

***Segmentation & the Jobs-to-be-done theory:
A Conceptual Approach to Explaining Product Failure***

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Abstract:

Based on Christensen et al.'s research the jobs-to-be-done theory tends to hold that (market) segmentation is a theory (2004, 2003, 2003). The criticism expressed is that companies frequently allocate their market segments close to attributes, which are easy to measure and just observe consumers' behaviour for developing new products. There exists the phenomenon that the vast majority of new products fail within a short period of time after market entry. The jobs-to-be-done theory supports that it is more important to align R&D alongside jobs consumers need to get done, jobs, which facilitate their lives and for which they searched a solution historically. The proposition the jobs-to-be-done theory offers is the identification of such jobs needing solutions, which may lead to the creation of new markets or to the extension of existing ones, which do not provide good enough products.

Scholars and academics put much emphasis on the process of segmentation – targeting – positioning, as an important tool to focus organisational resources and capabilities for the achievement of sustainable positioning in a challenging market environment. Therefore, this specific theory challenges what marketing theory considers as an important strategy for market success.

The proposition is that both approaches established STP and the approach by the jobs-to-be-done theory need to be well considered within strategic organisational decision making, especially for R&D and product strategy. While the traditional STP-strategy seems salient within incremental product novelties, the jobs-to-be-done theory is suggested to offer assistance for more radical product developments.

This way, organisations may find themselves in a dilemma to understand, where a borderline between incremental and more radical developments may be drawn, where it will be advantageous to rely on measuring consumer behaviour by classical market research and data and at which point it will be more promising to follow the propositions of the jobs-to-be-done theory for developing successful new products.

The proposition of this paper is that suggestions established by scholars' for a sound segmentation strategy need to be contrasted with the jobs-to-be-done theory in the understanding that there are market needs for incremental improvements and parallel to these, different markets are expecting more radical solutions to get jobs done, for which existing products are not good enough. The paper's conclusion will result in propositions of framing both these macro markets and contrasting them against each other.

Key Words: Jobs-to-be-done theory, segmentation, STP-strategy, new product development

Introduction

Market segmentation is generally accepted as one of the most fundamental and most important concepts in marketing (Kalafatis et al. 1997, Danneels. 1996, Wind. 1978). Therefore academic education and corporate practice put much emphasis on segmentation as part of the STP-strategy, segmentation – targeting – positioning. This strategy may be counted as one of the core elements for defining adequate corporate product strategies as it is considered to provide guidance for what an organisation's customer segments are expecting. With reference to this importance the assumption should be that sufficient data about markets and customer expectations could be collected to assure that new products will meet the necessary demand to make them economically successful and profitable. However reality tells a different story providing sufficient evidence that most of new products fail rather immediately after their introduction, while another high portion is withdrawn within their first

twelve months on markets since not finding enough market acceptance. Possible conclusions could either be that companies do not translate the data collected correctly or that the practice of segmentation may be inadequate.

We adopt the conception that new product development is related to innovation, since the release of new products to markets involves a degree of novelty. Such novelty varies by extent, impact and degree of innovation. Further such innovation can follow two paths, technology and market linkages, either separated or at the same time (Abernathy et al. 1984). Some new product releases are just a re-design of previous versions of the same product, others are constant improvements, while a third category may reach the degree of radical innovation, which could create a new market. It is suggested that in such categorisation, there are subdividing interstages, since not all new products can be clearly assigned to a single category. A critical apprehension of those approaches is expressed, when companies call those products innovative, which represent promotions. Offering the same product in a sales form with 10% more content is no innovation per se. This sales-oriented offer does not involve new technological developments, does not address new market segments and does not constitute innovative business models.

Considering the immense budgets, which R&D absorbs annually, organisations are expected to undertake effective prior efforts to assure that the outcome, the ROI, will be positive. Stevens et al. draw a critical picture of realities in that only one out of four products entering development will go to market, or that 3,000 raw ideas result in just one successful product (1997). This suggests that new products face two obstacles. Firstly, the idea must be adopted by an organisation internally before it becomes a project of R&D and secondly, when being ready to market, the product needs to convince the target groups, i.e., it needs fit with an organisation's existing segments or demands targeting new segments. In an appropriate market research-based process, this should be an interconnected consequence. When an idea is born and seems reasonable, then collected market data should justify that the development and investments involved will result in a product, which markets will adopt. With regard to the basic categorisation above this may count for product improvements, but is – as research has proven – rather guessing for more radical products, which are addressing new markets. Christensen's studies in the hard disk drives, e.g., showed that market research, forecast v actual sales, failed up to 550% for developments addressing new markets, since no market existed and therefore established market research designs were unable to provide reliable and valid data (2003). In the process of product evolution there is the example of Blu-ray DVDs, which were designed as improvements of the existing DVD. Only a short period of time after inauguration sales and prices came under much pressure, the superior product Blu-ray, the improvement of the DVD, could not attract sufficient customers, despite addressing the same market segments (Reisinger. 2008, Futuresource Consulting. 2009).

The history of new products is full of examples of failures counting for incremental product improvements or radical innovative products. Therefore organisational uncertainty is rather high and challenges established processes from marketing to R&D:

How can firms improve the acceptance rate of new products?

Can organisations rely on customer segments' behaviour and data to reduce the risk of failure?

Which products, which product features are necessary for new products to find sufficient market acceptance to become profitable?

To find answers to these questions, Christensen et al.'s research introduced the jobs-to-be-done theory, which tends to hold that traditional approaches fail, since they do not sufficiently

respect those jobs facilitating customers' lives (2004). In short, Christensen et al. consider the classical data collection for creating segments as (somehow) misleading. Taking this into consideration, then a dilemma becomes obvious. Incremental novelty relies on existing products, which offers some improvements. But in the framework of the jobs-to-be-done-theory, such innovation based alongside too obvious data frequently fails as it does not "facilitate" consumers' lives. Not all such product improvements fail and not all existing segments based on obvious data and the ways they are created support that only life-facilitating products can be successful. But as discussed in the following chapters, there is evidence supporting this theory.

