UDC 005.8:005.591
JEL Classification: O32, M11, M15
https://doi.org/10.31891/dsim-2026-13(28)

# APPLYING DESIGN THINKING TO DRIVE INNOVATION IN PROJECT MANAGEMENT

**REKUNENKO Ihor**
Dr.Sc. (Economics), Professor, Head of Oleg Balatskyi Department of Management
https://orcid.org/0000-0002-1558-629X
e-mail: i.rekunenko@biem.sumdu.edu.ua
**MATVIEIEVA Yuliia**
PhD, Associate Professor, Senior Lecturer at the Oleg Balatskyi Department of Management
https://orcid.org/0000-0002-3082-5551
e-mail: y.matvieieva@management.sumdu.edu.ua
**BOHDAN Eduard**
Sumy State University
https://orcid.org/0009-0001-3912-9018
e-mail: e.bohdan@student.sumdu.edu.ua

*The article explores the application of design thinking as a contemporary tool for stimulating innovation in project management under conditions of increasing uncertainty and environmental dynamics. The study analyzes recent scientific approaches to integrating design thinking with classical project management methodologies and substantiates its role as a human-centered, iterative, and creativity-driven approach to managerial decision-making. A significant methodological gap is identified, namely the lack of quantitative tools for assessing the innovativeness of ideas generated through design thinking practices. To address this gap, the article proposes a conceptual framework for an original Innovation Idea Index based on key dimensions such as novelty, feasibility, value creation, user-centeredness, and scalability. The use of a standardized 10-point evaluation scale is justified, along with the application of cluster analysis to classify and interpret project ideas. The practical significance of the research lies in establishing a foundation for the development of an applied digital solution—an Innovation Idea Calculator—which can be used in project management practice, innovation workshops, and educational environments to support evidence-based decision-making.*

*Keywords: design thinking, project management, innovation, innovation index, idea evaluation, cluster analysis.*

# ЗАСТОСУВАННЯ ДИЗАЙН-МИСЛЕННЯ ДЛЯ СТИМУЛЮВАННЯ ІННОВАЦІЙ В УПРАВЛІННІ ПРОЄКТАМИ

**РЕКУНЕНКО Ігор, МАТВЄЄВА Юлія, БОГДАН Едуард**
Сумський державний університет

*У статті досліджено застосування дизайн-мислення як сучасного інструменту стимулювання інновацій в управлінні проєктами в умовах зростаючої невизначеності, турбулентності та динамічності зовнішнього середовища. Акцентовано увагу на тому, що традиційні підходи до управління проєктами часто орієнтовані на жорстке планування, тоді як дизайн-мислення забезпечує гнучкість, емпатійність та орієнтацію на потреби користувача, що особливо важливо в умовах цифрової трансформації та швидких змін. Проаналізовано сучасні наукові підходи до інтеграції дизайн-мислення з класичними методологіями управління проєктами (PMBOK, Agile, Scrum) та визначено його роль як людиноорієнтованого, ітеративного й креативного інструменту прийняття управлінських рішень і генерації інноваційних ідей.*

*Виявлено наявний методологічний розрив, що полягає у відсутності уніфікованих кількісних інструментів оцінювання рівня інноваційності ідей, сформованих у процесі дизайн-мислення, що ускладнює їх порівняння, ранжування та відбір для подальшої реалізації. З метою подолання зазначеного розриву запропоновано концептуальну основу авторського Індексу інноваційності ідей, який базується на системі ключових критеріїв: новизна, здійсненність, створення цінності для стейкхолдерів, орієнтація на користувача та масштабованість. Обґрунтовано доцільність використання стандартизованої 10-бальної шкали оцінювання, що забезпечує можливість формалізації експертних суджень, підвищує об'єктивність прийняття управлінських рішень і створює передумови для подальшого статистичного аналізу. Доведено можливість застосування кластерного аналізу для групування проєктних ідей за рівнем інноваційності, що сприяє оптимізації портфеля проєктів та ефективнішому розподілу ресурсів.*

