



Who is co-creating?

The importance of the co-creator in product preference

“It is no longer a question of creating value for the customer; rather, it is about creating value with the customer and incorporating the customer’s value creation into the system.” S. Wikström (1996)

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Abstract (Portuguese Version)

Título da Tese: "Quem está a co-criar? A importância do co-criador na preferência de um produto "

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Nos dias de hoje os mercados estão cada vez mais competitivos e as empresas procuram novas maneiras de se diferenciar da concorrência. Co-criação é uma nova tendência no mercado empresarial e define-se como sendo uma estratégia de envolver os consumidores no processo de desenvolvimento de novos produtos. Esta tese pretende explorar as percepções dos consumidores relativamente a produtos co-criados. Além desta análise, será testado se estas percepções se alteram de acordo com o co-criador. Foi estudada a influência do co-criador no valor que o consumidor dá ao produto, através da medição da qualidade, recomendação, vontade de pagar e de comprar. Esta análise foi conseguida através de questionários em loja e on-line. As hipóteses definidas foram testadas usando uma experiência 4x1 entre sujeitos onde o mesmo questionário e produto foram usados no entanto, os entrevistados foram distribuídos aleatoriamente para um dos cenários de quatro diferentes co-criadores. Estes sendo um consumidor ocasional (*occasional user*), um consumidor profissional (*professional user*), um fornecedor externo (*external supplier*) e um empregado da loja (*internal staff*), sendo os dois primeiros consumidores de uma empresa de retalho e os dois últimos ligados a essa mesma empresa. Os resultados demonstraram que os entrevistados valorizam mais os produtos co-criados pelos consumidores, sendo o consumidor ocasional o co-criador com melhor impacto na percepção do produto. A exploração deste tema é de elevada importância para a criação de uma estratégia e comunicação para o mercado por parte das empresas.

Palavras-chave: co-criação, percepções, conhecimento, co-criadores, inovação, produto co-criado

Abstract

Thesis Title: “Who is co-creating? The importance of the co-creator in product preference”

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Nowadays markets are much more competitive therefore companies are trying to find new sources of differentiation. Co-creation is a new trend in the business market being a simple method of engaging consumers in the new product development process. This thesis sets to explore the perceptions of consumers of co-created products. Also it will be tested if this perception changes regarding the co-creator. The influence of co-creators on consumer’s perceived product value was studied by measuring its quality, recommendation, willingness to pay and willingness to buy. This was accomplished through face-to-face and online questionnaires. The hypotheses were tested using a *4x1 between-subject experimental design* in which the same questionnaire and product were applied however the respondents were randomly assigned to one of the four co-creators scenarios. Those co-creators were *occasional users*, *professional users*, *external supplier* and *internal staff* being the first two consumers and the last two company related. Results showed that respondents value the most the products co-created by *users*, being the *occasional user* the co-creator with the best impact on product perception. Exploring this topic is of most importance not only to companies when defining their strategy on new product development, but also regarding its communication to the market.

Keywords: co-creation, perceptions, knowledge, co-creators, innovation, co-created product

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Introduction

Business in the 21st century is more diverse than the one in the late 20th century. We are in the era of globalization of markets and because of that our knowledge is much higher than before. And why is this important? Because companies are trying to figure out what is the next step that the world will take. Of course that is not a simple question and a lot of researchers try to figure out what will be the next type of fuel that will conduct some companies to the so wanted fantastic success. The answer was companies' new best-friend: the consumer¹. Consumers are elevated to a new role, one that helps companies to succeed.

People are saying that they are overloaded with information and data with this internet era. Some people cannot even keep up with this new technology. A research made to understand the reaction of business executives to this technology era showed that 37% of them believed that their organization is unable to keep up with technology and 33% said that their company will disappear because of that (Annex 1). From Twitter to Facebook we are able to use the internet for all our needs. These needs are not only to interact with people but also to buy, create and sell goods to the world. In 2009, Kukar-Kinney, Ridgway and Monroe found that there is a positive association between the predisposition to buy spontaneously and motivations to buy in through internet. This era of internet, computers and mobile phones is reaching to billions of users all over the world thus improving global connectivity to levels never seen before (Prahalad and Ramaswamy, 2004). The number of such devices is growing in an uncontrolled way and in 2011, 90% of the world population were mobile phone users (David Aylward, 2011). Companies are aware of this trend, thus are creating and sharing their brand promoting content through this methods (Thompson and Malaviya, 2013).

The new way people relate to the world through the internet, allowed new interactions between firms and consumers. Conceptualized and defined by Prahalad and Ramaswamy in 2000, co-creation refers to the value gained by companies that are not ignoring the benefits of collaborating with their customers. Multinationals like Lego, BMW, Ikea and Unilever are using co-creation not only to sustain their competitive

¹ This thesis alternates the use of words 'consumers', 'customers' and 'users' meaning the same thing: end consumer of a company product

advantage but also to create new products and enter into new markets. BMW created an “M division” for car customization leading to improvements and engineering collaboration with customers (Gloor and Cooper, 2007). Unilever, started to include consumers in their choices with the development of concepts, packages and marketing (Medeiros and Needham, 2008). Also, Ikea trained sales representatives to interact with the customer to design their own kitchen (Wikström, 1996). Lego built a new industrial unit exclusively to personalize Lego models (Zwick, Bonsu and Darmody, 2008). Companies are exploring user creativity and knowledge into their own advantage, particularly to find new and better solutions for themselves.

“MyStarbucksIdea”, launched in 2008 by Starbucks Company, was created through a website where each consumer was encourage to submit ideas for improving products or even their store experience. Ideas such as free Wi-Fi, free birthday presents, happy hours, splash sticks and others brought some great inputs for the international company and even some innovations that set the company in a better position in this new digital realm (Annex 2). The fact that there were more votes and reviews is this site than in some mayoral elections shows how relevant it is to include customers in the development of new products.

The interaction of companies with consumers has been changing in the last years from a passive role to an active one in the creation of value for both parts. In a recent past companies had as it most important goal a customer orientation strategy. Now this relationship is changing since the consumer is asking for more. Consumers nowadays want a more personalized product or experience (Prahalad and Ramaswamy, 2004). Customers not only want a good quality product but also to be a part of the value creation (Fuchs, Gohner and Seelig 2011). Companies around the world understand this call and are starting to let customers participate in this value creation. Now the customer is a company’s partner in this innovation path.

The understanding of the importance of customer to a company raises, a new issue: who is the best product creator? Is it a professional company member or a normal user? Nishikawa, Schreier and Ogawa (2013) study, demonstrated that user co-creation can be preferred to professional ones. The authors showed that a user-generated product sells more and is even more likely to persist in a competitive market. So companies started to understand that co-creation could be a good way to innovate and understand that a user has the potential to be even better than the companies’ designers. The phenomenon of co-

creation is now a proved concept and a topic being studying around the world. But there are still some gaps in this study as we will see below.

Products that have a strong user input are perceived by consumers with higher innovation potential and with bigger purchase intention (Schreier, Fuchs and Dahl, 2012). Although, co-creation studies still do not show how consumer's perceptions change according to those that co-create. There is a big diversity in the co-creators knowledge of some products since clients, store staff or even suppliers can be included in the new product development. Even though there are a lot of studies about co-creation, we do not know if a consumer will better perceive a product if he knows that a product was made by another customer with the identical knowledge.

Consequently, this thesis is about how co-created products are perceived analysing the particular cases of the co-creator being: a professional user, an occasional user, an employee and a company supplier. Knowledge variable will be used to try to explain the difference between these four co-creators. Variables like quality, recommendation, willingness to pay (WTP) and willingness to buy (WTB) will explain the difference in the consumer perception. The objective is to reach a result of this perception in the mass market and to do so I will use a company in the retail industry because of the importance that this industry have in the market today. The fact that I am doing a Trainee program in a retail company is also a good source of information to use in this research. This company called Leroy Merlin has as main customers a more traditional type that can lead us to a better understanding of the co-creation effect in their perceptions. This traditional type of users is composed by people that are not aware of user innovation or that are not even conscious of this phenomenon, attenuating the effect of co-creation (Schreier, Fuchs and Dahl, 2012). To understand the perceptions of these traditional customers, I will firstly conduct a research about this concept.

Literature Review

Consumer involvement and participation

In 2004, Prahalad and Ramaswamy said that consumers are different than before and that nowadays they feel motivated to bargaining prices thus throwing the value of a product to a simple negotiation between companies and customers.

An important question that companies struggle to answer is how to obtain information about the consumers when they are unable to expose their needs (Rosenthal and Capper, 2006). A solution for this problem could be through understanding the notion of consumer involvement. Managers can build a relationship that involve consumers in the new product development. In this mutual valued relation, consumer involvement started to grow (Athaide and Klink, 2009). Mixing companies' inputs with consumer needs can lead the company to a market success over discovering customers' desires (Randall, Terwiesch, and Ulrich, 2007). This leads to a positive outcome since all needs are reached. The use of consumer communities in mass customization generates benefits not only to the product but also provides new type of information (Franke, Keinz, and Schreier, 2008).

The centric-company point of view belongs to the past and companies are in need of a big step towards a future relationship with consumers with the goal of good interactions that lead to a higher value creation (Prahalad and Ramaswamy, 2004). These interactions can be seen in companies like Disney or Ritz Carlton that work in this relationship with the consumer. These companies let the customers feel that they are participating and making part of the experience.

Consumer involvement can be seen as a way companies gain value with the client instead of losing some market. Clients that does not see the needs provided by a company that does not listen to them may start their own company and even steal market shares. A good example is the computer-controlled music instruments (Jeppesen and Frederiksen, 2006). This is another advantage for companies that use consumer involvement, the concept which gave birth to the user innovation. This type of consumer that wants to be more involved, is a single individual that not only creates a self-provision product but also finds something that can change the market (von Hippel, 2005).

Co-creation effects

Before the 21st century customers acted like a passive audience as a simple buyer of products, but the products offered by firms were not enough to satisfy the consumers (Prahalad and Ramaswamy, 2004). Nevertheless, in the beginning of this century, co-creation was hosted (Prahalad and Ramaswamy, 2000, p.80-82). The fact that customers only get involved with the company at the point of exchange turn them the “outsiders of the firm” and of the market with a gap. These consumers are asking for more proximity between the companies and them (Prahalad and Ramaswamy, 2004). At first co-creation was seen as a new interaction between consumers and companies but researchers have elaborated that interaction to see it more as a collaborative method than just an interaction (Humphreys and Grayson, 2008).

With the increasing number of researchers exploring this new concept, co-creation started to be seen more as a neighbouring relationship between companies and their consumers (Sogn-Grundvåg, Rånes, Grønhaug, Gray, 2009). Co-creation leads to new offerings with a superior match to customers’ requirements and preferences resulting in greater commercial potential and this impact can be found in the higher demand of a co-created product compared with normal goods (Lilien et al., 2002). Furthermore customers not only seek to buy more co-created products but also show greater willingness to pay for each product co-created since they can feel some resemblance to the co-creator (Fuchs, Prandelli, and Schreier, 2010).

Finally, co-creation can be perceived as a great asset for a company. As von Hippel (2005) pointed, since users will benefit directly from the co-creation, they are more willing to do it for free hence making it a cheaper process. Co-creation can be seen as a source of competitive advantage in business strategy where a simple plus can make a huge difference. Some authors even stated that co-creation is a “joint problem definition and problem solving” (Prahalad and Ramaswamy, 2004). This can open a lot of benefits for companies and for consumers since maybe we discover and resolve problems of this two subjects through dialogue and a good relationship. The customer can now not only add value at the end of the product development but also be a part of all the process as a collaborator and a partner that co-creates value with the company (Lusch, Vargo and O’Brien, 2007).

However, co-creation has its risks since the company may lose the control of the brand and some consumers might misused the image and culture of the company without a purpose of a co-creation by itself (Hoyer et al., 2010; Kozinets, and Handelman, 2004; Harold, 2004).

Through the studies mentioned above it is valid to say that people value co-created products. But consumers who are not familiar with this concept value products created over this process of innovation? This dissertation will try to respond this question aiming also to understand if this concept of co-creation is something that is known by consumers or not. So the first hypothesis is created with the goal of discovering if people that do not know the concept of co-creation think that this strategy is better for companies and for a product.

H₁: Consumers prefer co-created products to company products, even if they are unaware of this concept.

Perceptions of co-created products

Researchers began to look more to the perceptions of co-creation and tried to understand how companies using co-creation were perceived in the market (Fuchs and Schreier, 2010). Threadless and other companies started to outsource the new product development to their consumer's community on an enduring source (Schreier, Fuchs and Dahl, 2012). Undeniably, these companies are innovating by making new products, still being perceived as innovative is not the same thing as being innovative (Brown, Dacin, Pratt, Whetten, 2006). Although in 2015, Dahl, Fuchs and Schreier prove that customers prefer to purchase user's products rather than designer ones because of the higher identification with the firm that has implemented this user-driven strategy.

Hoegg and Alba study in 2011 conclude that consumer's product perception can be influenced by a lot of simple variables like for example product' colour. Schreier, Fuchs and Dahl in 2012 show us additional important arguments for a different perception in consumers' minds. Those factors are the number, the diversity, user and constraint. The first one is easy to understand since if we have a greater number of ideas the probability of finding a good one is larger. The example of Threadless presented above shows us that, since they started their new process, they had more than 150 submissions

of new t-shirt design per day. The diversity argument is that fact that we have a lot of different people in a consumer community and with diversity we can find creativity more easily (Mannix and Neale, 2005). The third argument refers to the circumstance that all consumers have some common characteristics and also can have the same needs, a characteristic that a company's designers may not have (von Hippel, 2005). Last, the constraint argument is also important since a user does not have any constraint or dependence, in contrary of a company designer who has it since it is its daily work.

