

## A Process Model for an Innovative Platform Enabling Industry–Academia Collaboration in the Furniture and Design Sector

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### ABSTRACT

The digital transformation of industry and higher education has increased the need for structured and technology-supported collaboration models facilitating communication, knowledge exchange, and innovation development across sectors. Despite the growing importance of interdisciplinary cooperation in creative and manufacturing industries, existing collaboration frameworks remain primarily oriented toward large enterprises and highly formalized production systems, offering limited applicability for small and medium-sized enterprises (SMEs), family-owned companies, and design-oriented environments. The furniture and design sector continues to face challenges related to fragmented communication, inefficient coordination, prolonged prototyping processes, and insufficient integration between academia and industry.

A conceptual and implementation-oriented process model is proposed for an innovative digital platform supporting collaboration between furniture designers, architects, manufacturers, developers, and higher education institutions. The study adopts a mixed-methods and design science research approach combining literature review, benchmarking analysis, exploratory stakeholder consultations, semi-structured interviews, observations, and iterative framework development.

Preliminary findings identified recurring barriers related to fragmented communication, limited workflow transparency, insufficient access to collaborative networks, and the absence of centralized digital environments supporting interdisciplinary cooperation. In response to these challenges, the proposed framework introduces a scalable process-oriented collaboration ecosystem adapted to the operational realities of SMEs and creative-sector organizations.

The proposed model contributes to research on digitally mediated collaboration and industry–academia integration by supporting communication standardization, knowledge transfer, project-based learning, and collaborative innovation within the furniture and design sector.

**Keywords:** digital collaboration, furniture industry, industry–academia cooperation, process management, project-based learning, SMEs.....

### INTRODUCTION:

The increasing digitalization of contemporary economies has transformed the ways organizations collaborate, exchange knowledge, and develop innovation across sectors. In the furniture and design industry, growing market expectations, individualized customer needs, and shorter product development cycles have intensified the demand for integrated collaboration models connecting designers, manufacturers, educational institutions, and business stakeholders.

At the same time, industry–academia cooperation has become an important component of innovation ecosystems and practice-oriented education. Despite the growing role of digital collaboration, the sector continues to face challenges related to fragmented communication, limited workflow transparency, inconsistent documentation standards, and difficulties in coordinating

interdisciplinary projects. These issues are particularly visible among small and medium-sized enterprises (SMEs) and family-owned manufacturing companies operating without formalized collaboration procedures or integrated digital infrastructures.

Existing collaboration frameworks are primarily designed for large industrial organizations, offering limited applicability for SMEs and creative-sector environments. In response to these challenges, a process-oriented model for an innovative digital platform supporting collaboration between designers, architects, manufacturers, developers, and higher education institutions is proposed.

The study adopts a mixed-methods and design science research approach focused on the development and preliminary validation of a conceptual collaboration framework and prototype platform environment. The proposed model contributes to research on digital collaboration and industry–academia integration by

introducing a scalable framework adapted to the operational realities of SMEs and creative-sector organizations within the furniture and design sector.

## LITERATURE OVERVIEW

The rapid development of digital technologies has significantly transformed collaboration models across creative, industrial, and educational sectors. Increasingly complex product development processes, distributed project teams, and the growing role of interdisciplinary cooperation have intensified the need for digitally supported environments facilitating communication, coordination, and knowledge exchange. In response to these changes, research on digital collaboration, process integration, and innovation ecosystems has expanded considerably in recent years.

One of the key directions in contemporary research concerns the impact of digital technologies on organizational strategy and inter-organizational cooperation. Bharadwaj et al. emphasized that digital business strategies increasingly integrate technological infrastructures with operational and organizational processes, influencing the ways organizations create value and manage collaboration networks (Bharadwaj et al., 2013). Similarly, Chesbrough's (2003) concept of open innovation highlighted the growing importance of external knowledge exchange and collaborative innovation processes involving multiple stakeholders operating across institutional boundaries.

