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**Concept of an Employee Suggestion System: The Perspective of
Open Innovation.**

Summary of the doctoral dissertation

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The Employee Suggestion System (ESS) is one of the oldest forms of engaging employees in the operation and improvement of the enterprise, widely utilized for obtaining creative ideas to improve the organization (Santos et al., 2017; Mikelsone, Liela, 2015a; Lasrado, 2013). On the one hand, the suggestion system is defined, in simplified terms, as a continuous, formalized mechanism consisting of administrative procedures and infrastructure designed to acquire, evaluate, and implement improvement ideas from employees (Van Dijk, Van den Ende, 2002). On the other hand, employee suggestion systems, or more broadly, idea management systems, play a much more important role in enterprises. They focus on processing ideas, suggestions, or rationalization proposals and the benefits derived from them, while also fulfilling a functional role in managing the organization, aiming to enhance its learning capacity and development through employees' participation in continuous improvement and the generation of new and innovative solutions (Skoczylas, 2015). Suggestion systems, relying not only on the creativity of experts and managers but also on the involvement of all executive employees within the organization, have a rich history of industrial empirical evidence and a well-documented body of scientific research, although they do not provide all the answers to the research questions posed in the current context of rapidly changing business environments and contemporary technological challenges (Mikelsone et al., 2022c).

Significance of the Research Problem

The evolution of ESS has led to the development of two main approaches, commonly referred to as the "Japanese" and "American" approaches in the literature (Santos et al., 2017; Pakdel et al., 2014). The first and prominently dominant approach, characteristic of the Japanese management style known for its high sense of teamwork and pursuit of operational excellence, is based on the assumption that all improvement suggestions, even the smallest ones, should be implemented. This approach is primarily perceived as a method to engage employees in the organization and enhance their sense of agency and responsibility. Consequently, the economic effects of implementing and operating ESS are considered secondary, and the financial benefits for the company are seen as potential outcomes.

On the other hand, the American approach places greater emphasis on the economic benefits resulting from the implementation of employee suggestions, thus significantly shifting the underlying purpose of such ESS (Gerlach, Brem, 2017; Lasrado et al., 2017). While maintaining a high level of employee participation in the system and providing employees with a tangible influence over their work positions remain important, the primary focus is placed on achieving specific financial benefits for the company, such as cost savings through

improvements. While the superiority of either approach in ESS is a matter of debate, most of the research and scientific studies focus on the Japanese approach (Terna et al., 2021; Gerlach, Brem, 2017; Santos et al., 2017; Mikelsone, Liela, 2015a). These studies examine the impact of various organizational and functional factors of ESS on outcome-dependent variables, primarily the level of employee participation or the number of suggested ideas, or latent outcome variables. Research within the American approach, where the explained variable is tangible financial benefits derived from ESS, is more challenging and less prevalent, partly due to reported difficulties in obtaining sensitive financial data from primary sources and inconsistencies in measurement frameworks (Kagan, Krzos, 2021; Schat, 2019a; Mikelsone, Liela, 2015b).

Furthermore, there is currently a lack of research on the influence of different characteristics of ESS on the financial benefits derived from employee suggestion systems in companies operating in Poland (Dekier, 2017; Szwiec, 2015). **Filling this gap requires undertaking research on ESS operating in Polish enterprises from the perspective of the effects achieved in the form of financial benefits.**

Simultaneously, there is an observed dynamic development of technology in the realm of communication methods, information tools, and modes and intensity of knowledge exchange. This implies that the emergence of new improvement suggestions is no longer solely derived from internal knowledge within the organization (both explicit and tacit), but rather an outcome of both internal and external knowledge originating beyond the boundaries of the enterprise (Mikelsone et al., 2022c; Quandt et al., 2019; Purgał-Popiela, 2017). In this context, the diffusion of knowledge assumes particular significance, as emphasized by some authors as one of the primary factors influencing the level of innovation capabilities in firms, as well as the internal and external channels through which knowledge reaches employees who are the key actors in ESS (Pietruszka-Ortyl, Prorok, 2018; Intezari et al., 2017).