A recent study shows that there are positive effects of user design in the consumer's buying intents, willingness to pay and even in disposition to recommend the company to others. The same study concludes that clients identify familiarity with the user that co-created and the complexity of designing the product as two important factors to this effect (Schreier, Fuchs and Dahl, 2012). This complexity of designing the product can also be called as the necessary knowledge to achieve a final product. When companies use clients to co-creating products, other customers can relate this to worst capabilities of innovation and even worst quality. The reason is that when comparing regular clients with professionals, the last ones have more of the knowledge referred above (Moreau and Herd, 2010). Other study showed that when customers were distracted, their reaction to a user-generated ad was positive. Thus if they were able to analyse without time limit, the reaction started to turn negative what creates a dilemma in using consumer's work (Thompson and Malaviya, 2013). The perception of the firm can also be better since user-driven firms are seen not only as more innovative but also as more consumer-oriented. People feel that these companies put their customers' interests first and because of that feel a closest relationship with the firm (Fuchs and Schreier, 2010). Once more, we can induce that co-creation leads to a better perception and thus to positive outcome for both parts.

How do we measure perceptions? Using Schreier, Fuchs and Dahl studies in 2012 as starting point, I will measure perceptions with the variables willingness to pay, willingness to buy, willingness to recommend and adding quality variable. Some people may prefer to buy only products made by companies since sometimes we find some scepticism over the consumers' products by others consumers.

Knowledge dilemma: user vs professional

Eric von Hippel introduced in 1986 the lead user concept. The main idea lies on consumers that have needs ahead of others. These needs can be explored by companies in order to identify what will be the future market (von Hippel, 1986). Lead users not only are a huge source of information but can also become the innovators and create a revolutionary product. Lilien and colleagues in 2002 found that ideas develop by lead users were eight times better than the ones using conventional methods.

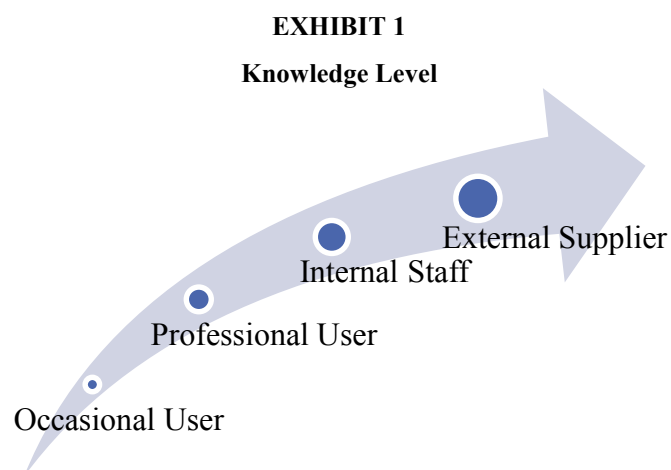
Showing that consumers can innovate more than before, a study in 2013 from Nishikawa, Schreier and Ogawa concludes that more than 5% of USA customers had already innovated in their home products. The software industry started to see the user source and stopped testing products in labs to start testing them in consumer platforms. Microsoft's Windows 2000 had more than 650 000 tests to their beta version showing the possible value that can be created with these consumer platforms (Pralhad and Ramaswamy, 2000). A Microsoft competitor Apache, utilizing this open source software, conquered a lot of market share in the security software (Poetz and Schreier, 2012). Even in radical sports like snowboarding and skate boarding we can see the presence of consumer innovation as it is the mainstream in the most innovative products in these sports (Shah, 2000).

This concept of lead user brings us to a new topic of research: user versus firm's professional. Some argued that successful innovation is only possible by professionals since they are the ones that have the knowledge (Ulrich and Eppinger, 2004) while consumers are unable to express their needs and thus creating a negative impact in the firm's innovation effort (Christensen, 1997). The firms' professionals have the advantage of knowledge and sometimes that advantage leads to a significant benefit in relation to user capabilities (Nishikawa, Schreier and Ogawa, 2013). Users rely on the familiarized daily basis consumption that prevents them to be open to predicting a better future product (Leonard and Rayport, 1997), thus not making users the most likely to innovate.

At the same time some studies say that users are the ones who can easily bring an innovation to the market (Poetz and Schreier, 2012). The consumer became more informed and consequently is better positioned to discuss the quality of the company's products (Pralhad and Ramaswamy, 2000). In 2012, Schreier, Fuchs and Dahl showed that, not only the knowledge, but also diversity brings some advantage to the user. That

is through the use of different backgrounds and a higher number of people, it is possible to increase the number of ideas and the generation of a potential disruptive innovation. The study exposed that consumers ideas were considered more beneficial and novel although less feasible when compared to professionals. A minimum level of knowledge will always be a prerequisite for new ideas but users have an ability to generate innovative ideas that can change the marketplace (Poetz and Schreier, 2012).

The goal of this thesis is to understand consumer perception of co-created products. For achieving this objective two groups will be created: users' co-creators (defined as Practical Knowledge - PK) and firms' co-creators (defined as Theoretical Knowledge - TK). The second hypothesis is created trying to prove that users' co-created products are better perceived than the ones related to a company. Even though the difference between the types of co-creator is tested with this hypothesis, a more concrete research is needed. Thus, to understand how co-creator's knowledge can influence the perception of customers in the final product four co-creators were generated: Occasional User (OU), Professional User (PU), External Supplier (ES) and Internal Staff (IS). Finally the H₃ is created trying to discover if the knowledge of the co-creator influences perceptions.



The knowledge staircase presented in exhibit 1 shows that the less knowledge co-creator is the Occasional User and that External Supplier is the one with higher knowledge. To better understand the reactions to those question, a perceptual map study with willingness to pay and quality variables will be executed.

Consequently this two hypothesis were added to a better conclusion of the problem this thesis is trying to answer.

***H₂**: User co-creators' products have higher a) willingness to pay and b) quality than company ones – PK vs TK*

***H₃**: The level of co-creator's knowledge is not related to higher a) willingness to pay, b) quality c) willingness to buy and d) willingness to recommend the products to others – OU vs PU vs ES vs IS*

Retail industry

The life cycles of consumers are starting to be lesser through time (Buckinx and Van den Poel, 2005). This is the consequence of competition becoming bigger in the markets in the last years. This result lead the consumer to feel that there no switching costs when changing the company they buy from (Reinartz and Kumar, 2000). As the relationship of a consumer and a company grows in time, the more the consumer will spend. Thus maintaining consumer in a relationship is sometimes the primary objective of a company (Buckinx and Van den Poel, 2005). In the AC Nielsen's report in 2001 this is well illustrated since more than 70% of the customers do their shopping in different supermarkets during the same month but nowadays is not easy to stablish a relationship with the consumer.

Even though a lot of consumers still have some behaviours of the traditional trade, the current retail market developed to satisfy the needs of social interactions and experiences of consumers (Amine and Lazzaoui, 2011; Ahlert, Blut and Evanschitzky, 2006). Those changes in this industry are due to the fact mentioned above of the growing of a new generation – generation Y – that is more internet cultured and has more knowledge than before (Weitz and Whitfield, 2010). Aspects like service of employees, music in store, the lighting and attractive colours of the stores are used to acquire consumers every day. These features create a new experience that goes above a normal shopping and involve them in a new co-creation relationship (Prahalad and Ramaswamy, 2000).

The retail industry is not an easy industry to study co-creation since it is a business-to-consumer market where we have a huge number of customers and because of that is difficult to maintain a close relationship (Sogn-Grundvåg, Rånes, Grønhaug, Gray, 2009). Even though retailing is a big industry with a huge number of products and transactions, it could give us an answer to some questions regarding co-creation thanks to the information provided by loyalty cards, store face-to-face relations and others. The know-how and expertise that companies have are studied by authors that discovered that front line staff could generate a real bond with the consumers in a way that could create a co-creation relationship even though the difficulty of getting to know the consumers (Sogn-Grundvåg, Rånes, Grønhaug, Gray, 2009).

Methodology

Definition of the methodology

Some authors that study co-creation say that is important to have control of the research environment and that the best way of doing it is with an experimental research where behaviours can be observed (Charness, Gneezy, and Kuhn, 2012).

In this investigation, the type of design was manipulated and because of that the experimental design was the best way to test the influence of the designer in the research questions that I am aiming to respond.

In order to respond to the research questions of this study I used a between-subject experimental design of a 4 x 1 dimensions presented by Charness, Gneezy, and Kuhn in 2012. In my specific study I will use 4 type of co-creators and 1 type of product. In this experiment each participant is allocated to just one type of treatment. Each consumer will be exposed to one specific co-creator. This study design has as main disadvantage a weak statistical power since it may miss important information along each consumer, as can they only provide one type of information. The advantages are that this kind of experiment is simple and the random assignment between groups is easier to achieve (Charness, Gneezy, and Kuhn, 2012).

Leroy Merlin

Leroy Merlin firm is a do-it-yourself hypermarket established near urban areas, providing retail self-service and sales assistance. This company was founded in 1923 by Adolphe Leroy and Rose Merlin that both wanted to open a business of American surplus but was only named Leroy Merlin in 1960. There are four main departments (do-it-yourself, building, decoration and gardening) offering a range of products tailored to customers' needs at the best price possible. This firm helps people and proprietors with their home-improvement products and projects as DIY Company. This company has a special commitment to providing home improvement solutions tailored to each customer's specific needs.

This firm has the goal of helping its customers, whether “do-it-yourselfers” or not, company’s employees, the community and the planet. This goal can be achieved through assisting customers to imagine and create the home of their dreams. All employees are connected in order to succeed in this important mission.

Leroy Merlin is a very innovative company since every time a consumer has a requirement that cannot be provided with what is available on the market, the firm starts creating a solution. This solution is not only delivered through new products but also with combination of existing products that match one another to fulfil the customer’s need.

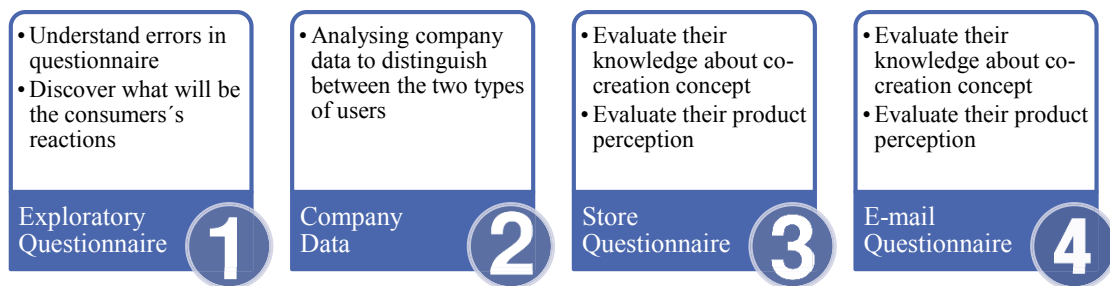
This company is the fourth-largest player in the do-it-yourself industry in the world. Is also the second-biggest in Europe and in France is the leader. The mission of this company is expressed in their logo, which represents the roof of a house.

Questionnaire design and data collection

The process of data collection will start by an exploratory questionnaire made to a Leroy Merlin employee, after analysing confidential data given by this company and at the end by two questionnaires as showed in Exhibit 2.

EXHIBIT 2

Primary and Secondary Data Planning



I conducted an exploratory interview to a Leroy Merlin employee responsible in the consumer department that gave some feedback as a pre-test. The focus of the pre-test was to understand if the questionnaires were suitable to Leroy Merlin’s customers and for the grass cutting machine. The first reaction was good and gave some tips to proceed to some modifications. Relatively to the scale measures, some scales were changed for an easy in-store data gathering. Hence, there were some questions that were changed in order to obtain relevant data for the company too.

In both questionnaires consumers were exposed to a product. The product presented in the questionnaires is the grass cutting machine *Sterwins*, design by this brand (a Leroy Merlin brand) through an intense market research with consumers and company's employees that led them to a solution of having an innovative grass cutting machine with only three wheels. This grass cutting machine has some characteristics as an easy turn and a bigger corner reach than the others machines that only have one wheel in the front part. It is an electric grass cutting machine which can be easily stored since it can bend into a smaller size. It is a product for people with a garden smaller than 300 m². Since the brand can influence the perception I never talk about this brand in the questionnaire and refer to it as a new innovation product without a brand (Keller, 1993).

Let us focus on the questionnaires. The first one, that I will call In-store questionnaire, was made directly to customers in a Leroy Merlin store (Annex 3). Consumers were exposed to a co-created product and were told who the co-creator was. Participants were shown the real product prototype, which they could try and after participants were asked to complete a questionnaire that measured the dependent variables and contained control and demographics questions. The questionnaire was administered in Portuguese (Annex 4) and was also created in an English version (Annex 5).

Then, a second questionnaire was sent by e-mail since there were some restrictions giving by the company about the people that could have access to this product. The structure of the questionnaire was the same than the first one but since this respondents would not see the product, an explanatory text was added in order to introduce the product. The goal of this second questionnaire was to find different demographic sources and a source that will not be influenced by the product itself but only by perceptions. This questionnaire was made in Google forms and sent through e-mail (Annex 6).

