will be installed</li> <li>• una tantum cost (investment)</li> </ul>
<b>License cost</b>	<ul style="list-style-type: none"> <li>• fees due by the company to the software house which developed the configurator</li> <li>• proportional to the number of machines where the configurator will run</li> </ul>
<b>Maintenance cost</b>	<ul style="list-style-type: none"> <li>• cost related to operations of software maintenance</li> <li>• normally a maintenance contract is established with the software house that developed the configurator</li> <li>• fixed cost of about 18% of license costs</li> </ul>

Table 5 - Relevant costs of a product configurator

In addition to these, other costs that might arise are:

- Hardware costs: they are related to the purchase, installation and maintenance of the hardware where the configurator will run;
- Personnel costs to support customer during configuration process.

Note that these costs are not directly connected with the configurator “*per se*”, but might occur, in particular cases, as a consequence of its implementation.

#### 4.3.4 Types of product configurator

Concerning the product configurators, we will concentrate on two main classifications:

- The first one is between “In shop” and “Online ”configurators, referring to where they are located (see figure 17):



Figure 17: First classification of product configurator

- **IN SHOP** configurators, as the word suggests, are installed within customer touch points (e.g. retailer outlets or company owned shops) and normally are used by qualified personnel. The customers willing to buy a personalized item ask the shop assistants who guide them through the whole process of configuration. This kind of configurator enhance the value of customers' shopping experience, as the presence of assistants gives them the perception of being more followed during the purchasing process. This solution is particularly suited when the customization space is very wide (e.g. a lot of features to be selected); in this case, it is necessary the presence of an expert user to prevent customers from getting lost during the configuration process, thus avoiding the risk of them giving up the purchase. Moreover, when the target customer is a "non-digitalized" category (e.g. senior customers) this kind of configurator is for sure the most effective one. In case this solution is implemented, besides the normal costs for a configurator, the company may need bearing additional costs like those related to the purchase of the hardware where the configurator will run and to the hiring of additional personnel.

Pros and cons of an in shop configurator are detailed in table 6:

PROS	CONS
Higher level of assistance	Limited time for customers to entertain themselves in the configuration process
Customization space can be wide	Generally higher costs
No need for companies to develop a web strategy	No expansion of the market reached
	Service available during opening hours of shops
	Brand awareness must be high enough to justify the investment

Table 6 - Pros and Cons of an in-shop configurator

- **ONLINE** configurators, on the other side, are not located within shops but are present in company's website. Normally, they are associated with an e-commerce module in order for customers to finalize the purchase. Unlike the in-shop solution, customers are left alone during the configuration process; if this aspect has pitfalls, like the lower level of assistance given to customers, it has also positive aspects, since customers can entertain themselves as long as they want in the configuration process, something which is not possible inside shops. In addition, the internet allows to increase the number of potentially interested customers reached by the offer and breaks down barriers related to the timing of the purchases, as one can shop 24h/24. This solution is particularly suited in case the target customer is represented by an "digitalized" category, made up by people familiar with the internet, like young adults and adults. The online configurator, in addition, can be implemented even by companies with a low brand awareness (e.g. start-ups) or whose outlets are not enough in number to guarantee a satisfying coverage of the service. An important advantage of this solution is that companies don't face both the cost of purchasing the hardware to be installed throughout the shops and the personnel cost to support the configuration process. Pros and cons of an online configurator are detailed in table 7:

PROS	CONS
Customers can entertain themselves as long as they want in the configuration process	Lower level of assistance
Generally lower costs	Customization space should not be too wide
Expansion of the market reached	Companies have to conduct a strong web strategy
Service available 24h/24	
Can be implemented even in case of low brand awareness	

Table 7 - Pros and Cons of an online configurator

- The other taxonomy is based on the functionalities offered by the configurator. Three types of configurators can be identified in figure 18:

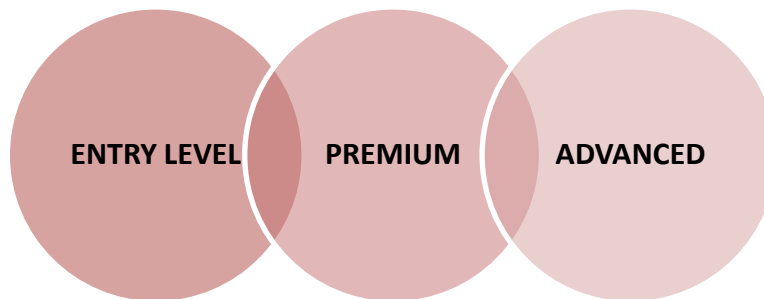


Figure 18: Second classification of product configurator

- **ENTRY LEVEL:**

This type of system is improperly referred to as a configurator, even if no possibility of customization is actually provided. This tool is just an “illustrator”, whose main role is to display product catalogs and, if integration with e-commerce module exists, it allows the finalization of the purchase via the web. Customers have no possibility of customization of product’s parts at all; typically the only space of intervention left to the users consists in the specification of macro characteristics of the item (e.g. size and color in case of cloths/accessories, Giga byte of memory in case of laptops, etc...). If installed within shops, this device has the important function of showing customers models which are temporarily unavailable because they ran out of stock; if interested, customers can put the order for the missing model. This function allows for reduction of stock levels within shops, with considerably costs savings. Nevertheless, benefits deriving from this aspect should be weighted with pitfalls, consisting in a lower availability of product for the customer. Due to the limitation in the functionalities offered, the entry level is the cheapest model of configurator. One example of illustrator (see figure 19) could be a common product catalogue with possibility of purchasing.

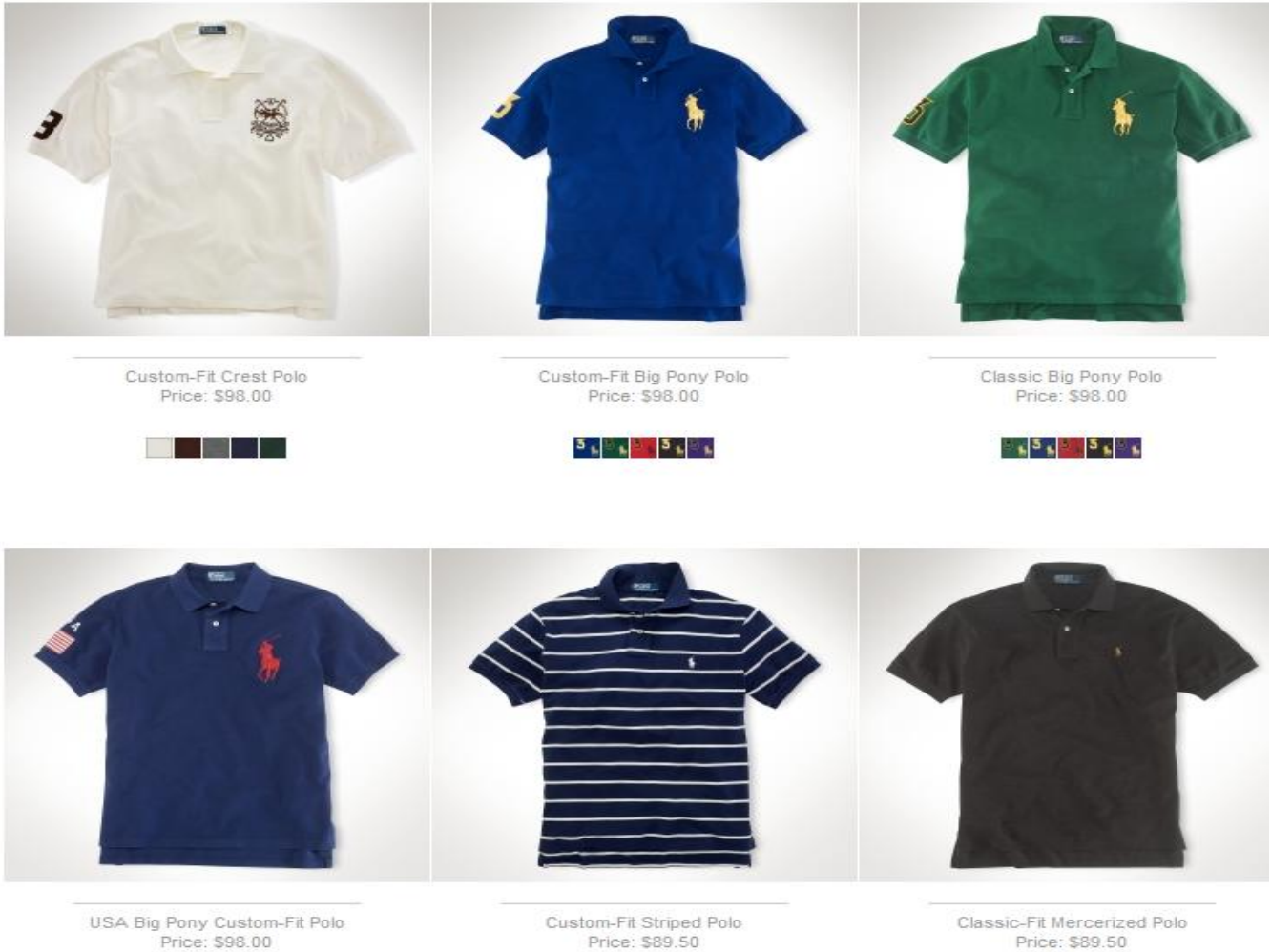


Figure 19 – Ralph Lauren configurator

○ **PREMIUM:**

This model is a step further with respect to the entry level, as it offers the possibility to customize the features of the product within the solution space provided by the company. Typically, the product is assembled starting from standard modules whose features can be defined by the users according to their preferences. Customers have the impression of creating their own product; in reality this is not the case, as the output will be one of the “n” possible combinations that can be obtained by playing around with the options provided in the customization process. A few relevant technical features provided by this type of configurator are: dynamic image (shown in many views), possibility of rotation of the object (especially relevant in case of clothing/accessories) and possibility of saving different customized models. One example of this tool could be the configurator developed by Chocomize to customize chocolate (see figure 20).



Figure 20 – Chocomize configurator

○ **ADVANCED:**

This is the most evolved and expensive type of configurator. The main differences with respect to the premium model lie both in the customization possibility and in the technical features. This kind of configurator allows for a higher degree of customization, as the product can be further personalized by adding some extra features defined by the customer. In a certain sense the user now becomes, partially, a co-creator of the product. In addition to the features of the solution space, in fact, requests of users concerning additional unplanned features to be added are now taken into consideration. Concerning the technical aspects, this type of configurator marks a difference with the premium model, due to higher performance offered in terms of quality of image, number of product views displayed, deepness of zoom, etc. This model of configurator is normally fully integrated with company's operative system, a thing which improves the speed and quality of processes and contributes to make the cost of the tool rise. One example is Porsche configurator, where features can be selected in a very detailed way (see figure 21).

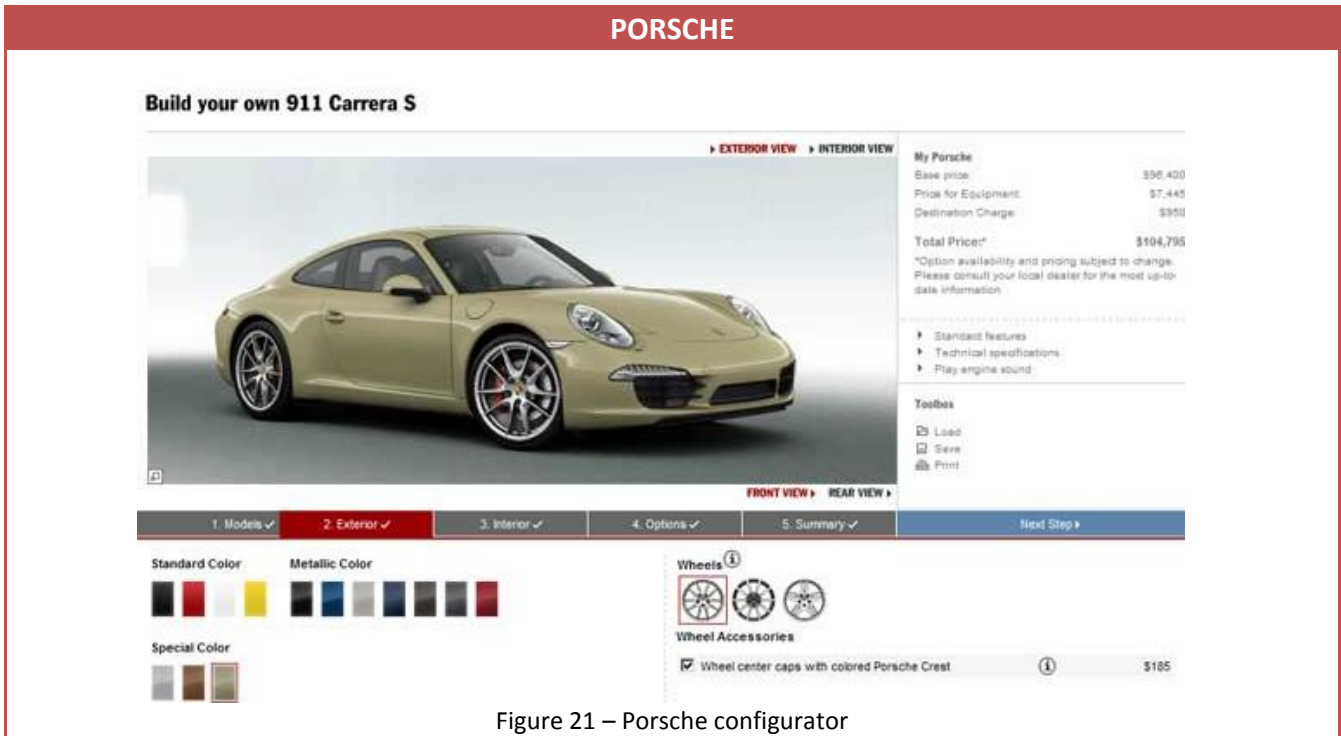


Figure 21 – Porsche configurator

### 4.3.5 Architecture of a product configurator

The architecture of a product configurator is based on four main elements: the user interface, the application server, the web server and the database. It is illustrated in figure 22:

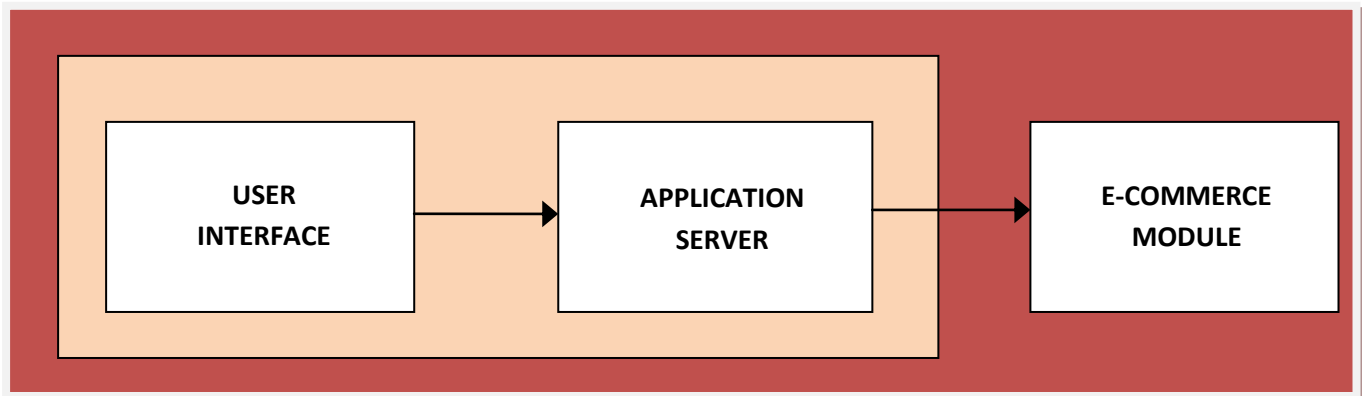


Figure 22 - Architecture of a product configurator

- In shop
- Online

- **User interface:** the user interface, also called Graphical User Interface (GUI) is the graphical module through which the customer can accomplish the configuration process. Put simple, it is the presentation layer of the configurator, which allows the user to interact with it using images rather than text commands. All the actions the user can make happen through direct manipulation of graphical elements (icons); this contribute to make the configuration process more involving and realistic. This module can be developed using different programming languages and architectures. For what concerns product configurators, the



GUI is developed in HTML+CSS+Javascript, Java, Actionscript or Flex, as a consequence of the fact that the execution environment of the application will be the web browser (Internet, Safari,...). One of the most challenging issues for software houses is to develop interfaces which are as much user friendly and easy to use as possible. An example of Graphical User interface is shown in figure 23:

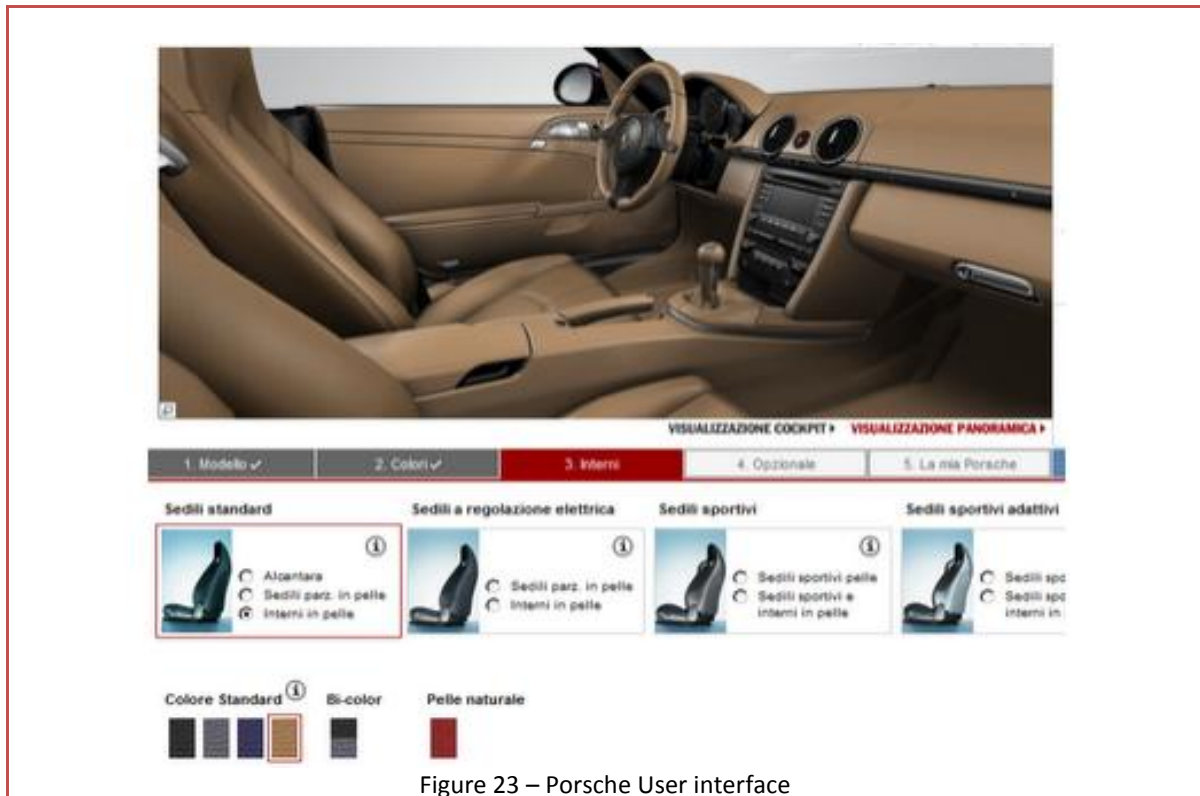


Figure 23 – Porsche User interface

- **Application server:** it is the module which responds to all the requests coming from the GUI. The application server can be seen as a collection of services designed to accomplish complex applications normally web-oriented. It is normally built up of different modules developed according to predefined standard, like HTTP, HTTPS or TC/IP protocols. The main services offered by the application server are: queries on databases, computations and elaborations related to the context of the configuration and validation formula of the input coming from the user. This module normally communicates with one or more databases or sources of data (in memory storage, network storage, cloud, etc...);
- **Web server:** the web server can be seen as the hardware (computer) which delivers, upon request of the user and through a dedicated software, a web content (web pages) accessed through the Internet. Web pages are normally delivered using HTTP language; the communication with the web server is initiated by a web browser asking for a determined web content. The server can either deliver the content, if this can be found, or return an error message, in case the content was not available.  
This module is very important in configuration solutions based on the web, as it is responsible for the performance of the product configurator. It is therefore fundamental that the web server adopted manages correctly the accesses to the cache memory;

- **Database:** this is the module which contains all the relevant data of the configuration process. The database is accessed by the application server in order to provide answers to requests coming from users during the configuration process.

Another important feature is represented by the *e-commerce module*. This is not a component of a product configurator, but it is one of its main functionalities and is particularly relevant in B2C contexts where customers can purchase products via the web. The e-commerce module allows customers to finalize the purchase of a product upon completion of the configuration process. E-commerce has experienced a rapid expansion over the last few years, especially among “internet literate” persons, who value the possibility of shopping at anytime and in anyplace they want, in a 100% safe environment protected by strong security protocols.