The plethora of internal and external influences, especially the concepts of turbulent markets and permanent change, require more specific and different strategies to the existing ones and some scepticism is expressed that present criteria applied in a segmentation process can overcome the turbulences overcrowded and hyper-competitive markets cause. It is suggested that organisations wishing to reduce uncertainty may find advantages by changing their process of segmentation and by reflecting on new product developments alongside their identified market segments only. In this environment a conceptual approach may have some benefits, which uses Abernathy et al.'s transience map being extended by a third dimension of an organisation's (internal) innovation capabilities based on their resources and capabilities [R&Cs] (1984). Supported by Vandermerwe's Client Activity Cycle (CAC) this framework initialises opportunities for the different degrees of product innovation (Matzen et al. 2006, cited in Kotler et al. 2002). Such framework may assist to reduce the failure rate of new products as coming closer to what marketing signifies as "what customers really want" and thus enables organisations to create a more sustainable competitive advantage.

Established Customer Segmentation*

Definitions of marketing segmentation are abundant but one of the first can be attributed to Smith (1956). According to Smith market segmentation involves viewing a heterogeneous market as a number of smaller homogeneous markets, in response to differing preferences, attributable to the desires of consumers for more precise satisfaction of their varying wants (1956). Marketing literature since Smith's definition has continued to discuss the concept with much emphasis put on the process of segmentation as an important tool to focus organisational resources (1956). An effective focus of these resources should in turn help in the establishing of a sustainable position in the chosen market.

Market segmentation may also lead to competitive advantage (Conant et al. 1990, McKee et al. 1989, Piercy et al. 1994, Snow et al. 1980, Vorhies et al. 1999). The process of market segmentation has other advantages in that it achieves a better understanding of customer needs and decision criteria can be achieved (Wind et al. 1972). Organisations using this enhanced customer knowledge will be able to match the requirements of the customer with firm's offerings (McDonald et al. 1995).

This paper is aiming to comment on, and propose a different approach to what is an established strategic process for many organisations. There is a plethora of literature on the process of segmentation however in order to be able to discuss a different approach there is a need to highlight the traditional methods and process of segmentation.

Each organisation works in at least one market with many, in this era of conglomerate companies, operating in many markets at the same time. The first step an organisation might take to segment the market is to identify any natural segments. This approach was adopted by both Volkswagen and Toyota in the 1960's, where they identified segments concerned with

car size and economy (Wilson et al. 2005). This market potential had been missed by previous companies in the past. Whether companies are fortunate enough to ‘stumble’ across these natural segments is perhaps a basis for further research but it is very likely that organisations will have to ‘grind’ out their own segments.

Wind commented that “over the years almost all variables have been used as a basis for market segmentation” (1978). Segmenting the market into the most appropriate segments is for some managers a challenge, as there does not seem to be a scientific approach available. Managers might have to rely on previous approaches adopted by other practitioners and documented by academics. One such approach might be to use a needs-based market segmentation approach proposed by Best (2000). Customer needs are the basic criteria for segmenting a market. Customers who have needs, which are homogeneous, are likely to respond to a particular marketing strategy (Doyle. 2002). The manager will use market research to investigate the needs of the customers in the market. The results will then be used to analyse the different needs. The different needs will be linked to consumer characteristics [Input-Throughput-Output Strategy (ITO)] (Doyle. 2002).

The well-known four major categories of consumer characteristics as discussed by Doyle will be grouped into (2002)

- Geographic
- Demographic
- Psychographic
- Behavioural

There may be differences within the characteristics to reflect the detail of information available to the marketer. Taking the underlying variables as what seems to be an accepted means of segmentation Wind goes on to make the observation that rarely only one of the variables will be used. There are often multivariates (1978).

The variables discussed so far are usually seen in consumer segmentation. Segmenting the organisational or business market might also use other variables in addition to the consumer variables. Bonoma et al. suggest segmenting the organisational market using the following variables (1983)

- Demographic
- Operating variables
- Purchasing approaches
- Situational Factors
- Personal Characteristics

The comment by Wind whereby multivariates would be used is also applicable to business market segmentation (1978).

The suggestion is that this literature presents a more or less acknowledged fundament, which organisations and their managers are likely to be familiar with. The underlying criteria consists of data, which organisational market research or studies by market research institutes collect, process and disseminate to clients (ITO) helping them to understand, how segmentation can be meaningful. There is nothing wrong in such processes, but as we argue, these factors in use to create customer segments are requiring a market environment needing at least some stability. Brown challenged the rather stereotype applied fundamentals of segmentation in the Harvard Business Review stating that “[t]he truth is, customers don’t know what they want. They never will” and adopts a rather provocative position in

recommending that organisations should not research customer needs (cited in Baker. 2007:353).

To Brown adds Lipovetsky's suggestion that the hypermodern society, highly influenced by "technologisation", gives rise to a new consumer profile being erratic, nomadic, volatile, unpredictable, fragmented and unregulated (2009). Rémy contributes that consumption has become an expression of social links and the desire of links, i.e., "regrouping of individuals by heterogeneous characteristics, but interlinked by a common experience, a shared emotion, the same passion" (2009). It is proposed that this indicates a shift of consumer behaviour, which cannot be ignored and challenges traditional segmentation theory and its attributes emphatically. It forms a dilemma for both research institutes and corporate marketers. The known major categories for segmentation may not be sufficient anymore. I.e. the data collected may be correct, but increasingly less applicable, since consumers of different categories, e.g., social class, may be united in one tribe, which was different in the previous decades. This permeability and volatility cannot be sufficiently caught in these segmentation categories. Further, we argue that for fragmenting markets, subject to increasing individuality, those classic factors of segmentation are not adequate anymore, since too inexact and ineffective by insufficient refinement to (post)modern trends and evolutions.

The Jobs-to-be-done Theory

Christensen et al.'s research about innovation and its implication for organisations have brought forward a number of theories (2004). The discussion whether failure of new products may be explained by wrong segmentation brings the jobs-to-be-done theory into focus. Christensen et al. tend to hold that companies' mistake is the concentration on the obvious instead of researching which products have the ability to facilitate consumers' lives (2004).

The theory contrasts and challenges the ways organisations are researching and creating their segments. It tends to hold that when a consumer buys a product, he/she wants the product to do a job, which, as Christensen et al.'s research found out, is remarkably stable in the way what people are looking for. At the same time it is argued that segmentation is a theory, when enterprises think that they can introduce successfully new products serving the customers' expectations being based on too obvious criteria, which are rather easy to measure. The factors product features, demography and so on being used for traditional segmentation are misleading and may not result in successful new products. Additionally, the jobs-to-be-done theory argues that organisations may risk disconnecting with their clients by new product offers, which are based on the classical segmentation. The theory suggests that new products will be successful when they facilitate consumers' lives and do a job for which a solution has been searched after for a long time. Understanding these jobs (to be done) may offer corporations a more successful way of new product development. Applying the traditional segmentation features instead may risk to be focused too much on features and applications, which existing allocation of segments may not consider as important enough to attract them.