The questionnaire measurement items can be analysed in table 1. Surveys were divided in two being the first part an explanation of co-creation concept, to understand respondent's awareness of the concept, namely the perceived value that the consumer gives to a company or a product that uses this strategy. The second part presented the new product and gave background on who created it. The aim was to understand differences

in perception regarding the co-creation mentioned and thus collecting data to answer to the research questions.

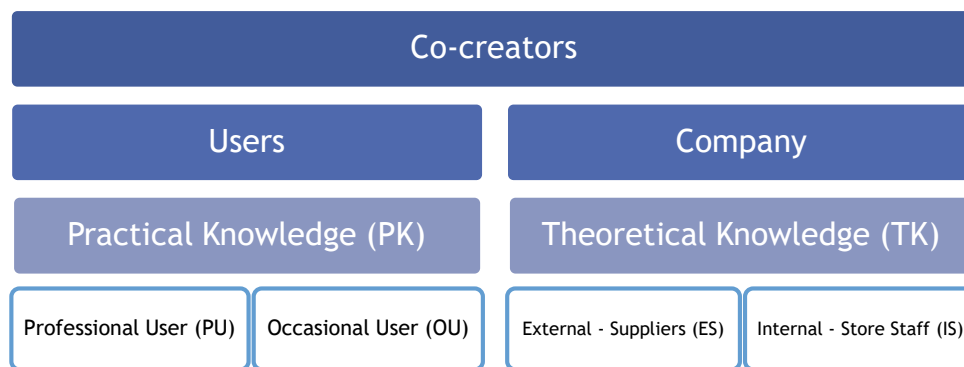
TABLE 1
Measurement Items

Construct	Items	Goal
Co-creation Knowledge	Do you already knew this concept? "No" (0); "Yes" (1)	In this three questions the main goal was to prove H1 that says people value co-created products even if do not knowing the concept.
Co-creation value (company)	Do you think that this method value a company? "No" (0); "Yes" (1)	
Co-creation value (product)	Do you think that this method value a product? "No" (0); "Yes" (1)	
User	Do you already use a grass cutting machine? "No" (0); "Yes" (1)	The goal in this two questions were to measure the knowledge of the respondant and also to filter all the people that never used a grass cutting machine. All people that said that never used a grass cutting machine were not added to statistics data.
Buyer	Do you already buy a grass cutting machine? "No" (0); "Yes" (1)	
WTP	The average price of a grass cutting machine is 100€. How much are you willing to pay for this one? "< 50 €" (1); "51 - 100 €" (2); "101 - 150 €" (3); "151 - 200 €" (4); "> 200 €" (5)	This four questions are important to understand the perception of the respondant. The value that people gave in this four questions are the ones that will be compared to reach to conclusions in H3 and H4.
Quality	Since this grass cutting machine was created by <i>Co-creator</i> , in a 1-10 scale, what is you perception of quality in this product? "None" (1) ... "a lot" (10)	
WTB	What is your willing to buy this product? "None" (1); "Little" (2); "Some" (3); "A lot" (4)	
Recommendation	In a 1-10 scale, what is the probability for you to recommend this product? "None" (1) ... "a lot" (10)	
Price Value	In a 1-5 scale, which value do you give to the following characteristics in a product? "Low value" (1) ... "High value" (5)	This five questions aim to answer what people value the most in a product. Will give a perception of which attributes are more important and even if the creator matters.
Quality Value	In a 1-5 scale, which value do you give to the following characteristics in a product? "Low value" (1) ... "High value" (5)	
Creator/Brand Value	In a 1-5 scale, which value do you give to the following characteristics in a product? "Low value" (1) ... "High value" (5)	
Innovation Value	In a 1-5 scale, which value do you give to the following characteristics in a product? "Low value" (1) ... "High value" (5)	
General Features Value	In a 1-5 scale, which value do you give to the following characteristics in a product? "Low value" (1) ... "High value" (5)	
Complexity	In a 1-5 scale, how do you perceive the complexity of creating a product like this? "Low complexity" (1) ... "High complexity" (5)	The last question of this questionnaire is to discover if peolpe understood this product as complex or not. We will measure in this question teh knowledge necessary to innovate in a grass cutting machine.
Age		Demographic data to compare In-Store questionnaires and Mail questionnaire.
Sex	"Female" (0); "Male" (1)	

Co-creator profile

First of all it is important to understand which kind of co-creators I want to study and their meaning. As stated before I will focus on the perception of customers in co-created products. But who will be the co-creators? I will differentiate the co-creators by their knowledge being professionals and suppliers as the ones with technical and experiential knowledge and the occasional users and store staff as the ones that only have the experiential understanding. The goal of studying four type of co-creators is to understand the difference of perception depending on the fact that the co-creator is part of the company or not. Let's try to explain better the definition of the four fictitious co-creators profiles (Annex 7).

EXHIBIT 3
Co-creators Scheme



For the two user's co-creators I used data given by the company Leroy Merlin to try to distinguish between the ones who are professionals from others that are only occasional users. It was easy to see though the company data, that the first ones have a special payed card to have more benefits and quantity discounts welfares that an occasional consumer does not have. The Professional one also has a different buying hour than the Occasional, going the first one in the earlier hours from 6 p.m. to 9 p.m.. Because of that I can conclude that there are two types of consumers in Leroy Merlin store. For the professional consumers that buy products at Leroy Merlin to use in their daily work I created "João Duarte" as *Professional User (PU)*. João works in the gardening service business owning a company and is a frequent consumer of Leroy Merlin. The second one is the *Occasional User (OU)* called "Manuel Cary". Manuel is a customer as João but is

only a family man that loves DIY products and invests some of his free time in weekends doing this kind of work at home.

The company co-creators are the ones that have some relationship with the company and for the case of the suppliers I will use a non-existent company with the name “B&C - Bricolage and Construção” (DIY and Construction). I created a logo to give some credibility to the company. This made-up company was created in 1995 in Portugal and produce some DIY products being a supplier of Leroy Merlin. To this co-creator I assign the *External Supplier (ES)* name.

For the other company co-creator I will use a staff member from the store. “Alberto Fernandes” is the conceived *Internal – Store Staff (IS)*. Alberto is a Leroy Merlin Store Staff that works for the company since 2005. This year he is the Garden department Chief in his store and because of that he has a daily contact with grass cutting machines.

In order to respond to the research questions a between-subject experimental design, talked in the Methodology, was created of a 4 (Type of co-creator: Professional user, Occasional user, External and Internal) x 1 (Type of product: grass cutting machine) dimension.

This questionnaire aims to respond to the major number of the research questions. A simple statistical analysis was done to understand the perceptions of the consumer.

Data analysis

In order to understand if there was significant difference in the variables of the four treatments, a one-way analysis of variance – ANOVA – was conducted (Annex 8, 9 and 10). The result was not the best since there were few variables with statistical significance. In the total sample the variables with lower p-value were only buyer (F crit = 2.65; p-value = 0) and complexity (F crit = 2.65; p-value = 0.03). In the in-store data the only question found with a lower p-value was willingness to pay (F crit = 2.70; p-value = 0.04). In the mail data set only buyer (F crit = 2.70; p-value = 0) and quality (F crit = 2.70; p-value = 0.03) had lower p-value.

Non-significant results mean that the sample provided little or even no evidence that the null hypothesis is false. Though, the high p-value is not confirmation that the null

hypothesis is true. The problem is that it is difficult to distinguish the effects. Even though the non-statistical significance found, the results can be interpreted and analyse.

Description of the sample

The data for this study was collected through two channels: In-store and Mail. The results obtained were a total of 227 (N = 227) as table 2.1 shows. I had 100 in-store and 127 through mail. Respondents were 93 women (41%) and 134 men (59%). The respondent's age is between 16 and 84 years old and the average age is 33 years. In the in-store respondents, 37 were women (37%) and 63 were men (63%) with an average age of 44 years. In the Mail data there were 55 women (44%) and 71 men (56%) with 24 years on average age.

TABLE 2.1
Summary of data - Total

TOTAL																	
Type of Co-creator	Co-creation Knowledge Mean	Co-creation value (company) Mean	Co-creation value (product) Mean	User Mean	Buyer Mean	WTP Mean	Quality Mean	WTB Mean	Recommendation Mean	Price Value Mean	Quality Value Mean	Creator/Brand Value Mean	Innovation Value Mean	General Features Value Mean	Complexity Mean	Age Mean	Sex Mean
ES	0,27	0,96	0,98	1,00	0,23	2,50	7,36	2,21	6,59	4,27	4,36	3,11	3,79	3,77	3,41	31,02	0,52
IS	0,32	0,96	0,89	1,00	0,28	2,61	6,93	2,14	7,11	3,82	4,30	3,14	3,67	3,86	2,91	35,44	0,61
OU	0,25	0,98	0,93	1,00	0,67	2,72	7,40	2,42	7,07	3,98	4,38	3,23	3,83	3,97	3,10	32,93	0,58
PU	0,22	0,94	0,91	1,00	0,24	2,70	7,13	2,26	6,44	4,07	4,46	3,06	3,72	4,19	2,93	33,28	0,65
Total	0,26	0,96	0,93	1,00	0,36	2,63	7,21	2,26	6,81	4,04	4,37	3,14	3,75	3,94	3,09	33,17	0,59

Relatively to awareness of the concept some information was found important to determine conclusions of the first hypothesis. Only 26% of the respondents knew the concept of co-creation but 96% respondents said that this concept values a company and 93% said that it values a product. With this results it can be said that H₁ is achieved. We can also see that 36% of the respondents are buyers of this kind of product. With this data I can conclude that more than one third of the respondents are buyers of the product, so it can be determined that they have some kind of experience with this product. The value that respondents give on average to the five attributes presented in the questionnaires were important to understand consumers' attribute preferences. These attributes were measured in a 1 to 5 scale and the goal is to see which attribute is most valued by consumers. Respondents value the most quality, price and general features ($M_{Quality} = 4.37$; $M_{Price} = 4.04$; $M_{General\ Features} = 3.94$). The attribute that was valued the worst was product innovation and creator/brand ($M_{Innovation} = 3.75$; $M_{Creator/Brand} = 3.14$). Result show also that this is a product with low complexity since the value gave to complexity by respondents was not high ($M_{Complexity} = 3.09$).

In the Total data, results showed that in products designed by Occasional User and Professional User respondents were more willing to pay ($M^{OU}_{Wtp} = 2.72$; $M^{PU}_{Wtp} = 2.70$) than in External Suppliers and Internal Staff co-creators ($M^{ES}_{Wtp} = 2.50$; $M^{IS}_{Wtp} = 2.61$). Regarding the perception of product quality results reported that Occasional Users and External Suppliers have the best product ($M^{OU}_{Quality} = 7.40$; $M^{ES}_{Quality} = 7.36$). Willingness to buy was significantly higher in Occasional User respondents ($M^{OU}_{Wtb} = 2.42$) than others co-creators ($M^{PU}_{Wtb} = 2.26$; $M^{ES}_{Wtb} = 2.21$; $M^{IS}_{Wtb} = 2.14$). Internal Staff and Occasional Users were the most recommended products ($M^{IS}_{Recommendation} = 7.11$; $M^{OU}_{Recommendation} = 7.07$) showing some confidence of respondents in their product and knowledge. At last the people that respond to the External Supplier questionnaires were the ones that perceived the product as more complex ($M^{ES}_{Complexity} = 3.41$) with a big difference to the others co-creators results ($M^{OU}_{Complexity} = 3.10$; $M^{PU}_{Complexity} = 2.93$; $M^{IS}_{Complexity} = 2.91$).

With the separation of the two sources of data it is possible to find more information that could be important to the research analysis. There are some differences in these questionnaires that were explained in the methodology chapter, being the stimulus of trying the product or not the central variance. Given the difference found, I will create a table for In-store questionnaire data (Table 2.2) and for mail questionnaire data (Table 2.3).

TABLE 2.2

Summary of data – In-Store

IN-STORE																			
Type of Co-creator	Co-creation Knowledge Mean	Co-creation value (company) Mean	Co-creation value (product) Mean	User Mean	Buyer Mean	WTP Mean	Quality Mean	WTB Mean	Recommendation Mean	Price Value Mean	Quality Value Mean	Creator/Brand Value Mean	Innovation Value Mean	General Features Value Mean	Complexity Mean	Age Mean	Sex Mean		
ES	0,16	0,96	0,96	1,00	0,36	2,48	7,44	2,44	7,40	4,36	4,64	3,20	3,84	3,68	3,52	39,64	0,60		
IS	0,36	0,96	0,84	1,00	0,44	2,40	7,80	1,88	8,72	4,08	4,56	3,52	4,12	3,92	2,92	48,40	0,64		
OU	0,16	0,96	0,84	1,00	0,44	3,00	7,76	2,52	7,88	4,32	4,64	3,40	4,20	4,12	3,20	44,56	0,64		
PU	0,16	0,88	0,80	1,00	0,36	2,76	7,36	2,44	7,08	4,28	4,72	3,08	3,72	4,40	3,04	44,88	0,64		
Total	0,21	0,94	0,86	1,00	0,40	2,66	7,59	2,32	7,77	4,26	4,64	3,30	3,97	4,03	3,17	44,37	0,63		

Regarding the In-store questionnaires Occasional User respondents were the ones that would pay the most ($M^{In-Store | OU}_{Wtp} = 3.00$) comparing with the other three co-creators that had much lower results ($M^{In-Store | PU}_{Wtp} = 2.76$; $M^{In-Store | ES}_{Wtp} = 2.48$; $M^{In-Store | IS}_{Wtp} = 2.40$). Concerning the perception of quality in the grass cutting machine the higher values were in the Internal Staff and Occasional User respondents ($M^{In-Store | IS}_{Quality} = 7.80$; $M^{In-Store | OU}_{Quality} = 7.76$). Occasional User respondents gave again a better score to this co-creator in the willingness to buy question ($M^{In-Store | OU}_{Wtb} = 2.52$) way above Internal Staff that had the lowest value ($M^{In-Store | IS}_{Wtb} = 1.88$). However people that responded to the

Internal Staff questionnaires had the biggest value by far in the recommendation question ($M^{\text{In-Store} | \text{IS}}_{\text{Recommendation}} = 8.72$) where the others co-creators were not perceived as so recommendable ($M^{\text{In-Store} | \text{OU}}_{\text{Recommendation}} = 7.88$; $M^{\text{In-Store} | \text{ES}}_{\text{Recommendation}} = 7.40$; $M^{\text{In-Store} | \text{PU}}_{\text{Recommendation}} = 7.08$). The co-creator respondents that perceived the product as more complex were the External Supplier ($M^{\text{In-Store} | \text{ES}}_{\text{Complexity}} = 3.52$).

