Customer Need-based Product Positioning for Disruptive Innovations

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Abstract: Developing disruptive innovations is still a daunting tasks for established companies. They are unmatched in creating sustaining innovations, but when it comes to highly innovative products, the success score of most corporates still lacks market-changing innovations. Incumbents' New Product Development (NPD) failure rates of ~40% most of all indicate an insufficient product-market-fit. Studies on disruptive innovations show that disruption is a continuous process that starts with introducing products in niche markets – defined as customers with a similar set of needs – from where they gain market share step-by-step. The problem is that popular market segmentation approaches are not suitable to group customers with a similar need-set and, hence, make it difficult if not impossible to define products with a great product-market-fit. In this paper, the authors present a decision model for a need-based product positioning approach. For this, an integrative framework is presented that connects the three object layers customer needs, market segments and product positioning in a holistic manner. The decision model will help companies to align product attribute positioning and customer needs more systematically in context of disruptive innovations – a starting point to increase new product success.

1 INTRODUCTION

Across industries many companies are confronted with a commoditization of their product base and a growing dynamic in their established markets – most often resulting in incumbents loosing market shares to new entrants (Christensen, 2015). As a result, companies increasingly try to avoid growing competition by either targeting new customer groups in existing markets or opening up entirely new markets (Kim and Mauborgne, 2016; King and Tucci, 2002). Long-term successful companies such as Procter&Gamble or Microsoft continuously open new markets before competitors do – even if it means cannibalizing current assets in order to profit from future business (Tellis, 2006). If new competitors with new products change an existing market structure permanently at the expense of established companies, this is called disruption (Yu and Hang, 2010; Sood and Tellis, 2011; Christensen et al, 2015). Companies across industries are striving to secure and expand their competitive position by introducing new products with a disruptive character on their own before new or existing competitors do (Hang, Garnsey, and Ruan, 2015; Yu and Hang, 2011;

Schmidt and Druehl, 2008). Yet, the task of introducing new products to new, normally small niche markets is most often not very successful (Yu and Hang, 2010): depending on the industry, the new product failure rate varies between 35-49% (Castellion and Markham, 2013). As a consequence, companies are hesitant to allocate resources for radically new, potentially disruptive projects and, instead focus on topics with a higher success rate – mostly being incremental innovations (Reinhardt and Gurtner, 2011).

The high NPD failure rate is somewhat surprising considering that incumbents' products are often technologically superior and, yet, only manage to acquire low market acceptance (Chiesa and Frattini, 2014; Talke and Snelders, 2013). With regard to CHRISTENSEN, one of the key reasons for this high failure rate is that companies are often following a one-size-fits-all approach, resulting in products that are not entirely fulfilling customers' actual needs (Christensen et al, 2007).The reason for this is that the customer needs within defined market segments often highly vary, making the definition of product features that resonate with the customers' needs very difficult. While established market segmentation

methods create segments, which are homogeneous regarding the underlying demographic, regional or behavioral segmentation criteria, the actual needs of the customers within those segments can hugely differ. (Ulwick and Osterwalder, 2016) Hence, defining products with a good product-market-fit for these segments is very difficult.

Addressing this issue, the paper aims for developing a customer needs-based product positioning approach. For this, an integrative framework is created that connects the three object layers customer needs, market segments and product positioning in a holistic manner. By describing customers based on their needs using mathematical vector models, similarity-identifying algorithms can be applied in order to create homogeneous need clusters. As these clusters are not yet targetable by standard marketing instruments, a cross-tabulation of these clusters with standard segmentation criteria ensures that these customers can be addressed with suitable marketing tools. Last, a decision model for positioning product attributes relatively to a market segments' need profile is presented.

