

## REVIEW

about the Ph.D. thesis

for the acquisition of the educational and scientific degree "Doctor" in the field of higher education "Technical Sciences", professional direction 5.3. Communication and computer technology, doctoral program "Computer systems, complexes and networks",

**Author of the Ph.D.thesis:** Iliyan Grozdanov Iliev, Institute of Information and Communication Technologies - BAS

**Titlr of the Ph.D. thesis:** "Optimization of the transition from asset management to service management in complex federated systems in the public sector"

**Reviewer:** Prof. Dr. Eng. Todor Stoilov, Institute of Information and Communication Technologies - Bulgarian Academy of Sciences

This review was prepared in my capacity as a member of a scientific jury, appointed by Order No. 104/17.05.2026 of the Director of IICT-BAS

### 1. **Actuality of the problems developed in the dissertation in scientific and applied terms**

For the purpose of unambiguous acceptance of the terminology applied in the dissertation, I will use the term "resources" instead of "assets" and "decentralized systems" instead of "federated systems".

The research solution applied in the dissertation is to implement the information service management process separately from the actual data transmission of the information service. From this decomposition of the type of information, an improvement in the quality of the information service is sought due to the implementation of management functions and the actual data transmission from various technical devices of the decentralized information and communication system. An improvement is sought and achieved in the timely transmission of a telephone

conversation and the selection of an appropriate combination of map information from observations of sea or river traffic.

A modern trend is the development of information and communication solutions that improve the quality of information services. The term used in the technical literature is "Quality of services". The dissertation develops a solution for improving the quality of services by decomposing the traffic to management data and service data, which are executed by various technical means of the decentralized system.

I assess the developed research problem as relevant and useful for the field of development and operation of information and communication systems.

## **2. Degree of knowledge of the state of the problem and academic interpretation of the literary material**

I positively assess the degree of knowledge of the problem of the functioning of information services in distributed information and communication systems. In the case of the dissertation research, the aim is to improve the quality of information service performance by independently processing the management and actual data for the information service by separate technical devices. This allows these activities to be performed in parallel and in a timely manner, which favors the reduction of delays (latency) of information services. The quality of the information service is assessed by the corresponding time delay and by reducing the volume of data that must be processed when combining map information when monitoring the movement of sea/river vessels.

The dissertation work shows good qualification of the doctoral student on the problems of the functioning of information services in information, computer and communication systems.

## **3. Correspondence of the chosen research methodology and the set goal and tasks of the dissertation with the contributions achieved**

The chosen research methodology is applied through analysis of the operation of existing information services and assessment of potential improvement of the service in terms of speed and/or reduction of redundant information exchange. The research approach in the dissertation work is decomposition of the types of information in the

information service and processing of the management and core information on separate technical means.

The applied author's modification of the modes of operation of information services consists in changing the technological structure and architecture of the distributed information and communication system.

The research methodology is a consequence of the task set for the dissertation work to develop modes of operation of information services, in which an increased quality of performance is achieved.

#### **4. A brief analytical description of the nature and assessment of the credibility of the material on which the contributions of the dissertation are built**

The dissertation is developed in five chapters

In chapter 1, a historical analysis of the introduction, development and use of information services is made. They are explained from the position of unifying computing resources, communication networks and developed information content. This chapter analyzes the type of information flows and the type of information that is transmitted between providers and users of the information service. Requirements that must be satisfied by the information service are commented on. The chapter sets out and comments on the research solution for dividing the type of information of the information service into management and actual data, which are to be managed and provided to the user by different technological devices. The main goal of the dissertation is to improve the quality of an information service. This chapter defines four information services for research, from which a solution for increasing the quality of an information service will be sought and developed.

In chapter two, a solution for encrypting information data is analyzed. The aim is for the data to be accessible to a limited number of users. Due to the existing practice of using an information service by a limited number of users, despite the use of a publicly available information and communication network, part of the data of the information service is encrypted. Thus, a limited number of users have access to the information service. In this chapter, the dissertation work does not have an original development. But it illustrates the type of information flows that can be decomposed into control data and actual data.