#### 4.3.6 Features of a good product configurator

A good product configurator developed for consumer users should be characterized by the following features (see figure 24):

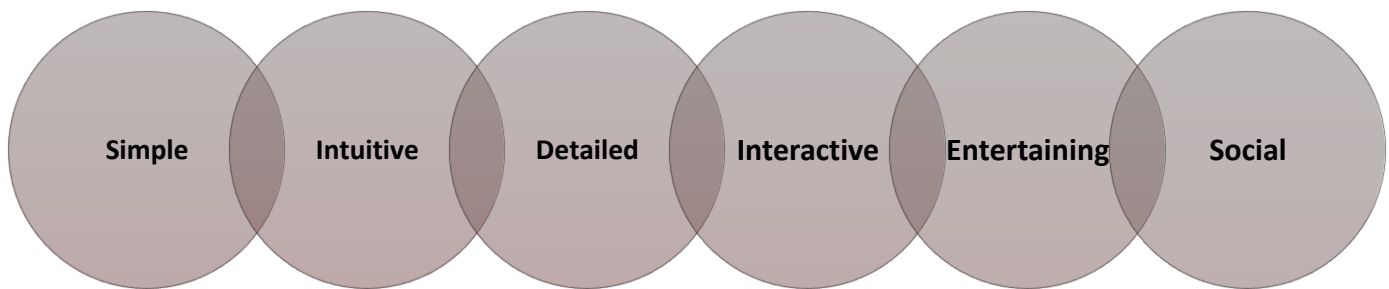


Figure 24: Features of a good product configurator

- *Simple and intuitive:* The interface should have a clear architecture, simple and intuitive also for less expert users;
- *Detailed and interactive:* Every time a new feature is selected or modified, the image of the product must be updated, so that customer can see the evolution of the product;
- *Entertaining:* The user should, somehow, have “fun” during the configuration process;
- *Social:* Once the configuration process has finished, it would be nice to give users the possibility to share the image of his/her customized product with friends; this can be possible using Facebook, Twitter or other social networks.

#### 4.3.7 Product configurators in footwear sector

More and more companies operating in footwear sector adopt product configurators as tools enabling the implementation of Mass Customization.

A detailed analysis of the product configurators implemented by some of the most known shoe manufacturing companies offering customized shoes will be carried out in chapter 5.4 of the thesis. As it is possible to note from the analysis, in footwear sector the most adopted configurators are of the type “online-premium”.

## 4.4 DEVELOPMENT OF THE METHODOLOGY

### 4.4.1 Introduction

In this section it will be developed a methodology to support a shoe manufacturing company, willing to offer customized shoes, to introduce the most appropriate product configurator and to assess how Business Model will change after its implementation.

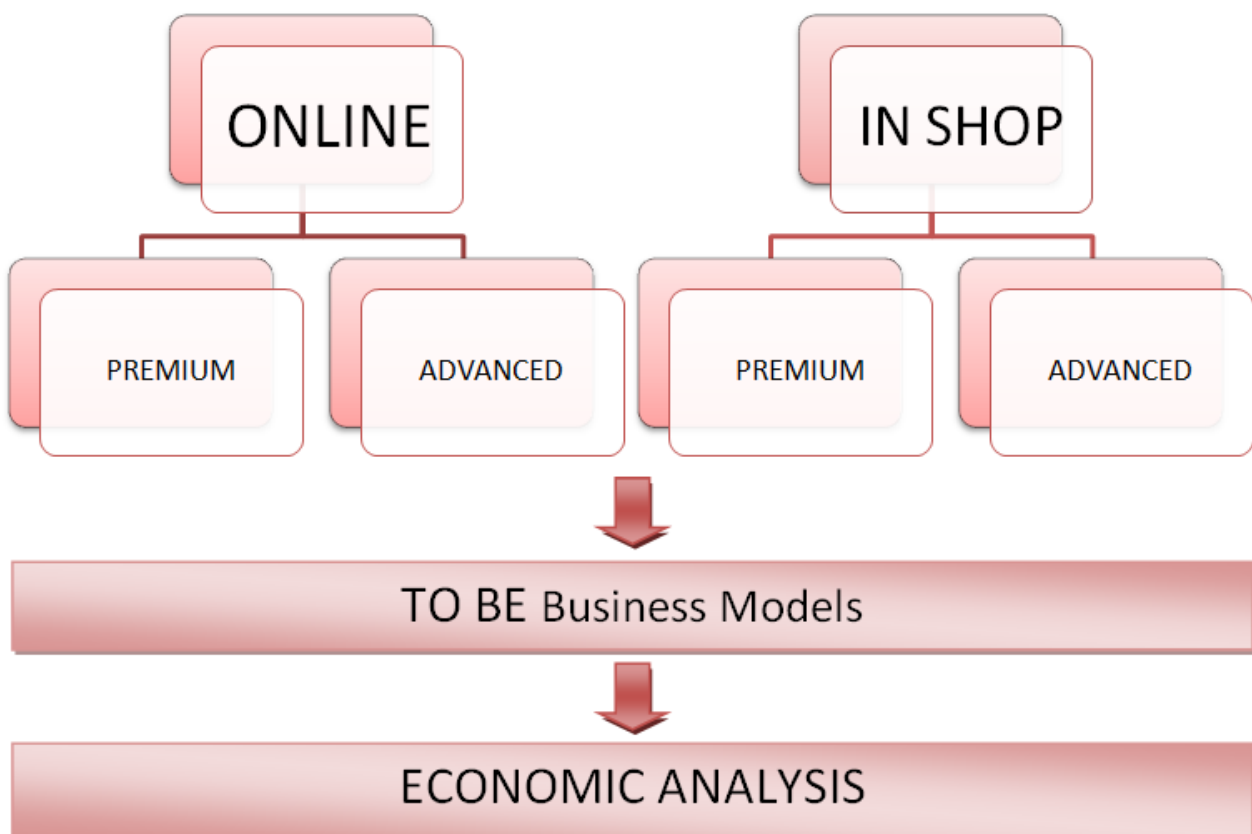
Before applying the methodology, anyhow, the company should carry out an internal and external analysis in order to analyze the needs which bring to the introduction of a configurator and the opportunities and limits related to the contest where the company operates, which cannot be left aside.

### 4.4.2 Steps of the methodology

To guide the company in this decision four steps should be followed:

- 1) Determine whether the configurator will be implemented "*online*" or "*in-shop*";
- 2) Decide the level of the configurator: "*premium*" or "*advanced*";
- 3) Assess the TO BE business models;
- 4) Carry out an economic analysis in order to assess if the investment is worth or not.

They are summarized in the following schema:



## 1) “Online” or “In shop”

The first step of the company is to decide where the configurator will be implemented: online or in-shop. This choice depends mainly on the following factors (see figure 25):

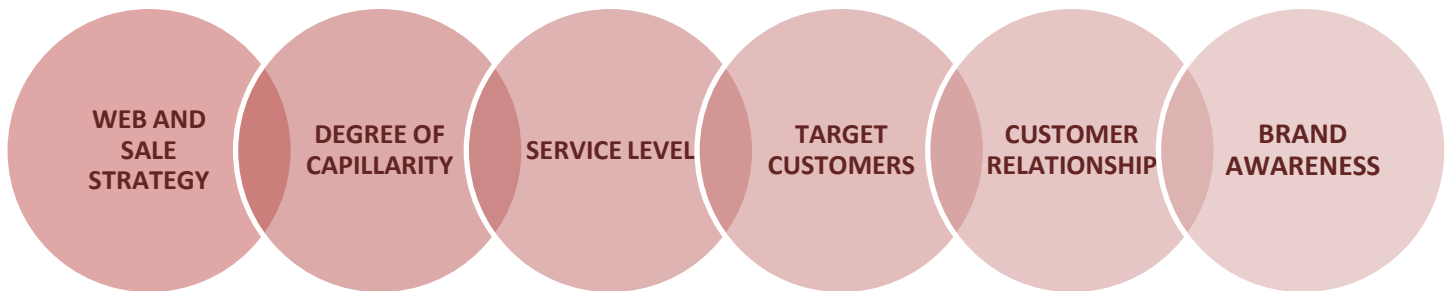


Figure 25 – Drivers to choose between “online” or “in shop” solution

In particular, the selection of an **ONLINE** solution for the configurator is particularly suited when:

- The company has put in place a strong web strategy. This means the company has committed part of its marketing costs to create a name and become known in the world wide web. Typically, a well designed web strategy allows the name of the company to be displayed in the first ranks when key terms associated with it are typed. In this way, it is easier for users to find company’s website through the search engines. It is clear that an online configurator would not be effective if it is difficult to get on company’s website while surfing.
- The company aims at offering the customization service in a very capillar way. The internet breaks down barriers related to the geography, making it possible for users to access the service regardless their actual location. Thanks to the internet, the market served is no longer the one close to company’s outlets, as it happens normally, but it becomes a much broader area which, potentially, can include the whole world. Customers can enjoy the configuration process directly from home, with the impression of being in a “real” company’s outlet.
- The company wants to offer high service level in terms of:
  - Purchasing possibility 24h/24;
  - Possibility for customers to experience the configuration process as long as they want.

The online configurator makes it possible for users to shop whenever they want, even outside the typical time slots of outlets. This can be particularly appreciated by those users who can surf the internet just at nights, after the working day. In addition, with the online solution customers can entertain themselves as long as they want in the configuration process, making as many trials as they like, something which would be unfeasible with configurators located inside shops.

- The target customer is represented by a “computer literate” category, made up of people who are familiar with the use of internet as well as with e-shopping procedures. In this case, an online solution would be more effective in targeting these users, since they are not

supposed to go to outlets to get their product customized. For the shoe sector, the “computer literate” category is constituted by teenagers, young adults and children whose parents are “digitalized” customers.

- The company wants to establish a direct relationship with customers. The reason for this can be twofold. On one side, this may be justified by the willingness of the company to speed up the process of order acquisition. On the other side, disintermediation from retailers allows the company not to erode product margins.
- The company has a low brand awareness. This is the case of companies whose products are not associated with a particular and recognizable brand. In this situation, it is very likely the company doesn't own proprietary outlets and reaches customers through multi-brand retailers. An online solution would be in this case more effective, as retailers would probably not take the risk of introducing the configurator within their shops and, even if they did it, probably the coverage of the service would not be enough for the company to break even.

Conversely, an ***IN-SHOP*** solution should be adopted when:

- The company has a weak web strategy. This may be a reflection of the managerial choice to use the marketing budget privileging traditional advertising channels rather than internet. If this is the case, probably the company doesn't even have a website or, supposing it has, users may find it almost impossible to reach the page while surfing the internet. As a consequence of this, until a stronger web strategy is put in place, the company has no choice but adopting an in-shop solution for the configurator.
- The company wants to offer assistance during the configuration process. With the in-shop solution, customers are guided through all the configuration steps by qualified personnel. The configuration process in this case is like a questionnaire, to whom customers have just to answer expressing their preferences about the features, which a qualified assistant will translate into the “configurator language”. Sometimes, the personnel can also give advice and suggestions about the product.

This contributes largely to enhance the value delivered to the customer. In case of shoes with a high number of customizable features or when the process of configuration is particularly articulated, the presence of an assistant may become necessary, in order to avoid customers getting lost in the middle of configuration process with subsequent risk of losing sales.

- The target customer is represented by a “computer illiterate” category, made up of people who are not familiar with the use of internet as well as with e-shopping procedures. To reach this target, an in-shop solution supported by the assistance of qualified personnel is necessary. Concerning the shoe sector, this category is mainly constituted by senior customers, used to shop in “more traditional” ways; an extension can be represented by children customers, for whom the configuration process can be designed as a “game” to be played in shops together with the assistants.
- The company already owns shops. When the company reaches its customers through retailers, it can experience resistance/oppositions coming from those players who don't agree to install the configurator within their shops. If the number of “hostile retailers” is high, the project of introduction of the configurator could not take place because of too low

capillarity. Conversely, if the company reaches its customers through proprietary outlets, it is very straightforward to adopt the in-shop solution for the configurator, because no such problems will ever be experienced.

- The company agrees to split the product margin with the retailers. When the configurators are placed within retailers' outlets, part of the product margin will be kept by them. Normally, the higher the bargaining power of retailers, the higher their stake of the margin will be. The bargaining power of retailers tend to be high when the products have a low brand awareness, and diminishes in case of branded products.

Table 8 better summarizes the guidelines:

ONLINE IF...	IN SHOP IF...
<ul style="list-style-type: none"> <li>• Company has a strong web strategy</li> <li>• Company wants to serve the market in a very capillary way</li> <li>• Target customer are teenagers, young adults and adults</li> <li>• Company wants to offer high service level in terms of :               <ul style="list-style-type: none"> <li>- Purchase 24h/24</li> <li>- Purchase everywhere</li> <li>- Possibility for the customer to experience the configurator as long as he/she want</li> </ul> </li> <li>• Company wants to establish a direct relationship with customer</li> <li>• Company has low brand awareness, because:               <ul style="list-style-type: none"> <li>- Probably company does not own shop to introduce it</li> <li>- No retailers will take the risk of investing in the configurator to sell something not known</li> <li>- The best way to make it known by many people is online</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Company does not have a website or it has a weak web strategy</li> <li>• Target customer are not supposed to purchase online or not able to use the computer (i.e. adults, senior, children)</li> <li>• Company wants to offer assistance during the configuration process, through qualified personnel</li> <li>• Company already own shops</li> <li>• Company agrees to receive less margin, since a part of it will be kept by retailers</li> </ul>

Table 8: Drivers to choose between Online and In shop configurators

## 2) "Premium" or "Advanced"

Once decided between "online" and "in shop", the company has to define the configurator' level: "premium" or "advanced", without taking into consideration the entry level, since it does not offer the possibility of customization.

This choice is driven by considering the features offered by each type of configurator, which are defined in figure 26:

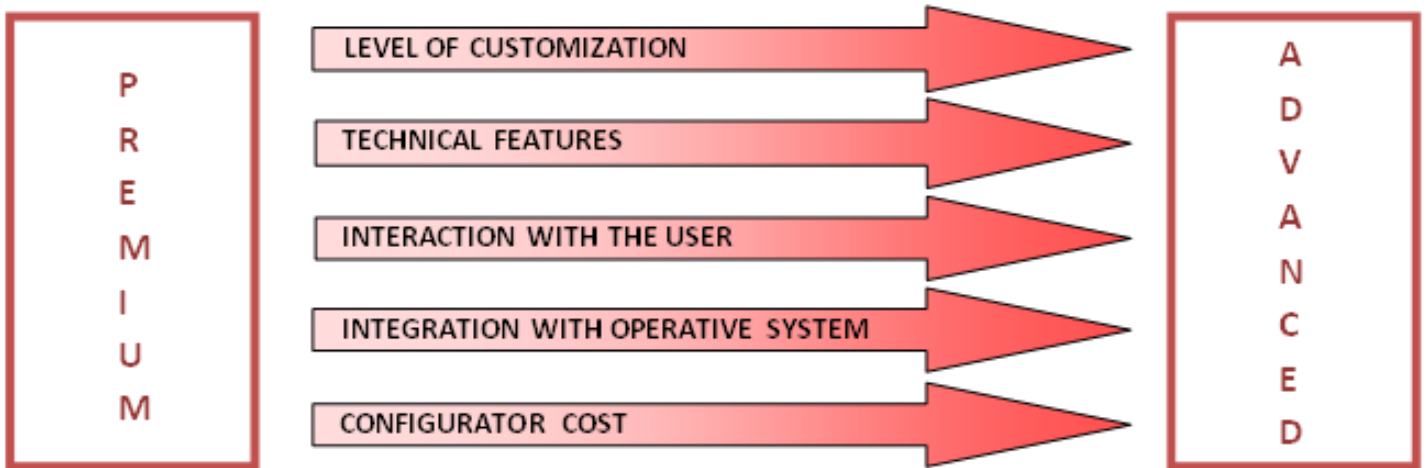


Figure 26 – Drivers to choose “Premium ”or “Advanced” configurators

- **LEVEL OF CUSTOMIZATION**

A **premium** configurator offers the possibility of customizing the shoes selecting the most desirable configuration of predefined features. Usually, customers can select the material and color of some parts of the shoe (i.e. upper, sole, laces) and, eventually, have the possibility to add small writings on the shoe body. Users can as well select the shoe size which is mostly like to fit them, choosing among standard numbers.

An **advanced** configurator, instead, offers a much higher degree of customization. In fact, besides choosing among predefined features, users also have the possibility to add on their shoes special components, like adhesives, paillettes, straps, bow, Swarovski crystals, etc.

A further possibility of customization is represented by the possibility for customers to specify all the relevant dimensions of their feet.

The measures tracked are used to understand the standard number to whom customer’s feet is most adherent to, in order to maximize the likelihood of the fitting; sometimes, when productive processes are flexible enough, companies can instead use these dimensions to create a sole 100% tailored according to customers’ feet.

In case of online configurators, customers have to take the requested measures on their own and communicate them during the configuration steps; in case of in-shop configurators, instead, feet dimensions are tracked with the use of 3D scanners.

Due to these characteristics, the advanced configurator allows for a deeper customization, thus enhancing a sensation of uniqueness in customers’ mind.

- **TECHNICAL FEATURES**

A **premium** configurator delivers medium-good performances in terms of technical features. In particular, it supports dynamic images, image rotation and zoom as well as the possibility to save customer’s own trials in a sort of “virtual collection”.

Dynamic images allow to show the product from different perspectives; this is important to help users understand how their self-styled creation will look like, to make sure all the selected features

match well one with the other or to easily understand what to change in case of unpleasant combinations.

Image rotation allows the shoes to spin on themselves; this is important to give users a tridimensional view of their product, which is a more faithful representation of how the shoes will look like in the reality.

Image zoom shows the product from a very close perspective, in order for users to better see all the particular details of the shoes.

Customers have, in addition, the possibility to save one or more trials they made, in a sort of “virtual collection”, to show their creations to friends/relatives or for comparing models in order to finalize the purchase of the most pleasant one.

In a premium configurator, the price of the shoes is displayed just at the very end of the configuration process, when all the steps have been accomplished.

This makes it impossible for users to understand the marginal increase in price given by each selection made.

Another pitfall of this kind of configurator is the partial integration with company’s informative system. This aspect may contribute to decrease the performances of company’s internal processes, due to the necessity of manual updating of information in case of necessity.

An **advanced** configurator, instead, delivers very good performances in terms of technical features, as it overcomes all the pitfalls of a premium configurator.

In particular, besides allowing for a deeper zoom, in this model the updating of the price happens contextually to the selection of a feature. In this way, users have a more clear idea of the economic weight that each selection will cause.

This may be useful especially for those price-sensitive users who care about finding a good trade-off between customization and price.

In addition, an advanced configurator is generally fully integrated with company’s informative systems, thus allowing speeding up of company’s internal process thanks to simultaneous updating of information.

Finally, another important feature of this model of configurator is the possibility of displaying customized shoes selected by other users, in order for customers to find inspiration while developing their own creations.

This functionality is not trivial to be added, as it requires a large database to store all the models realized in the past.

- **INTERACTION WITH THE USER**

As far as interaction with users is concerned, a **premium** configurator offers the functionality of limiting subsequent choices of colors/materials on the basis of selections made at previous steps. This is mainly done with the purpose of preventing users from creating models not pleasing to be seen, because their parts don’t match well one with the other.

An **advanced** configurator, in addition to this, offers a deeper degree of interaction with users, as it normally provide them with product-related suggestions. These suggestions can be of two types:

- Combinations of features/material/colors which match particularly well among themselves;



- Ancillary products which can complement the outfit, according to the model of shoes selected, like socks, bags, belts.

This functionality is not trivial to be added, as consultation with stylists is needed to accomplish it.

- **INTEGRATION WITH OPERATIVE SYSTEM**

The possibility to integrate the configurator with the operative system of the company is offered by the **advanced** configurator only.

In particular, this characteristics refers, for example, to the opportunity to:

- update the stock level of each shoe component;
- trace the whole sale process;
- save the customer lists;
- automatically generate the complete bill of material of the product;
- monitor the deadlines for customers and suppliers;

- **CONFIGURATOR COST**

For what concern the cost, a **Premium** configurator has medium-high cost, since its functionalities are limited. The **advanced** configurator, on the other hand, is very expensive and also the maintenance costs are higher.