Chapter I discusses the general necessity of laying the groundwork of developing a method to create similarity-based customer clusters in order to derive homogeneous market segments and respective product value propositions. Then, the theoretical background of customer needs, market segmentation and product positioning is outlined in chapter II. Subsequently, chapter III summarizes deficits of the current state of research considering product positioning approaches. Based on the previous chapters, in Chapter IV a method for a need-based product positioning is presented. The conclusion and explanation of future research demand in chapter V complete the paper.

2 THEORETICAL BACKGROUND

In the following, a short explanation and definition of some key elements within this paper are provided for an easier understanding of the methodology presented in chapter IV.

2.1 Customer Needs

Across disciplines such as product development, psychology, business administration or economics there is no universal definition to describe what users want. POHLMEYER states that terms such as attributes, wants, values, jobs, requirements, wishes, needs, demands, characteristics or wants are used interchangeably in literature. (Pohlmeyer). However, what can be differentiated is in how far these terms are of generic nature versus directed to specific objects. KOTLER defines needs as basic human requirements such as needs for food, air or safety . Needs turn into wants when they are directed to specific products such as – for the example food – a cheeseburger or a cake. (Kotler and Keller, 2012) Since the customer clustering serves as starting point for the definition of disruptive products that so far are non-existing, a non-product specific definition is more suitable. Thus, in the following the term customer needs shall generally describe "opportunities to deliver a benefit to a customer". Following ULWICK these needs can be of functional or emotional nature, addressing either psychological or social needs (e.g. feeling appreciated) versus more practical ones (e.g. cleaning the apartment) (Ulwick and Osterwalder, 2016) Generic needs such as need for comfort or safety are referred to as basic needs in the following. In contrast, product attributes are physical or digital solutions in order to address those needs (Pohlmeyer).
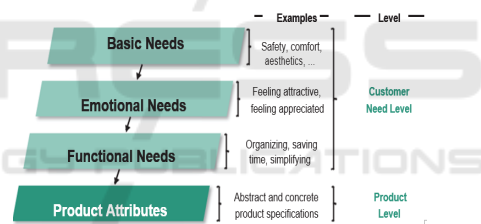

Figure 1: Types of customer needs and product attributes

2.2 Market Segmentation

There are varying definitions on how markets can be defined, i.e. definitions that concentrate on the goods that are traded – product- and industry markets – or definitions separating between real and virtual markets (Froböse and Thurm, 2016; Kotler et al, 2011). From a marketers' perspective 'the providers of goods and services form an industry and the (prospective) buyers represent the market' (Kotler et al, 2011). This customer-centric market understanding is also referred to as sales market (Froböse and Thurm, 2016) and shall apply for this paper as it puts the customer and his needs in focus. In the context of disruptive innovations, in general one specific market niche is addressed with a specific product strategy (Yu and Hang, 2010). Market niches are also called segments. A market segment consists of a group of customers that share similar

characteristics (Kotler and Keller, 2012). Segments are defined based on different segmentation criteria. Most often, criteria for segmentation are – among others – demographic, geographic or socioeconomic. By describing segments with these criteria they become targetable with different marketing mix instruments (Aumayr, 2016; Meffert et al, 2019). ULWICK criticizes the former mentioned criteria, stating that customer needs might be identical across several of those segments (Ulwick and Osterwalder, 2016). This criticism also motivates the overall objective of this paper which is grouping customers based on their needs to form more homogeneous groups.

2.3 Product Positioning

Product Positioning describes the position of a product within the perception space of a customer (Meffert et al, 2019; Herrmann and Huber, 2013). The perception space is defined as the key performance criteria (needs) that are relevant for the customers when evaluating a product (Bruhn, 2016). Positioning a product is conducted in comparison to competitor products and is successful if – from the customers perspective – the products' perceived value is superior to that of the competitor products (Aumayr, 2016). Hence, the product positioning is the core activity when it comes to creating a great product-market-fit.

3 RELATED WORK

Section III analyzes different product positioning approaches. For their evaluation, the subsequent criteria– derived in previous research papers of the authors (Schuh et a, 2018; Schuh et al, 2018) – are taken into account: integrative consideration of customer needs, market segments and product positioning; product positioning on a product attribute level; consideration of disruptive innovation characteristics.

