



FROM CUSTOMER EXPERIENCE TO PRODUCT DESIGN: REASONS TO INTRODUCE A HOLISTIC DESIGN APPROACH

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Abstract

In the recent years, the creation of a good Customer Experience has become one of means to help companies in competing in the arena of retail. This have led to a focus shift from product design to the customer services' design and customer marketing with the aim to elicit a unique experience able to improve customer satisfaction, influence customer's decision-making and foster repurchasing. In this context, the present paper investigates the close interplay between Customer Experience and User Experience and describes an experiment to give evidence of the effects of the customer journey on the user experience. It discusses the necessity of considering the whole Customer Experience in product/service design and proposes a new holistic approach centred on CX to support the design of all elements characterising the company's offering.

Keywords: Experience design, Organisation of product development, User centred design

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1 INTRODUCTION

In last decades, companies are paying more and more attention to Customer Experience (CX) strategies to enhance customer loyalty and gain competitive advantages. This have led to a focus shift from product design to the customer services' design and customer marketing (Chen-Yu and Kincaide, 2001) with the aim to elicit a unique experience able to improve customer satisfaction, influence customer's decision-making and foster repurchasing. This meaningful change of perspective is particularly evident in the retail sector (Berry et al., 2002).

CX represents the whole of a person's responses (internal and subjective) resulting from every direct interaction (e.g., purchase, use, customer service) or indirect interaction (e.g., word of mouth recommendations, advertising) with a company/brand (Meyer and Schwage, 2007). Consequently, CX encompasses every aspect of a company's offering (Zomerdijk and Voss, 2010), which span from the product itself to all the product-related service (PRS) and customer services (CS) (i.e. customer care service, sale services, etc.). This holistic viewpoint outlines the fact that nowadays the high quality of a product is not enough to ensure its success on the market. Berry et al. (2002) reinforced the concept that it is necessary to make the product part of a well-conceived and comprehensive CX strategy to guarantee consistency between all the signals (or clues) transmitted through every element of the company's offering (i.e., products, PRS and CS). The result is a total satisfactory CX at each moment the customer encounters the company (e.g. advertisement in social network platforms, shops, telephone).

As the clues that may affect the customer experience are everywhere (Berry et al., 2002), the implementation of a CX strategy will involves every activity within the company, from product development to the design of every related or correlated service and require that the development of all company's goods and services are addressed in an integrated way.

Therefore, a challenging question arises: how can the designer take into consideration a so large amount of information to conceive a product coherent with the CX strategy?

Despite the growing interest in CX, research in design methodology and product lifecycle management is scarce or completely absent. The majority of publications about CX (Berry et al., 2002; Meyer and Schwager, 2007; Frow and Payne, 2007; Verhoef et al., 2009) focuses on the definition of conceptual models with the aims to support managerial strategies. Many studies propose methods to analyse customer response and measure the quality of CX by constructing an emotional curve to represent customer reactions along the journey (Frow and Payne, 2007; Stauss and Weinlich, 1997; Verhoef et al, 2009) but no one provides an holistic approach to really integrate CX in product and service design practice. Very few studies consider the importance of the whole customer experience in service design (Teixeira et al., 2012), while CX-oriented methodologies able to support the introduction of CX in product design are still lacking.

Today, only user-centred-design (UCD) approach seems to come near to CX for the multidisciplinary disciplines it requires and for the methods and tools it proposes to ensure that products meet users' expectation. However, UCD focuses only on a specific stage of CX, that is the product use. It does not consider the whole story of interactions between the customer and the company. Moreover, it mainly takes into consideration the needs of people that will use the product while if you look at CX, the customers are every person meeting the company (e.g. the buyer, the user, the shop staff, the store-manager, the customer care operator, etc.)

In this multifaceted context, the present research aims to motivate the importance of considering the whole Customer Experience in traditional UCD by proposing a challenging holistic perspective for the definition of product/service requirements and the management of all choices along the whole product lifecycle process. It implies at first the planning of the CX strategy, then the modelling of the customer journey map for the definition of the requirements of all elements characterizing the CX and finally the management of parallel design processes for instance product design, service design, clues design, etc. The paper is structured as follow: first, we examine the interplay between CX and User Experience in determining perceived product quality. Secondly, we analyse, also through an experiment, the effect of customer journey on user experience. Thirdly, we introduce a new customer-centred design perspective and discuss its managerial implication, limitation, and future research.