While the phenomenon of knowledge diffusion and the utilization of its channels (mechanisms) in the context of innovation has been extensively described in Polish and international literature, the diffusion of knowledge and the intensity of its channel utilization in the perspective of ESS, predominantly processing employee suggestions characterized by small, incremental changes in processes, are poorly documented (Mikelsone, 2022c; Schat, 2019a; Sandstrom, Bjork, 2010). The limited publications on knowledge diffusion channels in the context of ESS, along with the **relatively scarce knowledge in this area, constitute a**

second contribution to research on ESS and the extent of utilizing external and internal knowledge diffusion channels.

The integration of open innovation perspectives into ESS further expands the spectrum of knowledge diffusion channels by assuming the free exchange of impulses for organizational development with external entities (e.g., ideas, concepts, knowledge, or materials) that extend far beyond the boundaries of a single firm. It also extends from the employee's immediate environment (internal, within the organization) to the area between external units of the same organization (partially open, within a unified organizational and capital area) and even to the bidirectional exchange of knowledge with external units (open area), thus creating **three models of ESS based on knowledge diffusion channels: closed, partially open, and open.** The literature extensively describes the successes of organizations applying open innovation approaches in the context of radical (breakthrough) and significant changes (Bigliardi et al., 2021; Lyu et al., 2020; Chesbrough, 2020). However, the effects of adopting open innovation perspectives, as well as **the statistical significance of the impact of knowledge diffusion channel utilization and extension intensity on the financial benefits derived from ESS, represent a cognitive gap.** This gap allows for further questions about the economic rationale for engaging in open innovation activities within ESS and, to a lesser extent, investigating internal barriers encountered by firms in such actions and their significance.

So far, structural studies have been conducted in this area, examining the statistical significance of the relationship between external knowledge sources and productivity measures of the studied entities, demonstrating the existence of a positive relationship between R&D expenditures and the growth of total factor productivity (Truskolaski, 2014; Welfe, 2007). However, these studies mainly focused on the diffusion of technical knowledge, which, in the context of ESS, represents only a fraction of the entire spectrum of knowledge flowing between entities. Furthermore, these studies generalized the obtained benefits to the overall efficiency of the entire firm, rather than solely focusing on the system processing employee ideas.

Since ESS are complex and multifaceted systems, they are susceptible to the influence of various internal and external factors. The literature has described at least 50 key organizational-functional factors that impact the outcomes achieved by ESS (Suchsland, 2021; Gerlach, Brem, 2017; Santos et al., 2017; Lasrado et al., 2017). Based on the literature review, it can be concluded that some of these factors have statistically significant and positive effects on both non-financial and financial benefits obtained from ESS (Suchsland, 2021; Lasrado et al., 2016). There is consensus that one of these key factors is the level of managerial support

provided to employees regarding their participation in ESS (Schat, 2017a; Schat, 2017b; Neagoe, Klein, 2009). Therefore, it justifies examining the statistical significance of the moderating effect of this factor on the relationships between the intensity of knowledge diffusion and financial benefits, as well as investigating the impact of other factors on financial benefits (financial performance) of the system.

Figure 1 depicts the conceptual framework and thematic areas addressed in this thesis, as well as the schematic connections between them.