*Практична значущість дослідження полягає у формуванні теоретико-методичного підґрунтя для розроблення прикладного цифрового інструменту — калькулятора інноваційності ідей, який може бути використаний у системах проєктного управління, стартап-екосистемах, освітніх програмах, інкубаторах та корпоративних інноваційних середовищах. Запропонований підхід сприяє підвищенню прозорості відбору ідей, обґрунтованості управлінських рішень та розвитку інноваційного потенціалу організацій.*

*Ключові слова: дизайн-мислення, управління проєктами, інновації, індекс інноваційності, оцінювання ідей, кластерний аналіз.*

Стаття надійшла до редакції / Received 04.01.2026
Прийнята до друку / Accepted 23.01.2026
Опубліковано / Published 29.01.2026

## STATEMENTS OF THE PROBLEM IN GENERAL FORM AND ITS CONNECTION WITH IMPORTANT SIENTIFIC OR PRACTICAL TAKS

In the context of rapid technological development and increasing uncertainty in project environments, organizations face the challenge of generating and selecting innovative solutions that ensure sustainable competitiveness. Traditional project management approaches, while effective for planning and control, often lack instruments for fostering creativity and systematically evaluating innovative ideas.

Design thinking has emerged as a promising methodology that addresses these challenges by integrating user-centered analysis, creative ideation, and iterative solution development into project management processes. However, the practical implementation of design thinking reveals a significant scientific and applied problem related to the absence of structured methodological tools for assessing the innovativeness of ideas generated within this approach.

This problem is closely connected with important scientific tasks, such as the development of methodological frameworks for innovation assessment, and with practical tasks, including the need for transparent, comparable, and operational decision-support tools in project management. Addressing this issue is essential for bridging the gap between creative project practices and evidence-based managerial decision-making.

## ANALYSIS OF THE LASTEST RESEARCH AND PUBLICATIONS

Recent scientific research demonstrates a growing interest in the application of design thinking as an effective tool for stimulating innovation in project management. This trend reflects a shift from traditional, process-oriented project management approaches toward more human-centered, flexible, and creativity-driven methodologies aimed at addressing complex and uncertain project environments [1].

A significant body of research focuses on the conceptual foundations of design thinking as an innovation-driven approach. Rösch et al. emphasize that design thinking enables organizations to systematically integrate user needs, iterative experimentation, and interdisciplinary collaboration into innovation processes, which is particularly relevant for project-based activities characterized by uncertainty and dynamic stakeholder expectations [2].

Several studies published in Scopus-indexed journals highlight the quantitative and empirical assessment of design thinking practices in innovation projects. Dell'Era et al. provide evidence that design thinking contributes positively to project outcomes by enhancing idea generation, problem framing, and learning through prototyping, especially in highly innovative and exploratory projects [3]. These findings support the view that design thinking complements traditional project management methodologies rather than replacing them.

Another important research direction concerns organizational and team-related factors influencing the effectiveness of design thinking in project management. Loderer and Kock argue that organizational climate, team autonomy, and psychological safety significantly foster the successful adoption of design thinking practices, ultimately leading to higher project performance and innovation success [4]. This underscores the managerial dimension of design thinking implementation.

The integration of design thinking into classical project management frameworks is also widely discussed in the literature. El Khatib and Alawadhi note that conventional project management tools often lack flexibility in addressing ambiguous user requirements, whereas design thinking introduces adaptive mechanisms that improve decision-making quality and stakeholder engagement throughout the project lifecycle [5].

Applied research further confirms the practical value of design thinking across various industries. Carvalho et al. analyze the use of design thinking as an innovation tool in project management within the metallurgical sector, demonstrating that the methodology enhances collaborative problem-solving and supports the development of innovative project solutions even in traditionally conservative industries [6].

In addition, bibliometric and systematic literature reviews reveal that design thinking contributes to organizational innovation by strengthening user orientation, promoting cross-functional cooperation, and enabling iterative learning processes in project environments [7]. These studies indicate that design thinking has evolved into a multidisciplinary research field at the intersection of innovation management, organizational behavior, and project management.