There are existing approaches that analyze customer requirements, benefits or wants in order to derive homogeneous customer segments (Tsai et al, 2015; Machauer and Morgner, 2001; Du, Jiao, and Tseng, 2003). Also, there are various methods focusing on matching customer requirements with suitable product positioning strategies on a brand level (Gursoy et al, 2005; Arora, 2006; Ibrahim and Gill, 2005). Last, some authors derive product designs on a product attribute and functional level based on their requirements (McAdams et al, 1999;

Yang and Yang, 2011; Borgianni et al, 2012). Yet, none of the above-mentioned approaches holistically considers and integrates the need-, segment- and product positioning-level.

Some authors describe product strategies that focus on differentiating their value proposition from competitor products (Kim and Mauborgne, 2016; Yang and Yang, 2011; Borgianni et al, 2012). Yet, the strategies in order to position these products are not defined in context of the specific characteristics of disruptive innovations. Focusing on the latter, different authors define characteristics of disruptive innovations that support market diffusion and customer adoption (Slater and Mohr, 2006; Kassicieh et al, 2002; Rueda et al, 2008; Sandberg 2008). But, these characteristics, e.g. relative advantage, compatibility, low complexity (Rogers, 2003), are very generic and not suitable to successfully position a product relative to competitor products.

In total, the existing approaches do not fulfill the criteria for a need-based product positioning method for disruptive products. Either, there is no consistent approach that step-by-step derives market segments based on customer needs which again could be used to specifically position products. Or, the existing product positioning strategies are formulated on a brand level and, thus, are too generic. Last, the few methods, which allow product positioning on a product attribute level, do not consider the specifics of disruptive innovations.

4 METHODOLOGY

In order to explain the developed methodology, this chapter is structured as follows: First, the underlying framework consisting of the three layers customer needs, customer segments and product positioning is explained. Afterwards, an approach to describe customers based on their needs is introduced. Using this description model, a way to define customer need clusters based on a clustering algorithm is presented. The fourth parts deals with transforming the customer need clusters into addressable market segments. Last, it is shown how product attributes can be derived based on the identified customer needs considering requirements of disruptive innovations.

4.1 Methodological Framework

The framework is derived from KOTLER'S generic market segmentation approach and is built upon the three elements customer needs, market segments and segment positioning (Kotler and Keller, 2012). The

first level of the framework describes customers based on their needs to solve a specific consumption problem, laying the fundamentals to create a successful product-market-fit. In order to be able to address customers with traditional marketing tools, customers have to be targetable. For this, on the second level customer segments are defined based on traditional segmentation criteria. The third level of the framework addresses the product positioning for the defined segments. Here, a product-attribute based approach is chosen in order to match the customer needs with suitable products attributes (Lilien et al, 2017).
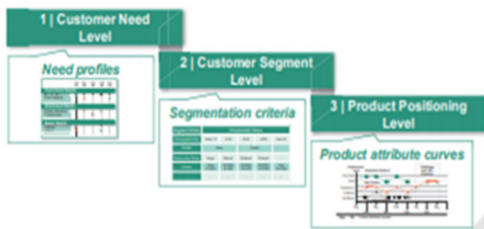

Figure 2: Framework of the Methodology.

4.2 Description of the Framework Levels

In this section the three layers of the framework are described in detail starting with the customer need level.

