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**The Impact of Product Characteristics on the Electronic
Commerce Environment**

Rezumatul tezei de doctorat

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1 Problem Description and Research Gap

The research conducted by the author found there is no standardized model until the present day to explain why certain products are predominantly sold online more and others are not or why consumers prefer to purchase them on- rather than offline.

There is in general a scarcity of models or frameworks for evaluating e-commerce success and few published empirical studies examined the online consumer behaviour.

The main question the study addresses is whether all goods can be sold over the internet (taking into account not just the pure feasibility, but also the required profit margin) and if not, which are more likely to succeed than others and based on which criteria.

The question of why consumers prefer to buy certain types of products online has not been sufficiently addressed.

And finally, there is a gap in the current research in the scientific community in explaining why the predominantly online sold products are indeed popular, and why the ones which enjoy much attention offline, in the traditional stores, fail to perform well online.

2 Objectives of the Study

The main objective of this study is to research a framework containing criteria distinguishing product types and products suitable for e-commerce. An adapted product classification scheme is developed, combining different elements of the already available models. Using the product classification scheme developed by the author, marketers can easily assess in what product classes they should order their products and can start using the *E-commerce Product Suitability Framework*. Applying the framework should provide them with realistic expectations and with the degree of readiness for marketing the products online.

Concluding, the main objectives of this study are to illustrate:

- The theoretical foundation on some of the elements around the electronic commerce platform and product category management
- What the current literature offers as product classification models so that it can become clear to the reader on the one hand how important product classification is and how many researchers have taken it upon themselves as an objective of study and how varied the divergent the objects of analysis and methods are in product classification on the other hand
- The importance of classifying products and its impact on a company's marketing strategy mix, including advertising, distribution channels, etc.
- An adapted Online Product Classification Model based on a study conducted on consumers and how they perceive a list of products given specific definitions
- A framework (*E-commerce Product Suitability Framework*) containing the main factors that influence the suitability of a product for e-commerce by combining the survey of the available literature on the current topic with different elements from the existing product classification models. The objective of the framework is to act as a tool which will assess a degree of success predictability for future companies

willing to use e-commerce to sell their products.

- The current research findings on product perception from the perspective of six influencing factors: age, gender, educational level, frequency of shopping and web shopping experience, need to sample products before buying and product brand.

3 Outline of the Study

The present thesis consists of four parts. The first two parts provide the reader with the study's introduction, its theoretical framework, the analysis of the research problem, part of the methodology that is employed during the research and a literature review.

Chapter I presents a short introduction into the topic of electronic commerce.

Chapter II presents the theoretical foundations, the types of electronic commerce, some definitions in the area of marketing strategy and provides an insight into the different marketing schools of thought.

Chapter III presents the different product type classification models, a short methodology of how the literature review, as well as a short analysis of some of the product classification models.

Chapter IV highlights why it is of vital importance to have both in theory and in practice a sound, standardized, easy to apply and understand product classification model. The impact classification has on the marketing strategy is analyzed.

Chapter VII addresses the topic of online product suitability and developed the *E-commerce Product Suitability Framework*. The author selected the factors which have been proven as having an impact on the product's suitability for e-commerce and compiled them into online product suitability framework.

Chapter VIII presents the findings from the field research conducted by the author, which investigated the correlation between certain demographic factors and consumers' product perception.

Chapter IX closes with the thesis's main findings, conclusions, practical implications and recommendations for further research.

4 Literature Review

The literature review showed that product categorization has been the object of study for several decades and the numerous schemes show that while we have extensive knowledge around the topics of product characteristics, product benefits or consumers' purchasing behaviour, we are still working towards achieving a standardisation. It is these characteristics that provide the building block and the foundation for the typology and the way a certain product type is being introduced into the marketing theory. And the product classification will remain a challenge, unless the scientific community agrees on a standardisation.