2 THE INTERPLAY OF CUSTOMER EXPERIENCE AND USER EXPERIENCE IN THE PERCEPTION OF PRODUCT QUALITY

Based on the most accepted definition, User Experience (UX) is intended as the whole of “person's perceptions and responses resulting from the use and/or anticipated use of a product, system or service” (ISO 9241-201:2010). Consequently, UX focuses on person-product interaction in a specific context: the moment and the place in which the person identifies itself as a user or she/he directly uses the product. It includes all the users' emotions, beliefs, preferences, perceptions, physical and psychological responses and behaviours that occur before, during and after use. It is determined by several factors: brand image, functionality, system performance, interactive behaviour and assistive capabilities of the interactive system, the user's internal and physical state resulting from his/her characteristics and background (e.g., prior experiences, attitudes, skills and personality), and the context of use. According to Hassenzahl (2008), two typologies of product attributes most determine the perceived UX, and so the perceived product quality related to the product use: pragmatic and hedonic attributes. Pragmatic quality refers to the product's perceived ability to support the achievement of "do-goals", so it refers to product utility and usability in relation of potential tasks external to the user. Hedonic quality refers to the product's perceived ability to support the achievement of "be-goals", so it refers to the ability of the product to support user in achieving personal goals (i.e., being special, being competent). Those attributes contribute in determine the user's opinion regarding the product, or in other words, the product image.

The image of a product, system or service is determined by the cognitive processing of its functional (e.g. functionalities, aesthetics, mental picture) and/or psychological characteristics (e.g., ease to use, feelings with product, emotions) (Echtner and Ritchie, 1991). These characteristics could be differently perceived according to the nature of the cognitive process itself (i.e., more or less holistic) the user considers and or at which stage the experience happens (Figure 1). The same process occurring for imaging a product occurs for any context where a user acts, explores, experiences such as a store or a web site. It is worth to notice that other stimuli that are beyond the intrinsic characteristics of the product (e.g., price, product brand, store name, country of origin) strongly affect the user perception about the product and influence the consumer behaviour (Swagler, 1979; Davis, 1985; Davis, 1987; Baugh and Davis, 1989). They are for example: the store merchandising, the scent of the retail store, the attitudes of the staff, etc. Consequently, a high price can generate a greater expectation about product quality, the store image can affect the product image (e.g. a pleasant store ambience, the kindness of staff can improve customer feelings with the product, the disposition of goods in the shelf can affect the mental picture of the product, etc.). Only by way of example, Figure 1 shows some of the possible functional and psychological characteristics of a product (1a) and of a store (1b), which can affect the product and store images the customer figures in his/her mind, without the claim to be exhaustive.