As described in chapter II, relevant types of customer needs are basic needs, emotional needs and functional needs. When it comes to the development of a new, potentially disruptive product these needs are gathered in context of a specific consumption problem, e.g. using an electric scooter for urban transport. As shown in (Schuh et al, 2018) and (Sood and Tellis, 2011), disruptive innovations either offer completely new performance dimensions for non-addressed needs or radically simplified solutions for too complicated products. Hence, needs have to evaluated in regards to a) the customers' level of satisfaction by existing solutions and b) the general relevance of the need for the customer. A widespread tool for need the evaluation is the Likert Scale which allows the transformation of qualitative information into quantitative data (Meffert et al, 2019). In Figure 3 the customer needs are positioned in a two-dimensional diagram – hereinafter referred to as 'Customer Need Portfolio' – against the aforementioned criteria 'relevance' and 'level of satisfaction'. In order to group customers with similar needs using statistical operations such as clustering methods, a specific customer is described based on its needs using a mathematical vector model. For this, i

indicates the number of the customer and m the number of customer needs as shown in equation (1).

$$c_i = \left(c_{i,1}\ c_{i,2} \ldots c_{i,n} \right) \text{ with } \in \{1; 2; 3; 4; 5\} \quad (1)$$
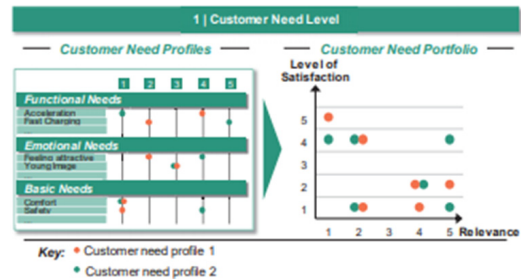

Figure 3: Customer need level described by customer need profiles and the customer need portfolio.

For a successful product strategy, the right group of customers (customer segments) have to be addressed with a suitable offering (product positioning) (Rogers, 2003; Meffert et al, 2019). Customer segments are created based on different geographic, demographic or behavioral segmentation criteria, e.g. city size, age or customer loyalty, as shown in Figure 4. Hereby, the customer groups become 'targetable' by various marketing instruments.

Figure 4: Customer segment level described by segmentation criteria.

The third level of the framework deals with the positioning of the product compared to competitor products. For the visualization of product positioning strategies, different mapping methods such as perceptual or preference maps apply (Meffert et al, 2019; Bruhn, 2016). Since this paper aims for positioning products based on specific product attributes in relation to addressed and non-addressed customer needs, an attribute-based perceptual map is suitable (Lilien, 2017). This map – in the following referred to as 'Product Attribute Curve' (see Figure 5) – lists selected product attributes on the abscissa which are evaluated regarding their 'performance level' on the ordinate.
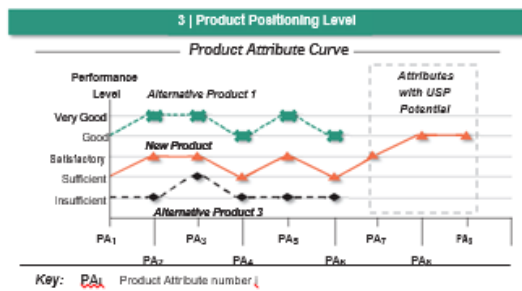
Figure 5: Product positioning level described by a product attribute curve.

4.3 Process of the Need-based Product Positionig

This section explains the overall process of how to derive a potentially disruptive product positioning on an attribute-level based on customer needs.

First, addressing the initial critique that standard market segmentation techniques develop clusters that are very heterogeneous on a customer need level (making it difficult to create a successful product-market-fit), a 3-step approach to create customer clusters based on their needs is presented. The first step describes the identification of customer need similarities. Then, using a clustering algorithm, customers with similar needs are grouped with every iteration until only one cluster is left (step 2). Defining the most suitable number of clusters is the third step. (Backhaus et al, 2016).
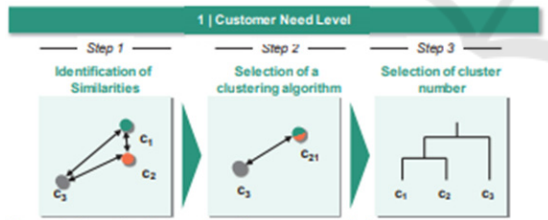

Figure 6: Steps for the creation of customer need clusters.