The growing role of digital collaboration has also been observed in project-oriented and manufacturing sectors. Research indicates that digitally integrated communication systems improve coordination efficiency, reduce operational barriers, and support faster implementation of projects and products. Studies conducted by Peng et al. (2014) demonstrated that digital technologies may significantly enhance collaborative product development processes by improving information flow and reducing communication delays between project participants. Likewise, Akinradewo et al. (2023) identified the importance of digital collaboration frameworks in coordinating complex supply-chain interactions and interdisciplinary workflows within construction and manufacturing environments.

At the same time, the literature increasingly emphasizes the role of process-oriented approaches in managing collaborative activities. Process modelling and workflow standardization are considered important mechanisms supporting organizational efficiency, task transparency, and coordination between distributed stakeholders. In the context of innovation-oriented environments, process frameworks are frequently combined with iterative and user-centered development methodologies. Baskerville et al. (2018) underlined that design science research provides an appropriate methodological foundation for developing practical artifacts and process-based solutions that simultaneously contribute to organizational practice and scientific knowledge.

Another important area of research concerns collaboration between academia and industry. The Triple Helix model

proposed by Etzkowitz and Leydesdorff (2000) conceptualized innovation as a result of dynamic interactions between universities, industry, and public institutions. Subsequent studies demonstrated that cooperation between higher education institutions and external organizations may support knowledge transfer, innovation capacity, and practical competency development (Perkmann et al., 2013). In particular, project-based collaboration between universities and companies has become increasingly important in sectors associated with creativity, design, and applied innovation.

Despite the growing number of studies on digital ecosystems and collaborative innovation, the operational realities of SMEs and family-owned enterprises remain underrepresented in existing research. Many digital collaboration frameworks and process management systems are primarily developed for large organizations characterized by advanced technological infrastructures and formalized management structures. As a result, smaller companies operating within creative and manufacturing sectors often face difficulties in implementing integrated collaboration environments adapted to their organizational capabilities and communication practices. Another important research stream focuses on the role of digital platforms in supporting collaboration and innovation processes. Digital platforms enable integration of multiple stakeholders, facilitate real-time communication, and support data-driven decision-making. However, empirical studies suggest that the adoption of such platforms in SMEs is highly uneven and dependent on organizational capabilities, technological readiness, and user competencies. In many cases, smaller enterprises struggle to align platform-based solutions with their existing workflows, resulting in low adoption rates or superficial usage limited to basic communication functions (Nayak et al., 2025; Pan, 2023). Despite the increasing interest in digital collaboration ecosystems, numerous studies indicate that small and medium-sized enterprises (SMEs) face substantial barriers in adopting digital technologies and integrated collaboration platforms. These barriers include limited financial resources, insufficient digital competencies, lack of standardized processes, and organizational resistance to change. As highlighted in recent literature, SMEs often operate with constrained infrastructures and informal communication mechanisms, which significantly restrict their ability to implement advanced digital solutions and to fully participate in complex collaboration networks (Brink & Packmohr, 2023; Krismajayanti et al., 2024). Consequently, digital transformation in SMEs tends to be fragmented and incremental rather than systemic and strategically coordinated.

In addition, relatively limited attention has been devoted to collaboration models simultaneously integrating designers, manufacturers, developers, and higher education institutions within a unified digital environment. Existing studies typically focus on isolated relationships between selected stakeholder groups rather than on comprehensive process-oriented collaboration ecosystems capable of supporting interdisciplinary cooperation across the furniture and design sector.

## RESEARCH GAP AND SCIENTIFIC CONTRIBUTION

Based on an analysis of the subject literature (Krismajayanti et al., 2024; Passos et al., 2023; Perkmann et al., 2013) largely grounded in a systematic literature review, a clear research gap can be identified that justifies the need to conduct studies on a digital business-to-business (B2B) collaboration platform in the furniture sector, with particular emphasis on small and medium-sized enterprises (SMEs) and artisanal firms. The existing body of literature on digital collaboration, process management, and industry–academia cooperation demonstrates the growing importance of integrated communication environments and digitally supported innovation ecosystems. However, current research remains largely concentrated on large-scale industrial organizations, highly formalized production systems, and technologically advanced enterprise environments. Consequently, relatively limited attention has been devoted to the operational realities of small and medium-sized enterprises (SMEs), family-owned manufacturing companies, and creative-sector organizations functioning within fragmented and less standardized collaboration structures (Nayak et al., 2025). The literature emphasizes that small and medium-sized enterprises face numerous barriers in the process of digital transformation, including limited financial resources, low levels of digital competencies, and insufficient organizational readiness, which significantly constrain their ability to implement advanced solutions (Krismajayanti et al., 2024).