In chapter three and four, the information services for distributing information from real video images and for performing calculations on a remote powerful computing system is analyzed. The analysis of these information services again shows the possibility of decomposing the video content and/or calculated data into control information and actual data of a video image/data. In this chapter, the dissertation work confirms its research decision to separate the control information from the actual data and to manage and execute them by separate technical systems.

The substantive part of the dissertation is presented in the fifth chapter of the example of the information service for telephony, Voice-over-IP. In a distributed communication environment, communication between two nodes can be performed along different routes. The dissertation's statement for separating the control information from the data and processing them by separate technical devices allows to determine the shortest route, which is recommended for use in routing telephone traffic. The control information also promptly changes the settings of intermediate routers to achieve a minimum path. The dissertation illustrates this solution by measuring time delays between two points between Varna and Balchik.

Additionally in the fifth chapter, an improvement of an information service for monitoring the motion of sea/river vehicles is considered. The user of this information service uses measurements from multiple measuring stations and receives a set of overlapping partial images. The separation of the control from the information part of the data and their processing by different devices allows the user of the information service to receive a smaller volume of data, which most fully presents the picture of the maritime traffic. Thus, the redundant data from the overlapping information is not transmitted and a small delay (latency) of the information system is achieved. An example of the movement of ships on the Danube River is simulated.

## **5. Scientific and practical achievements in the PhD thesis**

I assess that the dissertation work has a scientific and applied contribution. It consists in developing a modified model for separating the management information from the actual data for information services in decentralized information and communication systems. Accordingly, the processing of these types of information is performed in different technical means. The positive effect of this separation and processing is an increase in the relative speed of the information service (reduced

latency) when transmitting a telephone conversation and reducing the volume of overlapping information when monitoring the movement of sea/river vehicles.

I consider the results obtained from the dissertation research to be useful. They meet the requirements for developing a dissertation work for acquiring the educational and scientific degree "Doctor".

#### **6. Assessment of the degree of personal participation of the dissertation candidate in the contributions**

The research presented in the dissertation and the accompanying scientific publications with the author's participation give me reason to believe that the dissertation results were made personally by the doctoral student.

#### **7. Assessment of the Ph.D. publications and correspondence with the minimal national legislative requirements**

The dissertation presents six publications related to the topic being developed. They were presented at scientific conferences in our country and one in Turkey. Two of the publications were made in a journal published in our country. One of the titles is presented only as a summary and is not checked by the reviewer.

The content of the publications corresponds to the topic and content of the dissertation. I find that the legal requirements for publishing results of the dissertation research have been met.

#### **8. Few assessments, recommendations, and remarks**

The reviewer is critical of the style of presentation of the dissertation research. He recommends that the dissertation candidate use correct terms in Bulgarian. Terms that use English transcription must be correctly introduced and explained. Failure to comply with these recommendations also shows the unsuccessful definition of the title of the dissertation work. The reviewer is also critical of the intensive declaration in the

dissertation work that optimization is being performed. Optimization tasks are not defined and solved in the dissertation work.

I agree that the dissertation research and results must be given in the chapters after chapter one. In the first chapter, following an overview, a problem and a research idea must be posed that will develop solutions of the problem. The requirement for originality of the scientific or applied scientific research must be proven. Usually, this is fulfilled by a corresponding comparison between the dissertation result and the result that has existed until now.

I will note that the author's claims have a declarative nature, but not an evaluative, evidentiary part. This is a weakness of the defined scientific and applied contributions.

I recommend that the doctoral student seriously consider the recommendations made above.

## 9. Conclusion

I positively assess the scientific and applied contributions made by the dissertation work of Iliyan Grozdanov Iliev. I find that the requirements of the Act on the Development of the Academic Staff in the Republic of Bulgaria, the Regulations for its implementation are met in the presented dissertation work.

The above gives me reason to give a positive assessment of the presented dissertation work and to recommend to the Scientific Jury to award Iliyan Grozdanov Iliev the scientific degree "doctor" in professional field 5.3. "Communication and computer technology", doctoral program "Computer systems, complexes and networks",

9.6.2026 г. Member of the jury:  
Sofia

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