In statistics, identifying similarities between objects (here: customers) is done using proximity measures that calculate the distance between their defining variables (here: customer needs) (Backhaus et al, 2016). Since the authors described customers using vector models in section B, the distance can be calculated based on the Likert Scale data for every customer need. For practical applications, a widespread proximity measure is the 'Manhattan'-Metric (Backhaus et al, 2016). For an exemplary set of three customer profiles, the Manhattan-Metric is applied (see Figure 6). The results in the so-called 'distance-matrix' show that the shortest distance exists between customer 1 ($c1$) and customer 2 ($c2$), meaning that the similarity between their need profiles is very high.

Clustering algorithms evaluate the distances between objects under a wide set of rules in order to create clusters. Since this process is very complex and task specific, the selection of a suitable clustering algorithm (step 2) as well as well as the evaluation of the appropriate number of clusters (step 3) is out of the scope of this paper. Interested readers are referred to (Kuhn and Johnson, 2016; Kassambara, 2017; Everitt, 2011).
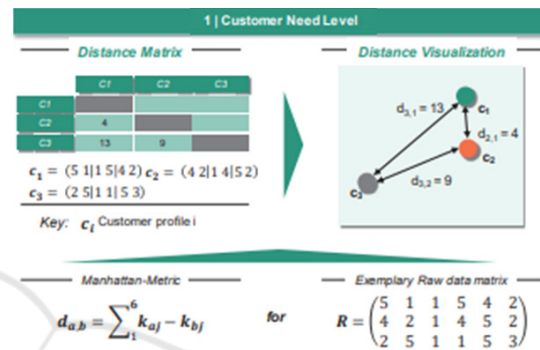

Figure 6: Step 1 of the customer need cluster creation.

The developed customer need clusters from level 1 group similar customer need profiles and, thus, allow the development of products with a good product-market-fit. However, addressing these customer clusters is not yet possible, as this step requires the identification of mutual characteristics within the clusters that make them targetable. For this, segmentation criteria such as geographic, demographic, behavioral or a combination of them apply (Kotler and Keller, 2012) In order to identify identical segmentation criteria between customers within one customer cluster, a cross-tabulation approach is used (Backhaus et al, 2016). As outcome, each previously non-targetable customer need cluster becomes a differentiable market segment with homogeneous needs that can be specifically targeted (see Figure 7).
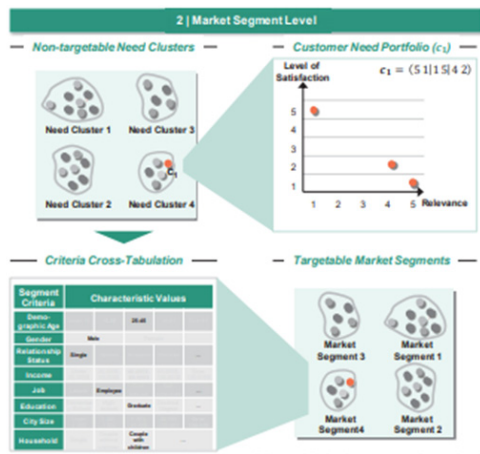
Figure 7: Applying cross-tabulation with established segmentation criteria on need-clusters in order to create targetable market segments.