5 Survey of Online Product Classification

As a consequence of the challenging task of classifying products the author decided two things need to be done:

- Highlight the importance of a standardized unified product classification model and its impact on the company's marketing strategy;
- Run a survey - with the objective to provide the practical basis for the tool elaboration - with 90 test persons who were asked to assign a set of 27 products to the according product types, given the operationalization of the five distinctive criteria: digital, tangible, dominant search, dominant experience and dominant credence.

This chapter introduces the six product types which constitute one dimension of the framework developed by the author.

6 E-commerce Product Suitability Framework

The six product types used in the E-commerce Product Suitability Framework are:

- Type A – digital dominant search products
- Type B – digital dominant experience products
- Type C – digital dominant credence products
- Type D – physical dominant search products
- Type E – physical dominant experience products
- Type F – physical dominant credence products

The E-commerce Product Suitability Framework is built on two dimensions: one is illustrating the product types, the other one is providing the criteria developed based on the literature review for online product suitability. Each criterion possesses two parameter values. It shows elements that have been proved to influence a product's e-commerce suitability. A rating of 1 translates into a high degree of the specific criterion's fulfilment, whereas a 3 illustrates a rather bad fit between the product's characteristics and the parameter value. Using the E-commerce Product Suitability Framework the user should analyze what parameter value best characterizes its product. The firm should strive to obtain a rating of 1 in as many of the criteria as possible.

7 Consumers' Product Perception Research Study

As mentioned earlier, the goods which were under investigation in this survey were classified according to Nelson's (1970) classification model, namely the Search Experience Credence schemata.

Following, the products are search, experience or credence, depending on whether the consumer can evaluate the products' quality and their benefits before or after purchase. And it is this consumer evaluation that plays an important role to which category a product belongs to, as this perception can be influenced by several factors such as: gender, age, frequency of shopping on the internet, previous experience with the online platform, etc.

7.1 Questionnaire and Study Design and Methodology

Data has been gathered through a structured semi open questionnaire. The language of the questionnaire was English. The survey was personally administered by the researcher to reduce incorrect answers which might lead to wrong findings or invalid answers. The unit of analysis in this particular survey has been the individual online shopper. The total population is comprised of literate people, so of individuals who know how to write and read and therefore use the internet. The questionnaires were e-mailed with a cover letter thanking the potential respondent for their participation and with a link to the online survey website.

The sampling design followed the non-random/non-probability principle of snowball. This is a process where a sample is being selected using network. In total this study received 271 valid completed responses, with a sample size of 273. Data were collected during the autumn of 2011.

The questionnaire is divided into three parts which address topics such as online shopping experience, frequency of shopping online, reasons for shopping online or not, website design, trust and trust worthiness, product, and demographic respectively. It was comprised of 46 questions out of which 12 questions directly related to the SEC classification model in such a way that after the respondents are asked how they perceive a list of products¹, they have to answer the question, what class of products would they be more inclined to purchase on the internet: search, experience or products.

The questionnaire was used to collect the necessary data which served as primary data to investigate whether the hypotheses enounced in the next chapter can be accepted or not.

The definitions for the SEC product categories have been the following:

A search product: the consumer can find full information online before purchase and does not necessarily require the use of the following sense: touch, smell, hear

An experience product: the consumer must try/use/see the product before purchase

A credence product: the consumer encounters difficulty evaluating / obtaining info on the product both before AND after purchase.

The various statistical techniques that are used in the data analysis are described in this section. Frequency Distribution Analysis was used to determine a demographic profile of the survey respondents. Cross-tab and Pearson Chi-square Test were used to determine the relationship between age, gender and product types according to the SEC classification. For the test of independence - test of homogeneity - the chi-squared probability of less than or equal to 0.05 has been chosen.

7.2 Hypothesis Development and Results

The majority of research studies on e-commerce investigate the basic demographic factors, such as age, gender, income level, country of residence, etc. The way in which these hypotheses differ from the previous studies is that they look for a correlation between all these demographic factors and product perception resulting from the Search Experience Credence product classification model.

H1₀: There is no significant correlation between gender and product perception as search, experience or credence.

H2₀: There is no significant correlation between age and product perception as search, experience or credence.