Christensen et al. support their findings by examples, like, e.g. Black & Decker. The argument is that before cheap DIY tools became available, consumers either had to hire a craftsman or invest in a rather expensive professional machine. Inconvenience of getting the job done or high investment created the path of success since Black & Decker's offerings allowed a quick and cheap solution. The reduced quality of the motor of a Black & Decker tool made no difference, simply as the quantity of holes to be drilled by a DIY worker is relatively low and the Black & Decker tool is therefore usually good enough. Another case can be found in the Home Entertainment Industry. The music industry refined segmentation in the last decade of the 20th century to an extent, which allowed a clear prediction of sales

figures of new releases (Kusek et al. 2006). This argues for a good segmentation, which provides an example for the movie industry and their dominant design of media, too. Here, are two occurrences of importance. First the new technology of the DVD made the VHS cassette obsolete. Two criteria are suggested as being important. For content owners, like Hollywood studios, the facilitation was that various languages could be united on one DVD and the medium was smaller (to store), manufactured in a quicker and more reliable process. The sum of these attributes resulted in lower cost. Consumers were attracted by the fact that DVDs provided better quality and unlike VHS cassettes did not lose quality each time of viewing giving DVD an overall superior performance (analogue v digital technology). Further the new DVD players play all other formats of optical discs, too, and the storage room of DVDs is much less, than that of VHS cassettes requiring a different player as well. The recent evolutionary step was the development of high-definition discs, which resulted in the surviving format of Blu-ray discs. Despite substantial investment in their development, a yearlong battle for this format against the competing HD DVD format and many marketing efforts it took only a little while until insiders of the industry raised scepticism about the success of this format as a mass or dominant design against the regular DVD. The Blu-ray market success since its inauguration supports this scepticism. The difference is that DVD does a job for consumers, same quality each time of viewing and better quality overall, single player for all discs, but Blu-ray does not make viewing or handling easier. For most DVD consumers the simple DVD is good enough and the new Blu-ray technology requires higher investment in further, additional hardware and the discs are still more expensive. Blu-ray does not do a job, which was not done by DVDs before and it does not facilitate consumers' lives.

Remaining in this industry leads to the music industry again. While Blu-ray fights against DVD, CD competes against the increasing number of downloads. The argument is that the online and dematerialised product represented by downloads facilitates consumers' lives: Immediate and easy access and consumption, unlimited availability, a format to be played on many devices. Convergent technologies, like USB sticks, memory cards or mobile phones facilitate consumption, too, since being versatile, very small and different players can be used, storing thousands of songs against carrying a comparably big player and a good number of CDs for the same amount of content. A USB stick is small and offers huge capacity. A CD-R instead has 12.5 cm of diameter and needs an extra specific player. Content has to be burnt and is either fixed or in the case of a CD-RW exchangeable, but demands significant more effort in contrast to the easy process of changing content on a USB stick.

Instead of buying a pre-recorded disc with fixed content, consumers have now a choice of buying exactly and those tracks only being of individual interest. This is a convenience, which does a job not only by improving quality of access and individual consumption, but as well of facilitating exchange and reducing cost, since unwanted tracks are excluded from purchase. Undoubtedly downloads have implications on corporate revenue streams, like copyright infringements or impacts on distribution, but shifting consumer behaviour challenges classical segmentation, which is not limited to specific groups the traditional segmentation considers. Doane's research provides evidence that consumer groups of various age and (social) background engage in the new, radical way of music consumption (2006). The age segments differ considerably in size, but file sharing is permanently growing among all segments (Oestreicher. 2007)

Many other examples, like e.g., the shift to plain paper copiers, to portable laptops or digital photography may find logic explanation by the jobs-to-be-done theory, as each time less convenient processes or applications were successfully replaced by those "facilitating" consumers' lives. Process and/or product innovation, which followed this concept, was able to

expand the market (e.g., from colour photocopier to desktop printer) or could even create new markets, as the historical example of the telephone or later the fax machine shows (Christensen et al. 2004, Utterback. 1996). Christensen et al. argue that designing segmentation alongside visible attributes tends to be inadequate (2004). The logic rationale of the jobs-to-be-done theory is convincing and may help to understand the phenomenon better, why products have succeeded and others failed. Nevertheless I tend to hold that relying on the jobs-to-be-done theory alone would oversimplify organisational planning of new products. But it is considered that the same counts for using the traditional knowledge about segmentation, as consumer behaviour shifts and segments of stability become rarer.

Segmentation based on criteria of age, gender, income, social background, education and so on is challenged by latest trends, which, as it is suggested, cannot be covered by the traditional approach. The adoption of Christensen et al.'s theory contradicts in various ways to the segmentation process of building consumer clusters on the obvious or that experiences with previous or competing versions of a product can be used for many new product entries. A consequent question for organisations should then be, how reliable and valid obvious criteria can be in a world, which is subject to permanent change? Attention is drawn to the development of postmodernism and its explicit behaviour or tribal tendencies against the still rather mechanic collection of market research data, which seems static and not sufficiently flexible to deal with groups being interested in experiential experiences when they consume (Lipovetsky. 2009, Rémy. 2009). Reflecting on new product development as a process of a varying degree of innovation and as a decisive driver of organisational progress demands to consider that customer segments are getting more and more permeable and less stable.

This theory suggests that companies are especially successful, when they identify jobs, which consumers are really interested in getting done and focus their R&D around these unsatisfied needs. This may be understood as a further interpretation of the marketing expression that a company needs to know, what customers *really* want. Christensen et al.'s studies provide evidence that market research in such new areas frequently fails, since no data exists (2004). This results in a specific dilemma. Following traditional segmentation may lead to failure, since the data exists, but consumers may consider existing solutions as good enough, but controversially there may be unsatisfied needs for which not sufficient data can be found to justify investment in the development of such products.

An approach by following the jobs-to-be-done theory and its different segmentation approach may create new markets but involves different risks and cost. A new or adapted market needs to be created, new distribution channels may become necessary and consumers beyond existing segments need to be informed that there may be a solution for a job, which is of real interest to them. This requires different corporate investments, an organisational culture allowing such different market approaches and most importantly a good part of the R&D process needs to be aligned to the detection of jobs consumers want to get done. The proposition is that a good part of organisational planning, development and manufacturing processes is on stake reducing the opportunity of creating efficiencies through routine. But product failure by following the obvious seems not less risky. The process of a different organisational product strategy is supported by Kelly proposing that for today's organisations "all is flux, no harmony" and that corporations should give up the perfectly known and embrace the perfectly unknown for assuring future orientation (1997). Acknowledging that organisations are confronted with the challenge that leaving the perfectly known (stability) means to enter fields of instability (the unknown). Efficiencies are only important and contribute to value creation, if they are subject to effectiveness, i.e. products must meet market expectations first, which may be more hidden than obvious.