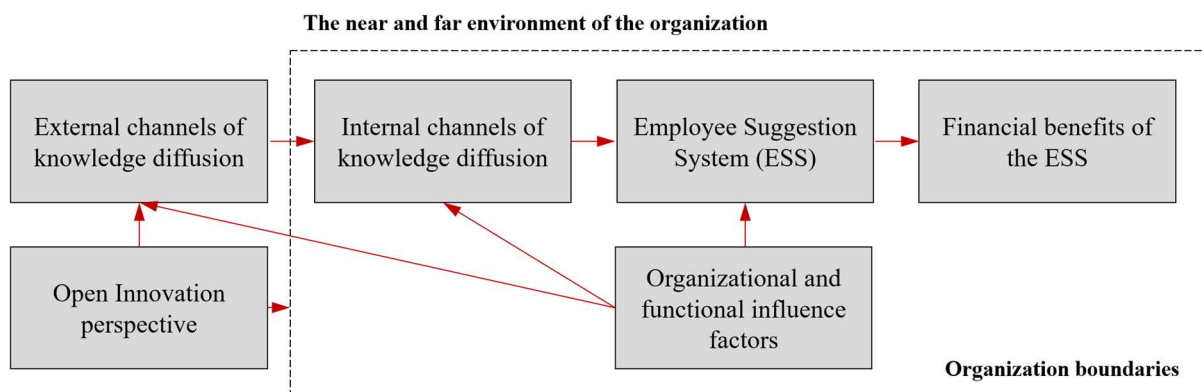


Figure 1. Conceptual framework and areas addressed in the thesis.

The considerations presented above allow to identify a **research gap as incomplete knowledge regarding the direction and strength of the impact of knowledge diffusion intensity in ESS on the financial benefits obtained from these systems under the moderating influence of selected internal organizational-functional factors of ESS**. Thus, this gap pertains to incomplete knowledge about designing economically efficient suggestion processing systems in terms of directed knowledge diffusion.

Research Objectives, Research Questions, and Hypotheses

Considering the aforementioned rationale for choosing the topic, **the main objective of this study is to identify the impact of knowledge diffusion intensity within ESS on the financial benefits derived from these systems**. This influence should be examined in relation to the type of knowledge diffusion channel and its scope in terms of openness to collaboration with the environment through the application of open innovation perspective. Additionally, the study aims to investigate the influence of a managerial support indicator, which operationalizes the scale of support provided to employees. **Consequently, this research will identify the premises for designing economically efficient management systems for employee ideas, based on the concept of open innovation.**

The broad subject scope and complex nature of employee suggestion systems lead to the establishment of specific research objectives:

1. Cognitive research objectives:

CO1: Identification of internal determinants of ESS functioning in organizations in terms of their goals and measures of achieved benefits.

CO2: Development of cognitive frameworks for organizational-functional factors of ESS that influence the benefits obtained from ESS.

CO3: Identification of types and scopes of knowledge diffusion channels employed by organizations within ESS, based on the scale of their environment.

CO4: Identification of internal developmental barriers of ESS in the context of extending knowledge diffusion channels to external entities.

CO5: Identification of potentials and developmental preferences of organizations that influence the adoption of an open innovation approach within ESS (e.g., *inside-out* and *outside-in* approach).

2. Methodological objective:

MO: Development of a conceptual model of ESS incorporating solutions characteristic of the open innovation approach and encompassing bilateral knowledge diffusion from internal and external sources.

3. Empirical objective:

EO: Quantitative verification of a model examining the impact of knowledge diffusion channel utilization intensity on the financial benefits achieved from ESS, with the moderating influence of internal organizational-functional factors.

4. Utilitarian objectives:

UO1: Formulation of conclusions and recommendations for business practice, enabling the design and operation of economically efficient ESS aimed at both broad employee engagement in the system and the attainment of financial benefits for enterprises, through the enhancement of the quality of submitted suggestions via effective utilization of knowledge diffusion channels in an environment-open system.

UO2: Formulation of recommendations for the development and improvement of ESS towards extensive collaboration with the business-scientific environment, employing an open innovation approach.

The accomplishment of the defined objectives required conducting research and analyses to address the following eight research questions:

RQ1: What ESS organizational model dominates among manufacturing enterprises (Japanese approach, American approach)?

RQ2: What financial and non-financial measures of benefits achieved from ESS are most utilized in manufacturing enterprises?

RQ3: Which knowledge diffusion channels for ESS are most intensively used by manufacturing enterprises in terms of internal and external diffusion?

RQ4: What is the impact of knowledge diffusion intensity in specific channels on the financial benefits obtained from ESS?

RQ5: What is the moderating effect of managerial support for employees in the context of ESS on the relationship between financial benefits derived from the system and the intensity of knowledge diffusion in specific channels?