Each market segment from the second level contains customers with similar need profiles. As explained in section B of this chapter, the corresponding customer need portfolio visualizes the assessment of different customer needs against the criteria 'level of satisfaction' as well as 'relevance'. As explained here (Christensen, 2015; Schuh et al, 2018; Druehl and Schmidt, 2009), disruptive innovations either target non-addressed customer needs (*new-market disruptions*) or those needs that are over-fulfilled by current product solutions (*low-market disruptions*), hereby creating a strong differentiation from competitor products that is part of their success. Hence, there is a close connection between the customer need profile and the corresponding product attribute positioning. Using a new approach that builds on former works of ULRICH (Ulwick and Osterwalder, 2016), five different areas within the customer need portfolio are defined and meant to support the decision-making process considering if and how the respective needs should be addressed, namely: *Irrelevance*, *Over-Fulfillment*, *Under-Fulfillment*, *Non -Fulfillment*, *Fulfillment*. While *removing* product attributes that address irrelevant needs sounds like a trivial advice, many products are over -specified due to ever - growing specification sheets that are not challenged with customers (Schuh et al, 2018). *Simplifying* product attributes for needs that are over -fulfilled by current product solutions is the second measure in order to position products. Differentiation from competitor products is possible for under-fulfilled needs by *optimizing* respective product attributes. Strong potential to *build* USP potential lies within addressing currently non- fulfilled, highly relevant

needs with new product solutions which is mostly enabled through technological breakthroughs (Danneels, 2004). This applies for the initially discussed 'new-market disruptions'. Last, customer needs located in the fifth area – fulfilled needs – have the last potential for differentiation, as they are either completely fulfilled or of low relevance for the customer. Hence, *aligning* product attribute performance to the established level of competitor products is the best choice. The area definition in the customer needs portfolio as well as the derived measures for the product attribute curve are visualized in Figure 8.
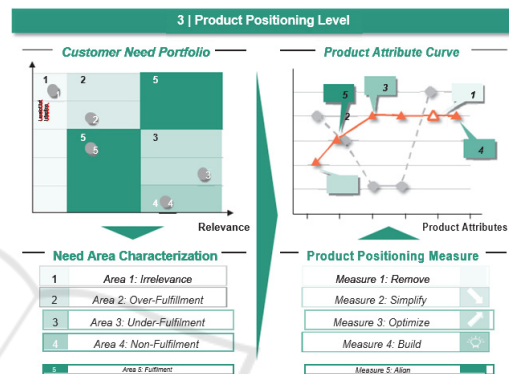

Figure 8: Deriving product attribute positioning measures for selective customer needs based on their level of satisfaction and relevance.

5 CONCLUSION AND FUTURE RESEARCH

Incumbent companies are faced with challenges from new entrants, increasing commoditization and a more and more dynamic market in general. Thus, the ability to constantly innovate and develop new markets becomes a necessity. Yet, studies show that new product development success is still a challenge many companies struggle with. One of the reasons for this is that often market segments are targeted that are homogeneous considering traditional segmentation criteria, but not in regards to the actual needs of the customers within these segments (Ulwick and Osterwalder, 2016).

In a previous paper on disruptive innovations (Schuh et al , 2018) the authors motivate the importance of a deep understanding of customer needs and the necessity of deriving corresponding product attributes that allow a strong differentiation from competitor products. Such a process requires an integrative model that combines customer needs, respective market segments and product positioning.

This paper addressed this question by developing a decision model that integrates all of the above-mentioned layers. For each layer, description models for the definition of (a) customer needs, (b) market segments and (c) product positioning are developed. Then, explanatory models for (i) a needs-based customer clustering using similarity algorithms, (ii) the transformation of customer need clusters into market segments based on cross-tabulation, and (iii) need-based derivation of product attribute positioning is presented.

In the scientific community, the results will foster the further discussion on how to bridge the gap between individual customer needs and innovations with a great product-market fit. Practioners, especially from marketing and product management, can use the results as framework in which they can implement existing tools and herby increase product success.

Yet, there is still more research necessary. For instance, until now, the need area characterization within the customer need portfolio was derived based on a small number of conducted projects and needs a more reliable quantitative grounding. Considering the development of customer need clusters, more research has to be conducted in regards to the selection of appropriate clustering algorithms. Last, the overall success of the models' implementation in order to develop potentially disruptive products has to be validated.

Considering the increasing interest in disruptive innovation research, we do feel confident that the important discipline of positioning disruptive products in relation to customer needs will receive more attention as well. For this, we encourage other researches to build upon the developed model in this paper.

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