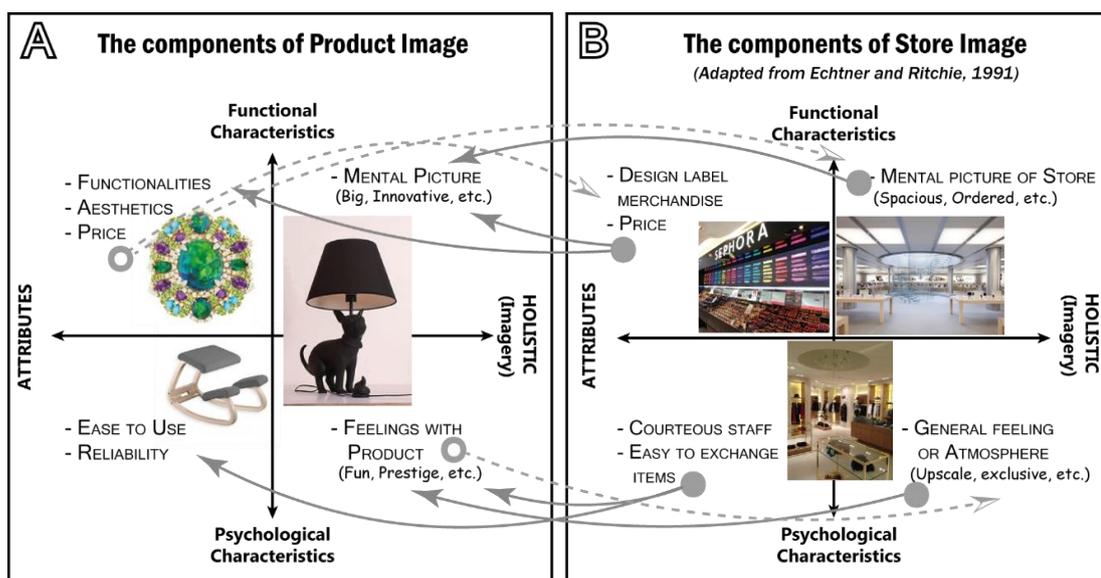


Figure 1. Possible influences of store image on product image

Chen-Yu and Kincade (2001) found that the product image significantly affect not only user perception about product quality but also his/her expectations regarding the product performance. In particular, when consumption performance is good, a high product image resulted in a high satisfaction level, but when consumption performance is poor, a high product image resulted in a low satisfaction level. These preliminary considerations highlight the mutual influence between UX and CX, point out the importance of adopting a holistic and integrated approach to design every product/service the user experience and demonstrate that the product image has a powerful influence not only in the purchasing process but also at all post-purchase phases. CX encompass all the phases that characterize the buying process, the consumption (or use) and the after-sale periods. Each phase is characterized by a set of episodes (or touchpoints), which may take place in various contexts (e.g., media, internet, shop). During each episode, every element the customer enters during the interaction (e.g., goods, services, people, etc.), determines a stimulus (or clue). Berry et al. (2002) classify the clues in two categories: those that concern goods or services functioning, and those concerning all the other aspects beyond the mere goods and services functionalities (e.g., smells, sounds, sights, tastes and textures of the good or service, as well as the environment in which it is offered). All these stimuli encountered by the customer before and after the purchase determine the customer's opinion regarding the product, or in other words the product image, and consequently they determine his/her expectations about the product performance.

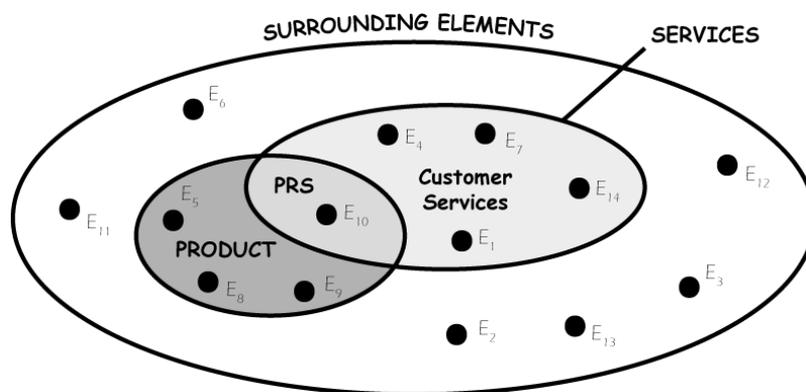


Figure 2. Elements affecting the overall quality of customer experience

So, it is necessary to understand how prospective and current customers use the various goods/services and how they perceive the company through the different elements they come in contact and how they would like the customer experience to be at various touchpoints. The Customer Journey is usually used to represent the life-cycle of relationship between the customer and the company for this purpose. According to Meyer and Schwager (2007), the customer journey can be considered as the representation of the customer's transition from never-a-customer to always-a-customer. It is a visual draw of the CX, which describes where the customer could be (directly or indirectly) in contact with company and shows the different touchpoints characterizing this path.