Attention is also given to the role of competencies and team formation in design thinking–based project environments. Blyznyukova highlights the importance of creative team development and adaptive leadership in IT projects, where design thinking supports flexibility, experimentation, and continuous improvement [8].

Moreover, recent publications emphasize the human-centered nature of design thinking as a key factor in managing complex projects. Researchers argue that design thinking "humanizes" project management by prioritizing empathy, communication, and stakeholder collaboration, which is especially critical in projects with high social and organizational complexity [9].

Overall, the analysis of recent research indicates that design thinking is increasingly recognized as a powerful methodological approach for stimulating innovation in project management. However, despite extensive theoretical and empirical contributions, there remains a need for developing practical tools and quantitative assessment methods that support managerial decision-making during the ideation and innovation stages of projects [10]. This gap justifies further research into integrated models and indices for evaluating innovative ideas within design thinking–oriented project management systems.

## ISOLATION OF PREVIOUSLY UNRESOLVED PARTS OF THE GENERAL PROBLEM, TH WHICH THE ARTICLE IS DEDICATED

The analysis of existing scientific research indicates that design thinking is widely recognized as an effective approach for fostering creativity and innovation in project management. However, despite extensive theoretical justification and numerous practical case studies, several aspects of the general problem remain insufficiently explored.

First, most existing studies focus predominantly on qualitative evaluation of design thinking outcomes, while offering limited methodological tools for the quantitative assessment of innovative ideas generated during project ideation stages. This creates difficulties in objective comparison, prioritization, and selection of ideas within project constraints.

Second, current research lacks unified and standardized indicators that would allow project managers to systematically measure the level of innovativeness of project ideas in a transparent and comparable manner. As a result, decision-making processes often rely on subjective judgments rather than structured analytical models.

Third, the integration of innovation assessment tools with digital solutions remains underdeveloped. There is a noticeable absence of applied software instruments that could operationalize innovation evaluation within design thinking–oriented project management processes.

Therefore, the unresolved aspects identified in this study justify the need for developing an original Innovation Idea Index and a corresponding digital calculator, which together aim to bridge the gap between creative ideation and quantitative project evaluation.

## FORMULATION OF THE PURPOSES OF THE ARTICLE

The objective of this article is to substantiate the application of design thinking as an effective tool for stimulating innovation in project management and to develop a methodological framework for the quantitative assessment of innovative project ideas. And to conduct a methodological analysis of the application of design thinking in project management as a basis for the subsequent development of an applied product aimed at assessing the innovativeness of project ideas.

## PRESENTATION OF THE MAIN MATERIAL

Design thinking has increasingly been recognized as an effective methodological framework for stimulating innovation in project management due to its human-centered nature, iterative logic, and focus on creative problem-solving. In contemporary project environments characterized by uncertainty, complexity, and rapid change, traditional linear project management approaches often fail to generate innovative solutions. As emphasized in recent studies, the integration of design thinking into project management enables teams to better identify stakeholder needs, reframe project problems, and develop value-oriented solutions [1–3].

The core advantage of design thinking lies in its structured yet flexible process, typically consisting of the stages of empathizing, problem definition, ideation, prototyping, and testing. Researchers highlight that this approach supports not only creativity but also systematic decision-making within project teams [4]. In the context of project management, design thinking functions as a complementary instrument that enhances classical methodologies such as PMBOK or PRINCE2 by embedding innovation-oriented practices into project life cycles [5].

Recent empirical studies confirm that projects applying design thinking principles demonstrate higher levels of innovation performance, stakeholder satisfaction, and adaptability to environmental changes [6]. Moreover, design thinking has been increasingly used in education and professional training of project managers, contributing to the development of creative, analytical, and collaborative competencies [7]. These findings indicate that design thinking should be considered not only as a creative technique but as a strategic management tool for innovation-driven projects.