To better summarize, the main differences between the two levels are described in table 9:

	PREMIUM	ADVANCED
LEVEL OF CUSTOMIZATION	<ul style="list-style-type: none"> <li>● Limited solution space, since customization is limited to the selection of standard features and size</li> </ul>	<ul style="list-style-type: none"> <li>● Larger solution space, since it is given the possibility of:               <ul style="list-style-type: none"> <li>-adding special components to the shoes;</li> <li>-tracking all the relevant dimensions of the foot;</li> </ul> </li> </ul>
TECHNICAL FEATURES	<ul style="list-style-type: none"> <li>● Dynamic image</li> <li>● Possibility of image rotation</li> <li>● Limited zoom</li> <li>● Possibility of saving different customized models;</li> <li>● Calculation of final price happens at the end of customization process</li> <li>● Partial integration with company's informative systems;</li> </ul>	<ul style="list-style-type: none"> <li>● Dynamic image</li> <li>● Possibility of image rotation</li> <li>● Deep zoom</li> <li>● Possibility of saving different customized models;</li> <li>● Updating of the price after each choice;</li> <li>● High integration with company's informative systems</li> <li>● Possibility of showing customized products selected by other customers;</li> </ul>

<b>INTERACTION WITH USER</b>	<ul style="list-style-type: none"> <li>Limited choices of colors/materials depending on previous choices;</li> </ul>	<ul style="list-style-type: none"> <li>Limited choices of colors/materials depending on previous choices;</li> <li>Provide suggestions about features, materials, colors, accessories.</li> </ul>
<b>INTERACTION WITH OPERATIVE SYSTEM</b>	<ul style="list-style-type: none"> <li>No possibility of integration with operative system</li> </ul>	Possibility to : <ul style="list-style-type: none"> <li>Update the stock level;</li> <li>Trace the sales process;</li> <li>Save customer lists;</li> <li>Generate the BOM;</li> <li>Monitor the deadlines;</li> </ul>
<b>COST</b>	<ul style="list-style-type: none"> <li>Medium-high costs</li> </ul>	<ul style="list-style-type: none"> <li>Expensive</li> </ul>

Table 9 – Differences between “Premium” and “Advanced” configurator

After the first and the second step, the company arrives at selecting one of the four alternatives of configurators (see figure 27):



Figure 27: Alternatives of product configurators

Each alternative has the following characteristics:

### ONLINE - PREMIUM

- Shoes are realized by assembling predefined components according to customer requests;
- Besides the model, size and color, there is possibility of choosing the materials and colors of some features and adding personalized writings;
- Medium-high cost;

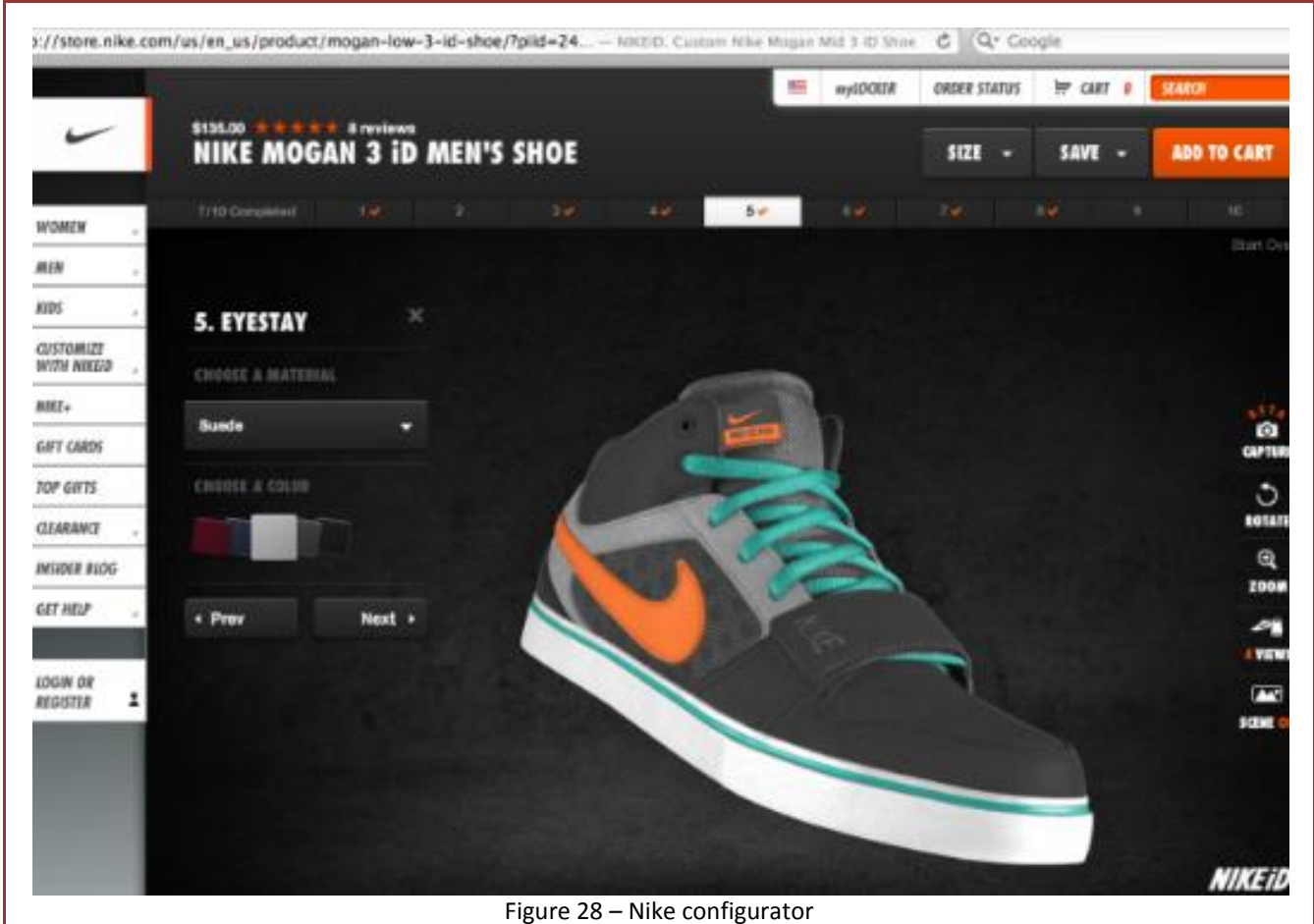
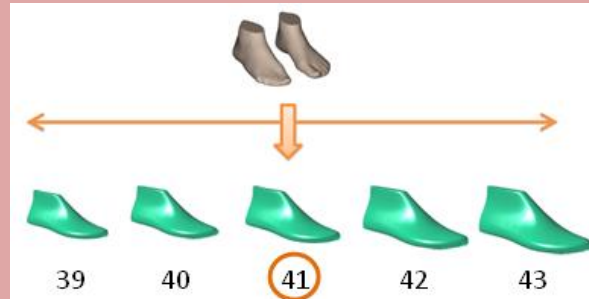
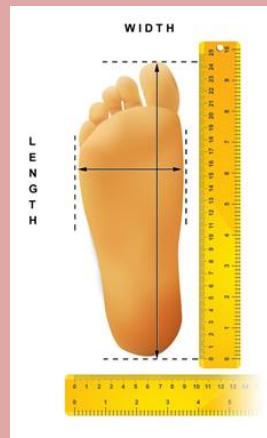


Figure 28 – Nike configurator

- Besides model, size, materials, colors, features and writings, as in the premium model, there is the possibility of adding special components (e.g adhesives, paillettes, straps, bows);
- Possibility of specifying customer's foot dimensions with one of these two purposes:
  - Understand at which standard size the customer's foot is closer to:



- Create a shoe exactly tailored on customer's foot dimensions:



- Very expensive;
- Necessity to originate contracts, in order to manage the return policy: company needs to protect itself in case of accusations about a non-respect of specifications expressed by customers; two different contracts can be signed to face this problem:
  - Real contracts, with legal value: in this case, the company receive customer specifications about foot dimensions, generate a confirmation form which must be signed by customer and re-sent to company through e-mail or fax;
  - Simple written agreements, with no legal value: the moment in which customer is submitting the order online, he/she is immediately asked to confirm the specifications.

ONLINE - ADVANCED

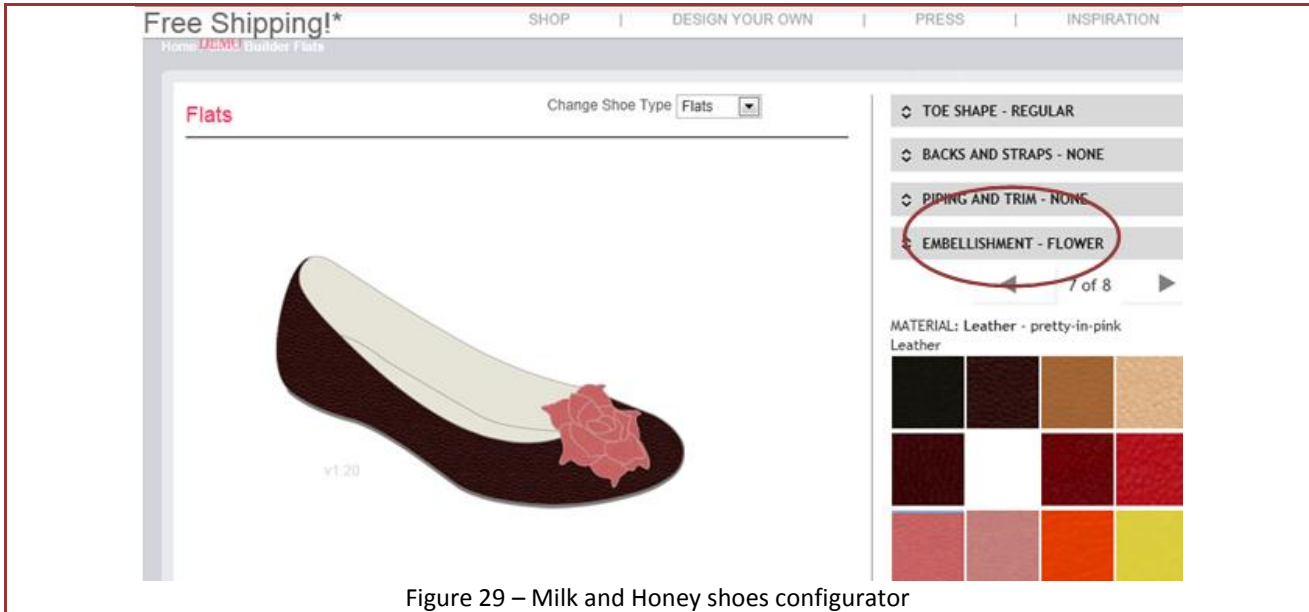


Figure 29 – Milk and Honey shoes configurator

IN SHOP - PREMIUM

- Shoes are realized by assembling predefined components according to customer request;
- Besides the model, size and color, there is possibility of choosing the materials and colors of some features and adding personalized writings;
- Customization process takes place within shops. Shoes can be either shipped directly at customer's home or in the shop where the order was placed. In this case, the customer has to go collect them there;
- Medium-high cost;



Figure 30 - Nike configurator

- Besides model, size, materials, colors, features and writings, as in the premium model, there is the possibility of adding special components (e.g adhesives, paillettes, straps, bows);
- Possibility of introducing a 3D scanner within shops:



## IN SHOP - ADVANCED

The device acquires the customer's footprint, with one of these two purposes:

- To understand at which standard size the customer's foot is closer to;
  - To create a shoe exactly tailored on customer's foot dimensions;
- After the customization process, possibility of generating a physical prototype, in order for customers to make sure the shoes fit well. Since the prototype takes a few days to be made, customer is obliged to visit the shop again when prototype is ready;
  - Very expensive;



Figure 31 – Adidas configurator

### 3) Definition of the TO BE Business Models

The following section is dedicated to the definition and description of four general TO BE Business Models corresponding to the four alternatives of configurators analyzed in the previous paragraph. Once identified the configurator to be introduced and the corresponding general TO BE Business Model, the company has to assess its current situation, in order to identify the blocks of the AS IS Business Model where the configurator will impact on and, in each block, highlight what exactly will change.

In this way, the general TO BE Business Model provided by the methodology can be adapted to whatever shoe manufacturing company, by considering the relevant components only.

The description of the different Business Models will be carried out by singularly analyzing each block and underlying how it changes among in the various configurations:

#### Customer segment

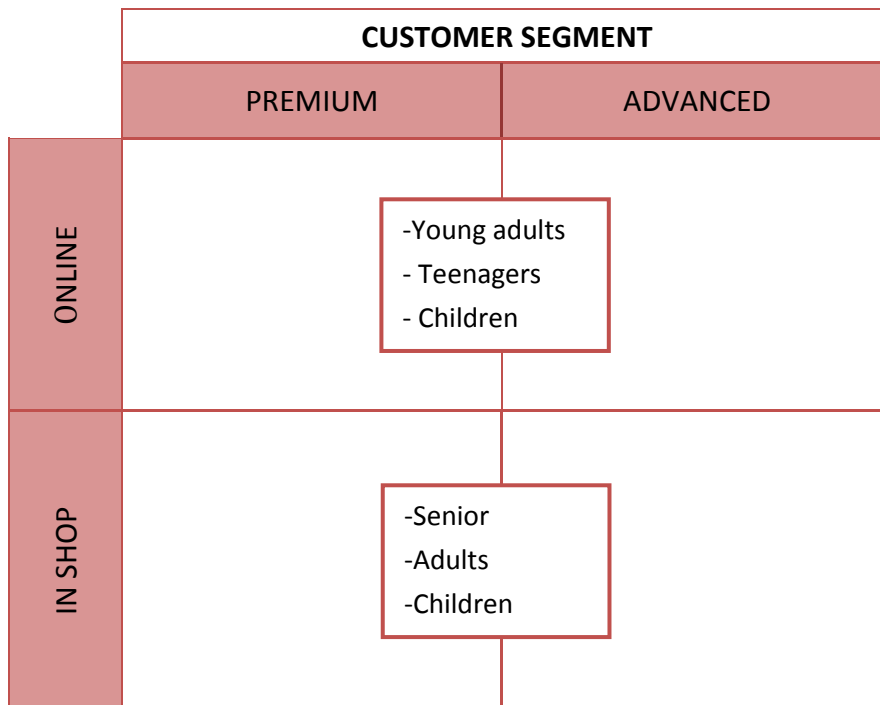


Table 10 – Customer segment blocks

The Customer Segment building block of the Business Model will vary on the basis of the selection of an online instead of an in-shop solution, since the two models of configurator address different customer segments. The differences in the Customer Segment building block, in this case, are not affected by the performance offered by the configurator; as a result, premium and advanced models address exactly the same target customers.

Considering an “**online**” configurator, the Customer Segment includes young adults, teenagers and children as key customers. Young adults and teenagers are the ones who are more confident with the use of the computer and of the internet in general. These customers are not afraid of making online purchases and value the possibility to shop whenever they want and to receive the product directly at home, without the need of going to shops. They are normally very involved in the

purchasing process and like entertaining themselves very long in their shopping experience, making comparison among different models of shoes.

Young adults, besides being “computer literate”, are also very likely to have an economic independence, allowing them to make payments using their funds. This is normally not the case for most of teenagers, for whom the purchase is financed through parents’ or relatives’ funds and thus subjected to their approval.

Even if children may have an active role in the customization process, in terms of specifying their preferences, they are not supposed to use the tool by themselves; normally, the task is carried out by parents or relatives who are also in charge of the payment. In this case, purchases are likely to happen if the supervising adult is, on his/her turn, a person confident with the use of the internet and already used with e-shopping procedures.

In case of “in shop” configurator the Customer Segment is represented by seniors, adults and children. The totality of seniors and most of adults normally have a scarce degree of competence in the use of technologies. This limitation has two consequences: on one side, the inability in the use of the configurator and, on the other, the distrust in the online shopping. These customers prefer to go to shops, where they can receive the assistance of qualified personnel to carry out the configuration process. In this way, the problem of making a senior customer use an online tool can be overcome.

Children are part of the target customer, too. As for the online configurator, also in this case they are not supposed to shop by themselves. Usually, children go to the shop with parents or relatives, who are also in charge of the payment. The configuration process in this case can be planned as a “game”, allowing children to create their preferred shoes in a playful way. The shop assistant has the role of coordinating the “game”, as well as translating children’s requests in the configurator language.

**Customer relationship**

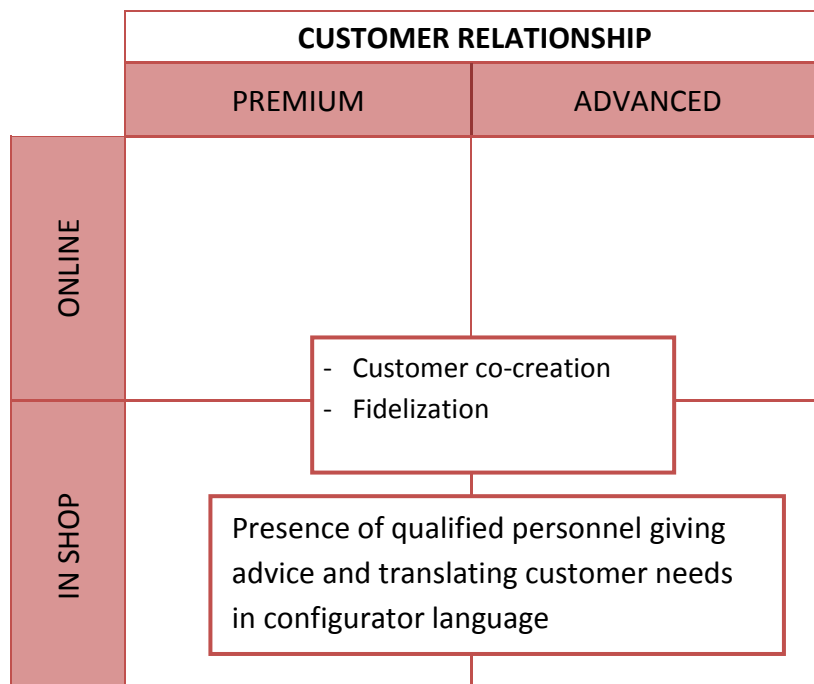


Table 11 – Customer relationship blocks



The Customer Relationship building block will vary as a consequence of the decision about “where” the configurator is located (online vs. in shop) and of the selection of a premium rather than an advanced model.

Concerning the “**online-in shop**” dimension, in both cases the relationship with customers is based on the possibility for them to co-creation and fidelization. Customer can, in fact, grow fond towards the brand and re-purchase, so to establish long term relationships.

Nevertheless, the in shop solution differs from the online one as it adds another point in the customer relationship, which is the support that customers receive when going to shops. This support, given by qualified personnel, has two aims: the first is to guide customers during all the personalization process, translating the needs into specification for the configurator; the second, very important indeed, is to give customers advice in case they have doubts about the selection of one or more features. Obviously, this kind of support is unfeasible in case of online configurators.

The “**premium-advanced**” dimension, instead, changes the customer relationship as it implies different broadness of the solution space offered to customers. As already explained in the description of the various models of configurator, a premium configurator offers the possibility to customize just a few features of the item whereas an advanced one leaves much more intervention space from customers. This aspect contributes to enhance the relationship with customers.

**Value proposition**

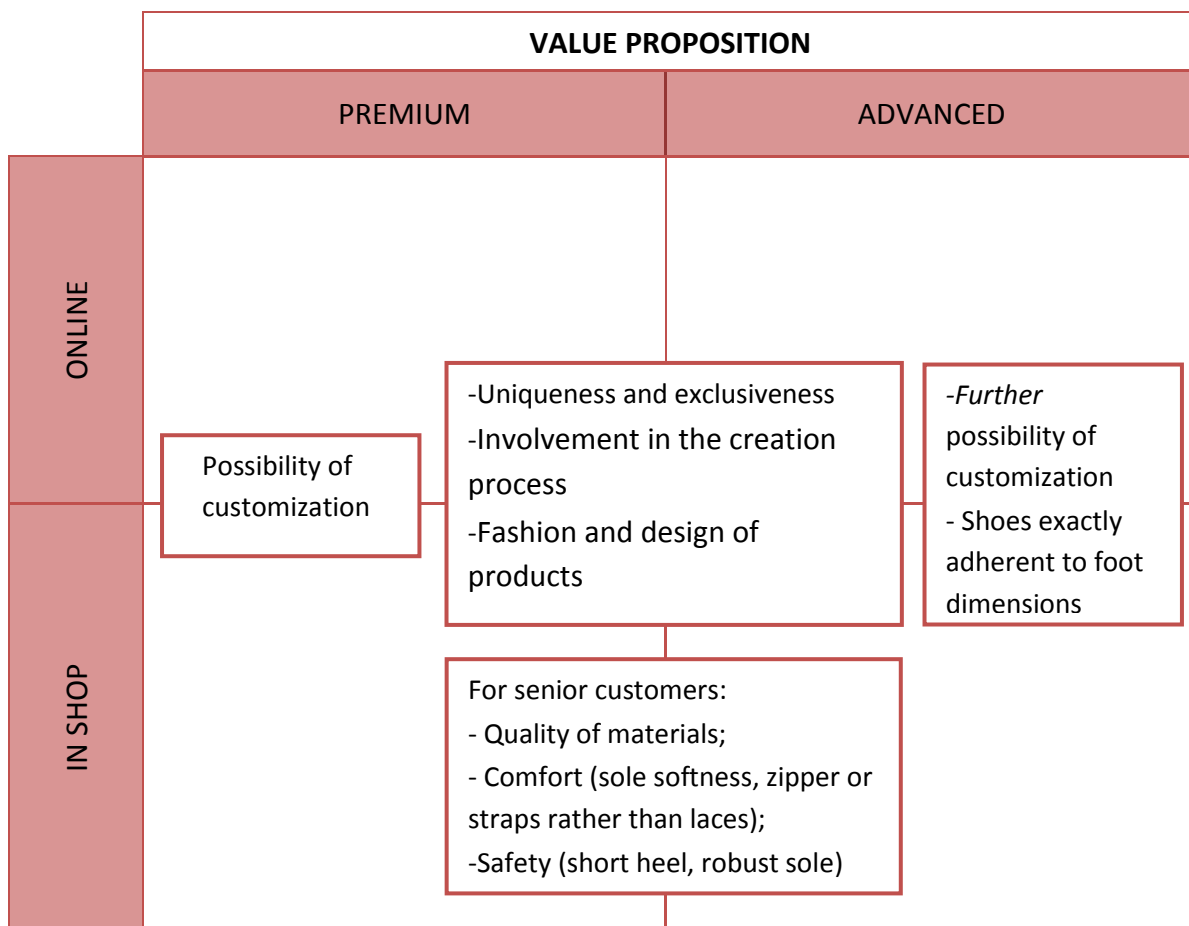


Table 12 – Value proposition blocks

All configurators, regardless the models, offer the possibility to create personalized shoes, this means unique and exclusive products created according to customers preferences. Customers, therefore, feel the involvement in the purchasing process and experience the shopping in a different way.

