REVIEW

For obtaining educational and scientific degree "Doctor" in D.A.Tsenov Academy of Economics

Autor of the review: Assoc. Prof. Ivan Marchevski, PhD, Department "Marketing" at D.A.Tsenov Academy of Economics, habilitated in the scientific specialty "Marketing". Member of the Jury, according Order № 1083 / 15.12.2021 of the Rector of SA "D. A. Tsenov"- Svishtov, the requirements of ZRAS in the Republic of Bulgaria, art. 70, par. 3 of PRAS in SA and Decision of the Faculty Council of the Faculty of Management and Marketing, Protocol №2 from 14.12.2021.

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Dissertation name: PRODUCT DIVERSIFICATION USING BIG DATA ANALYTICS

I. General presentation of the dissertation

The submitted manuscript entitled "Product Diversification using Big Data Analytics" has a total volume of 216 non-standard pages and includes an introduction, 3 chapters with approximately equal number of pages and a conclusion. Out of this volume, the texs includes a list of references (a total of 107 titles, mostly in foreign languages), lists of figures (50) and tables (46) included in the text, as well as a glossary of terms used by the author.

II. Form and content of the dissertation

The dissertability of such type of researches is mostly a function of the relevance of the problem. The relevance of this paper work can be found in several directions. First, the issues of using "Big Data" for predictive modeling of consumer behavior have serious and growing interest in the marketing literature over the past decade, and second, opportunities for growth by going beyond the core business is more and more popular among companies operating in saturated markets and thirdly, the rapid development of digitally based financial services is making telecoms a promising partner for financial institutions. These arguments give me reason to say that the dissertation addresses an important issue for theory and practice and has the potential to develop marketing knowledge.

The object of the research is: "alternative services, in particular in the financial sector, offered by the telecommunications company, unrelated to its core subject of offering connectivity", and the subject is „....market growth and related additional financial inflows generated as a result of offering own financial services by the telecommunications company in partnership with a financial institution '. Thus, defined object and subject are adequate to the main goal pursued by the author, namely: "offering a conceptual model to increase revenues of the telecommunications company through diversification, expressed in offering its own financial services based on its technological, information and physical infrastructures'.

To achieve this goal, the author sets 5 research tasks: 1) To demonstrate the ability of telecommunications companies to add value by offering financial services, 2) to demonstrate the benefits of cross-industrial use of Big Data and sharing analytical results with different areas of application, 3) to develop predictive models for the analysis of behavioral telecom data and the possibility of their use in unrelated industry, 4) to apply customer segmentation based on behavioral data and to test the hypothesis of its adequacy in the absence of another information and 5) to propose a business model based on active participation of a telecommunications company in the financial services market.

The research was realized in the frame of several important limits, which are correctly noted by the author in the introductory part and can be considered as objectively existing.

The exposition follows a logic that is subordinated to the research tasks set by the author. The first chapter focuses on the need to use new strategies for the development of telecommunications companies and the opportunities to do so by entering the digital financial services market.

The presentation begins with an outline of the problems facing telecoms at the moment, with an emphasis on market saturation, the general reduction in profitability and the specific problems posed by the digitalization of the economy. In this part one of dissertation's accents is brought out - the access of the telecoms to large data sets as a specific competitive advantage, which could be used for diversification of the activity.

Subsequently, the author analyzes important trends in the banking market - the digitalization of supply, the emergence of digital banking products, the emergence of a new type of competitors. The conclusions of this analysis give the author reason to conclude that in this market there are important changes that "open the door" for new players and / or new types of partnerships.

The third part of the first chapter author argues that in a saturated market and limited opportunities to increase consumption by increasing number of customers and/or increasing single consumption, combined with the entry of the product into the phase of "maturity", which is the situation in the market of telecommunication services, the strategy of diversification gives the best opportunities for growth. A special place in this part is given to the connection between diversification and opportunities to increase client capital. However, it must be acknowledged that these reasoning of the author does not fit convincingly enough into the general logic of the first chapter.

The first chapter ends with the examples of successful cooperation between telecoms and banking institutions, which leads to the main conclusion that: an effective response to the challenges of incoming alternative service providers should be sought in the integration and effective sharing of the infrastructure of the two industries - something unattainable and impossible to achieve by competition. (p. 87).

The second chapter is focused on theoretical and applied aspects of credit risk assessment, which is the basis for successful customer management in the banking sector and demonstrate the ability to create predictive models for its assessment using data available from telecoms.

The author's reflections on the possibilities of using alternative behavioral data for the purposes of credit risk assessment and in particular the examples of using data related to the consumption of telecommunications services are of the greatest cognitive value in this part of the study (p. 108 - 112). In this part, the author presents his idea of using CRISP-DM Methodology as part of the credit risk assessment process.

Point three of the chapter presents the author's methodology for assessing the "reliability" of clients. It is based on the idea that customers can be defined as "reliable" when they have an annual

declared income above the minimum wage and as "unreliable" when this income is below the minimum wage. A number of arguments can be stetted against the validity of such a statement, the existence of some of which the author himself admits on page 134, but the positive in it is the general idea, not the criterion itself. Within this part of the exposition the various algorithms for machine self-learning are presented (pp. 134 - 141).

The third chapter begins with the presentation of the results of the analysis of behavioral data and testing of the machine self-learning model. The analyzes lead to the conclusion that the models give similar results as they:" manage to show with relative accuracy the existing relationship between the declared individual income and the demographic and telecom data for consumption" (the author's statement on page 158).

Other focus in the third chapter is the opportunities for joint activities between companies offering telecommunications services and banking institutions. The author argues that banking institutions could successfully compete with new players (non-banking institutions) through joint activities with providers of telecommunications services.