Conceptualising the Jobs-to-be-done

Considering the low rate of ideas resulting in new products and a high failure rate argues for a changing segmentation process. A supporting argument is seen in the trend of fragmentising markets or increasing individually coined consumer preferences, which make segments less stable and predictable. Therefore it may be more advantageous to embrace the permanent change and adopt it as part of organisational culture for new product development. An important organisational expression of such thinking may then be to detect those jobs-to-be-done. The task of such identification is rather complex and requires different research methods than those many organisations are used to. Corporations have already started to develop products alongside consumers' desires by inviting them to discuss the features they are interested in. But the proposition is that for various reasons organisations may frequently not be able to disclose new concepts and ideas.

Vandermerwe's Customer Activity Cycle (CAC) may offer solutions to those companies, which prefer to detect and develop customer needs in an environment of discretion (Matzen et al. 2006, cited in Kotler. 2002). The CAC concept is introduced as a tool allowing to identify simplifications for customers' jobs-to-be-done. In principle it breaks all activities down into single steps, which are consequently necessary to get a job done. The importance is on the word all. Brushing teeth does not only mean that a toothbrush and toothpaste are taken and then teeth are brushed. The process of examining all activities may start with the opening of the bath cabinet to fetch brush and paste, then opening the tap, filling a glass of water and so on. The outcome is many different small steps, which need to be done to fulfil the job of tooth brushing. Such activities sum up to a number of many different single and small steps, a new successful product development may concentrate on reducing the mere number of these steps. If such a solution can be found, the likeliness should be rather high that consumers will consider the reduction of time significant. This supports the underlying problem to make sure that consumers contribute sufficient importance to the novelty, which may be related to other attributes as well, like price, comfort or other important improvements, e.g., reducing the frequency of visiting a dentist due to better attended teeth.

Considering the shaving market, companies like Gillette have invented the razor with initially one blade. Follow-up models introduced shavers with a mobile head reducing the danger of being hurt. Further developments increased the number of blades and used better steel to increase the comfort of shaving. Shaving soap was improved or foam came up further improving comfort and offering some reduction of time. The initial improvements were significant to men (less hurt, higher comfort), but the last marginal innovation is not supporting the core problem. Shaving still is an uncomfortable and time-consuming process to be done every day. If a new product can reduce the many necessary steps, hence can reduce shaving time considerably or extend the time until a man has to shave again, then importance and facilitation are involved. By breaking down the big number of single activities in the shaving process using the CAC model may become a guideline for analysing higher important improvements than just adding another blade to present models.

Previously it was referred to the Home Entertainment Industry. As an example, the CAC is applied by a simplified chart contrasting the rather substantial differences for a consumer listening to a CD or a download:

Vandermerve: CAC	
Listening to CD	Listening to Download
Standing up from chair	Opening PC
Going to CD shelf	Switching PC on
Searching for CD	Waiting for programme
Taking CD out of shelf	Opening player
Going to CD player	Opening folder with stored tracks
Switching amplifier on	Searching right track
Switching CD player on	Double click on selected track
Selection of track on inlay card	Listening to track
Pressing button to open sledge of player	
Opening CD case	
Taking CD out of case	
Putting CD case away	
Placing CD on sledge	
Closing sledge	
Selecting track on CD player	
Pushing button to play track	
Going back to chair	
Listening	
Total activities: 18	Total activities: 8

18 activities for listening to a CD compete against 8 for listening to a download. This becomes substantially more disadvantageous for CDs, when the process of purchasing, CD v download, or pre-recorded v individual single track purchase is taken into account or the procedure of saving a track on a recordable disc v, e.g., a USB stick is broken down by time and the lengthy v the quick exchange of content. To this adds the download's full mobility with regard to multiple players forming advantages against the static format of a CD and its rather big player. This may help to explain that the optical disc formats face the threat of becoming obsolete querying further product developments in this field. Consequently transferring the CAC-based model to movies, as emergent download area, may offer explanations, why marginal improvements like Blu-ray are likely to fail to shape their edge on the markets as a mass product. The proposition is, when developing a new product, companies should ask, how they can substantially reduce efforts (steps) to get the job done or the new product should offer decisive advantages for the job to be done attracting customers contribution of

importance to it. Otherwise, it is rather probable that they consider existing versions or competing offers as good enough or they turn to new technologies promising these advantages, even, if they are presently of inferior quality but much easier and/or quicker to handle. If this cannot be achieved, new product failure becomes a probable option.

The structural development for identifying what customers may be interested in, respects now two components starting with the jobs-to-be-done theory (new product development needs to be based upon less obvious data for customer segmentation) to which the Customer Activity Cycle (breaking a job down into its micro-steps and develop solutions, which facilitate the fulfilment of this job) contributes. These two components may provide a different starting point for thinking in terms of addressing customer segmentation and defining STP-strategy for decreasing failure of new products.

Innovation and the Transilience Map

Dosi tends to hold that "fundamental drivers of contemporary economies are the activities of search, discovery and economic exploitation of new products, new production processes and new organizational arrangements within and amongst business firms" (2007:153). This understanding of innovation is suggested relying more on technologies than on market linkages. Abernathy et al. stated that innovation has two impacts, technology and markets (1984). Therefore, Markides' position about innovative business models needs consideration, too, since in a Schumpeterian understanding, the effect on firms increases substantially, from time to time even discontinuously, when both streams combine and especially, when new technologies lead to a significant shift of consumer behaviour (2008, 1950). The consequences on existing and defined customer segments are considered to be vast. The assumption is that the higher the innovative degree in one path becomes, the less reliable and

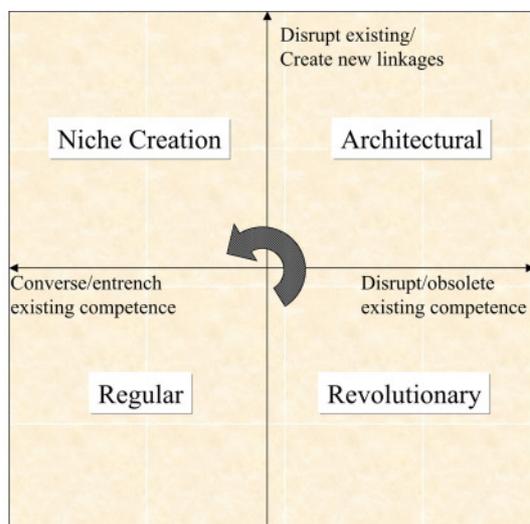
valid existing segmentation data becomes. In those interrelations, when both, technology and market linkages combine by impact, I tend to hold that established market segmentation becomes obsolete.