The advanced configurator, in particular, offer an higher degree of personalization, since it allows to specify the exact foot dimensions, with the result of shoes fitting at 100%.

For what concern the “**online**” configurators, both premium and advanced models offer the following features:

- High service level offered: customers can purchase 24 hours a days, without respecting the opening hours of the shops; they can purchase everywhere, from home or at work, without necessary reaching the shop which can be very far; they also have the opportunity to experience the shopping creation as long as they want, avoiding to remain in a shop for hours where other customers must be served, too.
- Creation of fashion and design shoes, the main features teenagers and young adults look at.

The “**in shop**” configurator, instead, offers both fashion shoes for children and comfort shoes for adults/senior, since they look for softness and high quality of material, rather than nice aesthetic only.

**Key partners**

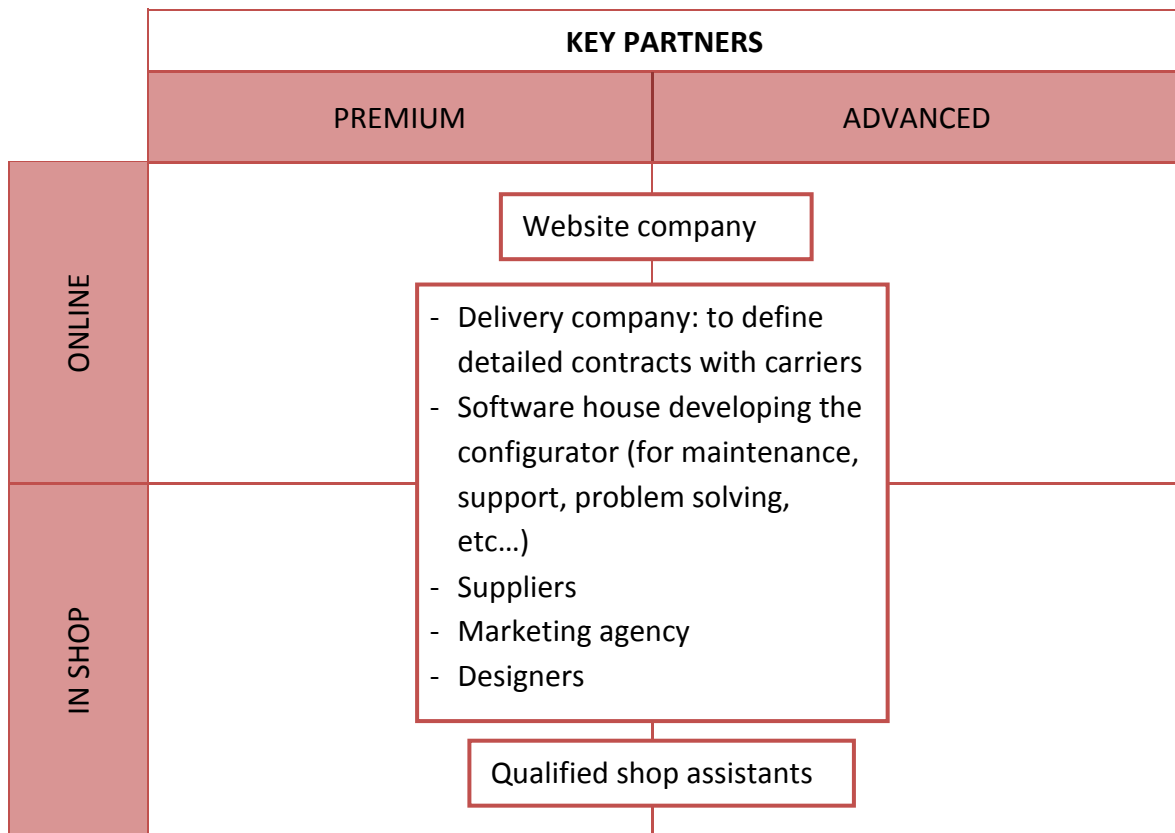


Table 13 – Key partners blocks

The Key Partners building block will vary on the basis of the selection of an online instead of an in-shop solution, since the two models of configurator rely on different key partners. The differences

in the Key Partners building block, in this case, are not affected by the performance offered by the configurator; as a result, premium and advanced models share exactly the same key partners.

Nevertheless, there are a few key partners which are common to both the “**online**” and the “**in shop**” solution. These are:

- **Delivery company:** this is the player in charge of making consignees to the various customers. This actor originates as a consequence of the introduction of the configurator, as customized shoes require a different shipping policy with respect to standard shoes. It can be seen as a key partner, since effectiveness indicators depend on its behavior. In particular, the delivery company is responsible for order punctuality, completeness and correctness. In a sector like footwear and apparel, those measures are really important and can be considered as a proxy of customer satisfaction. Therefore, it is vital for the shoe manufacturing company to define detailed contracts with freight carriers, specifying the time and costs of the deliveries. In a more collaborative optic, partnerships could be established between the two players, making it possible to reach even higher level of effectiveness towards customers.
- **Software house:** this is the company which has developed the configurator on the basis of the objectives set by the shoe manufacturer. It is a key partner mainly for two reasons:
  - it is responsible for correctly translating company’s needs into functionalities of the configurator. The success of a configurator solution largely depends on the way in which it has been designed. It does not exist a “standard” configurator: each solution is developed ad-hoc for the specific company, starting from its needs. Hence, the ability to catch and translate in the “configurator language” all the characteristics deemed relevant by the company is a vital issue.
  - it is in charge of carrying out routinely/unplanned maintenance activities on the configurator and, in general, it is the referent in case problems connected with it should arise. The software house must be easy to contact and ready to solve the problems, in order not to reduce the availability of the configuration service. In particular, when a failure in the system happens, the software house must guarantee satisfactory performance in terms of repairing time.
- **Suppliers:** this category comprises all the players whose supplies are key for the shoe manufacturing company, in the sense that they contribute to add value to the final product. Depending on the context, they must also ensure adequate level of flexibility to face company’s unexpected requests. Examples can be represented by leather, sole, laces suppliers.
- **Marketing agency:** nowadays, for most of shoe manufacturing companies, marketing services are externalized. The marketing agency is a key partner, because it is responsible for the success of company’s campaigns. According to the context, the agency must define the most appropriate advertising channels to reach the target customers. In particular, in case of online configurators, efforts must be put to create a strong web strategy, whereas, in case of in shop configurators, more traditional advertising channels should be adopted in the marketing strategy.

- Shoes designer: this actor is a key one, because it is on him/her that depends the success of the line of shoes. He/she has the important task to design shoe models which respect the characteristics deemed important by the customers: fashion in case of “young” target, comfort and reliability in case of “senior” target. This actor enters the Business Model as a partner in case he/she is not directly hired by the shoe manufacturing company, otherwise he/she must be considered as a resource.

The additional partner which is present in case of an “online” configuration solution is the website company, which is responsible for supervising and updating the contents of the web pages where the configuration service is hosted. It is also in charge of controlling that the e-shopping module runs smoothly.

Similarly, in case of “in shop” configurators, the differential partners are represented by the external agents and the qualified shop assistants. The external agents are responsible to expand the coverage of the configuration service, by finding new mono or multi brand retailers willing to introduce the configurator within their outlets. They are not present only in case the company owns directly all the shops; they enter the Business Model as partners in case they are freelance, otherwise they must be considered as resource. The qualified shop assistants support customers in the decision process and in the configuration of the shoes. They must be considered partners only in case they work within shops not owned by the company but by third parties (e.g. retailers, franchisers, etc...). If they are directly hired by the company, they enter the Business Model as resources.

**Key activities**

		KEY ACTIVITIES	
		PREMIUM	ADVANCED
ONLINE			Management of the contracts
		<ul style="list-style-type: none"> <li>- Design of personalized line using a CAD system</li> <li>- Definition of the solution space</li> <li>- New cutting process of customized shoes</li> <li>- Orders management</li> </ul>	
IN SHOP		<ul style="list-style-type: none"> <li>- Delivery</li> <li>- Monitor customer satisfaction (correctness, completeness and timeliness of the delivery) through mail, phone, surveys</li> <li>- After sale services (to manage the returns of customized products)</li> </ul>	

Table 14 – Key activities blocks

Regardless the type of configurator, the differential activities required by its implementation are:

- Design of the personalized line, supported by a CAD system and definition of the solution space, which refer to all the possibility of customization available for customer;
- New cutting process, connected with the CAD system, which is different from the traditional one. It will optimize the cutting, by saving materials, time and resources;
- Orders management: this activity refers to the gathering of orders coming by different customers and grouping them according to commonalities in features (colors, materials);
- Delivery is a key activities because the company should try to respect the delivery time promised and should also try to minimize the transportation costs, this is why a long term relationship with the freight company might be useful;
- In order to monitoring customer satisfaction, company has to collect feedback, comments, complaints about order completeness and punctuality;
- After sale service is required for what concerns the management of returns of customized products.

**Key resources**

		KEY RESOURCES	
		PREMIUM	ADVANCED
ONLINE			
IN SHOP			

-Configurator  
 -Software for designing the customizable line  
 -Skilled workers required by the customized line  
 -Shoes designer

-Skilled workers required by the customized line  
 -External agents  
 - Qualified shop assistants who support customers in the decision process and in the configuration of the shoes

Table 15 – Key resources blocks

Concerning the Key Resources building block, one can see that there are commonalities among the four scenarios that originate following the adoption of the configurator. The key resources which are present, regardless the particular model of configurator selected by the shoe manufacturing company are:

- The configurator: this is the tool allowing for customization of the shoes. It is a software constituted by four main parts: the user interface (GUI), the application server, the web server and the database. According to the context, the configurator can be hosted in users' computers (online solution) or in computers located within shops (in shop solution);
- The software for designing the basic models available for customization: this is a CAD system through which the stylists design the standard models which will undergo the process of customization by hand of the users;
- Skilled workers required by the customized line: figures hired ad hoc because of the introduction of the configurator. It is not possible to generalize about them and their tasks, since they can vary from company to company;
- The shoes designer, in charge of designing the new customized line;
- The CAD expert, responsible of the CAD software.

In case of “**online**” configurators, other differential key resources are represented by the website and the e-commerce module for online purchases . This module allows people to carry out the configuration process and to finalize the purchase.

Talking about in shop configurators, instead, the additional key resources that need to be taken into consideration are the platform for receiving orders, the external agents and the qualified shop personnel. The platform for receiving orders can be an e-mail account or, in case of high integration, an ERP functionality, through which the shops can communicate the orders to the shoe manufacturing company. For the voices “external agents” and “qualified shop assistants”, see the building block Key Partners.

**Channels**

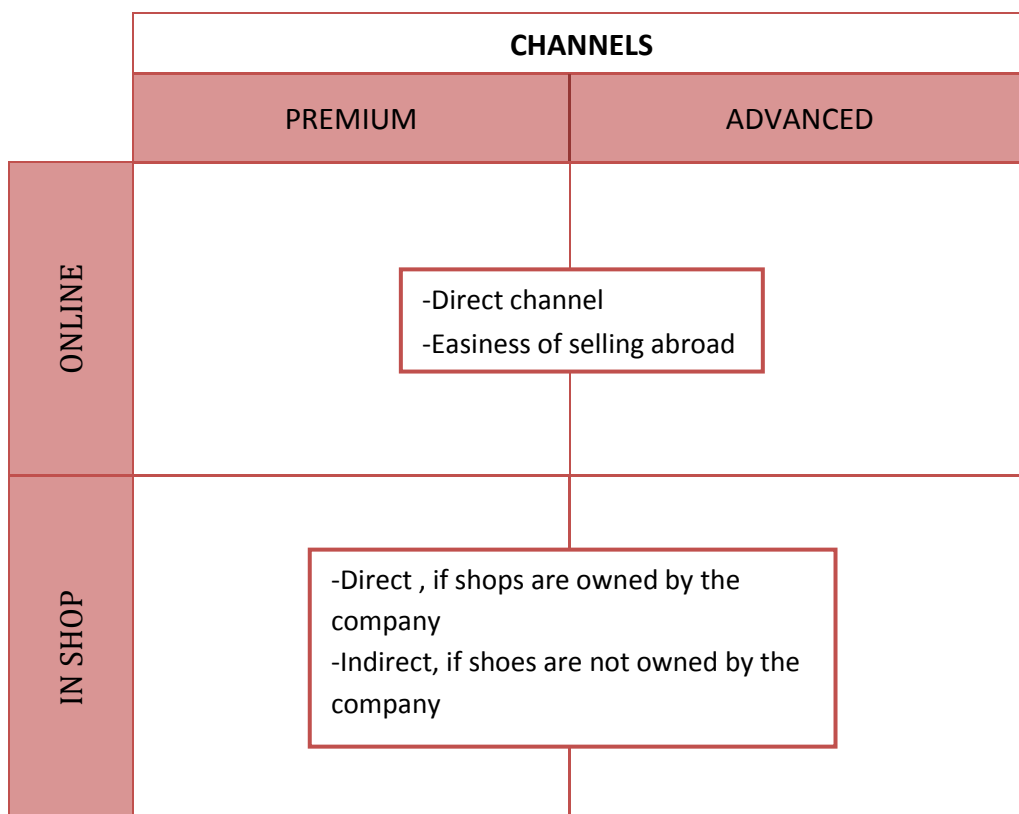


Table 16 – Channels blocks

The Channels building block will vary on the basis of the adoption of an online instead of an in shop solution. Even in this case, the decision to go for a premium rather than an advanced model doesn't impact on the building block.

In case of “**online**” configurators, customers will be reached in a direct way. The company communicates directly with its customers through the website, which is the interface allowing the placement of the order after the customization process has finished. The product will be delivered directly at customer's home within the specified lead time.

Considering “**in shop**” configurators, customers will be reached in a direct or in an indirect way. In particular, if customer orders are placed in shops owned by the company, the channel will be again a direct one. Conversely, if customer orders are placed in shops not owned by the company (e.g. franchisers, mono or multi brand retailers) the channel will be an indirect one, since the intermediaries will have to communicate on their turn the orders to the shoe manufacturing company. Customers can be given the option to decide whether to receive the item directly at home or to collect it in the outlet where the order was placed.

**Revenue stream**

		REVENUE STREAM	
		PREMIUM	ADVANCED
CHANNEL	ONLINE		
	IN SHOP		

Sales of customized shoes

Table 17 – Revenue stream blocks

The Revenue Stream building block is the same regardless the type of configurator selected, as the core of the business is always the sales of customized shoes.

Considering “**online**” configurators, the whole amount of money due by customers for their purchases is cashed out by the shoe manufacturing company, which retains 100% of the product margin on each sale. This happens also for “**in shop**” configurators installed within company's owned outlets.

Different is the case of “in shop” configurators running within third parties’ owned outlets. Here, the amount of money customers pay for their purchases is split among the shoe manufacturing company and the retailer. The percentage of the margin granted to the retailer depends on its bargaining power. Normally, the higher the bargaining power of retailers, the higher their stake of the margin will be. The bargaining power of retailers tend to be high when the products have a low brand awareness, and diminishes in case of branded products.

**Cost structure**

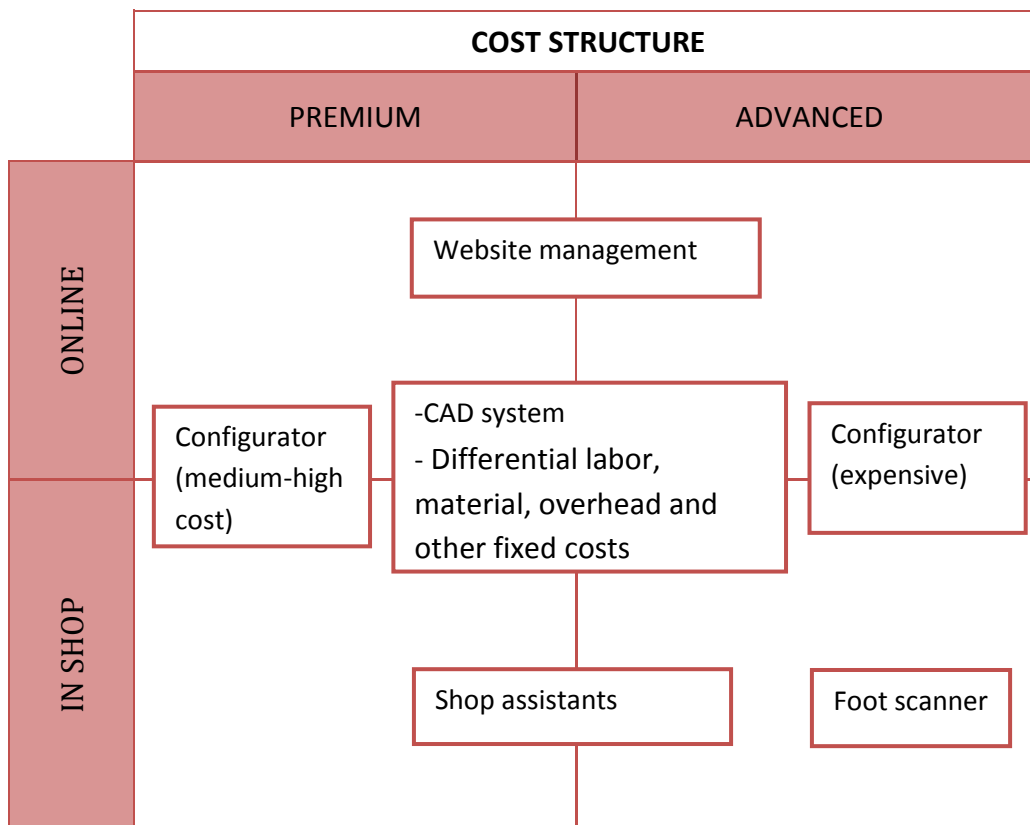


Table 18 – Cost structure blocks

The Cost Structure building block comprises costs which are in common to all the configuration solutions and costs which are specific for a certain solution.

The costs common to all the four scenarios are:

- Configurator costs: this voice includes all the costs directly connected with the tool. It is made up of software development cost, license cost and maintenance cost. The software development cost depends strongly on the functionalities offered by the configurator; normally, it is higher in case of advanced models, since they feature more complex potentialities. This cost doesn't depend on the number of machines where the software will be installed; it is a “una tantum” cost (investment). The license cost has the form of a fee due by the company to the software house which developed the configurator; generally, it is proportional to the number of machine where the configurator will run. The maintenance cost is related to operation of software maintenance. Normally, a maintenance contract is stipulated with the software house which developed the configurator.



- CAD system: this is the purchasing cost of the software for designing the basic models of shoes available for customization. The configurator needs to be integrated with the CAD system in order to display the various models of shoes.

Other costs depend on the kind of configurator selected. In particular, the additional cost needs bearing in case of “**online**” configurators is the website management cost. This cost comprises all the expenses due to the website company in charge of managing the website where the configuration service is hosted.

Concerning “**in shop**” configurators, instead, the differential cost is represented by the shop assistants in charge of supporting customers during the configuration process. It must be noted that this may not be an extra costs, in case shop personnel is interchangeable (no need to hire a figure specifically dedicated to the task). In addition, this cost doesn’t enter the Business Model when the shoe manufacturing company doesn’t own proprietary shops: in this case, in fact, it is the retailer which is in charge of it.

In case of in shop advanced model, the cost of the footwear scanner must be included.

