

STATEMENT

from Associate Professor Kamelia Vunova – Narleva, PhD

Nikola Vaptsarov Naval Academy

in professional field: 3.7. “Organization and management

outside the sphere of material production “

on a dissertation for the award of an educational and scientific degree "PhD"

Author of the dissertation: Julieta Deyanova Mihaylova

Topic of the dissertation: “Optimization of material flows of fast turnover goods in a small wholesale and retail company (the example of Malvis Trade LTD)”

Scientific supervisor: Associate Professor Tanka Milkova, PhD

This opinion has been prepared on the basis of the Order of the Rector of the University of Economics Varna № RD - 06. 78/ 05. 06. 2024 and in accordance with the Academic Staff Development Act in the Republic of Bulgaria (ASDA), the Regulations for its Implementation (RASDA) and the Regulations for the Development of Academic Staff at the University of Economics - Varna.

1. General characteristics of the dissertation

The dissertation research of Ms. Juliet Mihailova on “Optimization of material flows of fast turnover goods in a small wholesale and retail company (the example of Malvis Trade LTD)” is a thorough theoretical dissertation with clearly outlined practical results. The actual scientific methods and approaches applied by the author - random search modeling methods and linear optimization methods - approach a working model for optimizing the movement of material flows and the management of the firm.

Structurally, the dissertation has been developed in accordance with the provisions of the Academic Staff Development Act in the Republic of Bulgaria (ASDA) and the Regulations for its Implementation (RASDA). It consists of an introduction, a statement in three parts, a conclusion, appendices and a set of 102 references. The dissertation for the degree of Doctor of Education and Science highlights the author's position, the practical applicability of the proposals made and the contributions of the researcher, in the areas on which he works. They are based on modern and significant theoretical analyses and on appropriate economic and mathematical models for the optimization of supply planning and for the determination of an

optimal route in order to reduce the costs of storage of goods and transport while maximally satisfying the needs of the company's customers.

In order to achieve the above objective, the first chapter of the thesis provides a theoretical review of the modern methodological basis for optimizing the movement of material flows, as well as examines and analyzes the way the enterprise works - the organization of the activities of ordering, receiving, storing, selling and transporting goods and material values. Particular attention in this part of the dissertation deserves the theoretical analysis of the conceptual apparatus in the logistics sphere - supply chains and their management.

Chapter two discusses the methods used to analyze consumer demand. The proposed models provide a good opportunity for supply optimization and for minimization (or complete elimination) of shortages and surpluses of goods. This, in turn, leads to a reduction in the cost of storing surplus quantities (inventory) as well as losses from unfulfilled customer orders.

The third chapter of the paper presents the results and analyses of the application of the methods proposed by the author in the real activity of Malvis Trade Ltd. Particular attention here deserves the methods of route selection for optimizing the transport activity of a small wholesale and retail company. The use of the proposed model offers an option to actually reduce the number of trips made per day and the firm's transportation costs.

2. Contributive features of the dissertation

The thesis highlights a number of contributions, three of which are of particular importance.

The first is related to the topicality of the subject. In this case, the relevance stems from the economic reality of today - highly competitive, dynamic, crisis. Due to a number of challenges, small firms are faced with numerous difficulties related to the efficient use of available resources as well as to optimization.

The second is related to the methodological foundations for the research carried out. By means of random search modelling and linear optimization methods, the objective necessity of optimizing the activities of the small firm, and especially with regard to supply chain management, is demonstrated. The consideration of the changes to be implemented by firms in order to optimize costs is also a contributory point.

The third aspect is related to the practical usefulness of the thesis. The optimizations approbated in the company's practice allow for a more complete satisfaction of customer needs, a significant reduction of inventory management costs, and last but not least, a reduction of the costs for the transport of the sold inventory. These activities, following planned management changes, lead to an increase in the efficiency of the company's operations.

3. Recommendations for future scientific research

The author's future research can be tailored and improved with the following recommendations of theoretical and applied nature.

- Of particular importance in the theoretical aspect is to highlight the contributions of the so-called "sustainable supply chains"; to highlight their actual role and importance. In today's world, a new way of thinking is needed to help overcome the negative effects of the external and internal environment, in which the use of innovative technologies and attention to ecology are becoming extremely important.
- It is also essential for the development of theory and practice on the subject to highlight the external environmental factors that have an impact on the application of random search modelling and linear optimization methods in firms. In the future, such an approach would lead to an increase in the practical relevance of the author's research. The developed algorithms could be adapted, with a strong contribution effect, to the activities of other companies, sectors, industries.

4. Conclusion

Taking into consideration the requirements of the Law for the Development of Academic Staff in the Republic of Bulgaria and the Implementing Regulations, I consider that the dissertation of Julieta Deyanova Mihaylova: "Optimization of material flows of fast turnover goods in a small wholesale and retail company (the example of Malvis Trade LTD)" comprises theoretical and applied contributions that are eligible for the award of the educational and scientific degree "PhD" in professional field 3.8. Economics, scientific specialty "Optimal Management of Economic Systems".