RQ6: What is the influence of selected internal organizational-functional factors of ESS on the financial benefits obtained from the system?

RQ7: Which internal developmental barriers are most significant in manufacturing enterprises regarding the extension of bidirectional knowledge diffusion channels with external entities?

RQ8: What forms of collaboration with external entities within open innovation practices adapted to ESS are preferred by manufacturing enterprises?

Additionally, the study formulated 13 research hypotheses (in relation to research questions RQ1, RQ4, RQ5, and RQ6) that were verified in the conducted empirical research. Confirmation was obtained for 10 out of 13 hypotheses proposed, while 3 hypotheses were rejected.

Research Procedure

The research was divided into three main parts, as shown in Table 1. The first phase, the theoretical-conceptual phase, was dedicated to literature studies to identify and refine the

research gap and formulate the research problem. The critical analysis of the literature in the field of innovation and employee idea management was complemented by the author's participant observations. These prepared assumptions were subjected to preliminary investigations to confirm the significance of the research topic. This, in turn, enabled the formulation and refinement of research questions and the formulation of hypotheses for verification through quantitative empirical research.

Table.1. Three phases of the research procedure

1	<p>Theoretical and conceptual phase</p> <p>Critical literature analysis to identify the research gap Determination of the main research objective and specific goals Preliminary research on a group of 26 companies to confirm the relevance of the research topic Formulation of research questions and hypotheses Outline of the conceptual model of the SSP, incorporating the perspective of open innovation Development of a research model for hypothesis testing and its operationalization.</p>
2	<p>Empirical research phase</p> <p>Preparation of a procedure for conducting quantitative empirical research Development of a research tool in the form of a custom-designed questionnaire Two-layered sampling of an ideal research sample and purposive sampling based on screening criteria Conducting research in the form of standardized direct interviews with a questionnaire Statistical analysis and evaluation of research results.</p>
3	<p>Utilitarian phase</p> <p>Preparation of conclusions from empirical research Identification of recommendations for designing economically efficient SSP using knowledge diffusion channels Development of premises for industrial practice Determination of directions for further exploration.</p>

The empirical research was conducted in the second phase. Standardized direct interviews using a custom-designed questionnaire allowed for the collection of empirical data, followed by data analysis using appropriate statistical tools. The third phase of the procedure was the utilitarian part, in which the premises for designing economically efficient ESS were determined, supported by an open innovation approach. Conclusions from complementary research were gathered to fill the cognitive gap, and directions for further exploration and managerial implications for industrial practice were identified.

Empirical research, methodology, and research tools

To quantitatively verify the research hypotheses, own empirical research was conducted. The method used to obtain empirical data was a diagnostic survey using direct interviews with a questionnaire, conducted according to a predetermined research scenario. The research tool was a questionnaire designed specifically for this purpose by the author.

The research was carried out on a purposively selected sample of 74 manufacturing companies operating in Poland. The sample selection was conducted in a two-stage process. In

the first stage, each of the selected companies had to meet six criteria for selection into the research sample, which served as qualifying criteria. These criteria included factors such as the presence of an active ESS, organizational affiliation to the private sector, and minimum company age. It was also assumed that the study would include both Polish and foreign companies, with each of the surveyed organizations being part of a larger entity in the form of a holding, a group of companies, or branches of the same owner, or being a part of an international corporation. In the second stage, care was taken to ensure that the research sample corresponded quantitatively to the general population of manufacturing companies in terms of two characteristics: the spatial distribution of the sample and the type of manufacturing activity. Based on the above, a preselection of 102 companies was made, from which empirical data was collected from 78 companies during the conducted research. The response rate achieved was 76.5%. Then, based on the criterion of data completeness, the data from 74 companies from this sample were further analyzed and subjected to inference.

Each organization was represented by its employee - the respondent, selected for the study using four screening criteria. The empirical research was conducted from October 2021 to May 2022.

