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IMPROVING PUBLIC CONSULTATION PROCESSES IN PUBLIC ADMINISTRATION USING A SYSTEM OF INTELLIGENT DIALOGUE AGENTS

Within the framework of contemporary public management, the need to involve external stakeholders in decision-making processes carried out in public administration offices is emphasized. This stems not only from the progressive democratization of administrative actions but also from the perceived demand for various types of knowledge in decision-making processes, including non-expert knowledge held by the administration's stakeholders.

One of the mechanisms for involving stakeholders in decision-making processes carried out in administration is public consultation, which constitutes the subject of research in the thesis. However, consultation processes currently organized by public administration offices are characterized by numerous imperfections, which means that one of their basic functions – providing decision-makers on the administration side with knowledge useful in the decision-making process – is sometimes disrupted and not fully realized. Therefore, there is a need to eliminate or at least reduce these imperfections.

It is justified to consider public consultation processes from the perspective of knowledge and communication management. They are aimed at acquiring knowledge from stakeholders, and while they are being carried out, numerous knowledge-related processes occur, including – when appropriate conditions are provided – the generation of new knowledge, made possible by mutual interactions between consultation participants. For the gathered knowledge to constitute a useful resource throughout the decision-making process, it is necessary to carefully integrate it and provide conditions for its undisturbed communication by consultation participants. This, in turn, should be the subject of thoughtful management, supported by appropriately designed tools, including ICT tools.

The dynamic development of artificial intelligence (AI) observed in recent years and the popularization of its use in organizations mean that the utility of AI tools and their capabilities for supporting and improving processes carried out in offices are also recognized in public administration. It is noted that artificial intelligence tools can also streamline carrying out public consultation processes. A group of solutions attracting attention in this area are intelligent dialogue agents, which

have the potential to improve communication between public administration and its stakeholders, as well as – thanks to integration with large language models – the ability to process large resources of data, information, and knowledge.

Although the literature indicates numerous possibilities for supporting public consultations with artificial intelligence tools, a shortage of research on the actual possibilities of improving consultation processes as a result of implementing such tools is simultaneously observed. The reason for this shortage is primarily the lack of appropriate research artifacts, such as systems that comprehensively support carrying out consultations. The considerations on this topic presented in scientific publications are most often in the nature of a literature review or focus on supporting only selected activities undertaken as part of consultations, rather than the entire process. Therefore, there is a research gap in this area, which the research described in the thesis fills.

The main objective of the thesis is to develop a concept of the public consultation process carried out in public administration using a system of intelligent dialogue agents as a tool for knowledge and communication management. The rationale for its development is the need to eliminate or reduce at least some of the imperfections characterizing the consultation processes currently organized by public administration offices. The following specific objectives were also set:

- identification of imperfections related to carrying out public consultations perceived in public administration offices,
- assessing the demand of offices for new technological solutions that support carrying out consultation processes and improve these processes,
- identification of possibilities for improving public consultations through the use of artificial intelligence in knowledge and communication management in these processes,
- creation of a research artifact in the form of a system of intelligent dialogue agents supporting carrying out consultations in the proposed concept,
- assessing the compliance of the proposed system's operation with the needs and expectations of its potential users in public administration offices.

The set objectives also result in the research questions accompanying the thesis. The main research question is: "How can artificial intelligence be used in knowledge and communication management in public consultation processes to improve these processes?". The specific research questions are as follows:

- RQ1: Which imperfections among those indicated in the literature as potentially affecting the quality of public consultations are actually perceived in offices?
- RQ2: What ICT tools are used within public consultation processes in offices?

- RQ2.1: How common is the use of artificial intelligence tools in public consultation processes?
- RQ2.2: For what purposes are artificial intelligence tools used in public consultation processes?
- RQ3: Is there a perceived demand in offices for new technological solutions supporting carrying out public consultations?
 - RQ3.1: Given contemporary technological capabilities, can the identified demand be satisfied by appropriately designed artificial intelligence solutions?
- RQ4: Is the proposed concept of the public consultation process, carried out in public administration using a system of intelligent dialogue agents as a tool for knowledge and communication management, accepted by representatives of the offices?
 - RQ4.1: Does the proposed system of intelligent dialogue agents correspond to the needs and expectations of its potential users in offices?
- RQ5: Which areas and activities related to carrying out public consultations in public administration can be improved through the use of a system of intelligent dialogue agents as a tool for knowledge and communication management?

A four-stage research procedure was conducted as part of the thesis. The first stage included literature research aimed at identifying the current state of knowledge on the subject of study. The results of the literature research also provided the basis for the empirical research conducted later. In the second stage, survey research was conducted, aimed at identifying the demand for new technologies in consultation processes within public administration offices. Furthermore, the study identified the ICT tools currently used in these processes and the perceived imperfections of consultations. The third stage involved conducting design work aimed at developing a concept for the public consultation process carried out with the use of a system of intelligent dialogue agents. As part of this stage, a prototype of the proposed system was also created, implementing the assumed functions, which was verified through tests and experiments conducted using example consultation scenarios. In the fourth stage of the research, the developed concept of the public consultation process was subjected to evaluation in selected public administration offices, which culminated in individual in-depth interviews with their representatives. Individuals with knowledge and experience in organizing public consultations were invited to participate in the study, which meant that the assessment they provided was an expert evaluation. The purpose of this stage was to recognize the attitudes of officials toward the proposed concept, including the identification of opportunities for improving consultation processes that, in the opinion of the experts, the presented concept and its associated system create.