Despite the growing body of research on design thinking and innovation, a significant methodological gap remains in the quantitative assessment of innovative project ideas generated through this approach. Most studies focus on qualitative outcomes, while practical project environments require measurable indicators to support managerial decision-making [8]. To address this gap, this study proposes a structured methodology for evaluating the innovativeness of project ideas through the development of an Innovation Index.

The Innovation Index is designed as a composite indicator that integrates multiple dimensions of innovation relevant to project management. Each dimension reflects a key aspect of innovative potential and is assessed using a standardized 10-point scale, where 1 indicates a very low level and 10 indicates a very high level of the corresponding characteristic. This approach ensures both flexibility and comparability of results across different project ideas.

Based on the analysis of existing research [2; 4; 6; 9], the following core dimensions of innovation are proposed:

– **Novelty** – the degree to which an idea introduces new or original solutions compared to existing practices;

– **Feasibility** – the technical and organizational possibility of implementing the idea within real project constraints;

– **Value Creation** – the potential of the idea to generate economic, social, or strategic value for stakeholders;

– **User-Centeredness** – the extent to which the idea reflects stakeholder needs identified through empathic research;

– **Scalability** – the potential for further development, replication, or expansion of the idea.

A preliminary structure of the Innovation Index and its indicators is presented in Table 1.

**Table 1**

Core Indicators of the Innovation Index for Project Ideas

| Indicator | Description | Scale |
|---|---|---|
| Novelty | Originality and uniqueness of the proposed solution | 1–10 |
| Feasibility | Practical applicability within project constraints | 1–10 |
| Value Creation | Expected value for stakeholders | 1–10 |
| User-Centeredness | Alignment with user needs identified through design thinking | 1–10 |
| Scalability | Potential for growth and replication | 1–10 |

Source: author's development based on [2; 6; 9].

The integrated Innovation Index is calculated as a weighted or unweighted aggregate of these indicators, depending on project priorities and strategic objectives. Such flexibility allows project managers to adapt the assessment model to specific industries, organizational contexts, or innovation strategies [5].

The proposed Innovation Index is conceptually embedded within the design thinking process. Evaluation is conducted at the ideation and prototyping stages, where multiple project ideas are generated and require systematic comparison. By quantifying innovation-related characteristics, project teams can reduce subjectivity in idea selection while preserving creative freedom [3].

Figure 1 illustrates the conceptual relationship between design thinking stages and the innovation assessment process.