**Date: 08. 08. 2024
Varna**

Signature:

Заличена информация съгласно
ЗЗЛД и регламент (ЕС) 2016/ 679

Associate Professor Kamelia Vunova – Narleva, PhD

STATEMENT OF OPINION

from a member of a scientific jury for awarding the educational-and-scientific degree “doctor” as part of a procedure announced by the University of Economics - Varna

1. General information

Statement of opinion written by: Assoc. Prof. Radan Vassilev Miryanov, University of Economics – Varna

Reason for writing: Order RD-06-78/05.06.2024 of the Rector of the University of Economics – Varna for appointing a scientific jury and its decision from 11.06.2024 for electing a chairman of the scientific jury and its members who need to submit reviews and statements of opinion.

Author of the dissertation paper: Zhulieta Deyanova Mihaylova – PhD student in the Department of Statistics and Applied Mathematics in the University of Economics – Varna.

Topic of the dissertation paper: “Optimization of the movement of material flows with quick-turnover in a small firm for retail and wholesale (with the example of the “Malvis Trade” plc)”

Mentor of the dissertation paper: Assoc. Prof. Tanka Vassileva Milkova

2. General introduction of the dissertation paper

The volume of the dissertation paper is 236 pages. It has a titular, contents, introduction (4 pages), three chapters (169 pages), conclusion (3 pages), a list of references and an appendix (50 pages). The body of the paper includes 9 tables and 32 figures.

The relevance of the topic of the dissertation paper is predetermined by the need for firms to react on time to the dynamic changes of the environment. In such conditions it is useful to apply various models through which to suggest methods that allow for satisfying clients’ needs in optimal use of available resources. The particular application of one type of model or another is interesting from both theoretical and practical points of views.

The **subject** of research in the dissertation paper is the supply of goods as tangible values and the transportation activities of a small food retailer. The **object** of research is the optimization of these activities aiming at less costs for storage and transport in maximum satisfaction for the needs of clients. The **objective** of the research paper is to work out and probe models of optimizing the process of planning supplies and transport. On the ground of the set goal, particular tasks are formulated and completed in the paper.

In the dissertation paper the author defends the thesis that analysing the company’s activity, which is quick-turnover food retailing, as well as the

implemented economic-and-mathematical models will contribute for optimization in planning the supply of goods as tangible values, as well as for making optimal itineraries in carrying out the transportation activity.

I think that the objective and the tasks of the dissertation paper are achieved and the research thesis is duly proved.

The references used include 102 titles, out of these 23 in Bulgarian, 7 in Russian and 72 in English. In my opinion, the sources are credible and relevant to the topic of the research.

The dissertation paper is an independent research work and complies with the requirements of article 27, item 2 of the Regulations for applying the Law for development of the academic staff.

3. Publications and participation in academic forums

The PhD student has made her research work known by publishing an article and two reports. The article is part of the "Izvestiya" periodical of UE-Varna (in English). The periodical is indexed in RePec and CEEOL, and is included in the National list of references numbered № 2564. The reports are delivered at an international scientific-and-practical conference organised by the teaching department. The conference collection of papers is indexed in CEEOL with № 4711 in the National list of references.

With the above-mentioned activity, the PhD student meets the minimum national requirements in compliance with the Regulations for applying the Law for the academic staff in the Republic of Bulgaria and the Regulations for developing the academic staff in UE-Varna. The PhD student reports the necessary 30 points.

4. Assessment of the structure and content of the dissertation paper

The main body of the dissertation paper has introduction, three chapters and conclusion.

In the introduction the author defines the subject and object of the research, the tasks for completion and the software products used in the research.

The first chapter presents the essence and particularities of the supply chains. A characteristic of the retailers' activity is carried out, as well as of the significance of the transport activities for their work.

The second chapter reviews the basic models of the movement of reserves in arbitrary consumer demand. On this ground, a suitable methodology for modelling supplies is designed. The author uses real data on sales of the studied firm for the time period 2017-2023. The sales volume is modelled by use of dynamic rows.

The third chapter presents methods for modelling transport itineraries. A method is designed aimed at optimizing supplies for clients for a planned time period (a day) by use of the criterion minimal distance run. The task of the linear optimization is used, part of the variables being binary.

One needs to point out that, depending on the particular issues, the PhD student uses both plausible and determined models. Examples are given based on

real data on the activity of the studied firm. On the ground of the received findings, specific conclusions and recommendations are formulated.

In the conclusion of the dissertation paper the basic thesis is confirmed. In the appendices the PhD student presents the code of the software programs used and the data of the transport network which allows for reproducing the results.