H3₀: There is no significant correlation between education and product perception as search, experience or credence.

H4₀: There is no significant correlation between the frequency of purchase and product perception as search, experience or credence.

H5₀: There is no significant correlation between the brand of the product and the decision/intention to shop online for a certain product.

H6₀: There is no significant correlation between the need to touch/smell/taste the products before buying and the decision/intention to shop online.

H7₀: There is no significant correlation between the demographic factors or gender, age and education level and the decision/intention to shop online.

Based on the results, there is empirical support for the seven developed hypotheses. *First, the study finds that online purchase frequency plays a role in how consumers perceive the products, which could be indirectly related to the web experience they have; the less they feel uncertain about product attributes, benefits and quality, the less they perceive online purchasing as risky.*

Second, if online purchase experience is impacting the way the consumers perceive some products, it is clear that more products than the ones surveyed in this study will be impacted. Third, the online shopping differs from the traditional transaction in the physical store in that it requires a set of skills, and is not simply a usage of a credit or debit card. Therefore, a high degree of web knowledge and online purchasing familiarity could be a prerequisite for increased readiness and willingness to use the internet as an electronic commerce platform.

Moreover, while education has proven not to have a significant influence on certain products in the tested set, it can be that *education influences directly other factors, such as income, which in return impacts the product perception. Education could impact indirectly the product perception by playing a role in the factor of web experience or frequency of online purchase.*

Age plays a role in how consumers perceive the products, which could be indirectly related to the web experience they have; the less they feel uncertain about product attributes, benefits and quality.

8 Conclusions

What the retailers have come to realize is that not only is it a necessity nowadays to show electronic presence, but it can also be an untapped source of additional revenue by offering to the customers new products, which could not have been offered in the physical store, such as a customized or bundled products.

This leads to the very first important conclusions of this study, namely that not all products are suitable for online selling and in consequence not all products being sold in the electronic environment will enjoy the same degree of success.

One of the main objectives of this study has been to develop a criteria framework for analyzing the potential online suitability of products. This framework tool developed by the author might explain on the one hand the success factors of popular products bought online and might provide a set of guidelines for a company facing the decision of choosing the appropriate marketing channel on the other hand.

The author applied the *E-commerce Product Suitability Framework* to ten different products belonging to several product types and matched every criterion in the framework with the specific product characteristics in order to explain either the product's online popularity or its barriers for e-commerce. Following conclusions could be drawn by the author from the practical application of the tool:

- *For the online dominant products – examples of which have been provided in chapter VII, the framework confirmed the findings of the EIAA's Study from 2008 and 2011 and Nielsen's Global Consumer Report from 2010.*
- *For the offline dominant products applying the framework revealed that the product characteristics are at the moment not suited enough for the product to be marketed entirely via the Internet channel.*
- *There is a strong correlation between the practical application of the tool developed by the author and the results of different other researches conducted by different consulting firms in the areas of online product popularity. This implies that the tool developed by the author in this thesis has not only a theoretical value, but can also be used in the day to day business by the companies venturing into the electronic commerce environment.* The fact that the framework developed by the author of this thesis has empirical support has been by comparing the total criteria rating (R) of the *Framework* with different statistics and product rankings resulting from consumer research reports.
- *Although marketers have to analyze the product and its characteristics before deciding for a distribution channel, the consumer always has to be included in the analysis.*

In order to find out what moves the individual consumer to perceive a product in a certain way, the author conducted the survey (*Consumers' Product Perception Research Study*). One of the major findings of the study was that 53% of the respondents would buy online predominantly search products, 27% would venture and purchase experience products and 16% would shop online independent of the product type. This is a major discovery for the SEC paradigm, as not many researchers focused exclusively on a particular product classification model and not many have investigated for that model the individual consumer's perceptions. And it is exactly this gap that the current thesis has filled with the findings and practical implications of the research study.