The structure of the dissertation

The theoretical-empirical nature of the dissertation is reflected in its structure, which is linked to the achievement of the research objectives, and a division of the scientific work content into two parts was applied. The first part includes theoretical considerations (presented in chapters 1 to 3), based on a critical analysis of the literature. The second part presents the model and research procedures, formulated hypotheses, as well as the results of the empirical research and the conclusions drawn based on them (presented in chapters 4 to 6).

The first chapter of the dissertation presents market conditions, the genesis, and the scope of significance of ESS, referring to various concepts, trends, and approaches in the field of idea management systems. Based on a critical literature review and proposed contemporary definitions of ESS, a working definition of the system was formulated for further research, placing it within the stream of systems supporting pro-innovative employee initiatives. The meaning of the suggestion system was also expanded to an active idea management system, involving processes and tools for ideation and inspiring employees to submit suggestions. For research purposes, the scope of meaning of employee suggestions was proposed, specifying

distinguishing criteria while using synonymous terms such as improvement idea or employee idea, with the inclusion of external sources of suggestions in ESS beyond a single organization.

The second chapter of the thesis discusses the phenomenon of diverse goals set for ESS in organizations, followed by a description of the difficulties in constructing an adequate measurement framework for the effectiveness and efficiency of these systems. In this context, a review of the most used metrics in industrial practice was conducted, highlighting those whose measurement allows for further operationalization of the research model and the adoption of relevant explanatory variables encompassing two aspects: quantitative and qualitative, in the context of employee-submitted improvement suggestions and their impact on financial benefits. The perspective of the balanced scorecard for four-dimensional, strategic, and operational management of suggestion systems is also presented. This served as the basis for further discussion on the effectiveness of ESS, incorporating concepts found in the literature, ranging from the praxeology school to transaction cost theory. Building on the latter, the theoretical construct of total costs in suggestion systems, along with four possible strategies for increasing the economic efficiency of ESS and the resulting conclusions, is presented in the subsequent section of the second chapter. The remaining part of the second chapter contains the results of a critical literature review on internal organizational-functional factors influencing the performance outcomes of ESS.

The third chapter of the thesis is dedicated to aspects related to the process of generating improvement ideas within ESS, as well as the sources and methods of internal and external exchange of impulses for organizational development in the form of ideas, concepts, knowledge, or materials. The chapter distinguishes methods based on employee inspiration, interaction, and empirical experiences in the work environment during the emergence of suggestions. The particular importance of knowledge diffusion from internal and external sources in this process is highlighted as a stimulus for the leverage effect in creating organizational value through the conversion of tacit knowledge into explicit knowledge. Definitions and systematics of knowledge diffusion are presented, along with its four main subprocesses, and the most commonly occurring types of diffusion channels in enterprises are described along with a discussion on them.

The subsequent part of the chapter covers the concepts related to open innovation, the three forms of collaboration between market entities in this approach, and a discussion on the barriers faced by enterprises in this context, as well as the possibilities of adapting open innovation solutions to ESS. Against this background, a proposal for the classification of ESS

is presented, which is further used in the own research, in terms of the scope of knowledge diffusion.

The fourth chapter of the thesis is a methodological part. It is devoted to the description and operationalization of the research model, as well as the characteristics of quantitative research methods. The theoretically formulated constructs and their interrelationships in the form of research hypotheses are discussed in detail, along with lists of simple and composite variables used in the research model. The methodological foundations of the study and its geographical scope are further discussed. The statistical framework used to verify the research hypotheses and the description of the collected data are also presented. The two-stage process of selecting the ideal research sample using six criteria, the limitations associated with the sampling procedure, and the subsequent process of arbitrary sample selection based on qualifying criteria and two quota selection criteria are described. Attention is paid to the spatial distribution of the sample and the type of activity conducted by the surveyed organizations. Subsequently, the characteristics of the surveyed enterprises, the characteristics of the ESS implemented within them, and the characteristics of the respondents selected for the study based on four screening criteria are presented.