Trott criticises the simplified image of scientific discoveries and innovations (2008). This (over)simplification and the frequent oblivion of market linkages may mislead organisations and managements. This may count especially for those firms, whose organisational culture does not support the concept of the innovative firm. Innovation is a highly differentiated subject, which knows various degrees, from marginal or incremental up to radical, disruptive or discontinuous form. While marginal or regular innovation, e.g. Gillette, from one to five shaver blades, has beyond sales figures usually little market impact, radical innovation, e.g. the paperless office, may – as Schumpeter states – destroy existing and create new industries/markets (1950). Laptops replaced desktop computers, desktop computers removed mainframe computers (Utterback. 1996). Products can be successful on any step of the ladder of innovation. However, whether the existing customer segmentation of a firm and the traditional ways to base market expectations for products of higher innovative degrees – whether by technology, market linkage (including a new business model), or by the combination of both – on data, which can be easily collected is challenged.

The proposition is that the more radical technology changes with a new product, the more it challenges a corporation’s existing market linkages and the validity of existing customer segments. The lower the degree the more likely it is that new products can be aligned alongside defined customer segments. However, the latter does not necessarily mean a more convenient corporate position. The questions to be answered then are in which phase of the industrial and product lifecycle a new product will be placed and whether consumers in the defined segments pay sufficiently attention to a new product with marginal improvements or consider the old product as good enough for them. This argumentation can be expanded by adding an organisation’s positioning, the importance of a brand and further marketing related factors. There is little doubt that all this plays an important part. Nevertheless, I argue that even new products of established brands and well-positioned companies frequently fail, despite the power of position and brand.

The two extreme poles in the range of innovation are marginal/incremental innovation and radical/disruptive/discontinuous innovation. Abernathy et al.’s research in the automobile industry resulted in their model of the transilience maps (1984, 1983). The notion *transilience* is formed by the words “transformation” and “resilience”. Innovation can be part of one of the

two extremes, but most times it is likely to have a position in between. Therefore the transilience map proposes four different quadrants (Abernathy et al. 1984):



The configuration starts with the architectural sector. Architectural innovation embeds the importance of breaking the grip of the prior industries on the technological structure of the new industry (e.g., from analogue to digital photography). The second attribute is the durability of the concept and the third the role of science. To stay with the example of the Home Entertainment Industry, DVD was at the time of its inauguration an architectural innovation. The

assessment is qualitatively: Science brought new opportunities up to compress pictures so they fit on an optical disc. At the same time a refinement in technology allowed decisive improvements of the existing optical disc, CD. To these count dual layers, smaller bits and narrower rings of information on the disc. Additionally, the laser technology of the player was improved, but the basic concept of the optical disc existed before. Market linkages have not shifted, those having bought VHS cassettes before continued with the new format. However, other new market linkages emerged. The value chain of the digital medium was different to the one of the analogue era. Content owners selected new suppliers in different fields of production and manufacturing. Important for the judgement is that the technological structure of the new industry changed completely. VHS cassette duplicators became obsolete, only a few survived by adopting the new technology early enough, but most went out of business. Finally, the concept of DVD is durable or sustainable, as the DVD has become the dominant design of the sector movies since 1997 so far. Consumer market linkages renewed, adoption took quickly place as the DVD did a much better job for all participants than the prior VHS format or the earlier rather simple CD Video, which failed in nearly all market places. Only hi-end consumers adopted the improved technology, but the assumption is that the CD Video format mainly failed by market linkages. It was extremely expensive (10 times the price of a VHS plus specific player) and uncomfortable to handle.

The second sector is niche creation. Here, an emphasis lies in opening new market opportunities by the use of existing, but improved technology. The core of this quadrant is to conserve and strengthen established designs by using existing technology. By qualitative assessment the proposition is placing the Blu-ray format in this quadrant. Despite the manufacturers' desire to replace the normal DVD, there are a number of constraints, which are likely to contradict these efforts. Firstly, despite refinements of the laser technology and in the manufacturing process, this format may be considered as an attempt to flee upmarket, since virtual products threaten the optical industry (Christensen et al. 2004, Utterback, 1996.) Therefore a good technological refinement can help to conserve and strengthen the established design against a threat. But as Abernathy et al. state, niche creation is not sufficient to establish a long-term competitive advantage, when it can be easily copied (1984). Furthermore, with regard to market linkages, this format can shape an edge in competition, but especially for those, who are interested in higher quality (hi-def) and are therefore prepared to invest in the necessary further hardware.

The conceptual approach explaining product failure and whether a new or extended market can be created leads to reflections in a cause and effect chain. When Blu-ray discs are pushed by the industry to replace the present dominant design of DVD as the dominant design, then it should be asked, where the *real* customer advantage and value is (Utterback. 1996). Blu-ray does not "facilitate" consumers' lives, it does not offer a solution for a job, which consumers historically cared for and the assumptions about the industry's present customer segments may have been wrong. The DVD is simply good enough for most consumers and "does the job". The suggestion is that these factors count for many new failing products. Consequently, prices for discs and players are permanently decreasing. The first signs of a renewed price war are on the horizon. The proposition is: If the Home Entertainment industry used Vandermerwe's CAC and respected Abernathy et al.'s transilience map, then it would have been able to realise that this is not an architectural, but better a niche market product. Different organisational or functional strategies could then be formulated to address more appropriate customer segments. Price battles at an early lifecycle stage could be easier avoided, since manufacturing capacities would be lower and Blu-ray would not try to cannibalise its own sister-product DVD. Rather differentiated customer segments would be targeted, those caring less about price, but enjoy rather luxurious quality and pay a premium

for it and parallel to this the mass market for which DVD is good enough. This way two parallel markets are addressed with the potential of extending the market place. Consequently manufacturing output would result in lower market pressure with higher profits/unit, since business could be made with different (iated) customer segments. The Blu-ray STP-strategy could result in a more appropriate and stable positioning for this format then.