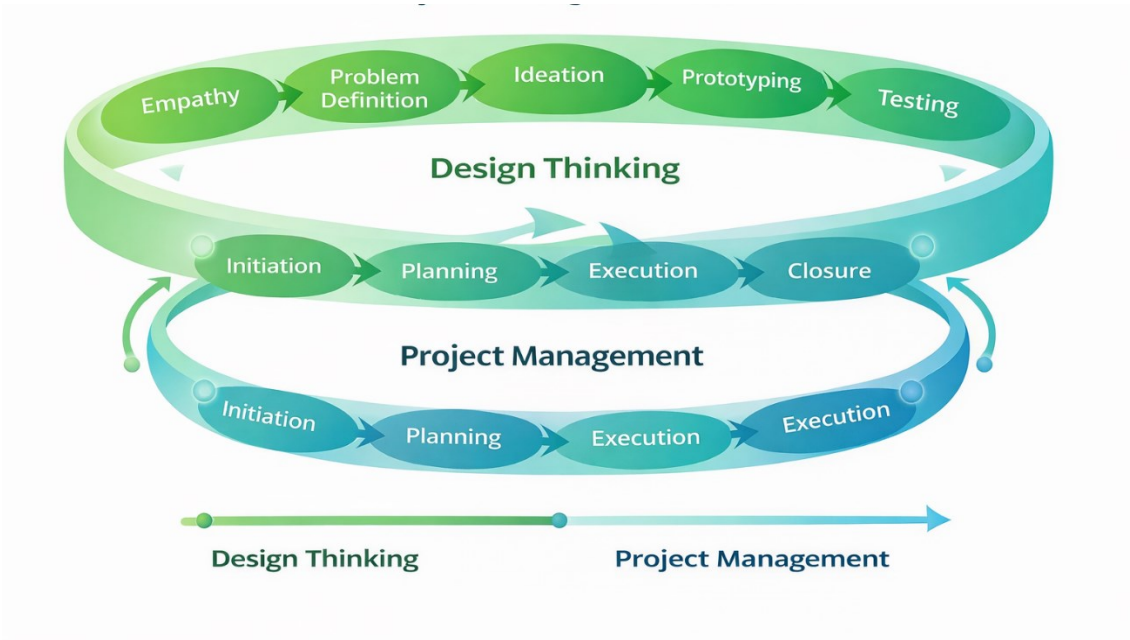


**Fig. 1. Integration of Design Thinking Stages and Innovation Index Assessment**

Source: author's development

The application of the Innovation Index enables project managers to prioritize ideas with the highest innovation potential and align project portfolios with organizational innovation strategies. Additionally, repeated assessments during iterative design thinking cycles support continuous improvement and refinement of project concepts [6; 10].

To enhance analytical depth, this study also предусматриває the use of cluster analysis as a supplementary method for interpreting the results of innovation assessment. Based on Innovation Index values and individual indicator scores, project ideas can be grouped into homogeneous clusters, such as highly innovative but low-feasibility ideas, balanced innovation concepts, or incremental improvement solutions.

Cluster analysis allows for the visualization of innovation landscapes and supports strategic decision-making regarding resource allocation, risk management, and portfolio diversification [8; 9]. At a subsequent stage of the research, clustering results will be visualized using specialized analytical software (viewer), enabling deeper interpretation of innovation patterns within project idea sets.

Thus, the methodological framework proposed in this study establishes a logical transition from qualitative design thinking practices to quantitative evaluation of innovative outcomes, creating a robust basis for calculating an Innovation Index of project ideas and further analytical procedures.

To deepen the analytical interpretation of the proposed Innovation Index and to contextualize it within existing research trends, a cluster analysis of scientific publications indexed in Scopus was conducted. The cluster visualization (Figure 2) reflects the intellectual structure of research on design thinking, innovation, and project management, revealing dominant thematic groups and their interconnections.