In the fifth chapter of the thesis, the empirical research results are collected and interpreted, divided into four main elements. The first element concerns the characteristics of the studied ESS models and the effectiveness measures applied. Attention is drawn to the duality in ESS associated with measuring both financial and non-financial benefits. The second element is related to the impact of the degree of knowledge diffusion channel utilization on the financial benefits obtained from ESS, with a division based on the practices characteristic of the three previously mentioned models of suggestion system operation: closed, open, and partially open. The third element comprises the results of a moderating study on the influence of managerial support on the relationship between knowledge diffusion and financial benefits from ESS, as well as the impact of selected organizational-functional factors. The fourth element includes the results of research on existing barriers to the development of enterprises in terms of applying knowledge diffusion solutions in an open system for ESS, as well as the expected forms of collaboration specific to open innovation approaches. The chapter concludes with a discussion on the limitations of the conducted research.

In the sixth chapter, general and specific conclusions are drawn from the thesis, highlighting managerial implications and indications for economic practice. The premises for further research are discussed, and five potential directions for exploring the topic are outlined.

Based on the gathered conclusions, an enrichment of ESS models is proposed, incorporating the perspective of open innovation aimed at achieving high economic efficiency of the system through the utilization of bidirectional knowledge diffusion channels from internal and external sources. Attention is also drawn to complementing the model with elements of a conducive organizational environment that promotes knowledge processing and the generation of improvement suggestions within organizations.

The thesis includes appendices, which consist of the survey questionnaire (Appendix 1) and the interview scenario (Appendix 2). The work concludes with a compilation of tables and figures used and a bibliography comprising over 300 references from literature in English (58% of the literature), Polish (29%), and German (13%).

Main Research Findings

In the first instance, it was found **that among the examined ESS, systems operating in the American stream predominated** (58.2% of the sample elements, excluding hybrid solutions), which are primarily focused on achieving financial rather than non-financial benefits for the enterprise in which they operate. This finding was consistent with the goals declared by the respondents for the implementation/operation of the ESS, where goals focused on obtaining additional financial benefits or making appropriate cost savings also dominated. A relationship was demonstrated whereby such oriented systems actually allowed for higher financial benefits to be achieved compared to those declared in their organizational form as Japanese systems, oriented towards the long-term development of a culture of continuous improvement and the involvement of employees in the enterprise.

Secondly, the measures used by organizations to assess the performance of ESS were examined. It was found that organizations use up to 14 different performance indicators for their suggestion systems, measuring the financial benefits of the system. The dominant role was played by the measure of financial benefits achieved from the implementation of a given suggestion within a 12-month perspective from the date of solution implementation (used in various forms by 100% of the surveyed entities). Non-financial benefits, on the other hand, were measured using 12 different indicators. In this area, a significant diversity of benefit estimation methodologies in organizations was encountered, as well as the phenomenon of using indicators that do not allow for a proper representation of cause-and-effect relationships. **This provided a basis for adopting the financial benefits obtained from ESS as a common dependent variable**, enabling the rigor of comparability of research results to be met.