TABLE 2.3

Summary of data - Mail

MAIL																	
Type of Co-creator	Co-creation Knowledge Mean	Co-creation value (company) Mean	Co-creation value (product) Mean	User Mean	Buyer Mean	WTP Mean	Quality Mean	WTB Mean	Recommendation Mean	Price Value Mean	Quality Value Mean	Creator/Brand Value Mean	Innovation Value Mean	General Features Value Mean	Complexity Mean	Age Mean	Sex Mean
ES	0,35	0,97	1,00	1,00	0,13	2,52	7,29	2,03	5,94	4,13	4,19	3,03	3,74	3,84	3,32	24,06	0,45
IS	0,28	0,97	0,94	1,00	0,16	2,78	6,25	2,34	5,84	4,09	3,63	2,84	3,31	3,81	2,91	25,31	0,59
OU	0,31	1,00	1,00	1,00	0,83	2,51	7,14	2,34	6,49	4,20	3,74	3,11	3,57	3,86	3,03	24,63	0,54
PU	0,28	1,00	1,00	1,00	0,14	2,66	6,93	2,10	5,90	4,24	3,90	3,03	3,72	4,00	2,83	23,28	0,66
Total	0,31	0,98	0,98	1,00	0,33	2,61	6,91	2,21	6,06	4,17	3,86	3,01	3,58	3,87	3,02	24,35	0,56

In the Mail questionnaires, respondents just saw pictures of the product, factor which could influence some answers. Results of the questionnaires showed that Internal Staff product was the most valued ($M^{\text{Mail} | \text{IS}}_{\text{Wtp}} = 2.78$) although all others co-creators have similar values ($M^{\text{Mail} | \text{PU}}_{\text{Wtp}} = 2.66$; $M^{\text{Mail} | \text{ES}}_{\text{Wtp}} = 2.52$; $M^{\text{Mail} | \text{OU}}_{\text{Wtp}} = 2.51$). Relatively to the product quality, External Supplier and Occasional User respondents gave the highest points ($M^{\text{Mail} | \text{ES}}_{\text{Quality}} = 7.29$; $M^{\text{Mail} | \text{OU}}_{\text{Quality}} = 7.14$) and opposing this result, Internal Staff respondents valued their product much lower ($M^{\text{Mail} | \text{IS}}_{\text{Quality}} = 6.25$). The WTB question had a tie between Internal Staff and Occasional User respondents values ($M^{\text{Mail} | \text{IS}}_{\text{Wtb}} = M^{\text{Mail} | \text{OU}}_{\text{Wtb}} = 2.34$). The most recommended product by far was the Occasional User product ($M^{\text{Mail} | \text{OU}}_{\text{Recommendation}} = 6.49$). The most perceived complex product was the External Supplier co-creator again ($M^{\text{Mail} | \text{OU}}_{\text{Complexity}} = 3.32$). After this data collection I could start to analyse the results shown in the next chapter.

Results

Interesting numbers

After analysing the data gathered, there are some results that are worth noting. Comparing In-Store and Mail questionnaires there were some interesting differences. Product quality was rated higher in the Mail ones ($M^{\text{In-Store}}_{\text{Quality}} = 7.59$; $M^{\text{Mail}}_{\text{Quality}} = 6.91$). That could be due to two facts: the first because of the product motivation since the respondent of in-store questionnaire had the stimulus of trying the product, the second could be the normal face-to-face questionnaire pressure in the in-store respondents that could influence them to give higher valuations. Another question that mail respondents gave a lower value was in the recommendation of the product ($M^{\text{In-Store}}_{\text{Recommendation}} = 7.77$; $M^{\text{Mail}}_{\text{Recommendation}} = 6.06$).

The mean of the ages between the two types of questionnaires can also be interesting since the in-store respondents were much younger than the ones that respond by mail ($M^{\text{In-Store}}_{\text{Age}} = 44.37$; $M^{\text{Mail}}_{\text{Age}} = 24.35$). This could justify some of the differences found in both types of questionnaires since a younger sample may have different product perceptions. Although, in this thesis I struggle to understand perceptions as a whole and not through different groups of consumers. A further research could understand better this point.

Perceptual map analysis

I developed a perceptual map to show results in a graphical presentation. This map provides a visual relationship and differences in the data in a way that we can see geometrically the results of the data gathered represented by the questions made to discover the perceptions of willingness to pay and quality in the product. This technique associates the objects (co-creators) and the descriptive attributes (WTP and Quality).

Difference between groups of co-creators

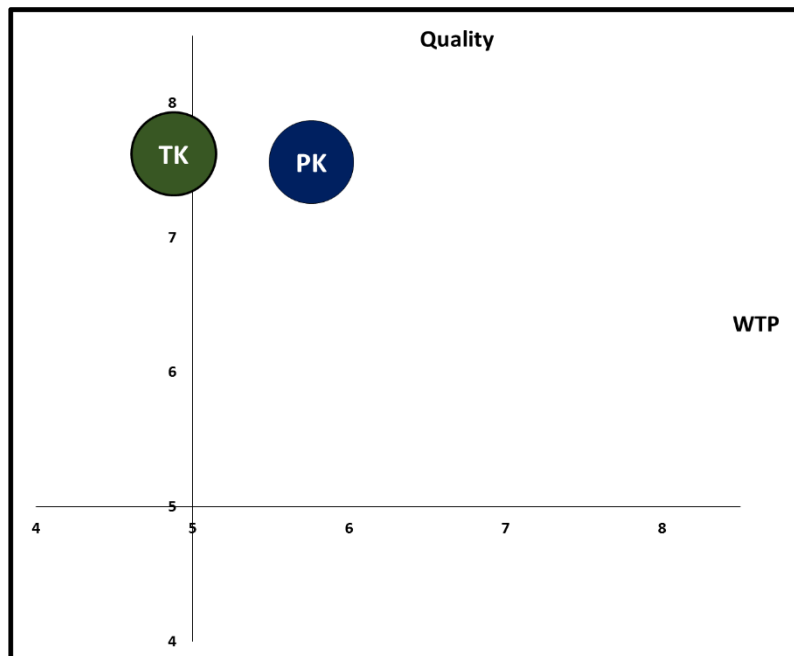
First I created a perceptual map based on the results of the two knowledge groups Practical Knowledge co-creators (Occasional Users + Professional Users) and Theoretical Knowledge (External Suppliers + Internal Staff).

TABLE 3.1
Knowledge Comparison – In-Store

I N - S T O R E	Co-creator	MWtp x 2	MQuality
	PK - Practical Knowledge	5.76	7.56
	TK - Theoretical Knowledge	4.88	7.62

EXHIBIT 4.1

Perceptual Map: Knowledge Comparison – In-Store



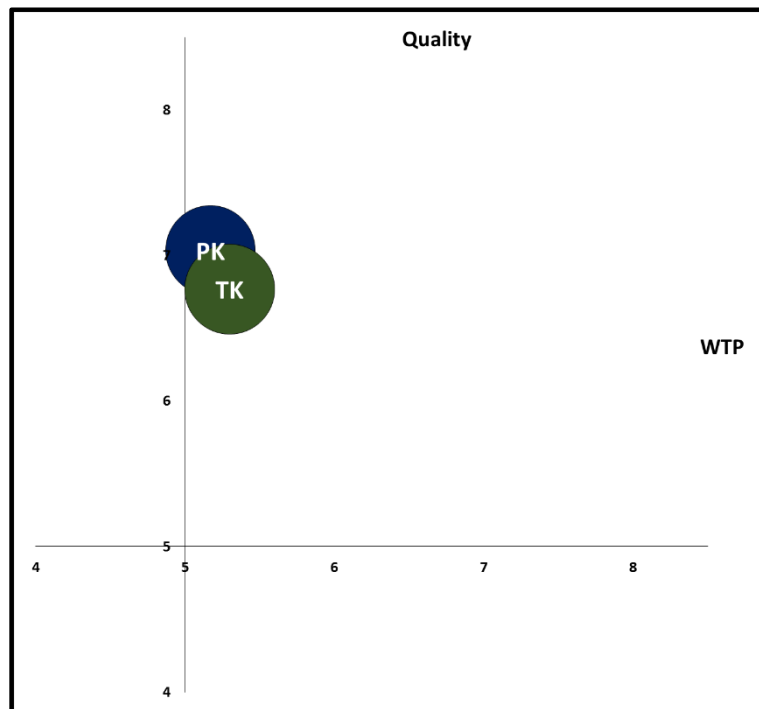
Analysing first the in-store data we can see a difference between the willingness to pay of practical knowledge respondents and theoretical knowledge ones ($M^{\text{In-Store} | \text{PK}}_{\text{Wtp}} = 5.76$; $M^{\text{In-Store} | \text{TK}}_{\text{Wtp}} = 4.88$). The perception of quality in the product were almost the

same just with positive difference for the theoretical knowledge respondents comparing with the other group of co-creators ($M^{\text{In-Store} | \text{TK}}_{\text{Quality}} = 7.62$; $M^{\text{In-Store} | \text{PK}}_{\text{Quality}} = 7.56$).

TABLE 3.2
Knowledge Comparison – Mail

M A I L	Co-creator	MWtp x 2	MQuality
	PK - Practical Knowledge	5.17	7.04
	TK - Theoretical Knowledge	5.30	6.77

EXHIBIT 4.2
Perceptual Map: Knowledge Comparison – Mail

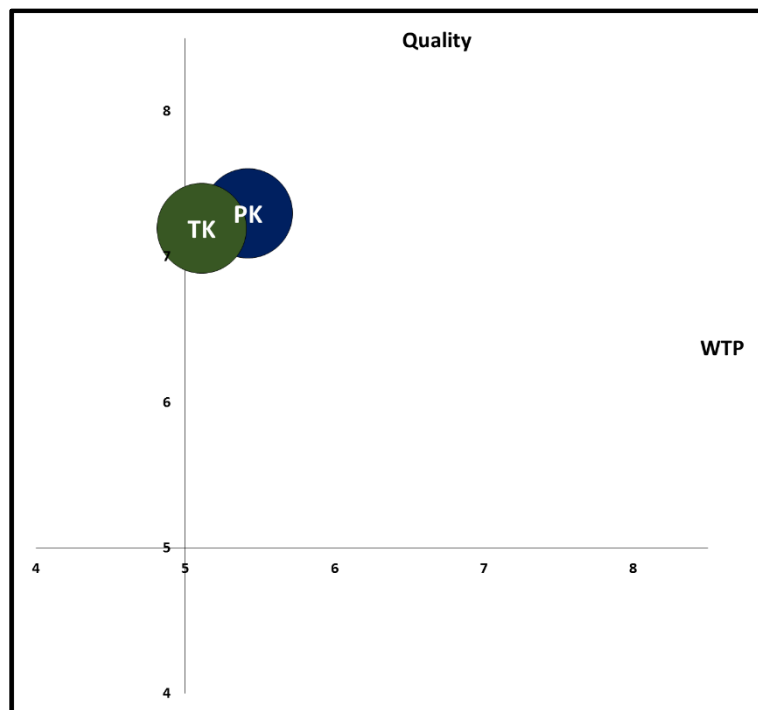


Considering now the mail questionnaires, it is possible to see the opposite compared to the other data group. There is no main difference between the willingness to pay of practical knowledge respondents and theoretical knowledge ones ($M^{\text{Mail} | \text{TK}}_{\text{Wtp}} = 5.30$; $M^{\text{Mail} | \text{PK}}_{\text{Wtp}} = 5.13$). The perception of quality in the product had a bigger difference being the practical knowledge respondents the ones that gave a higher value in average ($M^{\text{Mail} | \text{PK}}_{\text{Quality}} = 7.04$; $M^{\text{Mail} | \text{TK}}_{\text{Quality}} = 6.77$).