The current thesis has brought another novelty aspect in that it showed that what retailers need to keep in mind as well when classifying products is the product lifecycle theory. The practical implication from this thesis is that companies might find their products not so successful on the electronic platform but this might not be due to the fact that the product categorization and the corresponding marketing strategy are faulty. It might be explained with the simple check of the stage the specific product is in.

This study adds to those already reported in the literature review in several important ways.

- It uses an international, rather than regional or national sample of online consumers. The sample has extended over several countries, with respondents from Romania, France, Switzerland, Germany, Great Britain, Egypt, Spain and Turkey.
- The questionnaire is using specific products rather than hypothetical product classes. These types of findings can be important to e-tailers and support them in developing effective marketing strategies that target online consumers and are characterized by specific demographic profiles.
- The results are also beneficial to researchers in developing models linking the success of retailers using the online commerce platform to the demographic factors.

Regarding the conclusions that can be drawn from the Consumer Product Perception Research Study, there are several implications which can be issued.

- *First, the study finds that online purchase frequency plays a role in how consumers perceive the products, which could be indirectly related to the web experience they have; the less they feel uncertain about product attributes, benefits and quality, the less they perceive online purchasing as risky.*
- *Second, if online purchase experience is impacting the way the consumers perceive some products, it is clear that more products than the ones surveyed in this study will be impacted.*
- *Third, the online shopping differs from the traditional transaction in the physical store in that it requires a set of skills, and is not simply a usage of a credit or debit card. The consumer needs to know where to look for information about the product, where to buy and how. Therefore, a high degree of web knowledge and online purchasing familiarity could be a prerequisite for increased readiness and willingness to use the internet as an electronic commerce platform.*
- *Education could impact indirectly the product perception by playing a role in the factor of web experience or frequency of online purchase.*
- *Age plays a role in how consumers perceive the products, which could be indirectly related to the web experience they have; the less they feel uncertain about product attributes, benefits and quality. Taking the age factor into consideration, retailers can adjust or adapt their messages, adverts or website presence to either fit the consumers with a lot of web shopping experience or those less online purchasing savvy.*
- *Retailers can adapt their overall marketing strategy if they know for sure how certain age groups perceive certain products and product categories.*

8.1 Personal Contributions to the E-commerce Research

- Extensive literature research incorporating not only the product classification models in the past nine decades, but also their extensions and their qualitative analysis. Such an extensive review, alongside of the in depth analysis of the most prominent classification models, has been necessary to show not only that the product categorization models have been evolving and maturing over time, but also to illustrate that the classification schemes are building upon the product characteristics. It is these characteristics that provide the building block and the

foundation for the typology and the way a certain product type is being introduced into the marketing theory.

- Presented a new perspective at the issues that marketing strategies face when being confronted with faulty constructed product classification schemes. Proposed a product positional map where a product classification system could be placed at, based on the dimensions of “distribution channel dependency” and “scope”
- Conducted a survey to investigate how consumers perceive a set of products according to the SEC classification model and presented a positioning model for the search, experience and credence goods along the two dimensions of “need for detailed product information” and “need for visual aids and experience possibilities”
- Highlighted an overview of the conducted research by the scientific community in determining what types of products are most suitable for being marketed on the e-commerce platform
- Developed the *E-commerce Product Suitability Framework* which allows companies to match their products against a set of criteria with the end goal of reaching a decision whether their products are suitable for the online platform or not. It has been designed for a set of six product types, but it can be applied to any product types, as long as the specific criteria characteristics are adapted accordingly. There is a strong correlation between the practical application of the tool developed by the author and the results of different other researches conducted by different consulting firms in the areas of online product popularity. This implies that the tool has not only a theoretical value, but can also be used in the day to day business by the companies venturing into the electronic commerce environment.
- The Product Perception Research Study answered the “why do consumers categorized the products the way they did”, meaning it investigated the correlations between product perception and the SEC paradigm, and the correlation between brand and web shopping experience and the intention to purchase online. It proved to have empirical evidence to the stated hypotheses out of which several practical implications – which have been discussed above in this chapter – can be drawn and implemented by companies in building their (online) marketing strategy.

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