Finally, other costs must be considered, which may or may not originate as a consequence of the introduction of the configurator. They are:

- Hardware costs: they are related to the purchase, installation and maintenance of the machines where the configurator will run. It may arise for in shop solutions, in case of company owned shops;
- Change in supplies cost: the new business may impact the purchasing costs of raw materials and components, as a consequence of different production policies (e.g. smaller lots);
- Change in marketing cost: marketing expenses may vary with respect to prior the introduction of the configurator, because of the need to exploit new advertising channels;
- Change in the cost of agents/stylists due to the necessity to modify the contract with them;
- Other changes in labor costs, e.g. to hire new ad-hoc figures.

To summarize, the TO BE Business Models corresponding to the four alternatives of product configurator implementations are:

<b>ONLINE-PREMIUM CONFIGURATOR</b>	
<b>CUSTOMER SEGMENT</b>	<ul style="list-style-type: none"> <li>- Teenager</li> <li>- Young adults</li> <li>- Children</li> </ul>
<b>CUSTOMER RELATIONSHIP</b>	<ul style="list-style-type: none"> <li>- Possibility of customization</li> <li>- Co-creation and fidelization</li> <li>- Long term relationship with customer</li> </ul>
<b>VALUE PROPOSITION</b>	<ul style="list-style-type: none"> <li>- High service level offered in terms of :               <ul style="list-style-type: none"> <li>• Purchase availability: 24h/24</li> <li>• Possibility of purchasing everywhere</li> <li>• Possibility for customers to get involved in the purchasing experience as long as they want</li> </ul> </li> <li>- Uniqueness and exclusiveness</li> <li>- Involvement in the creation process</li> <li>- Fashion and design of products offered</li> </ul>
<b>KEY PARTNERS</b>	<ul style="list-style-type: none"> <li>- Website manager</li> <li>- Carriers</li> <li>- Software house</li> <li>- Suppliers</li> <li>- Marketing agency</li> <li>- Designers of personalized line</li> </ul>
<b>KEY ACTIVITIES</b>	<ul style="list-style-type: none"> <li>- Design of personalized line</li> <li>- New cutting process</li> <li>- Orders management</li> <li>- Delivery</li> <li>- Monitor customer satisfaction</li> <li>- After sale services</li> </ul>
<b>KEY RESOURCES</b>	<ul style="list-style-type: none"> <li>- Configurator</li> <li>- Website</li> <li>- E- commerce module</li> <li>- Skilled workers</li> <li>- Design software</li> <li>- CAD expert</li> </ul>
<b>CHANNELS</b>	<ul style="list-style-type: none"> <li>- DIRECT channel</li> <li>- Easiness of selling abroad</li> </ul>
<b>REVENUE STREAM</b>	Revenues come from selling customized shoes.
<b>COST STRUCTURE</b>	<ul style="list-style-type: none"> <li>- Configurator (medium-high cost)</li> <li>- CAD system</li> <li>- Website management costs</li> <li>- Differential labor, material, overhead and other fixed costs</li> </ul>

Table 19 – Business Model corresponding to Online- Premium configurator

ONLINE-ADVANCED CONFIGURATOR	
<b>CUSTOMER SEGMENT</b>	<ul style="list-style-type: none"> <li>- Teenager</li> <li>- Young adults</li> <li>- Children</li> </ul>
<b>CUSTOMER RELATIONSHIP</b>	<ul style="list-style-type: none"> <li>- Possibility of <i>further</i> customization</li> <li>- Co-creation and fidelization</li> <li>- Possibility of establishing a long term relationship with customer</li> </ul>
<b>VALUE PROPOSITION</b>	<ul style="list-style-type: none"> <li>- Shoes fitting the foot dimensions at 100%</li> <li>- High service level offered in terms of : <ul style="list-style-type: none"> <li>• Purchase availability: 24h/24</li> <li>• Possibility of purchasing everywhere</li> <li>• Possibility for customers to get involved in the purchasing experience as long as they want</li> </ul> </li> <li>- Uniqueness and exclusiveness</li> <li>- Involvement in the creation process</li> <li>- Fashion and design of products offered</li> </ul>
<b>KEY PARTNERS</b>	<ul style="list-style-type: none"> <li>- Website manager</li> <li>- Carriers</li> <li>- Software house</li> <li>- Suppliers</li> <li>- Marketing agency</li> <li>- Designers of personalized line</li> </ul>
<b>KEY ACTIVITIES</b>	<ul style="list-style-type: none"> <li>- Management of the contracts</li> <li>- Design of personalized Cutting process of customized shoes thanks to CAD system</li> <li>- Orders management</li> <li>- Delivery</li> <li>- Monitor customer satisfaction</li> <li>- After sale services</li> </ul>
<b>KEY RESOURCES</b>	<ul style="list-style-type: none"> <li>- Configurator</li> <li>- Website</li> <li>- E-commerce module</li> <li>- Skilled workers</li> <li>- Design software</li> <li>- CAD expert</li> </ul>
<b>CHANNELS</b>	<ul style="list-style-type: none"> <li>- DIRECT channel</li> <li>- Easiness of selling abroad</li> </ul>
<b>REVENUE STREAM</b>	Revenues come from selling customized shoes
<b>COST STRUCTURE</b>	<ul style="list-style-type: none"> <li>- Configurator (expensive)</li> <li>- CAD system</li> <li>- Website management costs</li> <li>- Differential labor, material, overhead and other fixed costs</li> </ul>

Table 20 – Business Model corresponding to Online - Advanced configurator

<b>IN SHOP-PREMIUM CONFIGURATOR</b>	
<b>CUSTOMER SEGMENT</b>	<ul style="list-style-type: none"> <li>- Adults</li> <li>- Senior</li> <li>- Children</li> </ul>
<b>CUSTOMER RELATIONSHIP</b>	<ul style="list-style-type: none"> <li>- Possibility of customization</li> <li>- Co-creation and fidelization</li> <li>- Support of shop assistants</li> </ul>
<b>VALUE PROPOSITION</b>	<ul style="list-style-type: none"> <li>- Uniqueness and exclusiveness</li> <li>- Differentiation from others</li> <li>- Involvement in the creation process</li> <li>- Fashion and design for the models for children, teenager, young adults and adults</li> <li>- For seniors: <ul style="list-style-type: none"> <li>o quality of materials</li> <li>o comfort (sole softness, zipper or straps rather than laces..)</li> <li>o safety (short heel, robust sole..)</li> </ul> </li> </ul>
<b>KEY PARTNERS</b>	<ul style="list-style-type: none"> <li>- External agents</li> <li>- Qualified shop assistants</li> <li>- Carriers</li> <li>- Software house</li> <li>- Suppliers</li> <li>- Marketing agency</li> <li>- Designers of personalized line</li> </ul>
<b>KEY ACTIVITIES</b>	<ul style="list-style-type: none"> <li>- Design personalized line</li> <li>- New cutting process</li> <li>- Orders management</li> <li>- Delivery</li> <li>- Monitor customer satisfaction</li> <li>- After sale services</li> </ul>
<b>KEY RESOURCES</b>	<ul style="list-style-type: none"> <li>- Configurator</li> <li>- Website (if shops not owned)</li> <li>- ERP(if shops owned)</li> <li>- Skilled workers</li> <li>- Design software</li> <li>- CAD expert</li> </ul>
<b>CHANNELS</b>	<p>DIRECT: if shops owned  INDIRECT: if shops not owned</p>
<b>REVENUE STREAM</b>	<p>Revenues come from selling customized shoes.  Owned shops: margin the same as online  Not owned shops: margins are lower</p>
<b>COST STRUCTURE</b>	<ul style="list-style-type: none"> <li>- Configurator (medium-high costs)</li> <li>- CAD system</li> <li>- Shop assistants costs</li> <li>- Differential labor, material, overhead and other fixed costs</li> </ul>

Table 21 – Business Model corresponding to In shop - Premium configurator

IN SHOP-ADVANCED CONFIGURATOR	
<b>CUSTOMER SEGMENT</b>	<ul style="list-style-type: none"> <li>- Adults</li> <li>- Senior</li> <li>- Children</li> </ul>
<b>CUSTOMER RELATIONSHIP</b>	<ul style="list-style-type: none"> <li>- Possibility of <i>further</i> customization</li> <li>- Support of shop assistants</li> </ul>
<b>VALUE PROPOSITION</b>	<ul style="list-style-type: none"> <li>- Shoes fitting the foot dimensions at 100%</li> <li>- Uniqueness and exclusiveness</li> <li>- Differentiation from others</li> <li>- Involvement in the creation process</li> <li>- Fashion and design for the models for children, teenager, young adults and adults</li> <li>- For seniors: <ul style="list-style-type: none"> <li>o quality of materials</li> <li>o comfort (sole softness, zipper or straps rather than laces..)</li> <li>o safety (short heel, robust sole..)</li> </ul> </li> </ul>
<b>KEY PARTNERS</b>	<ul style="list-style-type: none"> <li>- External agents</li> <li>- Qualified shop assistants</li> <li>- Carriers</li> <li>- Software house</li> <li>- Suppliers</li> <li>- Marketing agency</li> <li>- Designers of personalized line</li> </ul>
<b>KEY ACTIVITIES</b>	<ul style="list-style-type: none"> <li>- Design of personalized line</li> <li>- New cutting process</li> <li>- Orders management</li> <li>- Delivery</li> <li>- Monitor customer satisfaction</li> <li>- After sale services</li> </ul>
<b>KEY RESOURCES</b>	<ul style="list-style-type: none"> <li>- Configurator</li> <li>- Website (if shops owned)</li> <li>- ERP (if shops not owned)</li> <li>- Skilled workers</li> <li>- Software for design of customized line</li> <li>- Foot scanner (if shops owned)</li> <li>- CAD expert</li> </ul>
<b>CHANNELS</b>	<p>DIRECT: IF OWNED SHOPS INDIRECT: NOT OWNED SHOPS</p>
<b>REVENUE STREAM</b>	<p>Revenues come from selling customized shoes. Owned shops: margin the same as online Not owned shops: margins are lower</p>
<b>COST STRUCTURE</b>	<ul style="list-style-type: none"> <li>- Configurator (expensive)</li> <li>- CAD system</li> <li>- Shop assistants costs</li> <li>- Foot scanner</li> <li>- Differential labor, material, overhead and other fixed costs</li> </ul>

Table 22 – Business Model corresponding to In shop - Advanced configurator

### 3) Economic analysis

Once the company comes out with the most suited configurator to introduce, it is necessary to carry out an economic analysis, in order to assess if this investment is worth or not for the company.

The economic analysis includes the assessment of the economic indicators and the investment analysis. The evaluation is made in a differential way: starting from the as-is situation of the company (without the configurator), it will be assessed how the introduction of the configurator will impact on company's performances.

- **Economic indicators**

From both company and product perspective, the most important indicators used to perform the economic analysis are the following (see table 22):

CATEGORY	INDICATOR
<b>EFFICIENCY</b>	Period costs
	Unitary production costs
	Production lead time
	Variability of production lead time
	Value added time
	Capacity utilization rate
	Throughput rate
<b>PROFITABILITY</b>	Operating profit
	Unitary expected gross profit
	Product lifecycle cost
<b>INVESTMENTS</b>	Investment
	R&D investment intensity
<b>RISK MANAGEMENT</b>	Supply risk

Table 22 – Economic indicators

- **Investment analysis**

The investment analysis consists in the calculation of the Net Present Value (NPV) of the investment.

$$NPV = \sum_{t=1}^T \frac{CF_t}{(1+r)^t} - CF_0$$

Where:

- R is the discount rate;

- $C_0$  is the initial investment at year 0;
- $C_t$  are the future cash flows;
- $T$  is the time;

A positive value the NPV indicates that it is worth for the company to undertake the investment.

This methodology could be applied to whatever shoe manufacturing company willing to start approaching Mass Customization by introducing a product configurator. In order to validate it, in the next chapter it will be applied on a real case.

## CHAPTER 5 - TIGER'S CASE

### 5.1 Introduction

To validate the methodology described in the previous chapter it will now be applied to a real case, whose object is Tiger company, an Italian shoe manufacturing company which felt the need to introduce, after carrying out an internal and external analysis, a product configurator to start selling customized shoes. The methodology will guide the company to choose, on the basis of its needs and strategies, the most appropriate configurator and, starting from the AS-IS situation, it will assess how the introduction of the configurator will impact on company's Business Model. In performing the analysis, only the differential elements are taken into account, since the new line Tiger is going to introduce will not substitute the existing one, but rather it will complement it. At the end, an economic analysis is required, to assess if the investment is worth or not.

### 5.2 Description of the company

TIGER s.r.l. is an Italian company, operating in the shoe sector since 1975, located in the leather tanning district of Pisa, Tuscany. Employing about 50 workers, the firm is the typical small medium enterprise, with annual revenues amounting to 40M€ from sales occurring mainly in Italy (90%), E.U. (7%) and Japan (3%). The company has a market share of about 5% in its sector, with main competitors being Geox, Nero Giardini, Café Noir and Stonefly (see figure 32):

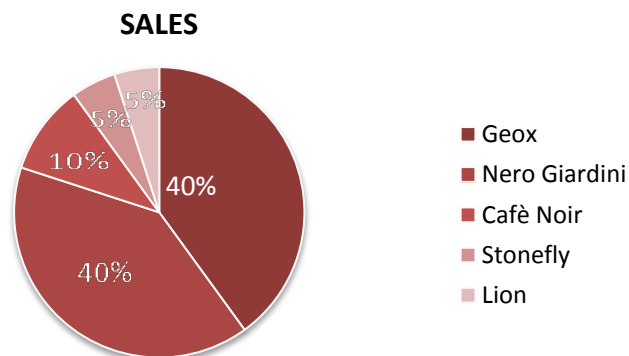


Figure 32 – Market share of Tiger's competitors

Company's main lines are:

- Free and working time walking shoe for men, rubber sole and leather upper
- Classic shoes for men, rubber and leather sole, leather upper.
- Sport and comfort shoe for women, rubber sole and leather upper.

They are addressed to both men and women in the age 30-70. Products have an average price of 150€, due to the attention for high quality materials supplied locally, and are distributed through a net of approximately 1000 multi-brand shops in Italy managed by agents, who are partly hired by the company and partly freelancers.

The value proposition that Tiger offers to its consumers is mainly based on the quality of products, the concept of "Made in Italy" and the constant innovation in materials used as well as in the



design. The relationships with retailers, instead, is based upon the strong brand awareness connected with reliability and the high level of service offered.

In order to operate its business, Tiger relies on a series of key resources, activities and partnerships. The tangible resources are represented by skilled workers, in charge of assembling shoes, and directly-hired agents who manage the relationships with retailers. Concerning intangible resources, paramount is the utilization of the software for designing products as well as the shoes-related patent the company has recently developed, named "Antistatica". The key activities Tiger need to carry out to maintain its competitive advantage are: shoes design, shoes assembly and specialized services to retailers (possibility to order anytime during selling season and availability of big-size shoes). Talking about key partnerships, Tiger mainly relies on stylists, who have the important task of developing shoes characterized by nice design and high comfort, and freelance agents, whose role is not just limited to maintain relationship with existing retailers but also to find new ones.

The cost structure of Tiger is constituted mainly by labor cost (40%) and raw materials cost (38%). Other relevant costs are represented by marketing costs (10%), agents cost (7%) and transportation costs (5%). Revenues stream is almost completely related to shoe selling.

At this point, an analysis of the contest, both internal and external, is necessary to highlight the reasons to adopt Mass Customization and introduce a product configurator.

### **5.3 Internal analysis**

The internal analysis has been carried out by analyzing the trend of Tiger's sales in these recent years.

In the last three years ,in particular, Tiger has witnessed a decrease in its sales (as shown in figure 33 and table 23). To answer to this situation it tried to address a new market segment, that is made by younger people (between 20-40 years old) and it decided to address this new segment by offering them the possibility to personalize their shoes through the use of a product configurator.

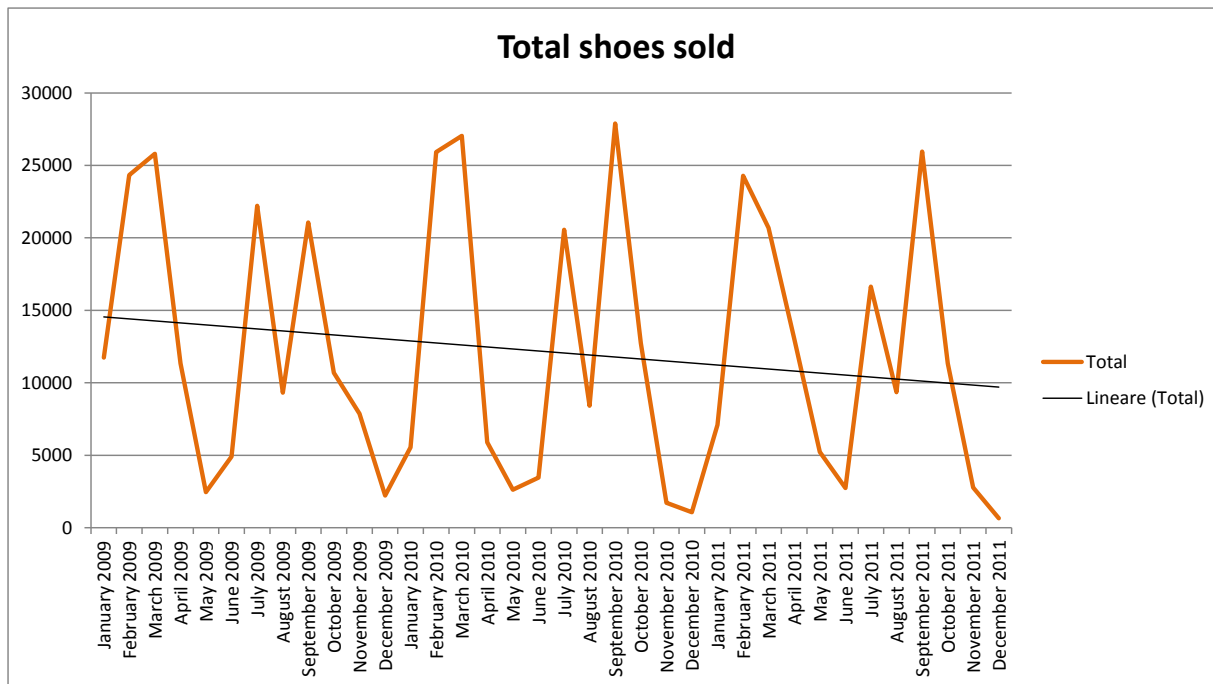


Figure 33 - Total shoes sold by Tiger

	SOLD	RETURN	TOTAL
<b>2009</b>	155.932	1.967	153.965
<b>2010</b>	144.821	1.952	142.869
<b>2011</b>	142.188	2.370	139.818

Table 23 - Units sold by Tiger per year

## 5.4 External analysis

By making an external analysis, it is possible to notice the following aspects:

- The never ending increase in the use of Internet and web sales, even in the shoe market in the last years (<http://www.rtmol.it/>);
- The failure of the "one size fits all" model that became out-of-date. Individuals now want to be seen and treated as unique and they are willing to pay for this.

From an analysis of Tiger's competitive system, instead, it comes out that more and more shoe manufacturing companies have recently started to offer personalized shoes, by introducing a product configurator which support customers during the customization process.

While in the as-is situation the main competitors of Tiger are Italian medium- size enterprises like Geox, Nero Giardini, Cafè Noir and Stonefly, the introduction of the configurator will cause a change in the competitive system.

In this new scenario, where customers can create customized shoes, the competitive environment is constituted first of all by Italian small-medium enterprises like Pànchic, Marziali shoes and Personal Shoes and, in a broader sense, by the most known multinational companies like Nike, Adidas and Converse.

All those companies have in common the fact that, besides offering pre-design shoes, allow customers to create personalized shoes, in particular to choose the model, the components, the colors as they prefer. Hereinafter, a description of the different companies and what they offer is provided (the information comes from the relative websites, listed in figure 34):

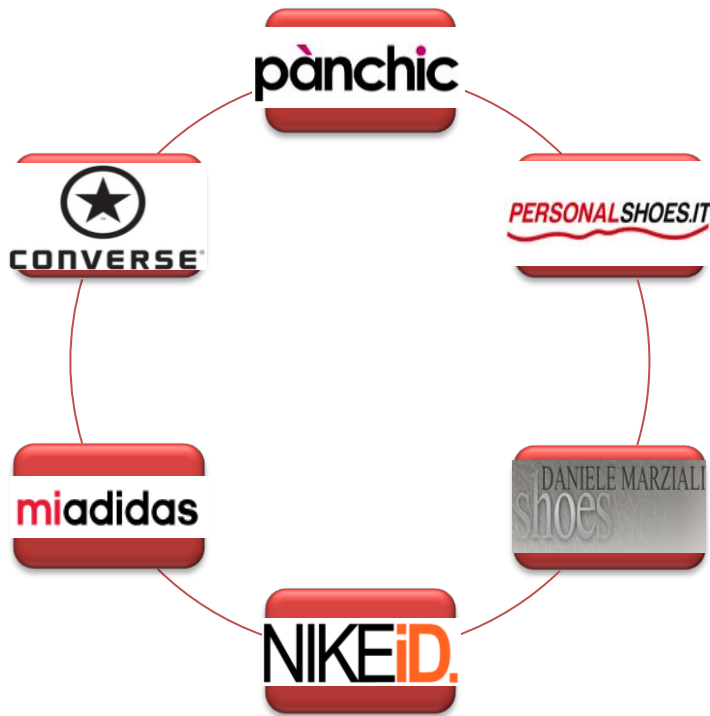


Figure 34 – Tiger' competitors in the To Be scenario

## PÀNCHIC

Pànchic is a family owned and managed enterprise, located in Fonte (TV), Italy. Until last year the company was known under the name of “Arsenale5” and was a subcontractor of other firms operating in the shoe sector. After losing an important customer, the company took the decision of entering directly in the market with the creation of its own lines of shoes.