TABLE 3.3
Knowledge Comparison – Total

TOTAL	Co-creator	MWtp x 2	MQuality
	PK - Practical Knowledge	5.42	7.30
	TK - Theoretical Knowledge	5.11	7.20

EXHIBIT 4.3
Perceptual Map: Knowledge Comparison – Total



At the end, a last perceptual map was made regarding the two groups of knowledge to respond to the H₂. Practical knowledge respondents gave a higher willingness to pay than theoretical knowledge ones ($M^{\text{Total}} | PK_{\text{Wtp}} = 5.42$; $M^{\text{Total}} | TK_{\text{Wtp}} = 5.11$). In the perception of quality in the product it was again the practical knowledge that had the highest value ($M^{\text{Total}} | PK_{\text{Quality}} = 7.30$; $M^{\text{Total}} | TK_{\text{Quality}} = 7.20$). I can determine that practical knowledge had better results than the theoretical knowledge group proving our H₂ as right

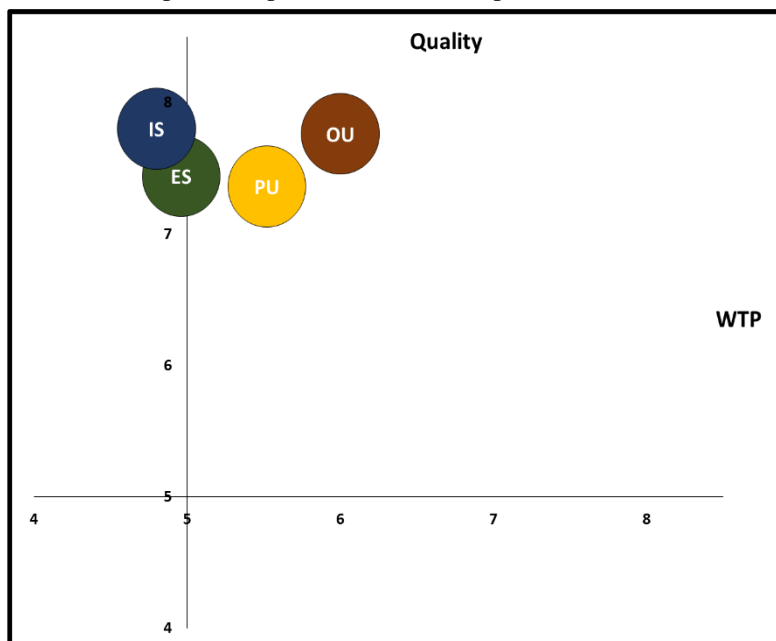
since the lower knowledge of the co-creator does not interfere in the value given by the respondents to the product.

Difference between the four co-creators

TABLE 4.1
Co-creators Comparison – In-Store

I N - S T O R E	Co-creator	MWtp x 2	MQuality
	PU - Professional User	5.52	7.36
	OU - Occasional User	6.00	7.76
	ES - External Supplier	4.96	7.44
	IS - Internal Staff	4.80	7.80

EXHIBIT 5.1
Perceptual Map: Co-creators Comparison – In-Store



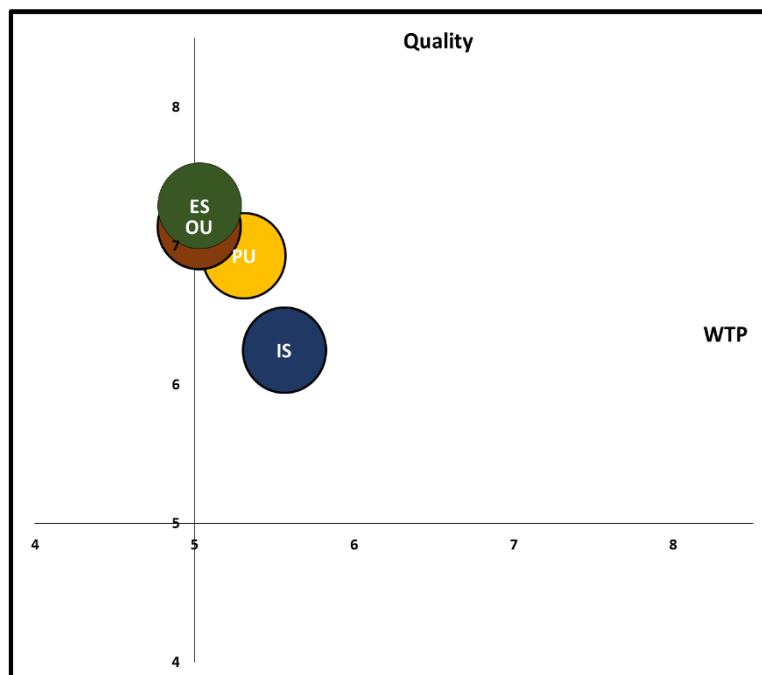
Evaluating first the in-store data we can see a big difference between the willingness to pay of occasional users respondents comparing with the other three co-creators although people that responded to the professional users questionnaire gave a

good value too ($M^{\text{In-Store} | \text{OU}}_{\text{Wtp}} = 6.00$; $M^{\text{In-Store} | \text{PU}}_{\text{Wtp}} = 5.52$; $M^{\text{In-Store} | \text{ES}}_{\text{Wtp}} = 4.96$; $M^{\text{In-Store} | \text{IS}}_{\text{Wtp}} = 4.80$). The perception of quality in the product was almost the same in internal staff and occasional users respondents but with a significant difference when compared with the others two co-creators ($M^{\text{In-Store} | \text{IS}}_{\text{Quality}} = 7.80$; $M^{\text{In-Store} | \text{OU}}_{\text{Quality}} = 7.76$; $M^{\text{In-Store} | \text{ES}}_{\text{Quality}} = 7.44$; $M^{\text{In-Store} | \text{PU}}_{\text{Quality}} = 7.36$).

TABLE 4.2
Co-creators Comparison – Mail

M A I L	Co-creator	MWtp x 2	MQuality
	PU - Professional User	5.31	6.93
	OU - Occasional User	5.03	7.14
	ES - External Supplier	5.03	7.29
	IS - Internal Staff	5.56	6.25

EXHIBIT 5.2
Perceptual Map: Co-creators Comparison – Mail



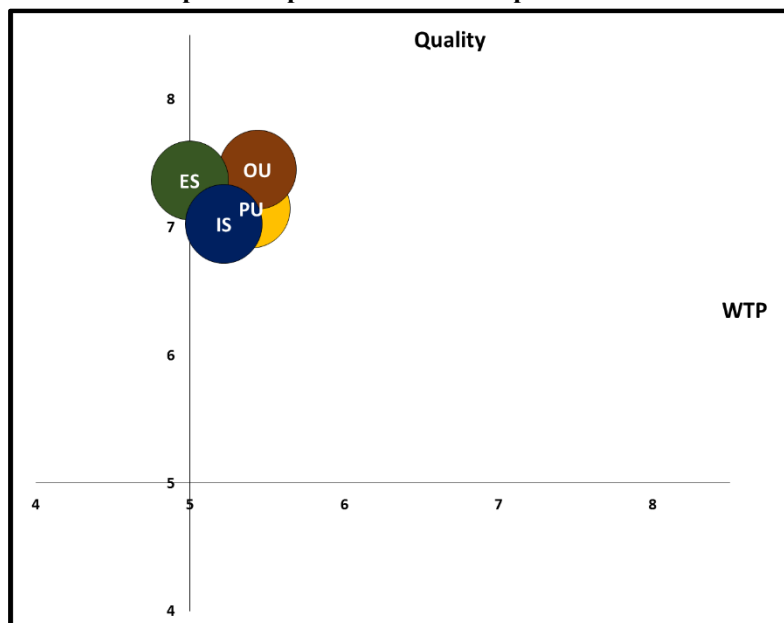
Considering now the mail questionnaires we can see some variances when compared with the other data group. There is not such a main difference between the willingness to pay but internal staff respondents were the ones that would pay the most for the grass cutting machine ($M^{\text{Mail} | \text{IS}}_{\text{Wtp}} = 5.56$; $M^{\text{Mail} | \text{PU}}_{\text{Wtp}} = 5.31$; $M^{\text{Mail} | \text{OU}}_{\text{Wtp}} = M^{\text{Mail} | \text{ES}}_{\text{Wtp}} = 5.03$). The perception of quality in the product had a bigger difference between the higher valued product by external supplier respondents and the internal staff ones ($M^{\text{Mail} | \text{ES}}_{\text{Quality}} = 7.29$; $M^{\text{Mail} | \text{OU}}_{\text{Quality}} = 7.14$; $M^{\text{Mail} | \text{PU}}_{\text{Quality}} = 6.93$; $M^{\text{Mail} | \text{IS}}_{\text{Quality}} = 6.25$).

TABLE 4.2
Co-creators Comparison – Total

TOTAL	Co-creator	MWtp x 2	MQuality
	PU - Professional User	5.40	7.15
	OU - Occasional User	5.44	7.45
	ES - External Supplier	5.00	7.37
	IS - Internal Staff	5.22	7.03

EXHIBIT 5.3

Perceptual Map: Co-creators Comparison – Total



Finally a last perceptual map was made regarding the two groups of knowledge to respond to the H₃. It is notable that the values do not differ so much as expected, although

they can show some interesting information about the perception of the consumers of some product according with their co-creator. Occasional user respondents gave a higher willingness to pay than the other three co-creators respondents but the difference to professional users was not that much ($M^{\text{Total|OU}}_{\text{Wtp}}=5.44$; $M^{\text{Total|PU}}_{\text{Wtp}}= 5.40$; $M^{\text{Total|IS}}_{\text{Wtp}}= 5.22$; $M^{\text{Total|ES}}_{\text{Wtp}}= 5.00$). In the perception of product quality occasional user had again the highest value ($M^{\text{Total|OU}}_{\text{Quality}}= 7.45$; $M^{\text{Total|ES}}_{\text{Quality}}= 7.37$; $M^{\text{Total|PU}}_{\text{Quality}}= 7.15$; $M^{\text{Total|IS}}_{\text{Quality}}= 7.03$). It is possible to determine that occasional user have better results than the others co-creators, proving our H₃ right.

Conclusions and Limitations

Conclusions and Discussion of Results

The purpose of this thesis reacts to a current trend of companies that are shifting their strategy to involving users' communities. Many firms have begun to supplement or even change their product design teams with the use of external communities. As a consequence, the user-driven firms benefit from the success of products (Lilien et al., 2002).

The first hypothesis was proved since people that do not know the concept of co-creation believe that it adds value to a product and company. Results showed that 93% of respondents think co-creation adds value to a product while only 26% knew the concept beforehand. Also related with this hypothesis, 96% of participants believe it brings value to a company.

Looking at the data set there was a difference between *Practical* and *Theoretical Knowledge* groups being the first ones perceived as having more quality and that respondents had more willingness to pay for them. This provides evidence to respond to the second hypothesis that users' co-creators products are better perceived than company ones.

Thus, as pointed by the third hypothesis, the knowledge of the co-creator does not imply better perceived value of a product given by the respondents. *Occasional User* was the one that had lower knowledge but it was the co-creator with better results in perceived product quality, higher willingness to pay and buy and the second best when it comes to recommendation. The fact that *OU* was the one with higher evaluation might be explained by a high usage contact with the functional needs of the product therefore having the need for better solution-oriented ideas. This is a valuable conclusion for companies since users do not only enjoy sharing their ideas (Humphreys and Grayson, 2008) but also user inputs are perceived as better.

This study provides the company with evidence that products designed by users are better perceived than products made by company internal teams. The perceptual map allowed to conclude that products co-created by *users* (*practical knowledge* group) not only have a higher willingness to pay but also a better perceived quality – counterintuitive

since customers tend to perceive peers with less expertise in new product development (Schreier, Fuchs and Dahl, 2012).

Academic Relevance

This research comes in an emerging stream of literature that study consumer's perception of co-creation (Fuchs and Schreier, 2011; Schreier, Fuchs and Dahl's, 2012). Academically this thesis tries to increase the knowledge about co-creation concepts in consumer's mind that are not involved with this process at all. This goal was obtained through the study of co-creation from a market point of view whereas the main literature look at user innovation.

Even though all the research made in this topic, a market analysis vision is needed although is not easy due to the difficulties to gather real data in the real market (Nishikawa, Schreier and Ogawa, 2013). In this thesis the research had the objective of gathering real data from real customers in a real store but also trough mail, analysing the effect of different co-creators in the perception of the value of a product.

Some focus of this thesis was to understand if the co-creator knowledge influenced the perception of the final customer. This influence was studied through the evaluation of willingness to pay, quality, willingness to buy and product recommendation.

The result of the users' products being perceived as having more quality and a higher willingness to pay is notable since people perceived users as less expertise and knowledge than company co-creators. Preceding research required a study that could include two types of user co-creators and other two types of company co-creators.

Moreover, this thesis studies a real DIY company' consumers with a real product which makes data gattered more accurate for academic research. Since a real cutting grass machine was used, this can be considered as a piece of somewhat complex. Although, respondents only considered that the complexity of this product was not that high ($M^{\text{Total}}_{\text{Complexity}} = 3.09$) what could influence the better results for the user co-creator.

Managerial Relevance

This thesis is significant in the managerial environment since it can assist managers in the perception of co-creation by the consumers by helping the prediction of consumer's reaction in a co-created product and the weight of the type of co-creator. Facts like more willingness to pay or even a better quality perception by the consumers are important for managers that have to define a strategy based in consumer behavior.

Start-up companies could use this example of co-creation to be unique comparing to the competition. These companies can shift their business to a more customer-oriented approach, involving the consumer in co-creation projects that can be a source of competitive advantage. For example, a company that sells a huge collection of products in the retail market could launch a co-created special collection of products.

Co-creation has a real positive impact on consumer's demands so it is always an important concept to study and analyse. The marketing and overall company strategy can be influenced with this way of availing consumers' insights. This thesis found evidence in favour of co-creation as an effective way to reach consumers needs that can be a potential position strategy for managers that are looking for a competitive advantage in the market place.

For a well thoughtful conclusion of this practical concept in the real business, additional academic work is needed to understand how and what skills are important for a manager to take co-creation as the overall strategy. Managing co-creation involves an open and cooperative leadership since it implies denying the traditional mind-set and trying to bring value to the company by using the consumers.