Although previous studies have explored digital transformation, collaborative product development, and inter-organizational knowledge exchange, there is still a noticeable lack of process-oriented collaboration models specifically adapted to the furniture and design sector. Despite the existence of studies on digital B2B platforms across various sectors, there is a lack of detailed analyses focusing on their application in the furniture industry, particularly in the context of SMEs and artisanal firms. In the furniture sector, where small and medium-sized enterprises predominate, there is a need to better understand how digital platforms can support collaboration among designers, manufacturers, and other stakeholders. In particular, existing research rarely addresses interdisciplinary cooperation involving designers, architects, manufacturers, developers, and

higher education institutions within a unified digital ecosystem. In this context, the literature points to a lack of sufficient domain-specific knowledge regarding digital B2B tools, including collaboration platforms, particularly among small-scale manufacturers (Zeicher et al., 2023), which indicates the need to develop dedicated B2B collaboration models. Most available frameworks focus on isolated operational relationships rather than on integrated collaborative processes combining creative, educational, and production-oriented activities.

A further limitation identified in the literature concerns the insufficient integration of process management approaches with practical implementation mechanisms supporting communication standardization, project coordination, and knowledge transfer across stakeholder groups. Existing collaboration systems are often technologically complex, resource-intensive, and difficult to implement within SMEs lacking formalized organizational structures or dedicated project management infrastructures. As a result, many smaller entities continue to rely on informal communication practices and fragmented workflows, which may contribute to operational inefficiencies, project delays, and difficulties in coordinating interdisciplinary activities. The literature highlights the potential of collaboration between industry and academia in the context of innovation and product development. However, there is a lack of studies examining how digital B2B platforms can facilitate and intensify this collaboration, particularly in the furniture sector. A research gap is identified regarding the role of universities in digital ecosystems oriented toward SMEs, indicating that their involvement in industrial collaboration platforms is rarely analyzed and often overlooked in B2B models (Wang et al., 2024). Passos et al. (2023) indicate the need for further research on the integration of various ecosystem participants, including higher education institutions, in the context of digital platforms supporting SMEs. Additionally, Wulf et al. (2024) analyze circular economy strategies in the furniture industry, emphasizing the role of digitalization and digital platforms in connecting stakeholders such as manufacturers, service providers, and consumers.

To synthesize the key strands of the literature discussed above and to highlight the main research gaps, Table I presents an overview of major research areas, their contributions, and identified limitations.

**TABLE I : KEY RESEARCH AREAS AND IDENTIFIED GAPS**

Research Area	Key Contributions	Limitations and Gaps
Digital Collaboration	Improved Communication, Coordination, Knowledge Sharing	Focus on Large Organizations
Open Innovation	Emphasis on External Knowledge Exchange	Limited Process Integration
Process Management	Workflow Standardization, Efficiency	Lack of Practical Implementation In SMEs

Industry-Academia Cooperation	Knowledge Transfer, Innovation Development	Limited Integration with Digital Tools
Digital Platforms	Integration of Stakeholders, Real-time Communication	Low Adoption in SMEs, Lack of Customization
SMEs Digital Transformation	Identification of Barriers and Drivers	Lack of Sector-Specific Frameworks

The scientific contribution of this study lies in the development of a process-oriented framework for an innovative digital collaboration platform tailored to the specific characteristics of the furniture and design sector. The proposed model integrates elements of process management, digital collaboration, project-based coordination, and industry-academia cooperation within a unified conceptual structure. Unlike existing solutions primarily designed for large industrial systems, the framework emphasizes flexibility, accessibility, and adaptability to the needs of SMEs and creative-sector organizations.

Furthermore, the study contributes to research on design science and implementation-oriented innovation by combining conceptual process modelling with iterative prototype development and practical validation mechanisms. The proposed framework also extends current discussions concerning industry-academia collaboration by introducing digitally mediated cooperation processes supporting knowledge exchange, educational engagement, and collaborative project implementation within the furniture and design industry.