Figure 3. An example of Customer Journey

The customer life cycle usually starts when the customer wants or needs a product or service, continues to the point where the product is chosen and purchased and finish with the product disposal or renewal (Nenonen et al., 2008). As represented in Figure 2, the customer may encounters several stimuli, which are determined by elements that the company can control (i.e., products or services) or are generated by other factors outside the company control (Verhoef et al., 2009). Consequently, no company will ever determine CX in a comprehensive way.

Only companies able to provide and manage an overall customer service (from the product advertisement to the retail, the assistance and the product withdrawal) have the possibility to manage the total CX. All the other can manage only specific episodes (or touchpoints).

However, the goal of any business should be to understand which stimulus they have to provide for ensure the best CX, depending on the episode and the context in which the interaction takes place. Several studies have been conducted to investigate how different stimulus affect the product expectation, and consequently the consumer perception of product quality. However, no research has been found to determine how the order of different stimuli affect UX. Consequently we performed an experiment to deeper analyse this aspect.

3 THE EFFECT OF CUSTOMER JOURNEY ON USER EXPERIENCE

An experiment was conducted to determine if and how UX and the product image is affected by the type and order of two different channels of product communication and company-user interaction (i.e., a brochure and a video). This allows the research to verify the above-mentioned statements about the influence of the customer journey touchpoints on the UX and then to set the basis for an approach to introduce CX in product design.

The context of experiment is offered by a small-sized company, i.e. Antrox s.r.l., that designs and manufactures architectural lighting systems for mass retail distribution. This choice is motivated by the fact that for such products, consumer choice is mostly affected by price and brand image, so that creating significant market impact is fundamental to ensure the success of new business initiatives.

3.1 Experimental design

The evaluation followed a between subjects design, with the order of stimuli (“brochure-video” and “video-brochure”) as the only independent variable.

3.2 Experimental conditions

The product under evaluation is a lamp for interiors characterized by a drop shape and by a light source whose orientation can be adjusted according to the space requirements.



Figure 4. Experimental material: the Drop LED Profile installed at the Antrox’s headquarter (on the left), the brochure (in the middle) and some frames from the video (on the right)

At the time of the experiment, such lamp had not yet been neither advertised nor marketed. Moreover, Antrox's market is mainly North Europe and Arab Emirates. Both conditions guarantee that any participant was not familiar with the Antrox brand or with the lamp. The prototype was installed on the ceiling of a corridor of the Antrox's headquarter (Figure 4), located in Italy.

Two different advertisement modalities were chosen for the experiment: a traditional paper-based brochure and an interactive and disruptive video that proposes a completely different way of communicating the brand image, the design intent and the product values. The brochure provides all technical information, and includes images of several examples of installations (Figure 4, at left). The video does not provide any technical information, but aims only to clarify the innovative nature of the product and to arouse emotions (Figure 4, at right).

3.3 Data collection procedure

A total of 40 students aged between 24 and 26 have been involved. They were randomly assigned to two groups, A and B (20 users each). Two experimental sessions were conducted for each group in two different moments. During the first one, participants (one per time) were asked to view the advertising channels.

Group A, first was shown the brochure and then the video. Group B, first was shown the video and then the brochure. Consequently, we can assume that both groups received the same information, by the same stimuli, but in different orders.

During the second session, the physical prototype of the lamp was shown to participants (one per time), and then participants were asked to answer to the Attrackdiff 2 questionnaire (Hassenzahl, 2004), by using a 1-7 Likert scale, in order to measure their UX respect to hedonic quality (HQ) and pragmatic quality (PQ).

3.4 Results and discussion

For each user, the perceived PQ and HQ, as well as the overall UX, was determined as the mean of judgments expressed by answering respectively to the PQ and HQ metrics, and to the whole questionnaire. One-way analysis of variance (ANOVA) was used to examine whether the order of advertisement stimuli significantly and directly influenced the overall UX. The results showed that the average scores of the overall UX are significantly different between the two groups, $F(1, 40) = 61.32$, $p = 0.000$. This demonstrates that the overall UX is strongly affected by the journey the customer experiences to be aware of the product. The mean scores were 5.45 for group A (brochure and video) and 4.99 for group B (video and brochure).