Co-creation is not market research and taking into account consumer's needs and feedback. In contrary, co-creation implies a welcome environment for the consumer to be included in all stages of the value creation process in order to take the most advantage of the best source of value a company could find – their own customers.

Limitations and Future Research

The conclusions of this thesis are linked with several limitations that should be taken into consideration when interpreting the results. First the questionnaires were only

made in one type of DIY store – Leroy Merlin store. This can influence the results since there were only Leroy Merlin consumers to respond to the in-store questionnaire.

The fact that the product used in the questionnaires was not yet available in the market stood up as a constraint as the survey could not be released online and therefore reaching a smaller sample of respondents.

Testing just one product was a limitation since some people could be unused to this type of product. Further research should use different products in order to have a better understanding of the results.

The stimulus material in the in-store and mail' questionnaires design were made by the researcher and not by a professional. An expert could have collected different results not only with a better questionnaire design but also with a more professional interaction with in-store respondents.

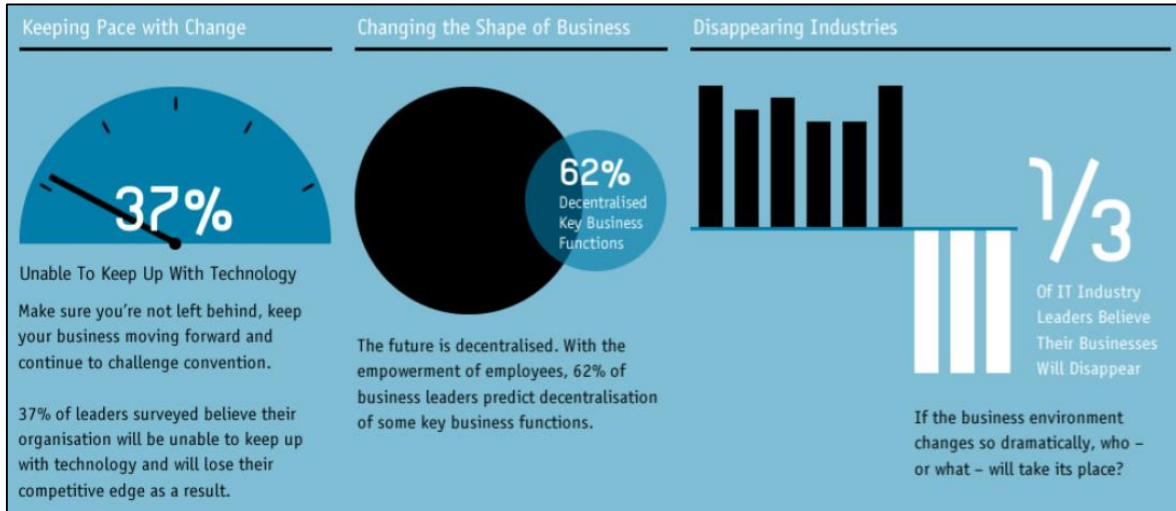
ANOVA tests showed that a lot of question results were not statistically significant. Different statistical data could lead to new and more meaningful results.

It could be interesting to study different groups of consumers' perceptions that exist. This could help to deeply understand the effect of co-creation in them. Variables like age could be a start to new studies.

Appendices

Annex 1 – Keeping with technology change

(Source: Ricoh and Economist Intelligence Unit)

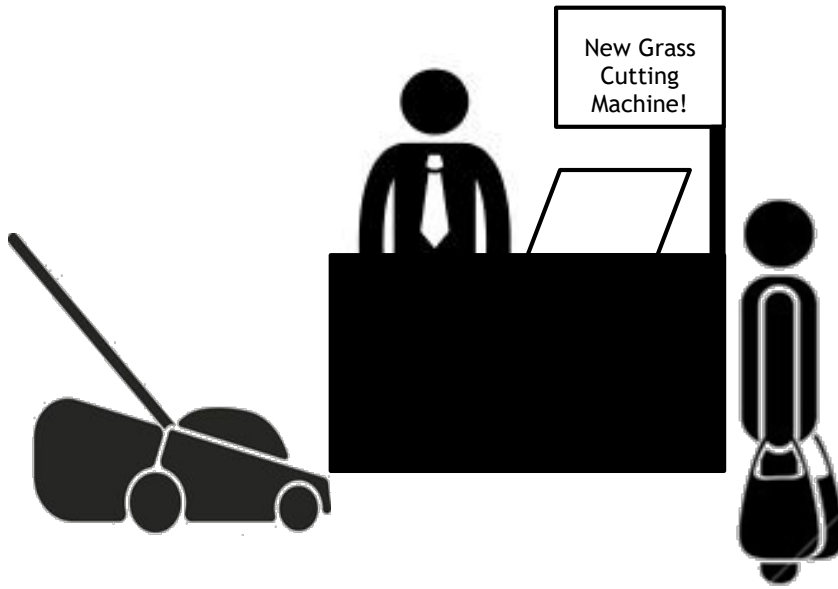


Annex 2 – MyStarbucksIdea

(Source: <http://www.businesswire.com/>)



Annex 3 – In-store Design



Annex 4 – In-store Questionnaire (Portuguese)

Cocriação: Questionário em Loja

Sou um estudante da faculdade Católica de Lisboa e gostaria de lhe fazer umas breves questões sobre um novo conceito de Inovação.

O conceito de Cocriação foi introduzido em 2000 e definido como “*a estratégia de mercado ou de empresas que valoriza a criação e constante realização de valor mutuo entre empresa e consumidor. Este conceito vê o Mercado como oportunidades para as empresas e os consumidores de partilharem, combinarem e recriarem os seus recursos e capacidades de criar valor através de novas formas de interacção, serviço e mecanismos de aprendizagem. Este conceito distingue-se da forma tradicional de trabalhar das empresas*” (Prahalad & Ramaswamy, 2000, p.81).

- Q1 – Já conhecia este conceito?
 Não (0) Sim (1)
- Q2 – Acha que este conceito valoriza uma empresa?
 Não (0) Sim (1)
- Q3 – Acha que este conceito valoriza um produto?
 Não (0) Sim (1)

Design do Questionário – Professional User

Este corta-relva foi criado por **João Duarte** – consumidor do Leroy Merlin que trabalha numa empresa de Jardinagem.

Explicação do produto.

Gostaria de lhe fazer umas perguntas em relação a este produto.

Q1 – Já utilizou este tipo de produto?

Não (0) – fim do questionário

Sim (1)

Q2 – Já comprou este tipo de produto?

Não (0)

Sim (1)

Q3 – O preço médio para este artigo é de 100 €. Quanto estaria disposto(a) a pagar por este produto?

< 50 € (1)

51 - 100 € (2)

101 - 150 € (3)

151 - 200 € (4)

> 200 € (5)

Q4 – Sendo o produto desenhado por **João Duarte**, numa escala de 1-10, qual é a qualidade que este produto tem para si?

1	2	3	4	5	6	7	8	9	10
Nenhuma									Muita

Q5 – Qual a sua vontade de comprar este produto?

Muito pouca (1)

Pouca (2)

Alguma (3)

Muita (4)

Q6 – Numa escala de 1-10, qual a probabilidade de recomendar este produto a alguém?

1	2	3	4	5	6	7	8	9	10
Não recomendo									Recomendo

Q7 – Numa escala de 1-5 qual o valor que dá a cada uma das seguintes características neste tipo de produto?

Q7.1 – Preço

1	2	3	4	5
Nenhum Valor				Muito Valor

Q7.2 – Qualidade

1	2	3	4	5
Nenhum Valor				Muito Valor

Q7.3 – Criador/Marca

1	2	3	4	5
Nenhum Valor				Muito Valor

Q7.4 – Inovação

1	2	3	4	5
Nenhum Valor				Muito Valor

Q7.5 – Aspectos físicos do Produto (ex: facilidade de manobra, peso, design, etc)

1	2	3	4	5
Nenhum Valor				Muito Valor

Q8 – Numa escala de 1-5 como avalia o grau de complexidade de este tipo de produto?

1	2	3	4	5
Nenhuma Complexidade				Muito Complexidade

Q9 – Idade __.

Q10 – Sexo

F (0)

M (1)

Annex 5 – In-store Questionnaire (English)

Co-creation: In-Store Questionnaire

Hello, I am a student from Catolica Lisbon University and I would like to make some questions regarding a new Innovation concept.

The concept of co-creation was introduced in 2000 and defined as “*a form of market or business strategy that emphasizes the generation and ongoing realization of mutual firm-customer value. It views markets as forums for firms and active customers to share, combine, and renew each other’s resources and capabilities to create value through new forms of interaction, service and learning mechanisms. It differs from the traditional active firm – passive consumer market construct of the past*” (Prahalad & Ramaswamy, 2000, p.81).

Q1 – Do you already knew this concept?

No (0)

Yes (1)

Q2 – Do you think that this method value a company?

No (0)

Yes (1)

Q3 – Do you think that this method value a product?

No (0)

Yes (1)

Questionnaire Design – Professional User

This grass cutting machine was created by **João Duarte** – Leroy Merlin consumer that have its own Garden Company.

Explanation of a product.

I would like to ask you some questions about this product.

Q1 – Do you already use a grass cutting machine?

No (0) – end of questionnaire

Yes (1)

Q2 – Do you already buy a grass cutting machine?

No (0)

Yes (1)

Q3 – The average price of a grass cutting machine is 100€. How much are you willing to pay for this one?

< 50 € (1)

51 - 100 € (2)

101 - 150 € (3)

151 - 200 € (4)

> 200 € (5)

Q4 – Since this grass cutting machine was created by **João Duarte**, in a 1-10 scale, what is your perception of quality in this product?

11	21	31	41	51	61	71	81	91	101
None									A lot

Q5 – What is your willing to buy this product?

None (1)

Little (2)

Some (3)

A lot (4)

Q6 – In a 1-10 scale, what is the probability for you to recommend this product?

11	21	31	41	51	61	71	81	91	101
None									A lot

Q7 – In a 1-5 scale, which value do you give to the following characteristics in a product?

Q7.1 – Price

11	21	31	41	51
Low Value				High Value

Q7.2 – Quality

11	21	31	41	51
Low Value				High Value

Q7.3 – Creator/Brand

11	21	31	41	51
Low Value				High Value

Q7.4 – Innovation

11	21	31	41	51
Low Value				High Value

Q7.5 – General features

11	21	31	41	51
Low Value				High Value

Q8 – In a 1-5 scale, how do you perceive the complexity of creating a product like this?

11	21	31	41	51
Low Complexity				High Complexity

Q9 – Age __.

Q10 – Sex

Female (0)

Male (1)

Annex 6 – Mail Questionnaire (Portuguese)

27/02/2016

Co-criação - PU

[Editar este formulário](#)

Co-criação - PU

Sou um estudante da faculdade Católica de Lisboa e gostaria de lhe fazer umas breves questões sobre um novo conceito de Inovação.

Gostaria de agradecer para já a disponibilidade e peço secretismo sobre este produto pois ainda não saiu para o mercado.

***Obrigatório**

Parte 1

Co-criação é uma forma de inovação que acontece quando as pessoas de fora da empresa como fornecedores, colaboradores e/ou clientes associam-se com o negócio ou produto de uma empresa trazendo inovação de valor. Esta associação é uma relação com a empresa desde o início ao fim do processo.

Já conhecia este conceito? *

- Sim
- Não

Acha que este conceito valoriza uma empresa? *

- Sim
- Não

Acha que este conceito valoriza um produto? *

- Sim
- Não

Parte 2

Este produto é um novo corta-relvas apenas com três rodas o que permite mudanças de direção a 360°

Este corta-relva foi criado por João Duarte – consumidor de uma empresa de Bricolage que trabalha numa empresa de Jardinagem. Estamos a fazer um estudo de mercado para descobrir se faz sentido apostar neste produto mesmo tendo sido pensado por este co-criador.

<https://docs.google.com/forms/d/154AUE2f1dkqFdyqzIqDjgZyaf-RTEFwQ9HstrC6zhzo/viewform>

1/4

**Já utilizou este tipo de produto (corta-relvas)? ***

Se responder não, passe para as últimas duas perguntas

- Sim
- Não

Já comprou este tipo de produto (corta-relvas)?

- Sim
- Não

O preço médio para este artigo é de 100 €. Quanto estaria disposto(a) a pagar por este produto?

- < 50 €
- 51 - 100 €
- 101 - 150 €
- 151 - 200 €
- > 200 €

Sendo o produto desenhado por João Duarte, numa escala de 1-10, qual é a qualidade que este produto tem para si?

- 1
- 2
- 3
- 4
- 5
- 6
- 7

- 8
- 9
- 10

Qual a sua vontade de comprar este produto?

- Muito pouca
- Pouca
- Alguma
- Muita

Numa escala de 1-10, qual a probabilidade de recomendar este produto a alguém?

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10

Numa escala de 1-5 qual o valor que dá a cada uma das seguintes características neste tipo de produto?

	1	2	3	4	5
Preço	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Qualidade	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Criador/Marca	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Inovação	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Aspectos físicos do Produto (ex: facilidade de manobra, peso, design, etc)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Numa escala de 1-5 como avalia o grau de complexidade de este tipo de produto?

- 1
- 2
- 3
- 4
- 5

Idade *

Sexo *

Homem

Mulher

100% concluído.

Nunca envie senhas pelo Formulários Google.