## RESEARCH ASSUMPTIONS

The research assumptions were developed on the basis of the identified research gap, literature analysis, and preliminary exploratory observations related to collaboration practices in the furniture and design sector. The assumptions refer to the potential impact of a process-oriented digital collaboration model on operational efficiency, project implementation processes, local business development, and industry-academia cooperation. Previous studies indicate that digitally supported collaboration environments may improve organizational coordination, communication quality, and information exchange between project participants. Integrated digital systems supporting workflow management and project coordination can reduce operational inefficiencies and improve collaboration transparency in interdisciplinary environments (Bharadwaj et al., 2013; Peng et al., 2014). In the context of SMEs and creative-sector organizations, where communication processes are frequently fragmented and insufficiently standardized, digitally integrated collaboration mechanisms may significantly improve operational performance.

Based on the literature review and exploratory findings, the following research assumptions were formulated:

*RA1: A digital B2B collaboration model positively influences operational efficiency in the furniture and design sector.*

Research on digital collaboration and integrated project environments also suggests that digitally coordinated workflows may contribute to faster product development and implementation processes. Shared communication systems, centralized project documentation, and improved coordination mechanisms can reduce delays associated with iterative communication and fragmented information exchange (Peng et al., 2014; Baskerville et al., 2018). Consequently, it is assumed that the implementation of a process-oriented collaboration framework may accelerate product development activities.

*RA2: A digital B2B collaboration model contributes to reducing product implementation time in the furniture and design sector.*

Another important issue concerns the role of digital collaboration environments in supporting smaller enterprises and local manufacturing ecosystems. SMEs and family-owned companies frequently experience barriers related to limited access to collaborative networks, project opportunities, and innovation-oriented partnerships. Existing studies emphasize that digital ecosystems may facilitate broader participation in innovation processes and increase access to external knowledge and business opportunities (Gaggiotti et al., 2019; Brennen & Kreiss, 2016). In this context, digitally mediated collaboration may support the diversification of products and services offered by local manufacturing companies.

*RA3: A digital B2B collaboration model supports the development and diversification of local SMEs and craft-based enterprises.*

The literature on industry–academia cooperation additionally highlights the growing importance of collaborative educational ecosystems connecting universities with industry partners (Etzkowitz & Leydesdorff, 2000; Perkmann, 2013). Digital collaboration environments may support project-based learning, practical knowledge exchange, and the integration of students and educators into real-world implementation processes. Such cooperation may strengthen the educational and innovation potential of higher education institutions while simultaneously supporting the operational needs of companies participating in collaborative projects.

*RA4: A digital B2B collaboration model increases the effectiveness of industry–academia cooperation within the furniture and design sector.*

Digitally supported collaboration environments may facilitate communication, knowledge exchange, and project-based learning between students, educators, and industry partners (Perkmann, 2013). In creative and design-oriented sectors, such cooperation may additionally support practical competency development and interdisciplinary innovation processes.

## METHODOLOGY

The study adopts a mixed-methods and design science research approach focused on the development and preliminary validation of a process-oriented collaboration model for the furniture and design sector. The methodological framework combines qualitative and exploratory research methods with implementation-oriented analysis in order to investigate collaboration challenges, organizational needs, and the applicability of digitally supported cooperation mechanisms within interdisciplinary environments.

The first stage of the research process involves a literature review and benchmarking analysis of selected collaboration models applied in creative industries, manufacturing sectors, and industry–academia cooperation initiatives. The analysis focuses on digital collaboration environments, workflow coordination systems, communication management practices, and process-oriented organizational frameworks. Particular attention is devoted to identifying limitations of existing solutions in relation to SMEs and creative-sector organizations. The exploratory stage involved preliminary consultations and qualitative interviews conducted among representatives of SMEs, furniture manufacturers, architects, designers, developers, and academic institutions operating primarily within the Polish furniture and design sector. The stakeholder groups were selected using purposive sampling in order to capture diverse perspectives related to interdisciplinary collaboration and implementation-oriented project environments.