Pànchic wants to pursue a competitive advantage of differentiation, focusing on the glamour of the products offered, on the excellence of materials used and on the originality, seen as they will not to resemble other players in the sector.

The company pays a lot of attention also to environmental issues, by implementing actions aimed at reducing the materials used for the packaging (shoes are delivered inside simple paper bags rather than traditional cases) and promoting the recycle of materials (customers can have shoes made using denim taken from an old pair of jeans).

Due to its status of “startup”, Pànchic has Italy as reference market; sales happen mostly (not to say totally) here and the brand is still unknown abroad. Communication is made through innovative channels (YouTube, Facebook page and Twitter), which allow a good reach of the target customer (young adults) with low expenditures.

The outlook for Pànchic seems very positive; with sales up to 700,000€ during the first two seasons and 450,000€ expected for the third season (S/S 2012) (<http://tribunatreviso.gelocal.it/cronaca/2012/05/03/news/scoppia-la-moda-panchic-le-scarpe-personalizzate-1.4455780>), the company is determined to grow rapidly.

The main products of the company are:

- *Pre-designed shoes*, launched on the market twice a year at the beginning of the shopping seasons (spring and fall). These shoes are offered in two separate collections, addressing respectively female and male public. Although they can be categorized as “casual shoes”, a lot of attention is devoted to design and careful selection of materials. Target customers are young adults (20-30) and children. Pre-designed shoes are sold through a net of retailers, both physical (traditional shoe shops) and online (Privalia, Spartoo, Zalando, etc). Prices vary in the range 90-120€.

- *Customized shoes*, offered in two “standard” models (cold season/warm season), whose features the customer can decide, so as to obtain the desired configuration. Both the model for the cold season and the model for the warm season are unisex. Although they can be categorized as “casual shoes”, a lot of attention is destined to design and careful selection of materials. Target customers are young adults (20-30) who love fashion and are particularly prone to eccentric and distinctive products. Customized shoes are sold uniquely on company’s website. The product has a fixed price of 148€ and delivery times are within 4 weeks. Delivery costs, whose amount vary according to the delivery/payment method selected, the country of destination and the total order value, are to be added to the final price of every purchase. Customized shoes are not subjected to the right of withdrawal. The customizable features are:
  - upper, toe cap, flap: 8 colors (suede), 5 colors (leather);
  - laces: 8 colors;
  - logo: 5 colors;
  - back line, below line, sole: 5 colors;
  - writing: optional (max. 6 characters).



Figure 35 – Panchic configurator

## PERSONAL SHOES

Personal shoes is a small-medium enterprise located in Brescia, Italy, active in the shoe sector since few years. Key aspects characterizing the company are originality of design and high quality of raw materials used in production; all shoes are realized manually by expert craftsmen.

Unlike other competitors, Personal Shoes sells its product uniquely online, without the intermediation of physical/online retailers; this choice is enabled by an effective delivery system, which guarantees consignees within at most 20 days since the order placement.

The disintermediation helps the company keep high margins on the products sold and good contracts with freight companies allow to leave customers free of shipping costs (at least in Italy).

The reference market for Personal Shoes is Italy, even if sales can happen worldwide thanks to e-shopping directly from company’s website. The company implements a communication strategy based on the use of innovative channel (Facebook page), which allow a good reach of the target

customer, constituted by young adults, with low expenditures.

The main products of the company are:

- *Pre-designed shoes*, offered in the two models “Flagshoes” and “Teamshoes”. Target customers are prevalently male young adults (20-30) who appreciate casual/athletic shoes featuring flags and football teams colors as main decorative pattern. These models have a fixed price of 99€. Right of withdrawal is possible only in case of wrong number.
- *Customized shoes*, offered in the 3 models “Mod. 100”, “Mod. 200” and “Mod. P5000”. Right of withdrawal cannot be applied due to impossibility in re-selling a personalized product.
  - In “Mod. 100” a personalized text (of maximum 8 characters) can be added on the shoes. Target customers are young adults (20-30); these shoes can be categorized as “casual”. This model has a fixed price of 99€.
  - In “Mod. 200” the customizable features are:
    - upper, tongue, heel, toe caps, eyelets: 12 colors (suede), 8 colors (leather), 4 colors (patent);
    - sole: 2 colors;
    - writing: optional (max. 8 letters).Target customers are young adults (20-30); these shoes can be categorized as “casual”. This model has a fixed price of 99€.
  - In “Mod. P5000” the customizable features are:
    - upper: 3 colors (leather wheeled), 3 colors (smooth skin), 1 color (suede);
    - external character: to be chosen among alphabet letters;
    - zipper: yes/no.

This product is more focused on fashion and design. Target customers are young adults (20-30) who pay attention to glamour. This model has a fixed price of 129€.



Figure 36 – Personal shoes configurator

## MARZIALI SHOES

Marziali shoes is an Italian small- medium company located in Porto Sant'Elpidio (AP), Italy; since 1960 it has been producing hand-made high quality women's shoes.

The main products of the company are casual-formal shoes for women aged 20-50.

In the last few years, following the decision to close the traditional channel, creations have been brought online, where they can be sold directly to the customers.

The sales are concentrated mostly in Italy even if, through to the online shops, the company can sell also abroad.

The main product of the company are:

- *Pre-designed shoes*, sold both on company's website and eBay virtual shop. About the pricing policy, the price of pre-designed shoes is variable in the range 80-100€.
- *Personalized models*, sold only on company's website. About the pricing policy, the price of customized shoes vary in the range 80-110€. Four models can be personalized, with the following features:
  - upper: 18 colors (suede), 18 colors (leather), 18 colors (patent);
  - heels: 18 colors and 2 shapes available.

For what concern delivery times and costs, shipping is supposed to happen within 10-20 days for whatever shoes, whereas the costs depend on the destination: in Italy 8,50€, in Europe 19€, worldwide 45€.

Marziali shoes offer the possibility to return whatever product within 10 days after receiving it, without necessarily specifying the reason.

Concerning communication on the social networks, the company has created a post on Facebook to count the number of click "I like it" that shoes advertised receive.



Sposta il mouse sull'immagine  
Fai una domanda su questo oggetto

**Materiale:** Pelle Vernice  
**Suola Interna:** Pelle  
**Tacchi:** Alti 12 cm  
**Provenienza Materiali:** Italia  
**Disegnate e Lavorate da:** Daniele Marziali

**Accessori inclusi:**  
scatola argento lucida logata  
velina protettiva nera  
sacchetti antipolvere  
sottotacchi di ricambio

EU	33	34	35	36	37	38	39	40	41	42	43	44	45	46
UK	1	1½	2	3	4	5	6	6½	7	7½	8	9½	10½	11½
US	3	4	5	6	6½	7½	8½	9	9½	10	10½	12	13	14
CM	22	22,5	23	23,5	24	24,5	25	25,5	26	26,5	27	27,5	28	28,5

Figure37 – Marziali shoes configurator

## NIKE

Nike is a multinational company founded in U.S.A in 1967. The company is world leader in production of sport shoes with an annual turnover of 20billion€, of which 11,5 billion€ are related to footwear sector. Nike was the first to introduce the possibility of customizing shoes with the creation of NIKEiD in 1999. Since Nike shoes are athletic, the target customers are considered to be children, men and women of all ages and all over the world. Main products of the company are:

- *Pre-designed shoes*, sold both by traditional and online retailers located worldwide and on company's website. The company designs a lot of models addressed to specific sports; considering the use, the price is variable in the range 45-400€. Considering Europe, the delivery time is in the range 2-7 days (e.g. in Italy 2-5 days);
- *Personalized models*, sold only on company's website. For each sport, different models can be personalized at different prices, variable in the range 120-250€. Delivery time is around 5-6 weeks.

Considering, for example, "Nike Blazer" model for woman, the customizable features are:

- upper: 3 colors;
- back tab, lining, eyelets, logo: 17 colors;
- laces: 15 colors;
- zipper: 8 colors;
- toe cap: 2 colors;
- writing: optional (max. 8 characters).

For what concern the delivery costs, in both cases Nike offers free delivery for orders higher than 150€, otherwise they depends on the destination (e.g. in Italy 6,95€).

According to Nike return policy, all shoes can be given back within 30 days after receiving them.

In addition, Nike allows to:

- share your design on Facebook, Twitter and the other main social networks, so everyone can see the creations made by other buyers;
- create a poster with a personalized background and with the picture of your personalized shoes;
- add your design to the Nike id gallery, so everyone knows you are the stylist of that shoes.

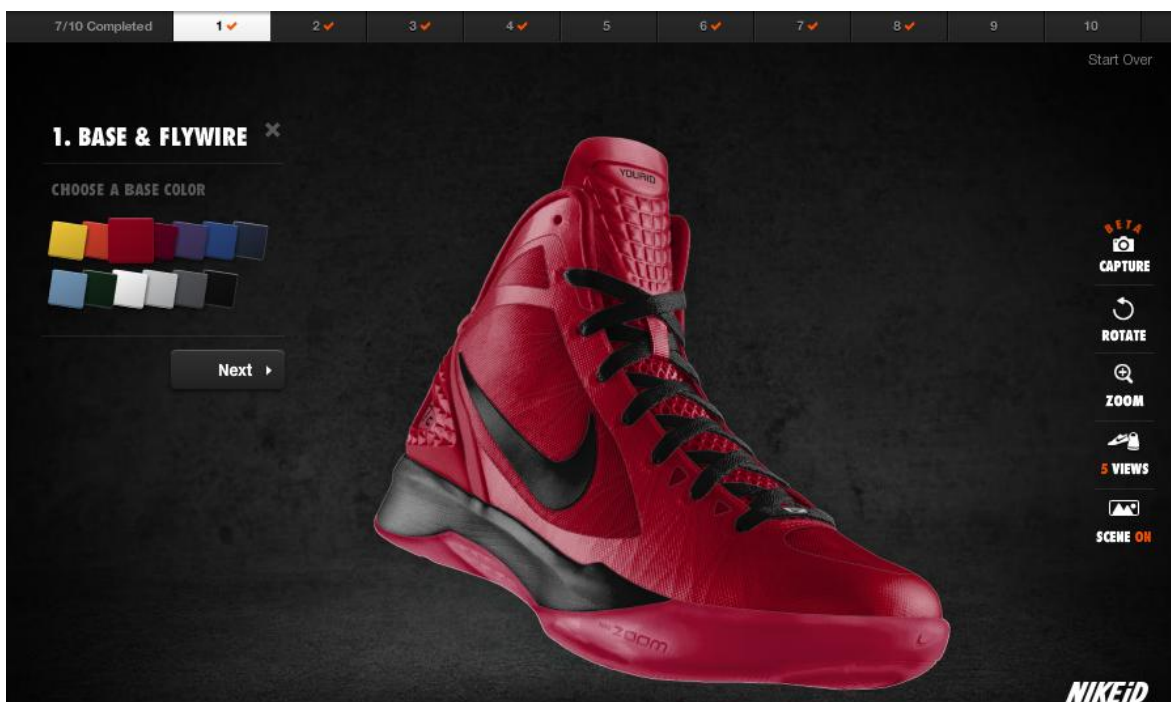


Figure 38– Nike configurator

## ADIDAS

Adidas is a multinational company founded in 1948 in Germany. It is the largest sportswear manufacturer in Europe and the second biggest sportswear manufacturer in the world after Nike, with a turnover of 13,3 billion € of which 6,3 are related to footwear.

The company realizes athletic shoes and the target customers are children, men and women of all ages and all over the world.

The main product are:

- *Pre-defined models*, sold both by traditional and online retailers located worldwide and on company's website. The price varies in the range 50€-400€ according to the model, instead the delivery time is around 2-4 days;
- *Customized shoes*, instead, can be created both on My Adidas website and on My Adidas stores, located in many countries (e.g. the Italian one is in Rome). The cost is in the range 90€-270€ while delivery time are estimated to be 3-4 weeks.

Considering, for example, the "Superstar II" model, the customizable feature are:

- upper, eye stay, tongue: 12 colors;
- stripes, laces: 16 colors;
- below line: 15 colors;
- eyelets: 11 colors;
- toe cap, outsole: 3 colors;
- writing: optional.

For what concern the delivery costs, in both cases Adidas offers free delivery for orders higher than 150€, otherwise they depends on the destination.

Returns, instead, are allowed only in case of pre-designed models.

Moreover, it's possible to share your design on Facebook, Twitter, etc. to make it seen by everyone.

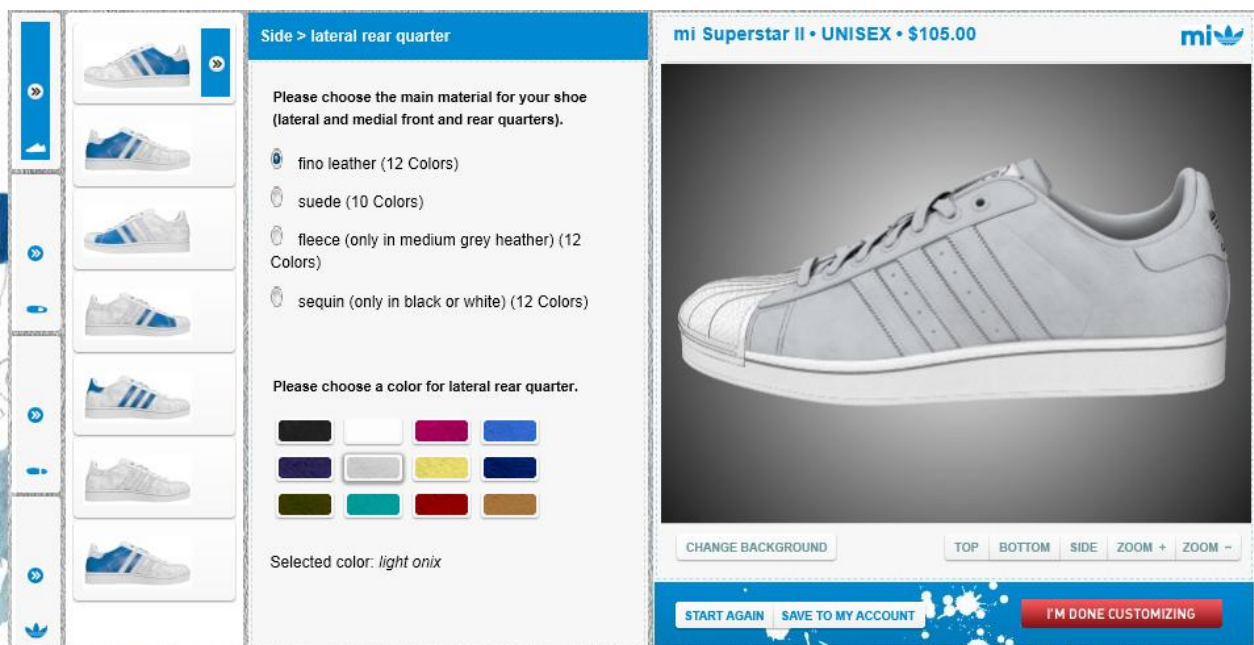


Figure 39 – Adidas configurator



## CONVERSE

Converse is an American multinational company, active in the shoe sector since the beginning of the 20th century, with a turnover of 1,1 billion€.

The most known product of the company is the All Star Converse model, created in 1923 by Chuck Taylor, a famous basketball player.

In July 2003 the brand was acquired by Nike, which introduced a lot of new All-Star models contributing to re-affirm the product on the market.

Converse creates athletic shoes addresses to a younger target than Nike or Adidas; customers are considered to be children, teenagers and young adults all over the world.

The main products of the company are:

- *Pre-designed shoes*, sold both by traditional and online retailer worldwide and on company's website. Price varies in the range 40€-180 € according to the model. The delivery time is estimated to be 8-14 days depending on the destination. Shipping costs amounts to 12€.
- *Personalized shoes*, sold only on company's website. Price is in the range 60€-110€. Currently customized shoes are not shipped internationally, but only within USA, with a shopping cost of 9\$.

Considering, for example, the "Chuck Taylor" model, the customizable features are:

- upper, lining : 24 colors (canvas)
- tongue, sewing thread: 14 colors
- eyelets: 12 colors
- toe cap, sole: 3 colors
- laces: 7 colors
- writing: optional

All shoes can be given back.



Figure 40 – Converse configurator



	PANCHIC	PERSONAL SHOES	MARZIALI SHOES	NIKE	ADIDAS	CONVERSE
<b>WEBSITE</b>	<a href="http://www.panchic.it">www.panchic.it</a>	<a href="http://www.personalshoes.it">www.personalshoes.it</a>	<a href="http://www.marzialishoes.it">www.marzialishoes.it</a>	<a href="http://www.nike.com">www.nike.com</a>	<a href="http://www.adidas.it">www.adidas.it</a>	<a href="http://www.converse.com">www.converse.com</a>
<b>HEADQUARTERS</b>	Fonte (TV)	Brescia	Porto Sant'Elpidio (AP)	USA	Germany	USA
<b>COMPANY DIMENSION</b>	family-owned and managed enterprise with < 10 employees	small - medium company	small-medium company	multinational company with 35000 employees	multinational company with 43000 employees	multinational company with employees
<b>TURNOVER (2011)</b>	700.000 €	no indication	no indication	20 billion € of which 11,5 billion € are related to footwear	13,3 billion € of which 6,3 billion € are related to footwear	1,1 billion €
<b>MARKET SERVED</b>	mostly Italy	mostly Italy	mostly Italy	all over the world	all over the world	all over the world
<b>TARGET CUSTOMER</b>	young adults (20-30) and children	young adults (20-30)	women (20-50)	man, women, children of all ages	men, women, children of all ages	children, teenagers and young adults
<b>TYPE OF SHOES</b>	Casual	casual/athletic	casual/formal	Athletic	Athletic	athletic
<b>TRADITIONAL CHANNEL (RETAILER)</b>	Yes	no	No	Yes	Yes	yes
<b>ONLINE RETAILER (Spartoo, Zalando..)</b>	Yes	No	No	Yes	Yes	yes
<b>PRE-DESIGNED SHOES</b>	only by retailers	on company's website	on company's website	both by retailers and on company's website	both by retailers and on company's website	both by retailers and on company's website
<b>CUSTOMIZED SHOES</b>	on company's website	on company's website	on company's website	on company's website	on company's website in My Adidas store	on company's website
<b>PRICES</b>	pre-designed: 100€ personalized: 150€	pre-designed: 100€ personalized: 100€-130€	pre-designed: 80€-110€ personalized: 80€-100€	pre-designed: 45€-400€ personalized: 120€-250€ (depending on the sport)	pre-designed: 50€-400€ personalized: 90€-270€ (depending on the sport)	pre-designed: 40€-180 € personalized: 60€-110€
<b>DELIVERY TIME</b>	within 4 weeks	at most 20 days for whatever shoes	10-20 days for all shoes	pre-designed: 2-5 days personalized: 5-6 weeks	pre-designed: 2-4 days personalized: 3-4 weeks	pre-designed: 8-14 days personalized: 2-3 weeks
<b>DELIVERY COSTS</b>	In Italy: free Abroad: depends on the country (e.g. 35€ to Paris)	In Italy: free Abroad: depends on the country	In Italy: 8,50€ In Europe: 19€ Worldwide: 45€	In most countries (including Italy) free delivery for orders higher than 150€. Otherwise, for Italy the standard cost is 6,95€. (e.g. for Germany is 3,50 €)	Free deliveries for orders higher than 150€. Otherwise, it changes from country to country	Pre-designed: 12€ in Italy Personalized shoes: only within USA (9 \$)
<b>RIGHT OF WITHDRAWAL</b>	only pre-designed shoes can be given back	all shoes can be given back if number is wrong	all shoes can be given back	all shoes can be given back	only pre-designed shoes can be given back	all shoes can be given back

Table 1 - Context analysis

**CUSTOMIZABLE  
FEATURES**

- upper
- sole
- laces
- toe cap
- flap
- logo
- back line
- below line
- writing

- upper
- sole
- tongue
- heel
- toe cap
- eyelets
- writing

- upper
- heels

- upper
- laces
- toe cap
- eyelets
- back tab
- lining
- zipper
- logo
- writing

- upper
- laces
- toe cap
- stripes
- eye stay
- tongue
- eyelets
- outsole
- below line
- writing

- upper
- sole
- laces
- toe cap
- tongue
- lining
- eyelets
- sewing thread
- writing

## 5.5 Application of the methodology

After the internal and external analysis, Tiger decided to undertake a new investment, which consists in introducing a product configurator to start approaching Mass Customization, by offering customized shoes, with the aim at:

- trying to increase sales in future years;
- being competitive in the market.