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Annex 7 – Co-creators Profiles

Professional User



- **Name:** João Duarte
- **Background:** João work in the gardening service business and is a frequent consumer of Leroy Merlin since he use their products in their daily work

Occasional User



- **Name:** Manuel Cary
- **Background:** Manuel is a family man that loves DIY products and invest some of his free time in weekends doing this kind of work at home

External - Supplier



- **Name:** Bricolage and Construção
- **Background:** BandC company was created in 1995 in Portugal that produce some DIY products

Internal - Staff Store



- **Name:** Alberto Fernandes
- **Background:** Alberto is a Leroy Merlin Store Staff that work for the company since 2005. This year is the Garden department Chief in his store

Annex 8 – ANOVA Test (Total)

Co-creation Knowledge

Anova: Single Factor

SUMMARY

Groups	Count	Sum	Average	Variance
ES	56	15	0,27	0,20
IS	57	18	0,32	0,22
OU	60	15	0,25	0,19
PU	54	12	0,22	0,18

ANOVA

Source of Variation	SS	df	MS	F	P-Value	F crit
Between Groups	0,26	3,00	0,09	0,44	0,72	2,65
Within Groups	43,88	223,00	0,20			
Total	44,14	226,00				

Co-creation value (company)

Anova: Single Factor

SUMMARY

Groups	Count	Sum	Average	Variance
ES	56	54	0,96	0,04
IS	57	55	0,96	0,03
OU	60	59	0,98	0,02
PU	54	51	0,94	0,05

ANOVA

Source of Variation	SS	df	MS	F	P-Value	F crit
Between Groups	0,04	3,00	0,01	0,42	0,74	2,65
Within Groups	7,68	223,00	0,03			
Total	7,72	226,00				

Co-creation value (product)

Anova: Single Factor

SUMMARY

Groups	Count	Sum	Average	Variance
ES	56	55	0,98	0,02
IS	57	51	0,89	0,10
OU	60	56	0,93	0,06
PU	54	49	0,91	0,09

ANOVA

Source of Variation	SS	df	MS	F	P-Value	F crit
Between Groups	0,25	3,00	0,08	1,28	0,28	2,65
Within Groups	14,62	223,00	0,07			
Total	14,87	226,00				

User

Anova: Single Factor

SUMMARY

Groups	Count	Sum	Average	Variance
ES	56	56	1,00	0,00
IS	57	57	1,00	0,00
OU	60	60	1,00	0,00
PU	54	54	1,00	0,00

ANOVA

Source of Variation	SS	df	MS	F	P-Value	F crit
Between Groups	0,00	3,00	0,00	65535,00	#DIV/0!	2,65
Within Groups	0,00	223,00	0,00			
Total	0,00	226,00				

Buyer

Anova: Single Factor

SUMMARY

Groups	Count	Sum	Average	Variance
ES	56	13	0,23	0,18
IS	57	16	0,28	0,21
OU	60	40	0,67	0,56
PU	54	13	0,24	0,19

ANOVA

Source of Variation	SS	df	MS	F	P-Value	F crit
Between Groups	7,68	3,00	2,56	8,83	0,00	2,65
Within Groups	64,69	223,00	0,29			
Total	72,38	226,00				

WTP

Anova: Single Factor

SUMMARY

Groups	Count	Sum	Average	Variance
ES	56	140	2,5	0,254545455
IS	57	149	2,614035088	0,526942356
OU	60	163	2,716666667	0,918361582
PU	54	146	2,703703704	0,589797345

ANOVA

Source of Variation	SS	df	MS	F	P-Value	F crit
Between Groups	1,700617896	3	0,566872619	0,980312186	0,402821316	2,645083528
Within Groups	128,9513645	223	0,57825724			
Total	130,6519824	226				

Quality

Anova: Single Factor

SUMMARY

Groups	Count	Sum	Average	Variance
ES	56	412	7,357142857	1,797402597
IS	57	395	6,929824561	3,137844612
OU	60	444	7,4	2,040677966
PU	54	385	7,12962963	2,718728162

ANOVA

Source of Variation	SS	df	MS	F	P-Value	F crit
Between Groups	8,199688772	3	2,733229591	1,130671882	0,337475145	2,645083528
Within Groups	539,0690337	223	2,417349927			
Total	547,2687225	226				

WTB

Anova: Single Factor

SUMMARY

Groups	Count	Sum	Average	Variance
ES	56	124	2,214285714	0,971428571
IS	57	122	2,140350877	0,944235589
OU	60	145	2,416666667	0,891242938
PU	54	122	2,259259259	1,025856045

ANOVA

Source of Variation	SS	df	MS	F	P-Value	F crit
Between Groups	2,405730123	3	0,801910041	0,838536928	0,474005589	2,645083528
Within Groups	213,2594681	223	0,956320485			
Total	215,6651982	226				

Recommendation

Anova: Single Factor

SUMMARY

Groups	Count	Sum	Average	Variance
ES	56	369	6,589285714	6,428246753
IS	57	405	7,105263158	6,917293233
OU	60	424	7,066666667	4,402259887
PU	54	348	6,444444444	7,987421384

ANOVA

Source of Variation	SS	df	MS	F	P-Value	F crit
Between Groups	18,8659664	3	6,288655468	0,984818355	0,40071467	2,645083528
Within Groups	1423,988659	223	6,385599368			
Total	1442,854626	226				

Quality Value

Anova: Single Factor

SUMMARY

Groups	Count	Sum	Average	Variance
ES	56	244	4,357142857	0,633766234
IS	57	245	4,298245614	0,463032581
OU	60	263	4,383333333	0,714971751
PU	54	241	4,462962963	0,5174703

ANOVA

Source of Variation	SS	df	MS	F	P-Value	F crit
Between Groups	0,77557949	3	0,258526497	0,442124824	0,723109756	2,645083528
Within Groups	130,3962267	223	0,584736443			
Total	131,1718062	226				

Innovation Value

Anova: Single Factor

SUMMARY

Groups	Count	Sum	Average	Variance
ES	56	212	3,785714286	1,044155844
IS	57	209	3,666666667	1,154761905
OU	60	230	3,833333333	1,15819209
PU	54	201	3,722222222	1,449685535

ANOVA

Source of Variation	SS	df	MS	F	P-Value	F crit
Between Groups	0,923117265	3	0,307705755	0,256745844	0,856478103	2,645083528
Within Groups	267,2619048	223	1,198483878			
Total	268,185022	226				

Complexity

Anova: Single Factor

SUMMARY

Groups	Count	Sum	Average	Variance
ES	56	191	3,410714286	1,119155844
IS	57	166	2,912280702	0,86716792
OU	60	186	3,1	1,040677966
PU	54	158	2,925925926	1,201956674

ANOVA

Source of Variation	SS	df	MS	F	P-Value	F crit
Between Groups	9,019206822	3	3,006402274	2,850231584	0,03826401	2,645083528
Within Groups	235,2186786	223	1,054792281			
Total	244,2378855	226				

Sex

Anova: Single Factor

SUMMARY

Groups	Count	Sum	Average	Variance
ES	56	29	0,517857143	0,254220779
IS	57	35	0,614035088	0,24122807
OU	60	35	0,583333333	0,247175141
PU	54	35	0,648148148	0,232354997

ANOVA

Source of Variation	SS	df	MS	F	P-Value	F crit
Between Groups	0,509615479	3	0,169871826	0,696489611	0,555076946	2,645083528
Within Groups	54,38906294	223	0,243897143			
Total	54,89867841	226				

Price Value

Anova: Single Factor

SUMMARY

Groups	Count	Sum	Average	Variance
ES	56	239	4,267857143	0,599675325
IS	57	218	3,824561404	0,932957393
OU	60	239	3,983333333	1,033615819
PU	54	220	4,074074074	0,93780573

ANOVA

Source of Variation	SS	df	MS	F	P-Value	F crit
Between Groups	5,803267745	3	1,934422582	2,201856363	0,088714589	2,645083528
Within Groups	195,9147939	223	0,878541677			
Total	201,7180617	226				

Creator/Brand Value

Anova: Single Factor

SUMMARY

Groups	Count	Sum	Average	Variance
ES	56	174	3,107142857	1,115584416
IS	57	179	3,140350877	1,479949875
OU	60	194	3,233333333	1,266666667
PU	54	165	3,055555556	1,261006289

ANOVA

Source of Variation	SS	df	MS	F	P-Value	F crit
Between Groups	0,965517318	3	0,321839106	0,251119205	0,86048945	2,645083528
Within Groups	285,8010025	223	1,281618845			
Total	286,7665198	226				

General Features Value

Anova: Single Factor

SUMMARY

Groups	Count	Sum	Average	Variance
ES	56	211	3,767857143	1,199675325
IS	57	220	3,859649123	0,944235589
OU	60	238	3,966666667	1,083615819
PU	54	226	4,185185185	0,568832984

ANOVA

Source of Variation	SS	df	MS	F	P-Value	F crit
Between Groups	5,314689287	3	1,771563096	1,855250559	0,138059156	2,645083528
Within Groups	212,9408173	223	0,954891557			
Total	218,2555066	226				

Age

Anova: Single Factor

SUMMARY

Groups	Count	Sum	Average	Variance
ES	56	1737	31,01785714	196,7087662
IS	57	2020	35,43859649	315,8577694
OU	60	1976	32,93333333	242,5378531
PU	54	1797	33,27777778	225,1855346

ANOVA

Source of Variation	SS	df	MS	F	P-Value	F crit
Between Groups	556,7156622	3	185,5718874	0,755823447	0,520020886	2,645083528
Within Groups	54751,5839	223	245,527977			
Total	55308,29956	226				

Annex 9 – ANOVA Test (In-Store)

Co-creation Knowledge

Anova: Single Factor

SUMMARY

Groups	Count	Sum	Average	Variance
ES	25	4	0,16	0,14
IS	25	9	0,36	0,24
OU	25	4	0,16	0,14
PU	25	4	0,16	0,14

ANOVA

Source of Variation	SS	df	MS	F	P-Value	F crit
Between Groups	0,75	3	0,25	1,515151515	0,215517935	2,699392598
Within Groups	15,84	96	0,165			
Total	16,59	99				

Co-creation value (company)

Anova: Single Factor

SUMMARY

Groups	Count	Sum	Average	Variance
ES	25	24	0,96	0,04
IS	25	24	0,96	0,04
OU	25	24	0,96	0,04
PU	25	22	0,88	0,11

ANOVA

Source of Variation	SS	df	MS	F	P-Value	F crit
Between Groups	0,12	3	0,04	0,695652174	0,556929321	2,699392598
Within Groups	5,52	96	0,0575			
Total	5,64	99				

Co-creation value (product)

Anova: Single Factor

SUMMARY

Groups	Count	Sum	Average	Variance
ES	25	24	0,96	0,04
IS	25	21	0,84	0,14
OU	25	21	0,84	0,14
PU	25	20	0,8	0,166666667

ANOVA

Source of Variation	SS	df	MS	F	P-Value	F crit
Between Groups	0,36	3	0,12	0,98630137	0,402655502	2,699392598
Within Groups	11,68	96	0,121666667			
Total	12,04	99				

User

Anova: Single Factor

SUMMARY

Groups	Count	Sum	Average	Variance
ES	25	25	1	0
IS	25	25	1	0
OU	25	25	1	0
PU	25	25	1	0

ANOVA

Source of Variation	SS	df	MS	F	P-Value	F crit
Between Groups	0	3	0	65535	#DIV/0!	2,699392598
Within Groups	0	96	0			
Total	0	99				

Buyer

Anova: Single Factor

SUMMARY

Groups	Count	Sum	Average	Variance
ES	25	9	0,36	0,24
IS	25	11	0,44	0,256666667
OU	25	11	0,44	0,256666667
PU	25	9	0,36	0,24

ANOVA

Source of Variation	SS	df	MS	F	P-Value	F crit
Between Groups	0,16	3	0,053333333	0,214765101	0,885948379	2,699392598
Within Groups	23,84	96	0,248333333			
Total	24	99				

WTP

Anova: Single Factor

SUMMARY

Groups	Count	Sum	Average	Variance
ES	25	62	2,48	0,26
IS	25	60	2,4	0,416666667
OU	25	75	3	1,5
PU	25	69	2,76	0,523333333

ANOVA

Source of Variation	SS	df	MS	F	P-Value	F crit
Between Groups	5,64	3	1,88	2,785185185	0,044928904	2,699392598
Within Groups	64,8	96	0,675			
Total	70,44	99				

Quality

Anova: Single Factor

SUMMARY

Groups	Count	Sum	Average	Variance
ES	25	186	7,44	2,756666667
IS	25	195	7,8	2,333333333
OU	25	194	7,76	1,856666667
PU	25	184	7,36	2,073333333

ANOVA

Source of Variation	SS	df	MS	F	P-Value	F crit
Between Groups	3,71	3	1,236666667	0,548410939	0,650412627	2,699392598
Within Groups	216,48	96	2,255			
Total	220,19	99				

WTB

Anova: Single Factor

SUMMARY

Groups	Count	Sum	Average	Variance
ES	25	61	2,44	1,34
IS	25	47	1,88	1,276666667
OU	25	63	2,52	1,426666667
PU	25	61	2,44	1,423333333

ANOVA

Source of Variation	SS	df	MS	F	P-Value	F crit
Between Groups	6,56	3	2,186666667	1,6	0,194466933	2,699392598
Within Groups	131,2	96	1,366666667			
Total	137,76	99				

Recommendation

Anova: Single Factor

SUMMARY

Groups	Count	Sum	Average	Variance
ES	25	185	7,4	7,416666667
IS	25	218	8,72	2,793333333
OU	25	197	7,88	2,36
PU	25	177	7,08	8,826666667