The empirical stage of the research includes semi-structured interviews, observations, exploratory consultations, and qualitative stakeholder analysis conducted among representatives of furniture manufacturers, designers, architects, developers, and higher education institutions. The purpose of the data collection process is to identify communication barriers, workflow inefficiencies, coordination challenges, and organizational factors influencing interdisciplinary collaboration within the furniture and design sector. The qualitative material was analyzed using thematic categorization focused on identifying recurring communication barriers, workflow inefficiencies, and collaboration challenges.

The collected data are used to support the development of a conceptual process-oriented collaboration framework integrating communication structures, workflow coordination mechanisms, and stakeholder interaction models. The study additionally applies an iterative and

user-centered development approach, enabling continuous refinement of the proposed framework based on stakeholder feedback and preliminary evaluation activities.

The methodological process also includes pilot-oriented validation procedures conducted within selected organizational environments. Preliminary evaluation focuses on usability, communication transparency, coordination efficiency, and the perceived applicability of digitally supported collaboration mechanisms. To support future implementation assessment, the study additionally proposes a preliminary KPI-based evaluation structure related to stakeholder engagement, project coordination, workflow efficiency, and collaborative activity within the platform environment.

## PRELIMINARY FINDINGS

The preliminary findings presented in this study are based on exploratory stakeholder consultations, semi-structured interviews, and in-depth qualitative discussions conducted among representatives of the furniture and design sector, including manufacturers, designers, architects, developers, investors, academic institutions, and students. The exploratory stage of the research focused on identifying operational barriers, communication challenges, and organizational limitations affecting interdisciplinary collaboration within the sector.

The collected observations revealed several recurring challenges experienced by furniture manufacturers and SMEs operating within the Polish and European market environment. One of the most frequently identified issues concerned increasing competitive pressure from foreign markets, particularly from non-European manufacturers offering lower production costs and large-scale manufacturing capabilities. Respondents additionally emphasized the growing costs of production, raw materials, logistics, and operational management, which significantly affect the competitiveness of local manufacturers.

Manufacturers also identified difficulties related to establishing direct relationships with architects, developers, and decision-makers responsible for large-scale investments and commercial projects. Many respondents highlighted the high costs associated with participation in trade fairs and industry events, which often constitute one of the few available channels for acquiring new business contacts. At the same time, smaller companies frequently lack sufficient marketing capabilities, digital visibility, and financial resources necessary for conducting large-scale promotional activities supporting local brands in online environments.

Another recurring issue concerned the limited accessibility of formalized cooperation mechanisms between industry and higher education institutions. Manufacturers emphasized the absence of centralized and transparent information regarding opportunities for cooperation with universities, particularly in relation to internships, student projects, practical workshops, and collaborative educational initiatives.

Representatives of the design and architecture sectors identified additional barriers associated with professional

development and project implementation. Respondents frequently reported difficulties in building professional portfolios suitable for large-scale investments and commercial projects. Many designers and architects also indicated limited experience related to scientific, educational, and training-oriented activities, which reduces their opportunities for broader industry–academia engagement.

The interviews additionally revealed recurring problems related to acquiring new clients, establishing long-term business relationships, and finding reliable manufacturing partners capable of supporting customized and individually tailored projects. Designers emphasized the lack of integrated environments connecting creative professionals with verified manufacturers, contractors, and technical consultants able to support project implementation processes.

The exploratory findings also highlighted important challenges affecting universities and students operating within creative and design-oriented educational programmes. Academic representatives indicated difficulties in identifying local companies capable of providing internships, practical workshops, and long-term employment opportunities for students. Limited access to companies offering professional implementation-oriented training and real-world project experience was identified as a significant barrier affecting practice-oriented education.

Students and educators additionally emphasized financial limitations associated with educational activities, including insufficient funding for study visits, material samples, prototyping activities, and industry-oriented workshops. Respondents also observed that existing collaboration opportunities are frequently based on informal personal networks rather than transparent and structured cooperation mechanisms accessible to a broader academic community.

Developers and investors participating in the exploratory consultations identified limitations related to market transparency and access to information concerning local manufacturers and their production capabilities. Respondents reported that many procurement and contractor selection processes remain highly informal, limiting the diversity of incoming offers and reducing opportunities for smaller companies to participate in larger implementation projects.