In this section the methodology developed in the previous chapter will be applied to Tiger's case, in order to support the company in the choice of the most appropriate product configurator and in the assessment of the TO BE Business Model following its implementation.

The four steps the methodology is based on are the following:

- 5) whether the configurator will be implemented "*online*" or "*in-shop*";
- 6) Decide the level of the configurator: "*premium*" or "*advanced*";
- 7) Assess the TO BE business models;
- 8) Carry out an economic analysis in order to assess if the investment is worth or not.

### 1) "Online" or "In shop"

Tiger decided to implement an "online" configurator and the choice was driven by:

- *Web strategy*: which the company decided to put in place;
- *Degree of capillarity*: Tiger has the objective to reach a broader market with the new line. This is possible by implementing an online solution for the configurator;
- *Service level*: Tiger wants to offer high service level;
- *Target customers*: the new line is designed for young adults, a "web-literate" category, which is more inclined to buy customized shoes using an online configurator rather than an in-shop one;
- *Customer relationships*: the company wants to establish a direct relationship with customers;
- *Brand awareness*: since Tiger does not own shops, it would be obliged to sell through multi-brand shops, which probably would not take the risk of introducing a configurator, due to the low brand awareness of the company.

### 2) "Premium" or "Advanced"

Tiger decided to opt for a "premium" configurator and this choice was driven by:

- *Level of customization*: Tiger wants to offer customer a limited number of customizable features, colors and materials;
- *Technical features*: Tiger configurator is supposed to be simple, not too much sophisticated with limited technical features;

- Interaction with the user: also this characteristic is limited, since customers are not guided or supported during the customization process;
- Integration with operative system: it does not represent a real need for the company;
- Configurator costs: Since budget is a constraint for the introduction of the configurator, Tiger can just opt for a medium-sophisticated model with limited features and possibility of customization.

At this point, the alternative chosen by the company is an “**online-premium**” configurator: it will allow customers to get their personal and unique shoes choosing among different customizable features; in particular, Tiger’s configurator is supposed to offer to customers the following features (see table 24):

<b>UPPER</b>		7-8 colors
<b>SOLE</b>		2-3 types of rubber; 1 type of leather;
<b>STRINGS</b>		All colors
<b>SEWING THREAD</b>		All colors
<b>WRITING</b>		Whatever

Table 24 – Tiger configurator’ characteristics

The configurator has an impact on some aspects of mass customization, summarized in table 25.

CATEGORY	INDICATOR	VALUE AND DESCRIPTION
----------	-----------	-----------------------

<b>CUSTOMIZATION LEVEL</b>	Average number of customizable features	of 5 (upper, sole, strings, sewing thread, writing).
	Average number of options per customizable features	<ul style="list-style-type: none"> <li>• Upper: 7-8 colors;</li> <li>• Sole: 2-3 type of rubber, 1 type of leather;</li> <li>• Strings: different colors;</li> <li>• Sewing thread: different colors;</li> <li>• Writing: chosen by customers.</li> </ul>
<b>SERVICE LEVEL</b>	Delivery lead time	3-4 weeks At most 6 weeks
	Customer experience/satisfaction	Data not yet available

Table 25 - Impact of the configurator on MC indicators

### 3) Definition of the TO BE Business Models

The general TO BE Business Model which refer to the “online-premium” configurator, described in the third step of the methodology defined in chapter 4.4.2, is the following (see table 26):

<b>ONLINE-PREMIUM CONFIGURATOR</b>	
<b>CUSTOMER SEGMENT</b>	Teenager, young adults, children
<b>CUSTOMER RELATIONSHIP</b>	<ul style="list-style-type: none"> <li>- Possibility of customization</li> <li>- Co-creation and fidelization</li> <li>- Long term relationship with customer</li> </ul>
<b>VALUE PROPOSITION</b>	<ul style="list-style-type: none"> <li>- High service level offered in terms of : <ul style="list-style-type: none"> <li>• Purchase availability: 24h/24</li> <li>• Possibility of purchasing everywhere</li> <li>• Possibility for customers to get involved in the purchasing experience as long as they want</li> </ul> </li> <li>- Uniqueness and exclusiveness</li> <li>- Involvement in the creation process</li> <li>- Fashion and design of products offered</li> </ul>
<b>KEY PARTNERS</b>	<ul style="list-style-type: none"> <li>- Website manager</li> <li>- Carriers</li> <li>- Software house</li> <li>- Suppliers</li> <li>- Marketing agency</li> <li>- Designers of personalized line</li> </ul>
<b>KEY ACTIVITIES</b>	<ul style="list-style-type: none"> <li>- Design of personalized line</li> <li>- New cutting process</li> <li>- Orders management</li> </ul>

	<ul style="list-style-type: none"> <li>- Delivery</li> <li>- Monitor customer satisfaction</li> <li>- After sale services</li> </ul>
<b>KEY RESOURCES</b>	<ul style="list-style-type: none"> <li>- Configurator</li> <li>- Website</li> <li>- E-commerce module</li> <li>- Skilled workers</li> <li>- Design software</li> </ul>
<b>CHANNELS</b>	<ul style="list-style-type: none"> <li>- DIRECT channel</li> <li>- Easiness of selling abroad</li> </ul>
<b>REVENUE STREAM</b>	Revenues come from selling customized shoes.
<b>COST STRUCTURE</b>	<ul style="list-style-type: none"> <li>- Configurator (medium-high cost)</li> <li>- CAD system</li> <li>- Website management costs</li> <li>- Differential labor, material, overhead and other fixed costs</li> </ul>

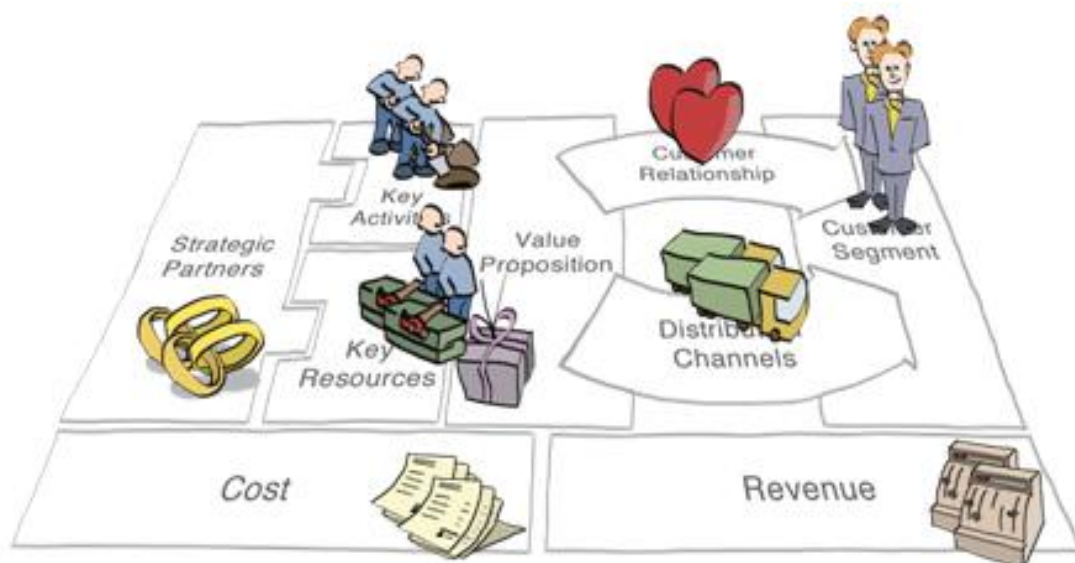
Table 26 – online - premium configurator Building Blocks

This Business Model is very general, and can be applied to whatever shoe manufacturing company willing to introduce an online-premium configurator.

In particular, starting from the AS IS situation of Tiger, it is possible to assess which block will be modified by the introduction of the configurator and what will change.

### Analysis of the as-is situation

The analysis of Tiger's as is Business Model is carried out by using Osterwalder's Canvas method.





## ***Value proposition***

The company delivers two value propositions, one addressed to the end customer and the other addressed to shoe retailers.

- The value proposition for the *end customer* aims at highlighting:
  - The quality of the products offered in terms of comfort, well-being and resistance. Particular emphasis is put on the communication of the in-house developed patents “Antistatica” (a system which frees the body from negative electrostatic charges), “Sofà” (anatomic sole ensuring comfort and preventing feet from sweating) and “Lionature” (a system for absorbing impacts and ensuring stability and flexibility).
  - The concept of “Made in Italy”: all Tiger shoes are produced in Italy thanks to the work of craftsmen who take care about every detail of the product. This allows high quality of processes and the identification of the brand as an example of style expressing the highest level of Italian creativity.
  - Innovation of material and design.
- The value proposition for the shoe retailers is oriented to stress the high service level provided by Tiger (in terms of stock out likelihood), as well as the reliability and strong reputation of the brand itself. All these factors contribute to diminish the risk the retailers embark with the purchasing of Tiger shoes.

## ***Customer segment***

Tiger target consumers are male and female between 30 and 70, with medium-high spending power. They are mostly attentive to quality rather than design.

## ***Customer relationship***

Tiger sells pre-designed shoes only. As a consequence of this choice, no customer relationship such as personal assistance or co-creation is put in place. Customer relationship activities concerns returned goods only (right of withdrawal).

## ***Channels***

Tiger adopts an indirect channel, meaning that the relationship between the company and the end customers is mediated by the shoe retailers. At present, Tiger sells its products to about 1.000 “multi-brand” shoe retailers of different size (from small boutique downtown to bigger shops inside malls), in different Italian regions. . Furthermore, Tiger also sells limited quantities to online players such as Privalia..

## ***Key activities***

Tiger’s core activities are:

- Design. This activity is in charge of two external designers (not hired by Tiger) with whom the company has established a long-term relationship. One designer is in charge of developing male collections, the other is responsible for female collections.
- Assembly., This activity is in charge of skilled craftsmen. Even though this process could be further automated, few activities (e.g. sewing) are intentionally made manually as a decision of the company to ensure an higher quality of the products.
- Specialized services. These services are offered to the retailers by the company, which permit them to order shoes any time during selling season or shoes for big sizes.
- Research and development. Tiger pays particular attention to finding solutions for improving comfort, design and durability over time, with the final goal of maximizing customer satisfaction.

### ***Key resources***

The main resources Tiger relies on are:

- Skilled craftsmen, who contribute for a large stake of products' value added;
- Software used by designers;
- Agents;
- Patents "Antistatica", "Sofà" and "Lionature", which add value to the products offered and convey to customers the idea of firm's commitment on research and development.

### ***Key partners***

Tiger's key partners are:

- Designers, who have the important role to create valuable collections allowing, where possible, to differentiate Tiger's products from other comparable products on the market. Designers are not hired by the company but they are called to work twice a year for the development of the collections. One designer is in charge of developing male collections, the other is responsible for female collections. The company has established long term relationships with them.
- Agents, whose mission is to advertise new products to Tiger' retailers as well as scouting new ones.

### ***Other stakeholders***

The main stakeholders are local communities. It is important, in an optic of environmental sustainability, to respect and not to put in danger people living and working in the neighborhood of the firm. This means that Lion has to pay attention to such aspects like level of emissions, waste sent to landfill, water discharges, noises, odors and landscape disharmonies which may negatively affect the life of the community.

The analysis of the AS IS situation has been the starting point to identify the blocks where the configurator will impact on and what will change in each block.

In particular, the TO BE business model of Tiger company is the following (see table 27):

<b>ONLINE-PREMIUM CONFIGURATOR</b>	
<b>CUSTOMER SEGMENT</b>	Teenager, young adults, children
<b>CUSTOMER RELATIONSHIP</b>	<ul style="list-style-type: none"> <li>- Co-creation and fidelization</li> <li>- Long term relationship with customer</li> </ul>
<b>VALUE PROPOSITION</b>	<ul style="list-style-type: none"> <li>- Possibility of customization</li> <li>- Fashion and design of products offered</li> </ul>
<b>KEY PARTNERS</b>	<ul style="list-style-type: none"> <li>- Website manager</li> <li>- Carriers</li> <li>- Software house</li> <li>- Suppliers</li> <li>- Marketing agency</li> <li>- Designers of personalized line</li> </ul>
<b>KEY ACTIVITIES</b>	<ul style="list-style-type: none"> <li>- Design of personalized line</li> <li>- New cutting process</li> <li>- Orders management</li> <li>- Delivery</li> <li>- Monitor customer satisfaction</li> <li>- After sale services</li> </ul>
<b>KEY RESOURCES</b>	<ul style="list-style-type: none"> <li>- Configurator</li> <li>- Website</li> <li>- E-commerce module</li> <li>- Skilled workers</li> <li>- Design software</li> <li>- CAD expert</li> </ul>
<b>CHANNELS</b>	<ul style="list-style-type: none"> <li>- DIRECT channel</li> <li>- Easiness of selling abroad</li> </ul>
<b>REVENUE STREAM</b>	Revenues come from selling customized shoes.
<b>COST STRUCTURE</b>	<ul style="list-style-type: none"> <li>- Configurator (medium-high cost)</li> <li>- CAD system</li> <li>- Website management costs</li> <li>- Differential labor, material, overhead and other fixed costs</li> </ul>

Table 27 – Tiger’s online- premium configurator Building Blocks

### ***Customer segment***

Tiger target customers are male and female aged between 20 and 40, with medium-high spending power. They are the mostly likely to use Internet channels and are attentive to fashion and, even if in a not so high extent, also to quality.

### **Customer relationship**

Tiger aims at establishing strong customer relationship and this can be built on fidelization and co-creation.

### **Value proposition**

In the **TO-BE** situation, another value proposition for the *end customer* is developed, which goes alongside the existing one. It strongly relies on:

- The possibility of customizing their own shoes, which will ensure a stronger alignment with customers' preferences and style.
- Fashion and design, which will characterize the "new" line of shoes. These aspects will contribute to enhance the value delivered to the end customers mostly concerned with glamour.

### **Key partners**

Tiger's additional key partners are:

- The new designer. The designer is not hired by the company but he/she is called to work twice a year for the development of the collections belonging to the "new line". Since the target customers of the "new lines" are young adults, the new stylist has to be particularly expert in fashion trends of this segment.
- Website manager.
- Marketing agency. It is in charge of advertising.
- Freight companies. It is important for Tiger to establish proper contracts/good relationships with carriers and to constantly monitor their behavior, as delivery time is a key driver for customer satisfaction.
- Leather's suppliers. Leather is the raw material which affects the quality of the shoes and, consequently, also customer satisfaction since leather is probably one of the most important detail people look at when deciding to buy a shoe. Therefore, it is important for Tiger to establish long-term relationships with reliable supplier which can provide high-quality leather in a short time.

**To answer to this situation two alternatives emerged:**

- 1. Use of the fast tanning technology**
- 2. Use of inventories at the supplier's site**

### **Key activities**

The additional activities of Tiger will be:

- Design of the “new lines”. This activity will be in charge of a new external designer (not hired by Tiger), who will have the task of creating fashionable shoes, always minding comfort and durability issues.
- CAD design. Alongside the introduction of the “new line”, an automated cutting machine will be purchased with the aim of speeding up the cutting process and minimizing waste of materials. The new cutting machine will rely on the use of the CAD technology for the acquisition of the drawings.
- Delivery. The shoes will be shipped directly to consumers through freight carriers (e.g., Bartolini, TNT..).  
Even if the delivery is not in charge of Tiger, it is important for the company to establish proper contracts/good relationships with carriers and to constantly monitor their behavior, as delivery time is a key driver for customer satisfaction.
- Management of returned goods. The issue of returned goods is particularly critical in the case of fashion products sold online, since the return rate naturally increases.  
An additional element of complexity will relate to the fact that different rules have to be applied to personalized items, compared to not personalized products.

### ***Key resources***

The main additional resources Tiger relies on are:

- The configurator. The configurator will be developed and managed by a software house .
- The website developed for supporting online sales. The current company website was not conceived to this aim.
- The CAD software. CAD will be used to produce the drawings to guide the cutting machine.
- The CAD expert. A new technician with the capabilities of using CAD software will be hired.
- The automated cutting machine, aimed to speed up the cutting process.

### ***Channels***

The end customers will be reached directly, without any intermediary, by exploiting Tiger’s website. This solution will allow Lion to keep margins that otherwise would be due to resellers. Online sales virtually put no constraints on the geographical areas that can be served by the company (allowing the company to sell its shoes also abroad). On the other hand, Tiger will continue to sell its “traditional line” through retailers, avoiding to create overlaps (and thus competition) between the two lines (traditional and new).

### ***Revenue stream***

Additional revenues come from the sales of the customized shoes:

### ***Cost structure***

Besides the differential costs related to the introduction of the configurator, the CAD system with the relative expert, the new cutting machine, the website management, the designer of the new

line, the new warehouse operator and, eventually, new skilled operators in the assembly process, additional costs refer to the raw materials, overhead and additional fixed costs required to realized the new customized line.

To summarize, each block of the TO BE Business Model will be compared to that of the AS IS Business Model, in order to assess the differential change following the introduction of the product configurator:

<b>CUSTOMER SEGMENT</b>	
<b>AS-IS</b>	<b>TO-BE (differential)</b>
Adults and Senior: male/female aged 30-70 with medium-high spending power	Young adults: male/female aged 20-40 with medium spending power

Table 28 - Customer segment block

<b>CUSTOMER RELATIONSHIP</b>	
<b>AS-IS</b>	<b>TO-BE (differential)</b>
No relationship with final customer, such as personal assistance or co-creation with consumers	Customer fidelization Co-creation

Table 29 - Customer relationship block

<b>VALUE PROPOSITION</b>	
<b>AS-IS</b>	<b>TO-BE (differential)</b>
Quality in terms of comfort, antistatic, well-being and resistance; innovation of materials and design; made in Italy	Fashion and design, customized shoes

Table 30 - Value proposition block

<b>KEY PARTNERS</b>	
<b>AS-IS</b>	<b>TO-BE (differential)</b>
Designers Agents	Designer of the new line Website manager Marketing Agency Freight companies Leather's suppliers

Table 31 - Key partners block

KEY ACTIVITIES	
AS-IS	TO-BE (differential)
Design	Design of the new line
Assembly	CAD – based cutting process
Specialized services	Delivery
Research and development	After sales service (management of returns of customized products )

Table 32 - Key activities block

KEY RESOURCES	
AS-IS	TO-BE (differential)
Skilled workers	Configurator
Software	Website developed for online sales
External agents	CAD software
Antistatica patent	CAD expert
	Cutting machine
	Skilled operator

Table 33 - Key resources block

CHANNELS	
AS-IS	TO-BE (differential)
Sales to retailers through a network of freelance agents	Through the configurator the “new line” is sold online directly to final customer Easiness of selling abroad

Table 34 - Channels block

REVENUE STREAM	
AS-IS	TO-BE (differential)
Sales of non customizable shoes	Sales of customizable shoes

Table 35 – Revenue stream block

COST STRUCTURE	
AS-IS	TO-BE (differential)
- Labor costs	- Configurator (medium-high cost)
- Overhead	- CAD system
- Raw material costs	- Website management costs
- Other fixed costs	- CAD expert
	- Designers of the new line
	- Warehouse operator
	- Skilled assembly operators
	- Differential raw materials
	- Differential overhead
	- Other differential fixed costs (Marketing costs, distribution costs).

Table 36 – Cost structure block

#### 4) Economic analysis

The economic analysis includes the assessment of the economic indicators and the investment analysis. The evaluation is made in a differential way, i.e., we use as a base case the current situation (without the configurator) and we analyze how the introduction of the configurator supported by two different alternatives (**fast tanning technology/inventories at the supplier's site**) will affect Lion performances. The three scenarios that have been considered are those characterized by 5.000, 10.000 and 20.000 units sold (returned goods have been calculated as the 10% of the products sold), expresses in table 37:

	<b>Net sales (without returned goods)</b>	<b>Returned goods</b>
Scenario 1	5.000 pair of shoes	500 pair of shoes
Scenario 2	10.000 pair of shoes	1.000 pair of shoes
Scenario 3	20.000 pair of shoes	2.000 pair of shoes

Table 37 – Three scenarios

In table 38 are listed all the economic indicators (both from a company and product perspective).

<b>Category</b>	<b>Indicator</b>
Efficiency	Period costs
	Unitary production costs
	Production lead time
	Variability of production lead time
	Value added time
	Capacity utilization rate
	Throughput rate
Profitability	Operating profit
	Unitary expected gross profit
	Product lifecycle cost
Investments	Investment
	R&D investment intensity
Risk management	Supply risk

Table 38 - Economic indicators

#### INVESTMENT ANALYSIS

Some indicators don't change their value on the basis of the alternative chosen. This means that the results that come out from the comparison between alternative 1 (fast tanning technology) and the AS-IS situation is the same one that come out from the comparison between alternative 2 (inventories at the supplier's site) and the AS-IS situation. Differently, where the value changes, it will be specified.