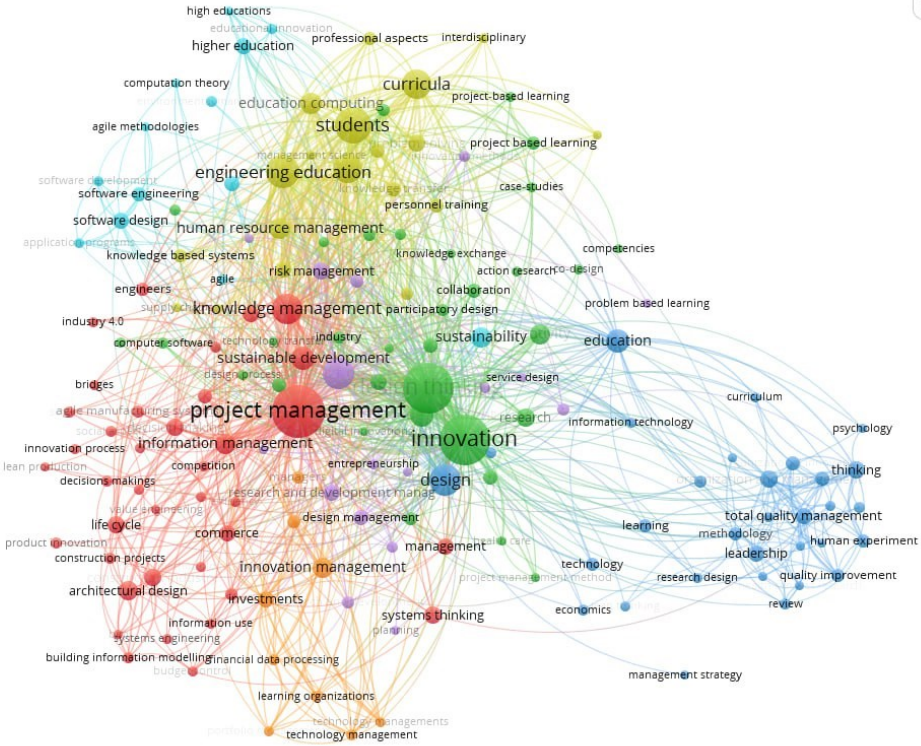


**Fig. 2. Cluster visualization of research domains related to design thinking, innovation, and project management**
Source: built by the authors based on VOSviewer (version 1.6.20), based on Scopus database data [11]

The cluster map demonstrates a dense network centered around the concepts of *project management*, *innovation*, and *design*, which form the core of the research field. Around this core, several distinct yet interconnected clusters can be identified, each representing a specific research focus.

The largest and most central cluster (green) is dominated by the terms “innovation,” “design,” and “project management.” This cluster represents the integrative research stream that combines innovation management with design-oriented approaches in project-based environments. The high density and central position of this cluster indicate that innovation assessment and design-driven management constitute the theoretical foundation of the field.

A second significant cluster (red) is associated with information management, decision-making, innovation processes, and life cycle management. This cluster reflects a managerial and process-oriented perspective, emphasizing structured decision-making, system engineering, and data-driven project control. These studies provide methodological support for formalized evaluation tools, such as composite innovation indices.

The blue cluster focuses on education, learning, thinking, quality management, and methodology, highlighting the pedagogical dimension of design thinking and project management. This research stream underlines the growing role of design thinking in management education and competency development, supporting the applicability of simplified yet robust innovation assessment models in educational settings.

The yellow cluster is primarily related to students, curricula, engineering education, and project-based learning. This cluster emphasizes experiential learning environments where design thinking is applied as a practical tool for innovation generation. The presence of this cluster justifies the use of a 10-point evaluation scale and transparent indicators suitable for academic and training contexts.

Finally, the orange and purple peripheral clusters address technology management, sustainability, system thinking, and organizational learning. These clusters indicate emerging research directions that link innovation with long-term development goals and systemic project impacts, reinforcing the need for scalable and adaptable innovation assessment frameworks.

The results of the cluster analysis provide empirical justification for the structure of the proposed Innovation Index. Each identified cluster corresponds to one or more dimensions of the index, confirming its conceptual validity and relevance to contemporary research trends.

Table 2

**Correspondence between research clusters and Innovation Index dimensions**

| Research Cluster (Figure 2) | Key Concepts | Corresponding Innovation Index Dimensions |
|---|---|---|
| Core innovation–design–project management cluster | Innovation, design, project management | Novelty, Value Creation |
| Information and decision-making cluster | Information management, decision-making, processes | Feasibility |
| Education and learning cluster | Education, learning, thinking | User-Centeredness |
| Project-based learning and curricula cluster | Students, curricula, engineering education | User-Centeredness, Feasibility |
| Sustainability and systems cluster | Sustainability, system thinking, technology management | Scalability |

Source: author's development.

The integration of cluster analysis into the methodological framework enhances the analytical robustness of the study. By positioning the Innovation Index within established research domains, the study ensures theoretical consistency and methodological relevance. In subsequent stages, cluster-based grouping of evaluated project ideas will allow the identification of dominant innovation patterns, comparison between idea types, and validation of the proposed index through empirical data.

Thus, the cluster analysis not only complements the Innovation Index methodology but also serves as a bridge between bibliometric evidence and practical innovation assessment in project management.

## CONCLUSIONS FROM THIS STUDY AND PROSPECTS FOR FURTHER EXPLORATION IN THIS DIRECTION

The conducted research confirms that design thinking is an effective and conceptually justified tool for stimulating innovation in project management. The analysis of recent scientific publications indexed in Scopus demonstrates a stable interdisciplinary convergence of design thinking, innovation management, education, and project-based learning. This convergence substantiates the relevance of applying design-oriented approaches not only for creative ideation but also for systematic decision-making within project environments.