The layout has good style. The author's language is compatible with the academic requirements. The presented personal abstract reflects in a synthesised way the content and structure of the dissertation paper.

5. Identification and evaluation of the scientific and scientific-and-applied contribution of the dissertation paper

The presented dissertation paper is an original study. On the ground of its content I accept the contribution claimed by the author:

1. As a result of the various sources studied, the essence of the supply chain and intangible flows is made clear.
2. There are presented the abilities of the economic-and-mathematical models and methods for optimized management of material flows.
3. Economic-and-mathematical models are designed for optimization of the planned supply of goods as tangible values to and from the distributor's stores.
4. Suitable algorithms are suggested for finding optimal decisions for the suggested economic-and-mathematical models
5. The designed models are probed by use of real data.

6. Plagiarism or lack of plagiarism in the dissertation paper or the personal abstract

I do not find any plagiarism in the PhD student's dissertation paper and personal abstract.

7. Critical notes and recommendations

I do not have any critical notes to make on the dissertation paper.

I recommend the PhD student to keep on using methods of economic-and-mathematical models in her future research work.

8. Questions to the PhD student

The dissertation paper says that a disadvantage of the suggested methodology for planning supplies is possible emergency situations (an example is the Covid-19 pandemic) which exert significant impact on the firm's activities. Can one find a way to avoid this disadvantage?

9. Conclusion

The presented dissertation paper with topic "Optimization of the movement of material flows with quick-turnover in a small firm for retail and wholesale (with the example of the "Malvis Trade" plc)" meets the minimal national requirements and the specific requirements of the University of Economics – Varna for awarding the educational and scientific degree "doctor". In writing the paper, an ability is demonstrated for carrying out independent research work. The dissertation paper has original scientific and scientific-and-applied contribution.

Having in mind the above-mentioned opinion, I give my positive assessment of the research done and recommend the respected members of the scientific jury to award Zhulieta Deyanova Mihaylova with the educational and scientific degree “doctor” in area of higher education 3. Social, economic and legal science, professional trend 3.8 Economics, scientific specialty “Optimal management of economics systems”.

13.08.2024
Varna

Signature:

Заличена информация съгласно
ЗЗЛД и регламент (ЕС) 2016/ 679

/Assoc. Prof. Radan Miryanov/

ACADEMIC OPINION

Бх. №:

Д/20-1070 / 16.08.2024

From: Prof. Todorka Ignatova Kostadinova, PhD, Director of "Accreditation, Quality and Project Activities" at the Medical University - Varna, Professor in the professional field "3.7 Administration and Management" at the Faculty of Public Health, "Marin Drinov" Street , 55, Varna 9002, tel. 052 677 089, mobile tel.: 0889588408, e-mail: kostadinova@mu-varna.bg, member of the scientific jury according to Order No. RD-06-78 / 05.06.2024 of the Rector of the University of Economics - Varna

Subject: Dissertation on the topic "Optimization of the movement of material flows of fast-moving goods in a small wholesale and retail company (on the example of "Malvis Trade" Ltd)"
with author Julieta Deyanova Mihailova

For: awarding of the educational and scientific degree "Doctor" according to an announced procedure by the University of Economics - Varna in professional direction 3.8 "Economics", doctoral program "Optimal management of economic systems"

Research supervisor: Assoc. Dr. Tanka Milkova

Reasons for drawing up the opinion: participation in a scientific jury, appointed by Order of the Rector of IU-Varna No. RD-06-78 / 06/05/2024 and decision of the scientific jury taken at the first meeting on 06/11/2024.

I. Data on the procedure and general evaluation of the dissertation

According to the present procedure, all the necessary documents provided for in the Law on the Development of the Academic Staff of the Republic of Bulgaria, the Rules for its Application and the Rules for the Development of the Academic Staff of IU-Varna have been submitted.

The Doctoral student Julieta Deyanova Mihailova has completed her training in the doctoral program "Optimal management of economic systems" in the professional direction 3.8 "Economics" at IU-Varna. She is enrolled in full-time studies with Order No. RD 17-1602/17.07.2020 of the Rector of IU-Varna at the Department of "Statistics and Applied Mathematics" with research supervisor Assoc. Dr. Tanka Milkova. She has successfully passed the doctoral minimum exams, completed the activities of the individual study plan and collected the necessary credits with positive attestation marks during the period of study in the doctoral program. The development of the dissertation was completed on time and a defense procedure was opened before a scientific jury with Order No. RD 17-563/12.10.2023 of the Rector of IU-Varna.

Julieta Mihailova's dissertation examines a current and significant issue for theory and practice. The value and usefulness of the development is enhanced by the fact that all analyzes and model tests in the thesis are made with real data provided by "Malvis Trade" Ltd.