The theoretical background for the research described in the dissertation consists of:

- Stakeholder theory, which was adopted as the base theory, justifying the study of processes organized by public administration offices while taking into account stakeholders in their external environment¹,
- The SECI model, developed within the systems approach to knowledge management, on the basis of which the processes of explicit and tacit knowledge conversion occurring during public consultations were described in the thesis,
- The theory of communicative action and the associated normative model of the ideal speech situation, which was adopted as the basis for designing communication processes in public consultations,
- The UTAUT model, used in research on technology acceptance, on the basis of which the scenario for individual in-depth interviews was developed.

The conducted research procedure allowed for the achievement of the set objectives of the thesis and for obtaining answers to each of the research questions posed. The concept of the public consultation process carried out using a system of intelligent dialogue agents as a tool for knowledge and communication management presented in the thesis can lead to the improvement of consultation processes. This is confirmed by both the results of the expert assessment and the experiments conducted, in which the correctness of the tasks entrusted to the system in the assumed public consultation scenarios was verified. Possibilities for improvement were identified at every stage of public consultation. Among the identified possibilities, one can point to, among others: enabling consultation participants to thoroughly familiarize themselves with documentation related to the consulted problems in a manner adapted to their needs and expectations (currently, issues subject to consultation are often difficult for stakeholders to understand), a positive impact on turnout in public consultations (currently, turnout is often low or even zero), and preparing, through the use of the system, a response to each of the proposals raised during the consultation (currently, this is often a neglected activity).

The thesis consists of an introduction, six chapters, and a conclusion.

In the introduction, the choice of topic was justified, the research gap was indicated, and the objectives of the work were defined. The research questions were also formulated, and the course of the procedure that led to obtaining answers to the posed questions was presented.

In Chapter 1, starting from the presentation of stakeholder theory and the New Public Governance paradigm, the justification for involving stakeholders in decision-making processes carried out in public administration was indicated. Public consultations, being one of the forms of public

¹ Additionally, the New Public Governance paradigm was adopted, related to public management, within which, among other things, the inclusion of external stakeholders in decision-making processes carried out in public administration is postulated.

participation, were characterized. The course of the consultation process was presented, including an original proposal for distinguishing the stages of public consultation, integrating approaches proposed by other researchers. Numerous imperfections and barriers that may have a negative impact on the quality of public consultations and, consequently, on the quality of decisions made on their basis, were pointed out.

In Chapter 2, the adoption of the knowledge and communication management perspective in the context of public consultations was justified. Numerous knowledge-related processes occurring during consultations were pointed out, as well as the need for careful design of communication occurring during consultations. Particular attention in the chapter was devoted to two theoretical models used in later research: SECI and the ideal speech situation.

In Chapter 3, the state of digitization of public consultation processes was presented. The concept of e-consultation was characterized, and ICT tools used at various stages of consultation were presented. The possibilities of using artificial intelligence solutions in public consultation processes were presented. Future perspectives were also outlined, noting that the implementations of this type carried out so far are still few in number.

In Chapter 4, the results of survey research conducted in municipal offices in the Śląskie Voivodship were described. Research hypotheses² were formulated and subsequently verified. The imperfections identified in the study that characterize the consultation processes currently carried out in offices were indicated. Lists of ICT tools used in these processes were presented, as well as the needs perceived in offices regarding the implementation of new technologies in consultation processes. It was noted that the research results obtained indicate a need for the use of artificial intelligence tools in public consultations.

In Chapter 5, the concept of the public consultation process carried out with the use of a system of intelligent dialogue agents as a tool for knowledge and communication management in this process was presented. The basis for formulating the assumptions of this concept was the results of the survey research described in Chapter 4. In developing the concept, reference was also made to the assumptions of the SECI and ideal speech situation models. It was noted that carrying out consultations solely using an IT system, even the most advanced one, does not allow for all the knowledge conversion processes included in the SECI model to occur, and thus could limit the possibilities of utilizing the potential of public consultations in terms of generating new knowledge. Within the concept, it was therefore proposed to combine the use of the presented system with traditional methods of carrying out consultations. For each stage of the consultation, the tasks that should be performed by the process

² The verification of these hypotheses is of a complementary nature in the context of the entirety of the research described in the thesis, therefore, they were not explicitly mentioned in the introduction, emphasizing that the main idea of the thesis is reflected in the research questions formulated earlier.

organizer (the office) were indicated, and the role that the system of intelligent dialogue agents associated with the concept should play was defined. The chapter characterizes the individual functions of this system and describes important aspects related to its prototype implementation. The description of the assumptions was completed by presenting example scenarios of public consultations carried out in accordance with the proposed concept. The limitations of the presented concept were also indicated.

In Chapter 6, the results of research on the acceptance of the concept presented in the thesis, which was conducted using the method of individual in-depth interviews in selected municipal offices in the Śląskie Voivodship, were described. In light of the constructs of the UTAUT model, the attitudes of the study participants toward the concept they evaluated were characterized. An important part of the chapter is the presentation of the possibilities for improving public consultations which, in the opinion of the experts participating in the study, are created by the implementation of the evaluated concept of the public consultation process and its associated system. The chapter concludes with the presentation of recommendations for the implementation of the concept proposed in the thesis, which allow for linking the results of the research conducted with the practice of public administration activities.

The conclusion summarizes the results obtained in the thesis. The most important findings were indicated, and the research questions posed were addressed, providing the answers obtained through the conducted procedure in a synthetic form. The limitations of the research described in the work were also indicated, against the background of which perspectives for future research were outlined.