A One-way ANOVA was used to examine whether the order of advertisement stimuli influenced the perceived HQ. The results showed that perceived HQ is significantly different between the two groups, $F(1, 40) = 106.82$, $p = 0.000$. Mean scores were 5.65 for group A (brochure and video) and 4.84 for group B. The judgments provided by group B are significantly lower than those of group A.

This could depend by the fact that users better remembered the information provided by the video that is able to give an emotionally charged picture of product than the brochure is. At the same time the video seems to transmit those values meeting the user expectations when the product is shown. This may mean that the stimuli provided by the video are consistent to the product features.

Finally, a One-way ANOVA was used to examine whether the order of advertisement stimuli influenced the perceived PQ. The results show that the perceived PQ is significantly different between the two groups, $F(1, 40) = 8.42$, $p = 0.006$. Although differences between the two groups are minimal (mean scores were 5.05 for group A and 5.28 for group B), this result confirms the finding of Chen-Yu and Kincade (2001), i.e. the product image generates an expectation affecting the perceived product performance.

As a consequence, this experiment gives evidence to the fact that the UX is affected by the mode, channel, type and order the user encounters the product and interact with the company. Moreover, it is possible to state that to maximize the UX is therefore necessary:

- To ensure that provided stimuli are consistent to the product features.
- To ensure that specific clues are provided in specific episodes of the customer journey.

4 A NEW HOLISTIC CUSTOMER-CENTERED DESIGN PERSPECTIVE

The proposed design approach aims at supporting:

- The definition of requirements of every product, service or clue in a comprehensively way, so to embrace the holistic nature of CX, considering the needs of customers and all other stakeholders, detected in every touchpoint along the customer journey;
- The management of CX development in an integral way, to ensure that the adopted design solutions in every touchpoint are consistent each other and able to highlight product peculiarities in every context of interaction.