The study has shown that despite the growing popularity of design thinking in project management practice, there remains a significant methodological gap in the quantitative assessment of innovative ideas generated through this approach. Most existing studies emphasize qualitative evaluation, while project managers increasingly require transparent, comparable, and operational metrics to support idea selection and portfolio prioritization. Addressing this gap represents an important scientific and practical challenge.

As a response to this challenge, the research proposes a methodological foundation for the development of an author's original Innovation Idea Index. The index is conceptually grounded in design thinking principles and integrates key dimensions of innovation, including novelty, feasibility, value creation, user-centeredness, and scalability. The use of a standardized 10-point evaluation scale ensures simplicity, flexibility, and applicability across different project contexts, particularly in educational, entrepreneurial, and organizational environments.

The incorporation of cluster analysis further strengthens the methodological contribution of the study. Bibliometric clustering of research domains confirms the structural validity of the proposed innovation dimensions and demonstrates their alignment with dominant scientific trends in project management and innovation studies. This analytical approach creates a solid theoretical basis for the empirical testing and refinement of the Innovation Idea Index.

In terms of practical implications, the results of the study lay the groundwork for the future development of a software application in the form of an Innovation Idea Calculator. Such an application will enable users to evaluate innovative ideas by inputting indicator scores and automatically calculating the Innovation Index. The envisioned tool may be applied in project management practice, startup ecosystems, innovation workshops, and higher education to support evidence-based decision-making and enhance the effectiveness of idea selection processes.

Prospects for further research include the empirical validation of the proposed index using real project data, refinement of weighting coefficients through statistical methods, and the application of advanced clustering techniques to identify innovation patterns across different industries. Additionally, future studies may focus on integrating the Innovation Idea Calculator into digital project management platforms, expanding its analytical capabilities, and assessing its impact on innovation performance and project success.

Thus, the research contributes to both theory and practice by bridging design thinking methodologies with quantitative innovation assessment and by outlining a clear trajectory for the development of an original, applied innovation evaluation tool.

## References


1. Kerzner, H. (2017). *Project management: A systems approach to planning, scheduling, and controlling* (12th ed.). Wiley.
2. Rösch, N., Tiberius, V., & Kraus, S. (2023). Design thinking for innovation: Context factors, process, and outcomes. *European Journal of Innovation Management, 26*(7), 160–176.
3. Dell'Era, C., Magistretti, S., Candi, M., Bianchi, M., Calabretta, G., Stigliani, I., & Verganti, R. (2025). Design thinking in action: A quantitative study of design thinking practices in innovation projects. *Journal of Knowledge Management*.
4. Loderer, M., & Kock, A. (2025). How organisational and team climates foster design thinking for project success. *International Journal of Project Management*.
5. El Khatib, M., & Alawadhi, H. (2024). How design thinking can add value to project management. *International Journal of Business Analytics and Security*.
6. Carvalho, B. R., et al. (2024). Application of design thinking as an innovation tool in project management in the metallurgical sector. *Research, Society and Development*.
7. Santos, J., Silva, A., & Ferreira, J. (2025). Design thinking in business: A bibliometric analysis. *Electronic Journal of Business Research Methods*.
8. Blyznyukova, I. (2023). The method of forming the creative team of IT project. *Bulletin of NTU "KhPI"*.
9. Stjerne, I. S., & Svejvig, P. (2023). Humanising complex projects through design thinking. *International Journal of Project Management*.
10. Verganti, R. (2009). *Design-driven innovation: Changing the rules of competition by radically innovating what things mean*. Harvard Business School Press.
11. Scopus. (n.d.). *Sustainable project management AND leadership*. Retrieved from Scopus database.
12. Scopus. (n.d.). *Design thinking AND project management AND innovation*. Retrieved from https://surl.li/pulsci