The third part goes through a description of 5 theoretical business models, suggesting different degrees of transformation of the core business by telecoms and banking institutions. The advantages and disadvantages of the models are outlined, the possibilities for creating added value from the partnership between the two types of business organizations are presented. Based on these considerations, the author outlines the parameters of a conceptual partnership model, which he entitled "Telecom Mobile Financial Credit Service, implemented through a separate structure" (p. 207).

The final part of the dissertation systematizes the main results reached by the author in the paper, as well as possible guidelines for future research.

What has been said so far gives me reason to conclude that the dissertation meets the requirements for the volume and structure of the paper and can be defined as a completed scientific product with the required quality.

The Trichkov language and style of writing are clear and meet the standards for scientific expression. Literary sources are used correctly. The citation style used is APA.

I did not find any evidences of plagiarism.

III. The quality of the achieved scientific results

The most important strengths of the reviewed material are:

1. The interdisciplinary nature of the development. It includes issues related to the telecommunications services market, the banking services market, as well as issues related to the use of Big Data to support business decisions.

2. Trichkov demonstrates originality in solving the scientific problem. The development does not follow the classical approach - an overview of existing knowledge, proposals for solving scientific problems, testing and summaries, but nevertheless it manages to achieve its main research goal.

3. The author shows a good knowledge of the real problems in the sectors that are the subject of analysis. Rich and up-to-date statistical information is presented, from which reasoned conclusions are derived, related to the main goal of the research.

4. Modern methods for empirical data analysis are used and their application is consistent with the nature of the processed information and the objectives of the analysis. Quantitative methods are used correctly as the information related to them is presented in a way that allows to obtain an adequate idea of the procedure used and proves the originality of the empirical study.

5. An innovative business solution is proposed, which gives reason to expect that the results of dissertations would provoke the interest of a wide range of stakeholders.

The list of the publications provided with the documents shows that Dimitar Trichkov meets the minimum national requirements for acquiring degree "Doctor". Dimitar Trichkov has 3 independent publications - 2 articles (one in English) and 1 study in English, which form 35 points, with a 30 required. All of them are related to the topic of the dissertation and published in refereed editions. These facts give me reason to conclude that the results of Trichkov's research have found the required publicity in the specialized scientific literature.

IV. SCIENTIFIC AND SCIENTIFIC-APPLIED CONTRIBUTIONS

In the reference to the documents and in the abstract the Dimitar Trichkov claims for the presence of 3 contributions. Scientific modesty, which makes a good impression against the background of the widespread practice in recent years of much larger claims to enrich knowledge in this type of papers. In my opinion, the contributions are real as they complement and develop mainly practical and applied knowledge in two directions.

First, provide empirical evidence of a link between the level of used mobile telecommunications services and the declared income of individual customers by demographic breakdown (contribution 2).

Second, development of a conceptual cross-sectoral business model based on alternative use of Big data (contribution 1 from the list) further developed and specified with procedures for distribution of responsibilities between the partners - telecommunications company and bank (contribution 3).

Although this is not stated as a moment of contribution, in my opinion such is the formulation and proof of the thesis that cooperation between two companies in different industries can be carried out not on the basis of sharing and/or pooling material resources, but on the basis unique information resource - customer data.

IV. CRITICAL NOTES, QUESTIONS AND RECOMMENDATIONS

From my point of view, the points of possible discussions are as follows.

1. The structure of the exposition by chapters and paragraphs creates a feeling of some clutter. For example, the analyses related to the demonstration of the credit risk assessment methodology based on a telecom data are present as separate parts in both the second and the third chapters. Questions about possible areas of joint activity between a financial institution and telecoms are present in both the first and third chapters.

2. The interpretation of some of the used categories could rise discussions. This is most clearly seen in the section on client capital. Thus, for example, the definition of client capital on page 77 states that it: „...is defined as the sum of the present and future value of the firm's clients", a

statement that is difficult to accept; the interpretation of the elements in the customer's lifetime value equation on page 76 (according to Gupta, 2006) is controversial. In places Dr. Trichkov is too "free" with terminology, which is not acceptable for such kind of research. An example in this respect is the use of the term 'industry', in which it inserts content that differs from the scientific content of the category.

3. Some of offered tools in the empirical part are too "simple". For example, "customer reliability" implies an assessment of the "nuances" and not just the endpoints - "reliable" or "unreliable". If banks adhere to such ambiguity in estimates, the risk of losing customers or accumulating bad credit would be high. The situation is similar with linking the reliability of customers with only one indicator - "income" and with a discriminatory value of the minimum wage. Such an approach has at least two weaknesses. First, there are serious regional income imbalances, which means that income equal to the minimum wage in one region is different from that in another, and second, it is debatable that borrowers' "integrity" depends only on declared disposable income.

According to these remarks, the author's views on the following issues would be of interest:

1. Given the fact that the financial services market is subject to serious regulation, how it sees the solution to two problems - obtaining authorization to provide financial services if the telecom will do so on its own, and overcoming the limitations of the GDPR in providing of customer data of the partner bank.

2. Who would be a more attractive partner for telecoms in the context of the joint offering of financial services - the classic banking institutions or the so-called fintech companies?

3. What additional customer information available to telecoms can be used to assess the reliability of customers in providing financial services?

VI. CONCLUSIONS AND OPINION

A completed scientific product with the necessary quality is presented for review. The issues raised for consideration are actual, and the approaches for solving scientific tasks are in line with the standards for such type of research. The manuscript form and content meet the standards. The set scientific tasks have been fulfilled.

These facts give me reason to propose to the esteemed scientific jury to award the educational and scientific degree "Doctor" in the scientific specialty "Marketing" to Dimitar Georgiev Trichkov.

19.01.2022 г.   Assoc. Prof. Ivan Marchevski, PhD