Frequently customers do not consciously notice improvements made in the third quadrant of regular innovation. Nevertheless, Abernathy et al. investigated that it can “have a dramatic cumulative effect” (1984:12). In the centre of this innovation sector is the approach to strengthen and fortify both production competence and market linkages. Regular innovation tends to develop over a longer period of time. Its evolutionary steps can be bigger or smaller. Therefore an organisational culture needs to support even very small steps. Over the time, a firm offers customers more convenience and/or better quality of the technology and services they know and use. This may be the quadrant where a STP-strategy based on established segmentation criteria may provide its best value, since market data may be rather reliable. For the example presented it is suggested that the diversification of optical discs is placed into this quadrant. CD ROM, photo CDs, the family of recordable discs and so on were developed on the basic technology of the CD. Each served a more specific need and improved quality and convenience in a specific field for customers. All relied on existing technology and addressed the same consumers. Customers used to listening to CDs understood easily the new products and were attracted by them without changing their behaviour in this market segment. All those innovations appeared over a relatively long period of time, the late 80’s and 90’s of the 20th century.

More specific is the view on recordable discs. The proposition is that their placement in this third quadrant cannot remain undisputed. On the one hand, recordable discs are a further development of the CD using good parts of its technology, but on the other hand they use a lot of new and different technology, too, in manufacturing and application and required specific players for recording. To this adds that prior to CD-R magnetic tape technology was the dominant design for recording or saving data. The introduction of recordable discs posed a threat on magnetic tapes for the purpose of recording and supported the destruction of this market substantially and created a new one (Schumpeter. 1950). Summing up all those elements suggests at least to position recordable discs on the borderline of quadrant three and four.

Customer needs change permanently, new trends emerge and technological innovation offers stimuli to introduce new applications. This may take a rather long time, which could help to understand, too, why new product designs often fail. R&D managers focused on regular innovation may not recognise that disruptive threats to existing products are on the horizon and organisations seeking for certainty may ignore the challenge for too long trusting in well established market linkages (Christensen cited in O’Sullivan et al. 2009). As many other industries before, Home Entertainment underestimated the radical innovation of the dematerialised, virtual product and did not recognise its threat to the existing dominant designs of CD and DVD. Abernathy et al. define the fourth quadrant as revolutionary innovation. Here is the place for innovation disrupting established technical and production competence. The dematerialised products create an impact on the whole value chain in many sectors of this industry (Benghozi et al. 2000). The threat on optical discs to become obsolete is high. Bénavent suggests that its disappearance is inevitable (2008). While the optical disc industry as part of the Home Entertainment industry (habitat) invests in mass production and flees upmarket (Blu-ray disc, holographic disc [in development]), the dematerialised form of consumption augments continuously and emerging new business models present further

innovative forms of consumption like e.g., hulu.com, pandora.com or spotify.com (Cassia et al. 2006, Renaud. 2008, Oestreicher et al. 2009). By Abernathy et al.'s definition, this quadrant requires new skills in labour and management, new relations with suppliers, it shifts competition and existing customer segments are on stake (1984). Downloads do a job for consumers by "facilitating" their lives: Prosumer qualities, extremely mobile, immediate access, permanently available, playable on micro-players, cheap, furthering peer-to-peer access and consumption (Oestreicher. 2009).

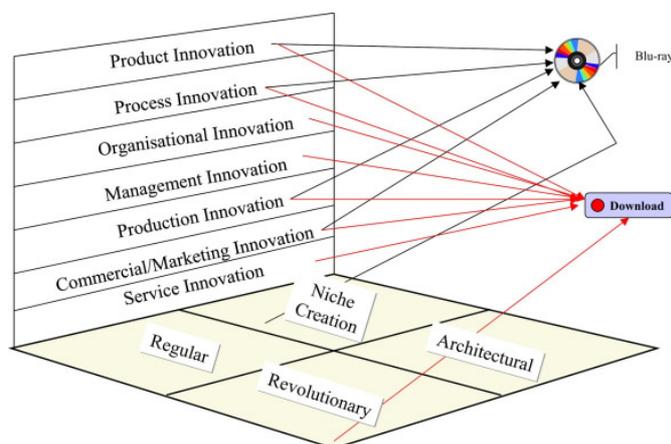
The introduction of Abernathy et al.'s transilience map, built on their studies in the automobile industry, presented a few examples of the Home Entertainment Industry to support the explanation of the major effects of each of its quadrants (1983, 1984). Its use can support organisational decision making for finding product and STP-strategies related to more meaningful segmentation by identifying necessary but less obvious criteria than those of established segmentation designs. New products may be assessed in the transilience map for a firm's reflections, which job they will do for customers. Positioning competing or potentially substituting products additionally may support the understanding of the likeliness and extent of affects and effects the new product launch may cause. This could help to refine the process of segmentation, since the results may offer some explanations, how existing customer segments may react due to obvious data, but which non-obvious data needs further consideration. The plethora of internal and external influences remains nevertheless high. Further theories, e.g., the disruptive innovation (quadrant one and four) and the resource-based theory should be applied in addition (Christensen et al. 2004, Barney et al. 2007).

The Addition of a Third Dimension

Brown challenges the established ways of thinking that customers know what they want [external organisational environment] (2007). To this uncertainty Kim et al.'s proposition of segmentation in three other categories can be added (2005): Customers on the edge of the market, those having refused current offers of a specific industry and customers having never thought about a market's offers as an option. Contrasting this to traditional market segmentation by geography, demography, psychography and behaviour likely includes a population meeting all of Kim et al.'s three sectors. Organisations studying established customer segments and observing their obvious behaviour may consequently be misguided then. These arguments in mind leads to a next question, how or whether it can be learned, which implications a new product idea will produce within a firm [internal environment]? Stevens et al. suggested that 3,000 ideas result in just one product (1997). Radical product solutions usually result in a rather lengthy process to establish a new market increasing corporate uncertainty further, e.g., due to developed efficiencies, established processes or resistance to necessary change (Utterback. 1996, Christensen et al. 2003, 2004). Regular (marginal) ones may not receive sufficient internal support, since too small to be attractive.

