

Review

of the dissertation of Penka Stefanova Chernaeva
on the topic "The Role of the Information System in the Digital
Transformation Process of the Agricultural Enterprise"

for the attainment of the educational and scientific degree "Doctor" in
the doctoral program "Application of Computing Technology in the Economy"

Reviewer: Prof. Dr. Vladimir Stoyanov Sulov,

from the University of Economics – Varna, Professor and Doctor in
"Application of Computing Technology in Economics" member of the academic
jury for the competition pursuant to order of the Rector of the D. A. Tsenov
Academy of Economics – Svishtov No. 341 / 28.04.2026 and appointed as a
reviewer at the first meeting of the jury on 29.04.2026.

I. General presentation of the dissertation

The dissertation, as the title suggests, is devoted to the study and
improvement of information systems in agricultural enterprises, and more
specifically, those involved in grain production.

Although I am not a specialist in the field of agribusiness, I consider
the topic to be timely, since information services and information systems are
continuously evolving and every enterprise should make the best possible use of
this development.

The total volume of the work is 256 pages, including an introduction, 3
chapters, a conclusion, a bibliography with 222 sources, appendices, as well as
lists of abbreviations, figures, and tables used (at the beginning of the
dissertation).

II. Assessment of the form and content of the dissertation

The introduction is concise.

The author has defined the thesis as “the evolution of information systems in agricultural enterprises from accounting to intelligent and analytical platforms is a determining prerequisite for achieving a full-scale digital transformation of production and management processes.”

The object of the dissertation is “the process of digital transformation in the grain-producing enterprise,” and the subject is “the influence of information systems on the process of digital transformation of the agricultural enterprise and opportunities for their optimization through modern approaches and technologies.”

A limitation is specified as “enterprises engaged mainly in grain production, with emphasis on the specific processes in agribusiness.”

The aim of the work is “to study the role of the information system in the digital transformation process of the agricultural enterprise and to propose a model for optimizing this system to increase efficiency.”

I find the thesis and the aim appropriate; I do have some remarks regarding the subject, object, and limitation, which will be made below.

Chapter one is 59 pages and is entitled “Information Systems in the Grain-Producing Enterprise.” It discusses information systems in principle, their types, application, and significance in the agricultural sector, including more specifically in the grain-producing enterprise, information systems for agricultural land management in Bulgaria, challenges and trends in the digitalization of the agricultural sector. The author summarizes that “information systems represent a fundamental tool for the modernization of the agricultural enterprise. They support decision-making, improve resource management, and provide a foundation for sustainable and competitive development in the digital economy.”

Chapter two is 79 pages and is entitled “Analysis of the Capabilities and Role of Modern Technologies in the Digital Transformation of the Grain-Producing Enterprise.” As the title indicates, it provides an analysis of the current state of digitalization in grain production, covers modern information technologies applicable in this field, as well as the impact of digital transformation on production efficiency. The main conclusions of the chapter are that “digital transformation in grain production is ongoing, but remains uneven and constrained by structural, financial, and human resource factors. The potential of technologies is significant, but to realize it, targeted policies, investment in human capital, and improved access to digital services are necessary. Only through a systemic approach involving the state, scientific institutions, and business can sustainable and competitive digital agriculture be achieved.”

Chapter three is 80 pages and is entitled “Model for Digital Transformation of the Grain-Producing Enterprise.” The chapter begins with the requirements for the model, the main principles for developing a digital strategy, and KPI indicators and economic effects from its application. It is followed by the presentation of the model itself, including phases, its architecture, and interaction between components. The chapter concludes with evaluation and validation of the model, which includes practical application and test scenarios, expected benefits, and opportunities for development and further enhancement.

The conclusion of the dissertation presents a “summary of results,” followed by “results,” which rather should be referred to as contributions, and finally recommendations for future research.

Overall, the dissertation has a sufficiently appropriate structure and content.

No plagiarism is detected.

The enclosed abstract accurately reflects the content of the dissertation.

III. Scientific and Applied Scientific Contributions of the Dissertation

At the very beginning of this review, I noted that the dissertation addresses a timely topic, if only because increasing the efficiency of any activity through information technologies and systems is always relevant. After reading the entire text, this observation is further reinforced, as it seems that grain-producing enterprises in Bulgaria have an even greater need for such transformation and optimization.

It is particularly noteworthy that the author is thoroughly familiar with the characteristics, processes, and issues of agricultural and especially grain-producing enterprises in Bulgaria—something that is even more important for a dissertation with such a topic and content.

A significant number of sources were used and cited properly, and appropriate means of illustration have been applied.

I would indicate contributions mainly in the following directions:

1. Numerous observations, studies, and analyses have been conducted regarding agricultural and especially grain-producing enterprises, their condition, and problems in principle as economic entities.
2. The research is also specifically oriented towards digitalization and digital transformation, as the state of enterprises' information systems greatly affects their efficiency.
3. A model has been proposed for the digital transformation and optimization of information systems in order to improve the efficiency of grain-producing enterprises, as well as a model of an information system for land management relationships with artificial intelligence.

The doctoral candidate has stated that there are a total of 4 publications on the topic of the dissertation—2 articles and 2 reports, 1 of each independently and 1—co-authored in each group. I find them sufficient and that they provide some publicity to the ideas of the work. However, I note that the title of one publication is incorrectly given in the list.

The doctoral candidate meets the minimum national requirements for the educational and scientific degree “Doctor” in the professional field 3.8 Economics.

IV. Critical Notes, Questions, and Recommendations on the Dissertation

The subject and object could have been defined and formulated better; for example, “the influence of information systems on... digital transformation” does not sound logically consistent to me, though this partly depends on the author’s understanding, about which I will ask a question below.

The author places a restriction at the outset—“on enterprises primarily engaged in grain production, with an emphasis on the specific processes in agribusiness.” If that is the case, then the title of the dissertation could also focus exclusively on grain-producing enterprises. On the other hand, other areas of agribusiness are also frequently discussed, which to some extent leads to lack of systematization and sometimes to dilution.

I find the content of the first and to some extent the second chapters too extensive, with too many descriptions of various technologies and some repetition. In my view, the dissertation would have been much better if the first two chapters had been merged into one, the second was devoted entirely to the proposed model and developed in more detail, and the third—to the model’s testing, also developed and described more thoroughly.

In connection with my main comments, I would pose the following questions:

1. Similar texts exist in the dissertation, but I would still like to hear in person how the author defines the concepts “information system” (singular), “information systems” (plural), “digitalization,” “digital transformation,” and the relationship between them.

2. The restriction does not mention Bulgaria. Does this mean that the proposals are also valid for other countries, or are they relevant only for Bulgaria?

3. The dissertation mentions effectiveness hundreds of times. But how can we measure the effectiveness of information systems and technologies?

V. Overall Conclusion and Opinion

The work under consideration addresses a current issue, with an appropriate topic, structure, and content. Despite my comments, I consider that the dissertation “The Role of the Information System in the Digital Transformation Process of the Agricultural Enterprise” meets the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria and its implementing regulations. I give a positive assessment of the dissertation and propose that Penka Stefanova Chernaeva be awarded the educational and scientific degree “Doctor” in the doctoral program “Application of Computing Technology in the Economy”.

18.05.2026 г.

Varna

Reviewer:

(prof. dr. Vl. Sulov)