The dissertation has a total volume of 236 pages. The main part consists of a title page, table of contents, introduction, three chapters, conclusion and references. Appendices in a volume of 50 pages have also been added. The scientific research and the obtained results are well illustrated with 9 tables and 32 figures. The reference to the literature used contains a total of 102 sources, of which 30 are in Bulgarian and 72 are in English. A sufficient number of the cited publications were issued in the last 5 years, which indicates awareness of current developments in the field under consideration.

I. Characterization and evaluation of the content of the dissertation

The introduction presents the nature and features of the supply chain as an element of logistics and the nature and features of material flows in a commercial enterprise. A characterization of the research object has been made. The main research thesis, the purpose of the dissertation work and the tasks set for solving are formulated clearly and correctly. The object and the subject of the research have been defined, an adequate research toolkit has been applied. The stated limitations of the research show the good faith of the PhD student, considering the specifics of the field of work. From the beginning to the end of the development, her personal attitude to the problem and professional commitment to the subject is visible.

The first chapter of the dissertation presents the theoretical statements on the subject of managing the movement of material flows. Theoretically different possibilities are presented, the organization of work in the company is described and an analysis of strengths and weaknesses, opportunities and threats (SWOT analysis) is proposed. Doctoral student Mihailova presents the three main flows (material, information and financial) that are included in the scope of the supply chain and moves on to a more in-depth examination of the material flow.

Even in this theoretical part, the practical experience of Julieta Mihailova is evident and she emphasizes both the movement of the material flow and the static state of this flow - the stocks in the commercial enterprise.

In the second chapter, Julieta Mihailova offers an author's methodology for modeling the supply of goods with random consumer demand, which is based on forecasting using a one-parameter Holt model (exponential smoothing), a two-parameter Holt model and ARIMA models.

A valuable moment is the adaptation of the methodology for the specific requirements of „Malvis Trade“ Ltd. and its testing with real data over a 7-year period. In parallel, analyzes have

been made that are applicable to small wholesale and retail businesses, and arguments have been presented for reducing excess inventory storage costs and backorder losses.

In the third chapter of the dissertation, doctoral student Mihailova works on determining optimal routes for transporting the goods to the customers of "Malvis Trade" Ltd.

Here again, an author's methodology for planning optimal transportation routes is proposed, which aims to minimize the costs of carrying out all transportation. Valuable moments in this chapter are the created road network on a digital geographic map Google My Maps and the use of the R language, which offers a free software environment for calculations when solving the optimization task.

The conclusion of the dissertation follows the logical structure of the dissertation and is formulated comprehensively and clearly.

I. Contributions and significance of the development for the practice

I accept all contributions formulated in the abstract as follows:

1. Based on in-depth research and analysis, the essence of the supply chain, material flows and their management is supplemented and clarified.
2. The possibilities of economic-mathematical models and methods for the optimal management of material flows in the supply chain are presented.
3. Economic-mathematical models have been developed to help with optimization when planning the supply of commodity-material values and when preparing the routes used for delivery.
4. Suitable methods and algorithms are proposed for finding optimal solutions of the proposed economic-mathematical models.
5. The applied aspects of the optimizations carried out through an analysis of the activity of the company "Malvis Trade" Ltd are presented.

IV. Abstract and publications

The abstract faithfully reflects the content of the dissertation and emphasizes the most important results and conclusions of the research. It is prepared in a volume of 37 pages and includes the sections: General characteristics of the dissertation work; Brief presentation of the dissertation work; Reference for the contributions in the dissertation work; Dissertation publications.

Doctoral student Julieta Mihailova also presents 3 publications (two scientific reports and one article, including item 1 in English). Her participation in Bulgarian and international scientific forums shows that the topics and ideas of her dissertation have been commented on in scientific circles and are visible in the public space.

V. Critical Notes and Recommendations

My recommendation to Julieta Mihailova is to continue and expand her research with options for including the company's activities in international networks.

VI. Conclusion

The dissertation research offers a broad view of optimizing the movement of material flows in a small wholesale and retail enterprise. The research is focused on the topic and is logically constructed. The dissertation is a research work in which the doctoral student demonstrates in-depth knowledge, consistent search and extraction of practical solutions based on convincing empirical analysis.

The dissertation meets the requirements of the Law on the Development of the Academic Staff of the Republic of Bulgaria, the Regulations for its Application and the Regulations on the Development of the Academic Staff of IU-Varna.

All this facts and arguments give me the conviction to give a positive assessment and propose the award of an educational and scientific degree "Doctor" in the professional direction 3.8 "Economics", doctoral program "Optimal management of economic systems" to Julieta Deyanova Mihailova.

14.08.2024

City of Varna

Member of the Scientific Jury:

/prof. Todorka Kostadinova, PhD

Заличена информация съгласно
ЗЗЛД и регламент (ЕС) 2016/ 679