## Period costs

Period costs include all the costs not related to the production process (see table 39).

<b>Period costs (fixed)</b>	<b>[€/year]</b>
Marketing	80.000
Licenses and SW maintenance	1.000
Configurator depreciation quota	5.000
<b>TOTAL</b>	<b>86.000</b>

Table 39 – Period costs

## Unitary production costs

Production costs include all the costs related to labor, materials and overheads, and distribution. Unitary labor costs have been calculated dividing the total costs by the number of units produced in total (demand + returned goods). See table 40:

<b>Labor</b>	<b>Scenario 1 [€/year]</b>	<b>Scenario 2 [€/year]</b>	<b>Scenario 3 [€/year]</b>
CAD technician	30.000	30.000	30.000
Cutting operator	30.000	30.000	30.000
Warehouse operator	30.000	30.000	30.000
Designer	80.000	80.000	80.000
Skilled workers	60.000	60.000	90.000
<b>TOTAL</b>	<b>230.000</b>	<b>230.000</b>	<b>260.000</b>
<b>TOTAL unitary costs</b>	<b>41,82 €/pair</b>	<b>20,91 €/pair</b>	<b>11,82 €/pair</b>

Table 40 – Unitary production costs

The introduction of the configurator requires the introduction of operators. The only difference between the three scenarios is given by the costs of skilled workers, that increases on the basis of the volume (pair of shoes) produced.

Unitary cost of materials and overheads costs (energy and waste), instead, don't change in the three scenarios, but change on the basis of the type of sole used (see table 41):

<b>Materials and overheads</b>	<b>Rubber sole [€/pair]</b>	<b>Leather sole [€/pair]</b>
Sole	6,0	15,0
Upper	9,0	9,0
Lining	3,0	3,0
Insole	2,0	2,0
Strings and other accessories	1,0	1,0
Other variable costs (energy, dump, waste)	1,9	1,9
Shoe box	0,5	0,5
<b>TOTAL</b>	<b>23,4</b>	<b>32,4</b>

Table 41 – Material and overhead costs

The item other variable costs include costs associated to energy, dump and wastes. In particular, energy includes all the costs related to the new cutting machine and to the traditional process and it is calculated as follows (see table 42):

<b>Energy</b>	
Price per KWh	0,146 €/KWh
Energy used by cutting machinery	8 KWh
Number of pair of shoes / hour	5 pair/hour
TOTAL energy cost with the new machinery	$(8 \times 0,146) / 5 = 0,23$ €/pair
TOTAL energy cost with the traditional process	0,22 €/pair
<b>TOTAL energy cost</b>	<b>0,45 €/pair</b>

Table 42 – Energy costs

Dump concerns the costs associated to the discharge of waste material leather in the field and it is calculated as follows (see table 43):

<b>Dump</b>	
Waste materials cost (leather)	0,125€/kg
Waste material for pair of shoes	0,076 kg/pair
<b>TOTAL cost for dump</b>	<b>0,01 €/pair</b>

Table 43 – Dump costs

The cutting machine will be used only for the production of the new lines. So the differential costs will be given by the wastes related to the production of each new pair of shoes.

<b>Waste</b>	<b>TO-BE (with the new cutting machine)</b>
Leather used for pair of shoes	3,32 feet square/pair
% of waste material	15%
Waste materials	0,52 feet square/pair
Leather price	2,80 €/feet square
<b>TOTAL cost per pair</b>	<b>1,46 €/pair</b>

Table 44 – Waste

Distribution costs have been calculated on the basis of the costs provided by the current carrier that serves Lion (see table 45):

<b>Distribution</b>	<b>€/pair</b>
<b>TOTAL cost per pair</b>	<b>6,00</b>

Table 45 – Average distribution cost

So the unitary costs related to the production process are expressed in table 46:

<b>Unitary production costs</b>	<b>Scenario 1 [€/pair]</b>	<b>Scenario 2 [€/pair]</b>	<b>Scenario 3 [€/pair]</b>
Labor	41,82	20,91	11,82

Material and other overheads	Rubber sole: 23,4 Leather sole: 32,4	Rubber sole: 23,4 Leather sole: 32,4	Rubber sole: 23,4 Leather sole: 32,4
Distribution	6,00	6,00	6,00
<b>TOTAL costs if rubber sole</b>	71,22	50,31	41,22
<b>TOTAL costs if leather sole</b>	80,22	59,31	50,22

Table 46 – Unitary Production Cost

Production lead time / Variability of production lead time / Value added time / Capacity utilization rate / Throughput rate: these indicators cannot be evaluated because data are not yet available.

### **Operating profit**

Operating profit is calculated as the difference between revenues and cost of sales and period costs (see table 47):

Revenues	Scenario 1	Scenario 2	Scenario 3
Pair sold (without returns)	5.000 pair/year	10.000 pair/year	20.000 pair/year
Price	150 €/pair	150 €/pair	150 €/pair
TOTAL revenues	750.000 €/year	1.500.000 €/year	3.000.000 €/year

Cost of sale	Scenario 1 [€/year]	Scenario 2 [€/year]	Scenario 3 [€/year]
Materials and overheads (+)	153.450	306.900	613.800
Labor (+)	230.000	230.000	260.000
Depreciation (+)	18.000	18.000	18.000
Distribution and service (+)	36.000	72.000	144.000
Variation of inventories (finished goods) (-)	36.495	50.445	81.073
Provision of returned goods (+)	18.248	25.223	40.536
TOTAL cost of sale	419.202	601.677	995.264

Table 47 – Operating Profit

Relevant assumptions:

- Material and overheads has been calculated in connection to the following product mix: 50% of shoes are produced with rubber soles and 50% of shoes with leather ones;
- The item “Service” refers to the movement of returned goods, so this cost includes even the distribution costs related to returned goods;
- Returned goods increase the inventories of finished goods (valuated at production cost);
- Half of the returned goods are not resalable on secondary markets, hence a provision is foreseen.

The resulting operating profit is calculated as follows (see table 48):

<b>OPERATING PROFIT</b>	<b>Scenario 1 [€/year]</b>	<b>Scenario 2 [€/year]</b>	<b>Scenario 3 [€/year]</b>
Revenues	750.000	1.500.000	3.000.000
Cost of sale	419.202	601.677	995.264
Period costs	86.000	86.000	86.000
<b>TOTAL operating profit</b>	<b>244.798</b>	<b>812.323</b>	<b>1.918.736</b>

Table 48 – Operating Profit

### **Unitary expected gross profit**

Based on the above calculation, the unitary expected gross profit is calculated as follows (see table 49):

<b>UNITARY EXPECTED GROSS PROFIT</b>	<b>Scenario 1 [€/year]</b>	<b>Scenario 2 [€/year]</b>	<b>Scenario 3 [€/year]</b>
Revenues	750.000	1.500.000	3.000.000
Cost of sale	419.202	601.677	995.264
Gross profit	330.798	898.323	2.004.736
<b>TOTAL unity gross profit</b>	<b>66,16 €/pair</b>	<b>89,83 €/pair</b>	<b>100,24 €/pair</b>

Table 49 – Unitary expected gross profit

### **Product lifecycle cost**

This indicator cannot be evaluated because data are not yet available.

### **Supply risk**

Not measurable and not relevant for Lion case study.

### **Investment analysis**

To estimate the returns on the investment, the Net Present Value was used. We made this evaluation on four years and on the basis of some hypothesis, i.e.:

- The demand remain constant;
- NCF is calculated without considering the fiscal effects;
- The distribution is made only within Italy;
- The product mix is composed by 50% of shoes with rubber soles and 50% of shoes with leather ones;
- Discounting rate (r): 6,5%.

<b>INFLOWS</b>	<b>Scenario 1</b>	<b>Scenario 2</b>	<b>Scenario 3</b>
Pair sold (without returns)	5.000 pair/year	10.000 pair/year	20.000 pair/year
Price	150 €/pair	150 €/pair	150 €/pair
<b>TOTAL</b>	<b>750.000 €/year</b>	<b>1.500.000 €/year</b>	<b>3.000.000 €/year</b>

<b>OUTFLOWS</b>	<b>Scenario 1</b>	<b>Scenario 2</b>	<b>Scenario 3</b>
Period	81.000 €/year	81.000 €/year	81.000 €/year
Labor	230.000 €/year	230.000 €/year	260.000 €/year
Distribution and service	36.000 €/year	72.000 €/year	144.000 €/year
Materials and overheads	146.475 €/year	292.950 €/year	585.900 €/year
<b>TOTAL</b>	<b>493.475 €/year</b>	<b>675.950 €/year</b>	<b>1.070.900 €/year</b>

<b>INVESTMENTS [Year 1]</b>	<b>Scenario 1</b>	<b>Scenario 2</b>	<b>Scenario 3</b>
Investment in fix assets	105.000,00 €	105.000,00 €	105.000,00 €
Investment in OWC	50.600,00 €	64.500,00 €	95.200,00 €
<b>TOTAL</b>	<b>155.600,00 €</b>	<b>169.500,00 €</b>	<b>200.200,00 €</b>
<b>INVESTMENTS [Year 2-3]</b>	<b>Scenario 1</b>	<b>Scenario 2</b>	<b>Scenario 3</b>
Investment in fix assets	0,00	0,00	0,00
Investment in OWC	0,00	0,00	0,00
<b>TOTAL</b>	<b>0,00</b>	<b>0,00</b>	<b>0,00</b>
<b>INVESTMENTS [Year 4]</b>	<b>Scenario 1</b>	<b>Scenario 2</b>	<b>Scenario 3</b>
Investment in fix assets	0,00	0,00	0,00
Investment in OWC	-50.600,00 €	-64.500,00 €	-95.200,00 €
<b>TOTAL</b>	<b>-50.600,00 €</b>	<b>-64.500,00 €</b>	<b>-95.200,00 €</b>

Table 50 – Investment analysis

Investments in operating working capital is given by the sum of variation of inventories of finished goods and of accessories.

Thus, the NCF of the 4 years are the following ones:

<b>[€]</b>	<b>Scenario 1</b>	<b>Scenario 2</b>	<b>Scenario 3</b>
NCF Year 1	100.930,00	654.505,00	1.728.927,00
NCF Year 2	256.525,00	824.050,00	1.929.100,00
NCF Year 3	256.525,00	824.050,00	1.929.100,00
NCF Year 4	307.120,00	888.595,00	2.024.273,00
<b>NPV</b>	<b>772.033,06</b>	<b>2.714.004,47</b>	<b>6.494.732,38</b>

Table 51 – NPV

The NPV of the three scenarios is always positive, therefore it is worth undertaking the investment: the introduction of the product configurator, in fact, is expected to increase the sales in the future and offer Tiger the opportunity to make a leap in quality.

## CHAPTER 6 - CONCLUSIONS

According to the objectives of the thesis, our work consisted in the development of a methodology to support shoe manufacturing companies in the introduction of a product configurator “business to consumer” and in the assessment of the changes needed to adapt the Business Model as a consequence of this choice.

The product configurator is a tool which allows for the customization of an object, by giving users the “right to choose” what they prefer about a few key features of the product itself. This involvement in the creation process gives customers the possibility of differentiation and enhance the sensation of uniqueness connected with the purchase. The importance of the product configurator lies in the fact that, nowadays, it is one of the most used tools through which companies can operatively implement Mass Customization.

The methodology is articulated at two levels: starting from company’s objectives and characteristics, the first step guides the selection of an “online” or rather of an “in shop” configurator; once defined this, the second step has the aim of suggesting the adoption of a “premium” or of an “advanced” model, based on more technical characteristics, regarding the tool itself.

The guidelines are an attempt to standardize a process which, by its nature, is very difficult to be generalized. The selection of a product configurator, being strongly dependent on company’s specific characteristics, is in fact very hard to be formalized. One can argue that it is impossible to find two companies adopting the same product configurator: this gives the idea of how much the configurator is a company-tailored product. Nevertheless, the methodology can be used as a support for defining a few macro characteristics that the tool should offer.

The selection of the proper model of product configurator, anyhow, is not an end in itself. Our work, in fact, makes a step forward, as it assesses the changes that the introduction of the tool causes on the different parts of the business. In doing this, the framework adopted to approach the business model is the “Business Model Canvas” from famous author Alexander Osterwalder. In particular, the implications deriving from the selection of a particular model of configurator have been listed for each business model building block.

The necessity of being as general as possible forced us to list all the possible impacts that could occur at business model level; as before, it is not said that a company will be affected by all of them, as contingency and company’s dynamics play an important role also in this case.

To move from theory to practice, the above-mentioned methodology has then been applied to a real case, as a validation and consistency check of the various steps of the methodology. Taking company’s needs and objectives as input, and supported by an external analysis to better characterize the context, the observation of the guidelines allowed to come up with the suggestion of which should be the most suited model of product configurator to introduce in the case considered. Finally, a comparison between the “as-is” and the “to-be” business model of the company has been carried out, in order to assess the changes originating at business model level following the introduction of the product configurator.

The absence of exhaustive literature about product configurators forced us to ground our work on sources other than books. In particular, our sources consisted of interviews with experts in the field of configurators. The formalization of what we have been told during the interviews and, secondly, the application of the methodology to a real case study, represent the main contribution to the literature that this thesis work can give.

As far as the contribution to companies is concerned, our work can be seen as a collection of guidelines useful to:

- help companies willing to start implementing Mass Customization through a product configurator to understand which are the most important macro features that differentiate the various models, thus orienting the selection of the most suited tool based on the specific characteristics of the company and of the environment where it operates. This reduction in the informative asymmetry can speed up the time and reduce the likelihood of failure connected with the selection process of the proper product configurator. In addition, the methodology can suggest possible changes that may need implementing at business model level, following the introduction of the product configurator;
- help companies which have already implemented Mass Customization through a product configurator to check whether the selected tool is exactly the right one for them, or whether there can be room for improving the performances of customization process through the selection of a different model. Secondly, the methodology can help to understand if relevant changes in the business model following the introduction of the configurator have been neglected and still need implementing.

In order for our methodology to acquire more empirical relevance, what still needs to be done is a broader validation. The methodology should be applied to a much higher number of shoe manufacturing firms and, possibly, extended also to companies operating in different consuming goods sectors.

## REFERENCES

- Ahlstrom, P., and Westbrook, R, 1999. Implications of mass customization for operations management: an exploratory survey. *International Journal of Operations and Production Management* 19(3), 262-274.
- Ahlstrom, P., Westbrook, R., 1999. Implications of mass customization for operations management: An exploratory survey: *International Journal of Operations and Production Management* 19 (3) ,262-274.
- Boyton, A., Victor, B., Pine,J.,1993. New competitive strategies: Challenges to organizations and information technology, *IBM Systems Journal* 32 (1), 40-64.
- Casadesus - Masanell R. and Ricart J. E. (2011). How to design a winning Business Model. *Harvard Business Review*, 101-107.
- Christel, M., Kyo C. Kang , 1992. Issues in Requirements Elicitation. Technical Report\_CMU/SEI-92-TR-012.
- Christopher, M.,2005. *Logistics and Supply Chain Management: Creating Value Adding Networks*, 3rd Edition.
- Claycomb, C., Droge, C.,Germain,R.,2005.Appliedcustomerknowledgeina manufacturing environment: flexibility for industrial firms. *Industrial Marketing Management* (6),629–640. F.S. Fogliatto et al./ *Int. J. Production Economics* 138 (2012) 14–25.
- Da Silveira, G., Borenstein, D., Fogliatto, F.S., 2001. Mass customization: literature review and research directions. *International Journal of Production Economics* 72 (1), 1–13.
- Davis, S., 1989. From future perfect: mass customizing. *Planning Review* 17 (2), 16–21.
- DeVor, R. Graves, R., Mills, J., 1997. Agile manufacturing research: Accomplishments and opportunities, *IIE Transactions* 29 (10),813-823.
- Dietrich, A.J., Kirn, S., Sugumaran, V., 2007. A service-oriented architecture for mass customization: a shoe industry case study. *IEEE Transactions on Engineering Management* 54 (1), 190–204.
- Drizo, A., Pegna, J., 2006. Environmental impacts of rapid prototyping.
- Feitziger, E., 1997. Mass Customization at Hewlett-Packard. The power of postponement. *Harvard Business Review* 71 (5), 161-121.
- Gilmore, J., Pine, J., 1997. The four faces of Mass Customization 75 (1), 91-101.
- Gutman, R., Graves, R., 1995. The agile manufacturing enterprise- Both a new paradigm and a logical extension of flexible and lean, *EAMRI Report ER95-10*, Rensselaer Polytechnic Institute, Troy, NY.



- Hart, C., 1995. Mass Customization Conceptual underpinnings, opportunities and limits. *International Journal of Service Industry Management* 6 (2), 36-45.
- Helms, M.M., Ahmadi, M., Jih, W.J.K., Ettkin, L.P., 2008. Technologies in support of mass customization strategy: exploring the linkages between e-commerce and knowledge management. *Computers in Industry* 59 (4), 351–363.
- Jagdev, H., Browne, J., 1998. The extended enterprise - a context for manufacturing, *Production Planning and Control* 9 (3), 216-229.
- Jagdev, H., Browne, J., 1998. The extended enterprise in a context for manufacturing, *Production Planning and Control* 9 (3), 216-229.
- Johnson M.W., Christensen C.M. and Kagermann, H. 2008. Reinventing Your Business Model. *Harvard Business Review*, 50-59.
- K. Turowski,1999. A virtual electronic call center solution for mass customization, *Proceedings of the 32nd Annual Hawaii International Conference on Systems Sciences*, 152-164.
- Kotha, S., 1995. Mass Customization Implementing the emerging paradigm for competitive advantage. *Strategic Management Journal* (16), 21-42.
- Kotha,S.,1996. Mass Customization strategy for knowledge creation and organization learning. *International Journey for Technology Management* 11 (7/8), 846-858.
- L. Goldman, R.L. Nagel and K Preiss,1995. *Agile Competitors and Virtual Organizations - Strategies for Enriching the Customer*, Van Nostrand Reinhold.
- Lampel, J., Mintzberg, H., 1996. Customizing Customization. *Sloan Management Review* (38), 21-30.
- Lau,R.,1995. Mass Customization, the next industrial revolution. *Industrial management* 37 (5), 18-19.
- Magretta, J. (2002). *Why Business Models Matter*. *Harvard Business Review*, 80 (5), 86-92.
- Mintzberg, H. (1994). *The Rise and Fall of Strategic Planning*.
- Nielsen, K.J., Cox, J.J., 2008. Implementation of biomechanical mating conditions in CAD. *Computer-Aided Design and Applications* 5 (1–4), 338–353.
- Ninan, J.A., Siddique, Z., 2006. Internet-based framework to support integration of customer in the design of customizable products. *Concurrent Engineering* 14 (3), 245–256.
- Osterwalder A. (2004). *The Business Model Ontology - a proposition in a design science approach*. Dissertation. University of Lausanne, Switzerland.
- Osterwalder A. and Pigneur Y. (2010). *Business Model Generation*. Hoboken, New Jersey: John Wiley & Sons, Inc.

Piller, F.T., 2004. Mass customization: reflections on the state of the concept. *International Journal of Flexible Manufacturing Systems* 16 (4), 313–334.

Piller, F.T., Tseng, M., Handook of research in Mass Customization and personalization (1), 175-176.

Pine II, B.J., Victor, B., Boynton, A.C., 1993. Making mass customization work. *Harvard Business Review* 71 (5), 108–118.

Powell, S., Gallegos, F., 1998. Securing virtual corporations, *Information Structure: The Executive's Journal* 14 (4) 34-38.

Qiao, G., 2001. CAID platform for mass customization manufacturing. *Journal of Software* (12), 393-398.

Shafer S. M., Smith H. J. and Linder J. (2005). The power of the business models. *Business Horizons* (48), 199-207.

Simpson, W., 2004. Product platform design and customization. *Artificial Intelligence for Engineering Design, Analysis and Manufacturing* 18(1), 2-20.

Squire B, Brown S, Readman J, Bessant J (2006) The impact of mass customization on manufacturing trade-offs. *Prod Oper Manag* (15), 10–21.

Storch, R., Lim, S., 1999. Improving flow to achieve lean manufacturing in shipbuilding, *Production Planning and Control* 10 (2), 127-137.

Svensson, C., 2002. Computers in industry. *Stimulating Manufacturing Excellence in Small and Medium Enterprises* 49 (1), 77-79.

Von Hippel, E., 2001. *Journal of Product Innovation Management* 18 (4), 247–257.

Wikner, J., Rudberg, M., 2005. Integrating production and engineering perspectives on the customer order decoupling point. *International Journal of Operations and Production Management* 25 (7), 623–641.

Wind, J., Rangaswamy, A., 2001. Customization: the next revolution in mass customization. *Journal of Interactive Marketing* 15 (1), 13–32.

Zott C., Amit R. and Massa L. (2010). *The Business Model: theoretical roots, recent developments, and future research*. Copyright © 2010 IESE Business School, University of Navarra.