ANOVA

Source of Variation	SS	df	MS	F	P-Value	F crit
Between Groups	38,19	3	12,73	2,379809939	0,074428523	2,699392598
Within Groups	513,52	96	5,349166667			
Total	551,71	99				

Price Value

Anova: Single Factor

SUMMARY

Groups	Count	Sum	Average	Variance
ES	25	109	4,36	0,573333333
IS	25	102	4,08	0,826666667
OU	25	108	4,32	0,643333333
PU	25	107	4,28	0,876666667

ANOVA

Source of Variation	SS	df	MS	F	P-Value	F crit
Between Groups	1,16	3	0,386666667	0,529680365	0,662978791	2,699392598
Within Groups	70,08	96	0,73			
Total	71,24	99				

Quality Value						
Anova: Single Factor						
SUMMARY						
Groups	Count	Sum	Average	Variance		
ES	25	116	4,64	0,323333333		
IS	25	114	4,56	0,256666667		
OU	25	116	4,64	0,406666667		
PU	25	118	4,72	0,293333333		
ANOVA						
Source of Variation	SS	df	MS	F	P-Value	F crit
Between Groups	0,32	3	0,106666667	0,333333333	0,801256287	2,699392598
Within Groups	30,72	96	0,32			
Total	31,04	99				

Creator/Brand Value						
Anova: Single Factor						
SUMMARY						
Groups	Count	Sum	Average	Variance		
ES	25	80	3,2	1,416666667		
IS	25	88	3,52	1,676666667		
OU	25	85	3,4	1,583333333		
PU	25	77	3,08	1,493333333		
ANOVA						
Source of Variation	SS	df	MS	F	P-Value	F crit
Between Groups	2,92	3	0,973333333	0,631010265	0,596761371	2,699392598
Within Groups	148,08	96	1,5425			
Total	151	99				

Innovation Value						
Anova: Single Factor						
SUMMARY						
Groups	Count	Sum	Average	Variance		
ES	25	96	3,84	1,556666667		
IS	25	103	4,12	0,943333333		
OU	25	105	4,2	0,833333333		
PU	25	93	3,72	2,043333333		
ANOVA						
Source of Variation	SS	df	MS	F	P-Value	F crit
Between Groups	3,87	3	1,29	0,959702418	0,41509973	2,699392598
Within Groups	129,04	96	1,344166667			
Total	132,91	99				

General Features Value						
Anova: Single Factor						
SUMMARY						
Groups	Count	Sum	Average	Variance		
ES	25	92	3,68	2,06		
IS	25	98	3,92	1,076666667		
OU	25	103	4,12	1,11		
PU	25	110	4,4	0,333333333		
ANOVA						
Source of Variation	SS	df	MS	F	P-Value	F crit
Between Groups	6,99	3	2,33	2,034934498	0,114113749	2,699392598
Within Groups	109,92	96	1,145			
Total	116,91	99				

Complexity						
Anova: Single Factor						
SUMMARY						
Groups	Count	Sum	Average	Variance		
ES	25	88	3,52	1,51		
IS	25	73	2,92	0,826666667		
OU	25	80	3,2	1,416666667		
PU	25	76	3,04	1,623333333		
ANOVA						
Source of Variation	SS	df	MS	F	P-Value	F crit
Between Groups	5,07	3	1,69	1,257284563	0,29347761	2,699392598
Within Groups	129,04	96	1,344166667			
Total	134,11	99				

Age						
Anova: Single Factor						
SUMMARY						
Groups	Count	Sum	Average	Variance		
ES	25	991	39,64	223,3233333		
IS	25	1210	48,4	282,3333333		
OU	25	1114	44,56	241,1733333		
PU	25	1122	44,88	192,7766667		
ANOVA						
Source of Variation	SS	df	MS	F	P-Value	F crit
Between Groups	972,75	3	324,25	1,380364834	0,25345574	2,699392598
Within Groups	22550,56	96	234,9016667			
Total	23523,31	99				

Sex						
Anova: Single Factor						
SUMMARY						
Groups	Count	Sum	Average	Variance		
ES	25	15	0,6	0,25		
IS	25	16	0,64	0,24		
OU	25	16	0,64	0,24		
PU	25	16	0,64	0,24		
ANOVA						
Source of Variation	SS	df	MS	F	P-Value	F crit
Between Groups	0,03	3	0,01	0,041237113	0,98877338	2,699392598
Within Groups	23,28	96	0,2425			
Total	23,31	99				

Annex 10 – ANOVA Test (Mail)

Co-creation Knowledge

Anova: Single Factor

SUMMARY

Groups	Count	Sum	Average	Variance
ES	31	11	0,35483871	0,23655914
IS	32	9	0,28125	0,208669355
OU	35	11	0,314285714	0,221848739
PU	29	8	0,275862069	0,206896552

ANOVA

Source of Variation	SS	df	MS	F	P-Value	F crit
Between Groups	0,122137263	3	0,040712421	0,186146891	0,905653075	2,678300858
Within Groups	26,90148478	123	0,218711258			
Total	27,02362205	126				

Co-creation value (product)

Anova: Single Factor

SUMMARY

Groups	Count	Sum	Average	Variance
ES	31	31	1	0
IS	32	30	0,9375	0,060483871
OU	35	35	1	0
PU	29	29	1	0

ANOVA

Source of Variation	SS	df	MS	F	P-Value	F crit
Between Groups	0,093503937	3	0,031167979	2,044619423	0,111126267	2,678300858
Within Groups	1,875	123	0,015243902			
Total	1,968503937	126				

Buyer

Anova: Single Factor

SUMMARY

Groups	Count	Sum	Average	Variance
ES	31	4	0,129032258	0,116129032
IS	32	5	0,15625	0,13608871
OU	35	29	0,828571429	0,734453782
PU	29	4	0,137931034	0,123152709

ANOVA

Source of Variation	SS	df	MS	F	P-Value	F crit
Between Groups	11,98791082	3	3,995970273	13,60666397	1,00808E-07	2,678300858
Within Groups	36,1223254	123	0,293677442			
Total	48,11023622	126				

Quality

Anova: Single Factor

SUMMARY

Groups	Count	Sum	Average	Variance
ES	31	226	7,290322581	1,079668882
IS	32	200	6,25	2,774193548
OU	35	250	7,142857143	2,067226891
PU	29	201	6,931034483	3,280788177

ANOVA

Source of Variation	SS	df	MS	F	P-Value	F crit
Between Groups	20,33126171	3	6,77707236	2,971401381	0,034470584	2,678300858
Within Groups	280,53488	123	2,280771382			
Total	300,8664147	126				

Recommendation

Anova: Single Factor

SUMMARY

Groups	Count	Sum	Average	Variance
ES	31	184	5,935483871	4,862365591
IS	32	187	5,84375	6,587701613
OU	35	227	6,485714286	5,139495798
PU	29	171	5,896551724	6,881773399

ANOVA

Source of Variation	SS	df	MS	F	P-Value	F crit
Between Groups	9,091943171	3	3,030647724	0,519523514	0,669625093	2,678300858
Within Groups	717,5222301	123	5,833514066			
Total	726,6141732	126				

Co-creation value (company)

Anova: Single Factor

SUMMARY

Groups	Count	Sum	Average	Variance
ES	31	30	0,967741935	0,032258065
IS	32	31	0,96875	0,03125
OU	35	35	1	0
PU	29	29	1	0

ANOVA

Source of Variation	SS	df	MS	F	P-Value	F crit
Between Groups	0,032012002	3	0,010670667	0,677767895	0,56726722	2,678300858
Within Groups	1,936491935	123	0,015743837			
Total	1,968503937	126				

User

Anova: Single Factor

SUMMARY

Groups	Count	Sum	Average	Variance
ES	31	31	1	0
IS	32	32	1	0
OU	35	35	1	0
PU	29	29	1	0

ANOVA

Source of Variation	SS	df	MS	F	P-Value	F crit
Between Groups	0	3	0	65535	#DIV/0!	2,678300858
Within Groups	0	123	0			
Total	0	126				

WTP

Anova: Single Factor

SUMMARY

Groups	Count	Sum	Average	Variance
ES	31	78	2,516129032	0,258064516
IS	32	89	2,78125	0,563508065
OU	35	88	2,514285714	0,433613445
PU	29	77	2,655172414	0,662561576

ANOVA

Source of Variation	SS	df	MS	F	P-Value	F crit
Between Groups	1,589221424	3	0,529740475	1,113713038	0,346268354	2,678300858
Within Groups	58,50526676	123	0,475652575			
Total	60,09448819	126				

WTB

Anova: Single Factor

SUMMARY

Groups	Count	Sum	Average	Variance
ES	31	63	2,032258065	0,652258065
IS	32	75	2,34375	0,619959677
OU	35	82	2,342857143	0,52605042
PU	29	61	2,103448276	0,667487685

ANOVA

Source of Variation	SS	df	MS	F	P-Value	F crit
Between Groups	2,497981126	3	0,832660375	1,369912737	0,255173336	2,678300858
Within Groups	74,76186139	123	0,607820011			
Total	77,25984252	126				

Price Value

Anova: Single Factor

SUMMARY

Groups	Count	Sum	Average	Variance
ES	31	130	4,193548387	0,627956989
IS	32	116	3,625	0,951612903
OU	35	131	3,742857143	1,196638655
PU	29	113	3,896551724	0,95320197

ANOVA

Source of Variation	SS	df	MS	F	P-Value	F crit
Between Groups	5,734739762	3	1,911577921	2,031942284	0,112902118	2,678300858
Within Groups	115,7140791	123	0,940764871			
Total	121,4488189	126				

Quality Value						
Anova: Single Factor						
SUMMARY						
Groups	Count	Sum	Average	Variance		
ES	31	128	4,129032258	0,782795699		
IS	32	131	4,09375	0,539314516		
OU	35	147	4,2	0,870588235		
PU	29	123	4,24137931	0,618226601		
ANOVA						
Source of Variation	SS	df	MS	F	P-Value	F crit
Between Groups	0,41459326	3	0,138197753	0,195129663	0,899546481	2,678300858
Within Groups	87,1129658	123	0,708235494			
Total	87,52755906	126				

Creator/Brand Value						
Anova: Single Factor						
SUMMARY						
Groups	Count	Sum	Average	Variance		
ES	31	94	3,032258065	0,898924731		
IS	32	91	2,84375	1,168346774		
OU	35	109	3,114285714	1,045378151		
PU	29	88	3,034482759	1,10591133		
ANOVA						
Source of Variation	SS	df	MS	F	P-Value	F crit
Between Groups	1,297259665	3	0,432419888	0,410098316	0,746024594	2,678300858
Within Groups	129,6948663	123	1,054429807			
Total	130,992126	126				

Innovation Value						
Anova: Single Factor						
SUMMARY						
Groups	Count	Sum	Average	Variance		
ES	31	116	3,741935484	0,664516129		
IS	32	106	3,3125	1,060483871		
OU	35	125	3,571428571	1,25210084		
PU	29	108	3,724137931	0,992610837		
ANOVA						
Source of Variation	SS	df	MS	F	P-Value	F crit
Between Groups	3,706873873	3	1,235624624	1,23386896	0,300382902	2,678300858
Within Groups	123,1750159	123	1,001422893			
Total	126,8818898	126				

General Features Value						
Anova: Single Factor						
SUMMARY						
Groups	Count	Sum	Average	Variance		
ES	31	119	3,838709677	0,539784946		
IS	32	122	3,8125	0,866935484		
OU	35	135	3,857142857	1,067226891		
PU	29	116	4	0,714285714		
ANOVA						
Source of Variation	SS	df	MS	F	P-Value	F crit
Between Groups	0,629989296	3	0,209996432	0,259974363	0,854099285	2,678300858
Within Groups	99,35426267	123	0,807758233			
Total	99,98425197	126				

Complexity						
Anova: Single Factor						
SUMMARY						
Groups	Count	Sum	Average	Variance		
ES	31	103	3,322580645	0,825806452		
IS	32	93	2,90625	0,92641129		
OU	35	106	3,028571429	0,793277311		
PU	29	82	2,827586207	0,862068966		
ANOVA						
Source of Variation	SS	df	MS	F	P-Value	F crit
Between Groups	4,326830704	3	1,442276901	1,695947924	0,171390515	2,678300858
Within Groups	104,6023032	123	0,850425229			
Total	108,9291339	126				

Age						
Anova: Single Factor						
SUMMARY						
Groups	Count	Sum	Average	Variance		
ES	31	746	24,06451613	70,06236559		
IS	32	810	25,3125	110,6733871		
OU	35	862	24,62857143	80,24033613		
PU	29	675	23,27586207	37,20689655		
ANOVA						
Source of Variation	SS	df	MS	F	P-Value	F crit
Between Groups	68,34461835	3	22,78153945	0,301216441	0,824464483	2,678300858
Within Groups	9302,7105	123	75,63179268			
Total	9371,055118	126				

Sex						
Anova: Single Factor						
SUMMARY						
Groups	Count	Sum	Average	Variance		
ES	31	14	0,451612903	0,255913978		
IS	32	19	0,59375	0,248991935		
OU	35	19	0,542857143	0,255462185		
PU	29	19	0,655172414	0,233990148		
ANOVA						
Source of Variation	SS	df	MS	F	P-Value	F crit
Between Groups	0,673478836	3	0,224492945	0,90138362	0,442667828	2,678300858
Within Groups	30,63360778	123	0,249053722			
Total	31,30708661	126				

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