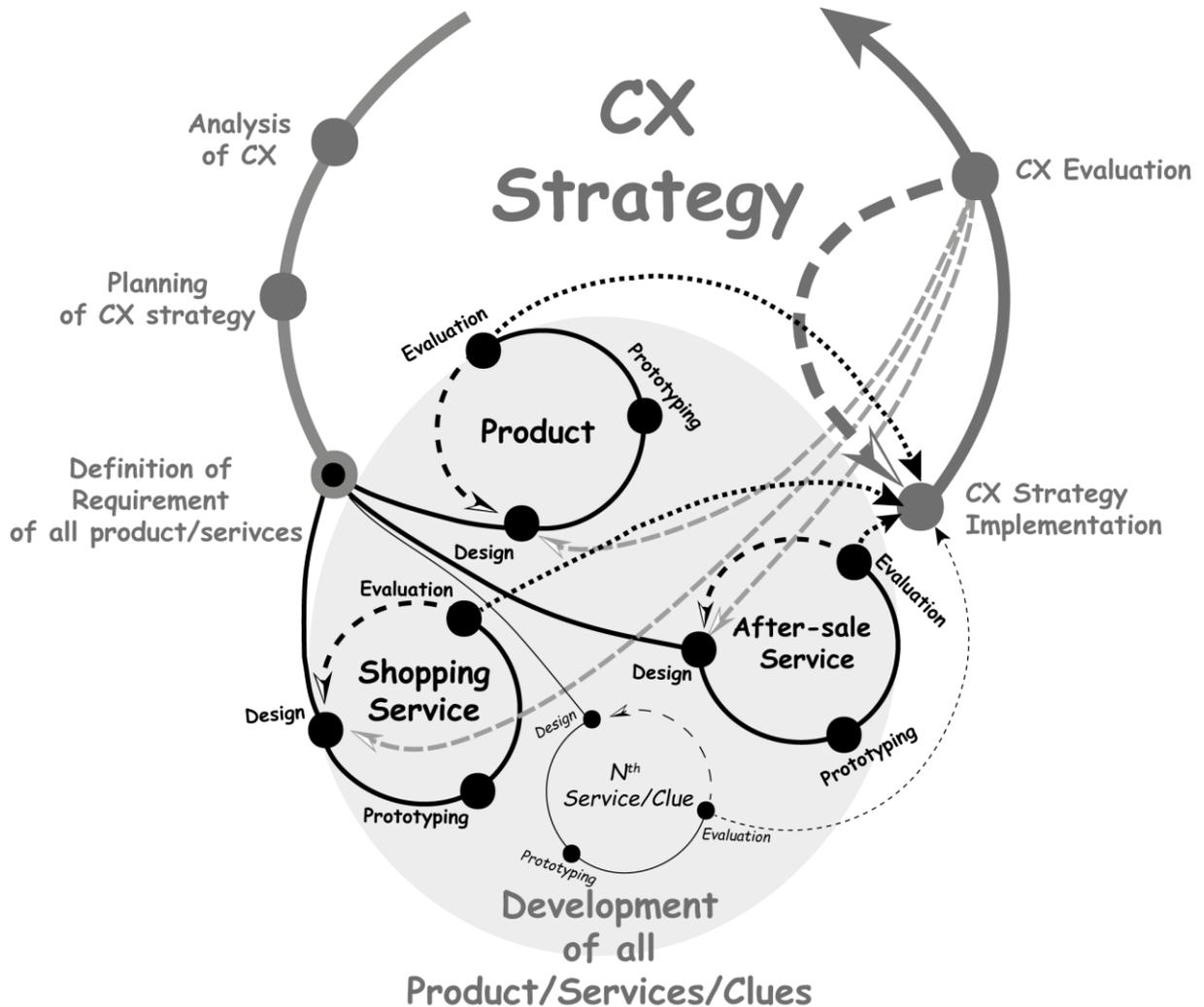


Figure 5. The proposed Customer-centred approach

It is based on a customer-centred iterative process, characterized by six main activities:

1. **Analysis of CX:** it implies the observation of behaviours of customer to understand needs, goals and expectations influencing the customer actions. Moreover, it requires the analysis of each stakeholder's behaviour to understand their influence on CX. The results of the analysis can be represented through the construction of the customer journey map. Customer journey map should describe all the interactions between the customer and the company: from the customer awareness about the need of product, passing through the buying process and the use stage, till the product disposal or renovation.
2. **Planning of a strategy to improve CX:** definition of all strategical actions (i.e., designing of a new product, introduction of new CS, improvement of product and/or CS, introduction of specific clues) that the company must implement to maximize CX in every touchpoint.
3. **Definition of Requirements** of every element characterizing the company's offering.
4. **Development of all intended products, services and clues:** every element characterized the company's offering (e.g., products, shopping services, after-sale services, etc.) have to be design

through a traditional user-centred design process.

5. **Implementation of the prototypal CX strategy:** introduction of prototypes of all products, services and clues (i.e., the outputs of UCD process carried out in the previous step) along the customer journey in order to test the achieved CX performance.
6. **Testing and evaluation of resulted CX:** to define possible improvements such as varying the order of the stimuli, proposing design guidelines to make the product and services more pleasant or the journey more attractive, etc.

The proposed approach is schematically described in Figure 5. The customer-centred iterative process is represented in grey, while the traditional user-centred design processes of all company products and services are in black.

“Definition of requirements” represents a key activity of the overall approach as it influences most of the subsequent choices about the product/service/clue design. A method to set requirements in an integrated and comprehensive way is here proposed. It is based on Quality Functional Deployment approach (QFD) (Cohen, 1995). The adopted waterfall relationship of QFD matrices for CX strategy implementation is schematically represented in Figure 6.