Organisations could find advantages by combining the CAC with the jobs-to-be-done theory for reflecting on how they can eliminate steps of a job for improving customers' comfort and provide better solutions to get the job done. This process can be influenced by prior research for jobs consumers look solutions for introducing a conceptual approach being aligned parallel to Christensen's *innovative cognition* (2008, Christensen et al. 2004). The assessed outcomes may be inserted into the transilience map with regard to necessary technological developments, the lateral combination of existing ones and the assessment of market linkages, new market design, alteration or using existing ones. Additionally, this offers the opportunity to assess competing or potentially substituting products against the new development to define the potential competitive edge within market linkages. But it lacks of a differentiated view on organisational impacts.

New product developments require change, which may be of technological, manufacturing, skills and management (including marketing) nature. By a resource-based view this requires adaptation or new combination of an organisation's resources. The proposition is to attribute to organisations a similar ranking of innovative behaviour. Those being able to improve continuously over the time in small minor steps, which must not necessarily be developed inside a firm, up to those, which inherit a high innovative power to which count, e.g., Apple or Sony. Therefore the concept of the transilience map should receive a third dimension focusing on an organisation's functional levels. The reasoning for this extension is supported by Teece's statement that "fast-moving business environments open to global competition, and characterized by dispersion in the geographical and organizational sources of innovation and manufacturing, *sustainable* advantage requires more than the ownership of difficult-to-replicate (knowledge) assets. It also requires unique and difficult-to-replicate dynamic [innovative] capabilities" (2007). This leads to the assumption that the more an organisation's dynamic and innovative capabilities are developed, the better its new product developments will be addressing the right market segments. This is supported by Kim et al.'s model of high-growth strategy, firms challenging industrial borderlines (1998). Again, Apple is a good example, since combining radical technology with new market segments (iPhone, iTunes, iPod).



The left-hand model extends Abernathy et al's transilience map, which is introduced as the Transilience Organisation Innovation Map. As an example it assesses comparatively physical Blu-ray discs against virtual downloads. The suggestion is that the more levels within an organisation are affected the more subsequent implicit and explicit problems will need attention. Here, optical discs' existing technology and market linkages,

physically oriented, compete against the multitude of denominated virtual advantages (qualitatively assessed by CAC, jobs-to-be-done theory and transilience map). The proposition of the 3-D model is that a firm may detect at which corporate levels it is affected, may need changes and can reflect on its product's and/or firm's inherent advantages/disadvantages respecting both technology and market linkages. This additional assessment helps to contrast implicitly and explicitly strategies, investments and necessary efforts to position a new product against a competing or substituting one with specific regard to internal needs. If products, like Blu-ray here, want to compete successfully against another one (downloads), then a firm needs to create (real) strengths on various corporate levels. Each functional level can break down, test and assess, whether its knowledge and resources support the new product idea, whether each function is superiorly or inferiorly equipped for the new product's subsequent requirements. The function-based assessment needs to provide evidence that R&Cs exist, can be adapted or new ones can be built to justify investments in what is intended to become a new product competing successfully against others (Christensen et al. 2004). This is a forward-backward process. In combination with Vandermerwe's CAC, the third dimension added to Abernathy et al.'s transilience map suggests a conceptual framework for more detailed recognition within corporate functions (1984). Special attention to resolve potential zones of dilemmas, in which a new product may require better solutions than competing ones, can be allocated then. The assessment to be made is, whether constraints reduce or threaten the durability of the new product overall, whether the firm has sufficient or

can develop new skills and resources to convince customers and finally, whether a solution will still be profitable then.

Organisations' new product development may, by detecting non-obvious data easier (using the CAC), provide better solutions for jobs-to-be-done (applying the theory) and define improved STP-strategies being then attractive for market acceptance in various competitive environments or may recognise earlier external and internal constraints exceeding opportunities. Basically it is about industries or firms asking themselves, which *real* advantage any new product provides in comparison to the existing, competing or substituting one. Will existing or future R&Cs support products, which can do a job for customers, which established products cannot do, is their advantage sufficiently important for customers (facilitation of use and consumption), is the organisational culture supportive?

Using the transilience organisation innovation map has two major implications. The first is that products will not always show such clear differences as in the example. When assessing two new products with rather low innovation rate, than the difference will be rather small. Secondly, as mentioned before, the dimension of internal levels needs refinement by a cascading style. Each level of the third dimension is broken down into single processes, e.g., Commercial/Marketing Innovation – the seven Ps of the marketing mix, after sales services and so on. All single maps are then united in one being a similar process to building strategy maps. The detection of cross-influences between organisational functions may lead to a synergetic process of R&D for more profitable outcomes. The framework's intention is that it may help reducing negative outcomes like Toshiba's, which requested to write off hundreds of million dollars and disappointed the customers of its HD DVD format being loser of the race against Blu-ray.

Reflecting on Explanations for New Products' Failure

The problematic of new product failure is acknowledged among scholars and professionals. Hoets states the high stakes and the culprits of new product failure are frequently the lack of information and wrong assumptions (2007). Organisations use various even parallel procedures to assess new developments. One observed underlying problem is that many of these procedures are not refined enough. Important to question is, whether and how such processes for new products divide and subdivide innovation sufficiently and correctly into the right degrees of innovative impact and, whether and how these are evaluated for innovation's both dimensions, technology and market linkages and to which extent they consider organisational impacts? The proposition is that the high failure rate of new products invites to subdivide the macro-environment, the field in which a new product competes against existing other solutions. These may be competitors or substitutes, or own improvements. As the microenvironment the direct competition with parallel-aligned products is suggested, e.g., when Wilkinson introduces a five-blade shaver against Gillette's similar product. With reference to the transilience organisation innovation map the position of competing products will vary, closer or wider in both micro- and macro-environment, and will produce more or less organisational implication links on the 3-D map. However, when new offerings need to be assessed too closely against existing solutions, e.g., Blu-ray discs against HD DVD or CD against Mini Disc (Sony) then the likeliness that one product will not survive increases, as the power and likelihood of providing a better solution may not be sufficiently attractive. If the new product is positioned in the architectural or revolutionary sector, then the observation is that it may have to undergo first a rather lengthy time to convince customers, who are likely to be part of new or different segments, with prior less considered commonalities. The efforts and implications on a firm's R&Cs increase considerably then. I.e., if a firm's resources may not be strong enough or corporate culture and constraints by investors do not support a long

process of (new) market development then a new product is likely to fail, even if it will be able to do an excellent job for customers. The proposition is that already the links in the sectors organisational and management innovation will cause major problems.