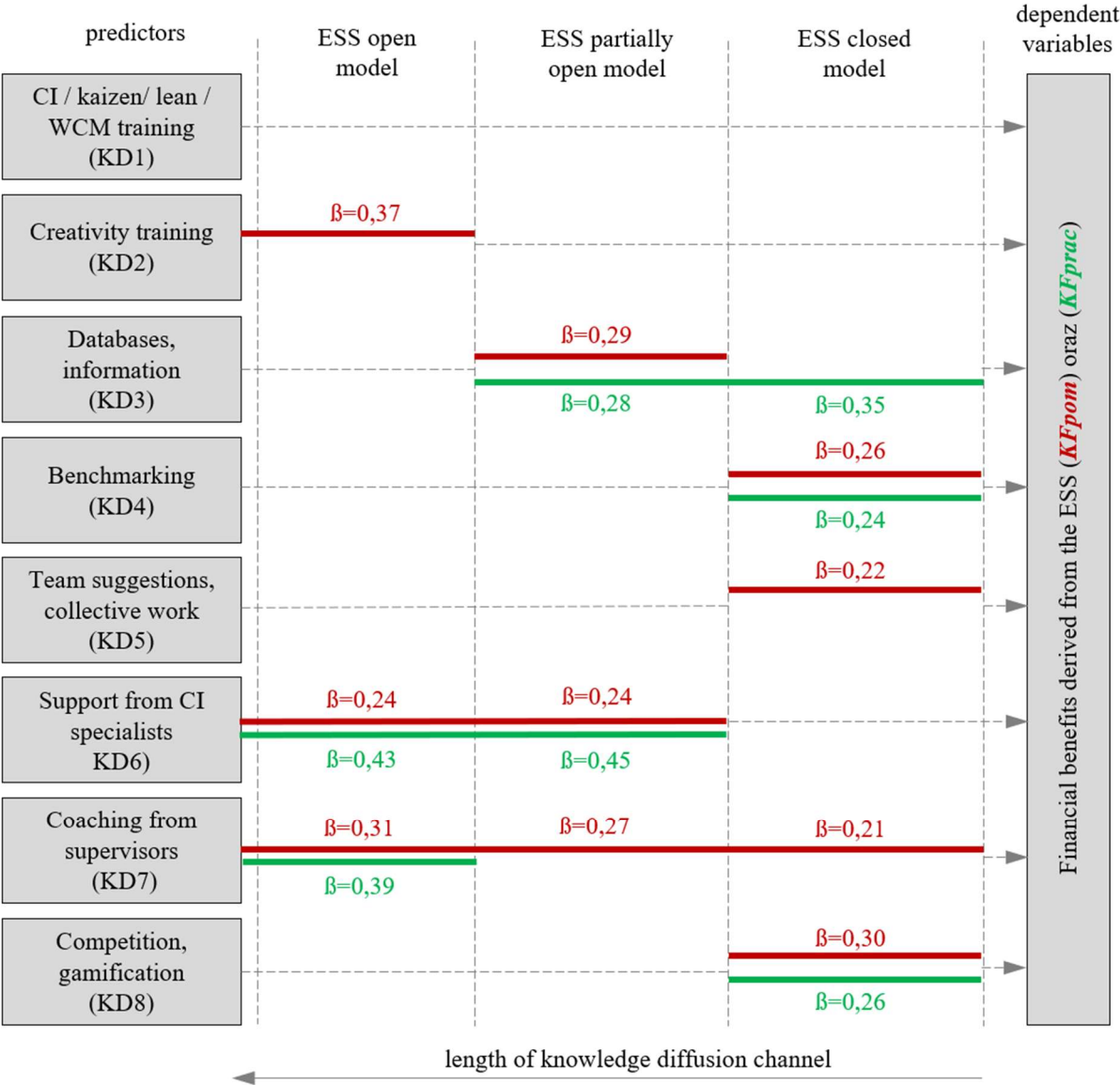
Next, an examination was conducted to determine which knowledge diffusion channels were most intensively used by enterprises in relation to ESS. **The most active organizations utilized all eight distinguished channels of knowledge diffusion in a closed model (with a dominance of seven), and this number decreased as the range of channels increased. The least active companies only used two channels in parallel.** Significant differences in the intensity of channel utilization were also observed between organizations. Considering the described range function of the knowledge diffusion channel, the use of databases and information with access to already implemented improvement solutions dominated among closed ESS, while training and workshops in organizational improvement were used in open ESS. Among partially open ESS, the channel of direct substantive support from specialists in improvement/kaizen/lean management was utilized most intensively. The least popular knowledge diffusion channels included those related to training in creative problem-solving skills and unconventional thinking, as well as engaging in competition and gamification.