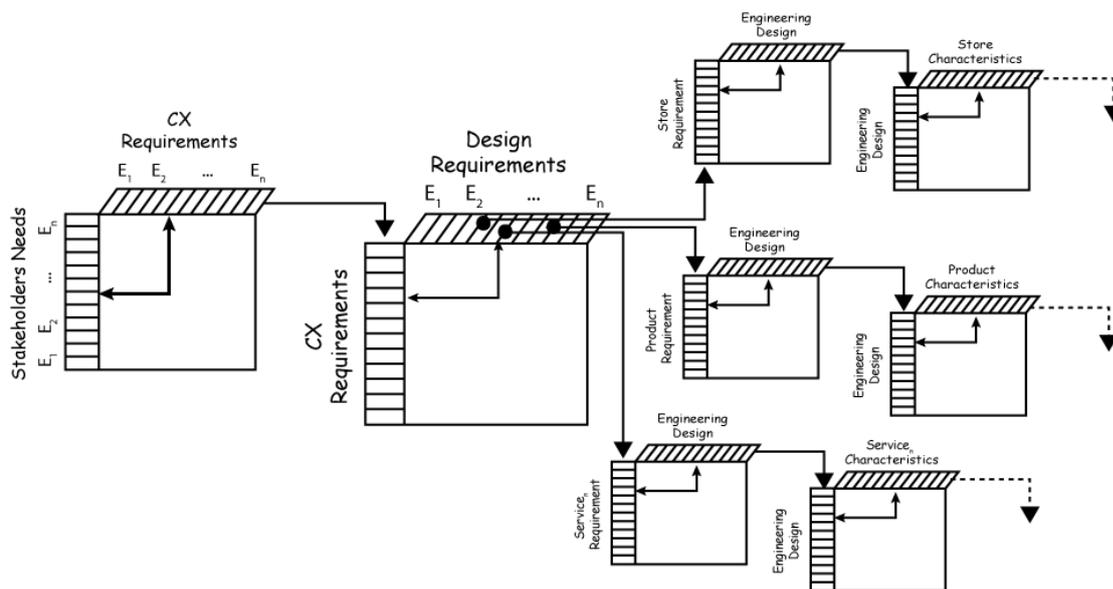


Figure 6. Waterfall relationship of QFD matrices to support CX design

It starts with the definition of CX requirements (WHATs) through the construction of a first relationship matrix, which allow to analyse the interrelationship between all stakeholders' needs in every episode of the customer journey and to estimate their relative importance in achieving the CX strategy objectives. In general, stakeholders' needs may have inner dependence among them, so that some of them will support each other whereas others will adversely affect the achievement of others. These supporting and conflicting needs can be identified by a correlation matrix emphasizing necessary trade-offs (Karsak et al., 2003).

Once defined CX requirements, a second relationship matrix is constructed to support the analysis of relationship between CX requirements and Design Requirements related to every products and services characterized the company's offering, and estimate their relative importance in every episode of the customer journey. Because a desirable change in one product/service may result in a negative effect on another service, a correlation matrix may facilitate the understanding and management of those impacts. Additional design metrics such as cost, extendibility, manufacturability, etc. can also be incorporated into the analysis at this step (Shillito, 1994). These metrics help in determining priorities and directions for improvement, as well as providing an objective means of assuring that requirements have been met. In this way, Design Requirements of all company's products and services are defined in a comprehensive way.

At this point, it is possible to define the for all product/service the Engineering Design components and characteristics and proceed in this way to their project and implementation.

5 CONCLUSION

The present research investigates the effects of the stimuli encountered by the customer along his/her journey in determining product image and the role played by the product image in determining UX. Investigations through a preliminary experiment allows to set the basis for a challenging approach to design a product/service according to a consistent and integral Customer Experience perspective. The experiment, carried out in the context of lighting products, reveal that UX is strongly affected by the channel of interaction and the order in which customers experience the stimuli. All these results emphasize the importance of considering the whole Customer Experience in traditional UCD by considering the interplay between CX and UX in determining the perceived product quality.

The proposed approach shifts the design perspective from traditional UCD to a holistic customer-centred point of view. QDF offers a tool for the coherent definition of product/service/clue requirements and the management of all choices along the whole product lifecycle process.

Future research should aim to verify the effectiveness and reliability of this new approach, by comparing its performance with UCD in several industrial cases. Approach applicability implies the development of novel prototyping methods and tools to ensure CX strategy simulation and subsequent evaluation at the end of product and services conceptual stages. This opens further research lines.

The implementation of the proposed approach within a company is a very challenging task as it requires the involvement of all departments and the introduction of a coordinator able to apply a waterfall CX approach.

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