Conversations with corporate executives for more than two decades and ongoing long-term research in the Home Entertainment Industry provide evidence that technology driven organisations are often too technology focused and do not consider sufficiently, whether customers can find sufficient improvements for jobs to be done within new product offerings. Market driven organisations frequently add technological features believing that these improve their products attractively. As the disruptive innovation theory tends to hold, consumers honour such additional features by paying a premium as long as their expectations are not overshoot (Christensen et al. 2004). As soon as they are overshoot additional features are added on companies' expense. Products may be withdrawn from markets then, since they become unprofitable.

This discussion draws attention to the process of identifying new product opportunities especially then, when these products are developed to facilitate jobs, which were lengthy, difficult or expensive to be done. Reducing these efforts, making them cheaper, not just by price cuts, or quicker may assist to attract customers even beyond existing customer segmentation. But as argued, a firm's proposition of such solutions is doubtful then, when only obvious data about markets and segments is applied. Recognitions may misguide organisations and can lead to wrong assumptions. Not only that existing customer segments could not contribute enough importance to new offers, even if improved, they may result as well in missing those customers, which conventional data collection cannot identify, e.g., Kim et al.'s different segmentation (2005). The assumption is that such procedure may miss big numbers of potential customers not corresponding sufficiently to the (obvious) data collected.

This is expected to count even more for the environment of turbulent markets, hyper competition and permanent change, in which product features and attributes are by far not the only decision criteria for purchase. The prosumer concept, producer and consumer, plays a role, e.g., single individual download v pre-recorded content of a disc (Kotler et al. 2002). Trends of the "technologised" consumer seeking for experiential consumption satisfying his/her needs by "try[ing] something new every day" become increasingly important. This finds expression in the Consumer Culture Theory (CCT) pointing towards innovation's interdependence of technology and market linkages (Lipovetsky. 2009, Rémy. 2009). The application of the consumer culture theory challenges the collection of too obvious data for customer segmentation further, since – as Lipovetsky argues – postmodern customer behaviour and environmental factors support the dissolution of societal classes (2009). Hence, the question is, how data based on demography, psychography and so on can be sufficiently reliable today. On the other hand "trying something new everyday" imposes the desire for innovative experiences. New products developed for this environment should offer really improved opportunities, while products just improving incrementally established ways to do jobs might be not attractive enough for consumers searching for new experiences, adopting different identities and sharing different social links (Rémy. 2009).

Consumer Culture Theory	
Socio-historic pattern of consumption	Marketplace cultures
Consumer identity projects	Mass-mediated marketplaces ideology

When it is about adoption of new product offerings and addressing the right segments, then novelties should take into consideration that chances can be significantly reduced, when they do not support or fit in one or more of the CCT's quadrants being different to the established

customer segmentation. Despite that these considerations open an additional and different field of research about customer segmentation and product failure, it is suggested that they add to the explanation, why many products fail. The further proposition is that CCT indicates that marginal product innovation might earn less and less attention, if this theory's criteria are not receiving a juxtaposition in R&D, therefore suggested as an interdependent process of technology and market linkages. With reference to the transilience organisation innovation map, this argues for a potentially higher risk of product failure in the quadrant of regular innovation in the future, suggesting developing at least products in niche creation. On the organisational dimension those products supporting the status quo most may increasingly fail, because there are not sufficient new customer experiences. Therefore, successful new products may reduce corporate efficiency development, since effectiveness will require really new products even quicker. If so, in such market environment the map's organisational implications will gain increasingly importance, since the two quadrants, architectural and revolutionary may threaten many established products further and will provide an augmenting impact on corporate structures and their adaptation. However, niche creation, as Abernathy et al. tend to hold, will not allow holding a long-term position due to copy effects. Organisations need to adapt their processes on the internal dimension ongoing then, since "all is flux, no harmony" (Kelly. 1997). Expressed differently, the desire to maintain the status quo, to group and allocate resources and capabilities by extrapolation can increase the risk of product failure.

Further Research

The transilience organisation innovation map in conjunction with the application of the jobs-to-be done theory and the CAC is an interconnected concept based on Abernathy et al.'s, Christensen et al.'s and own long-term research (1984, 2004). It lacks still of empirical testing and application in real-life environments. Therefore it has a significant limitation by presently being a hypothetical concept.

Next steps of research require the concept's testing in the environment of different industries and the collection of adequate data for evaluation with regard to validity and reliability in a multi-industry environment of new product development. Important is to contrast differences of success and failure rates by applying the concept.

Further behavioural research is suggested, whether organisations will be prepared to take this concept into consideration. Even more important seem studies, whether such concept can change attitudes especially in the context of organisations relying more on regular innovation caused by their desire to reduce organisational change and maintain the status quo.

Christensen et al. and to a certain extent Utterback found that market research fails, when data for disruptive products and new markets are collected, since no data exists. This is a high burden for any new product R&D. When challenging the established ways of customer segmentation than emphasis should be put on studying ways, how valid and reliable data beyond the obvious can be collected to provide better backgrounds for organisational decision making and strategy processes.

Conclusion

The transilience organisation innovation map is presented as a part of an interconnected and interacting process to reduce uncertainty for R&D and product failure. The first step, with specific consideration to the established process of customer segmentation and STP-strategies, is the application of the jobs-to-be-done theory for the avoidance of thinking only in traditional terms and observing the too obvious (Christensen et al. 2004). The second step

recommended is the application of Vandermerwe's Customer Activity Cycle, searching for the reduction of steps to get a job done or to improve and facilitate the ways to do it significantly (Matzen et al. 2006, cited in Kotler. 2002). The concept of the intended novelty may then be positioned in the transilience organisation innovation map being based on Abernathy et al.'s transilience map, linked to organisational functions being affected, which can then refine the process by breaking it down to detailed functional impact (1984). In this map, a new product is contrasted against competing or substituting products for the identification of impact on competition, whether similar or better technology and higher or less favourable market linkages can be expected and by a firm's needs with regard to R&Cs. The whole framework may contribute to detect better, whether customers will allocate sufficient importance to the novelty and their likeliness to adopt it, or in the contrary, may refuse acceptance.

The transilience organisation innovation map will not be panacea or prevent from future product failure. But in comparison to many of presently implemented corporate decision making processes it may provide support to discover the gaps, which can help to explain and reduce product failure. The structure of this approach is complex, but should be compared to the loss of resources in time and money, when a new product fails. Overall the assessment on different levels quits the established ways of the terms of customer segmentation since concentrating more on non-obvious data, too. In future, further challenges for new products are expected, if the quadrants, which the consumer culture theory proposes, influence mass consumption then querying established customer segmentation procedures even more.

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