In addition, **the positive impact of the intensity of knowledge diffusion channel utilization on the financial benefits obtained from ESS was empirically confirmed**, as shown in Figure 2. In terms of the length of knowledge diffusion channels and the dependent variable type, the following relationships were observed (all positive relationships):

- financial benefits from ESS expressed on an implemented idea: the influence of knowledge diffusion was demonstrated through KD4, KD5, KD7, and KD8 for internal organizational diffusion (closed ESS), KD3, KD6, and KD7 for moderate-scale diffusion in the organization's environment (partially open ESS), as well as through three channels for ESS operating in an open model, namely KD2, KD6, and KD7,
- for financial benefits from ESS expressed per employee: linear regression occurred for knowledge diffusion channels KD3, KD4, and KD8 in the closed ESS model, two diffusion channels KD3 and KD6 (with the highest standardized coefficient value $\beta=0.45$) in the partially open model, and two channels KD6 and KD7 in the model of ESS open to the enterprise's environment.

Only one out of the 8 examined knowledge diffusion channels, namely managerial coaching (KD7), demonstrated an impact on the financial benefits from ESS (KFpom) throughout its entire length, i.e., for each of the 3 suggestion system models. Furthermore, a lack of statistically significant influence of knowledge diffusion through the channel "KD1: training and workshops for employees and management in the continuous improvement field" on the financial benefits from ESS was observed in each of the ESS models. It was also

discovered that there is no statistically significant impact of the diffusion channel KD4 "benchmarking, personal observation of solutions, and direct experience" on financial benefits within the open and partially open models.



β – standardized regression coefficient
 Figure 2. The impact of knowledge diffusion intensity on the financial benefits of ESS

The empirical material also provided evidence that the examined impact of knowledge diffusion channel utilization on the financial benefits derived from **ESS depends on the degree of managerial support provided to employees by their superiors**. Such a positive, statistically significant moderating relationship was observed in the context of moderate and high levels of managerial support coefficient (WWM). The identification of this relationship confirms the assumptions made by researchers in the literature (Gutknecht, Heitmeyer, 2019) and highlights the particular role of management style described as "appreciative and

participatory leadership" in achieving high results from suggestion systems. This style creates conditions for experimentation in process improvement, facilitates the submission and implementation of suggestions, motivates efforts, and fosters an organizational culture conducive to change starting from the lowest level of superiors.

Based on the research, statistically significant interactions of selected internal organizational-functional factors of ESS on the obtained financial benefits were also established. **This group includes 4 out of the previously identified 7 predictors:**

- The positive impact of using financial motivators in two forms: (1) monetary rewards based on the value of savings (additional income) generated by the implemented suggestion and (2) a fixed or calculated amount for each implemented improvement idea.
- The positive impact of non-financial motivators in the form of: (1) publication of news about the best implementations and individuals submitting selected suggestions on the organization's social media, (2) descriptions in company periodicals, and (3) public and official congratulations from superiors in an appropriate forum.
- The implementation of goals for superiors in the context of their subordinates' participation in ESS, defined as the number of suggestions required in a settlement period or a specified level of participation to be achieved by the entire team.
- Increasing the level of employee participation, which research shows positively translates into the level of financial benefits from ESS. However, exceeding the approximate level of participation of 50-55% reduces the value of the dependent variable in terms of financial benefits per employee.

Part of the research also included an analysis of the significance of barriers to extending knowledge diffusion channels towards cooperation with external organizations and thus a broader application of open innovation concepts. **Two out of the 9 identified barriers were found to be the most significant:** (1) the lack of legal regulations regarding potential cooperation with external entities and (2) concerns about disclosing trade secrets or proprietary technologies. At the same time, the surveyed organizations identified the preferred form of collaboration in two-way external knowledge diffusion, **emphasizing the overwhelming interest in the exploratory role (outside-in innovation), which allows them to play the role of recipients of ready-made ideas**, improvements, materials for employees, technologies, photos, or sketches with solutions (100% of interested entities with the highest rank $M = 2.68$

on a scale of 0 to 3). The least interesting role was defined as collaboration in the development of solutions (mixed innovation, co-creation).

As a result of the undertaken efforts and research activities, recommendations and implications for management theory and managerial practice were formulated. Within this framework, a series of conclusions were proposed for researchers of employee innovation management systems, as well as for managers of companies aiming to improve or implement their own ESS based on elements of the open innovation approach.

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