Across all stakeholder groups, one of the most significant recurring problems concerned the absence of centralized communication structures supporting interdisciplinary cooperation. Respondents emphasized difficulties associated with direct communication between stakeholder groups, inconsistent information exchange, fragmented project documentation, and the absence of standardized collaboration procedures.

Particular attention was devoted to issues related to commission-based cooperation agreements, unclear responsibility structures, and insufficiently formalized arrangements concerning intellectual property rights and project ownership. Many participants reported that collaboration processes are frequently based on verbal

agreements or individually negotiated conditions lacking standardized contractual frameworks.

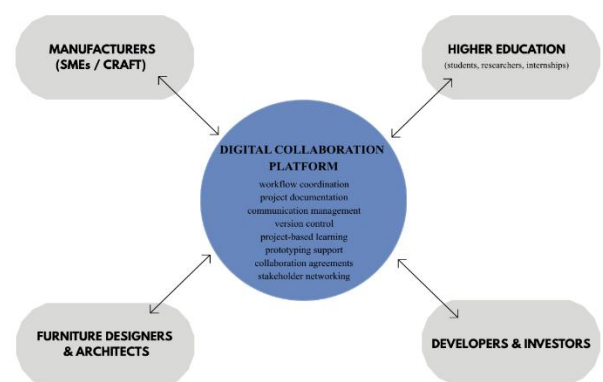
The findings additionally revealed the absence of integrated digital environments enabling efficient management of project documentation, version control, and real-time access to updated technical files and design materials. Stakeholders emphasized that fragmented communication channels frequently contribute to implementation errors, coordination delays, and misunderstandings during project realization processes.

The identified challenges and stakeholder expectations directly informed the development of the proposed process-oriented collaboration framework and supported the conceptualization of a centralized digital platform integrating communication, workflow coordination, project documentation management, and industry–academia cooperation mechanisms within the furniture and design sector.

## CONCEPTUAL FRAMEWORK OF THE PLATFORM MODEL

The proposed conceptual framework is based on a process-oriented approach integrating multiple stakeholder groups operating within the furniture and design sector. The model was designed to support structured collaboration between designers, architects, manufacturers, developers, and higher education institutions through a shared digital environment facilitating communication, workflow coordination, and knowledge exchange.

The framework assumes that effective interdisciplinary cooperation requires clearly defined communication structures, transparent process management, and digitally supported coordination mechanisms. Unlike traditional collaboration models based primarily on informal communication and fragmented project documentation, the proposed solution introduces an integrated collaboration ecosystem enabling stakeholders to participate in shared project environments adapted to their operational roles and responsibilities. The proposed stakeholder ecosystem is presented in Figure 1.



**Fig. 1. Conceptual framework of the process-oriented digital collaboration platform for the furniture and design sector**

The model consists of several interconnected components supporting collaborative project implementation. The first component involves a process-oriented workflow structure defining the sequence of activities, communication channels, decision-making points, and stakeholder responsibilities throughout the design and implementation process. The workflow framework is intended to improve coordination efficiency, reduce communication barriers, and increase transparency within interdisciplinary projects.

The second component concerns the digital collaboration platform itself, designed as a centralized environment supporting project management and communication activities. The platform concept includes dedicated stakeholder panels, project documentation exchange, version control mechanisms, communication tools, material specification systems, scheduling functionalities, and collaborative project coordination modules. The structure of the platform is intended to support both operational flexibility and process standardization within SMEs and creative-sector organizations.

An important element of the framework is the integration of higher education institutions into collaborative project environments. The model enables universities to participate in practical implementation processes through project-based learning activities, workshops, consultations, internships, and collaborative prototyping initiatives. This approach supports knowledge transfer between academia and industry while simultaneously strengthening practical competency development among students and young professionals.

The framework additionally incorporates iterative collaboration and continuous feedback mechanisms allowing stakeholders to refine project assumptions, evaluate communication effectiveness, and improve workflow coordination during subsequent stages of implementation. The proposed model is therefore intended not only as a technological solution, but also as a process-oriented collaboration ecosystem supporting long-term interdisciplinary cooperation in the furniture and design sector.

## **IMPLEMENTATION POTENTIAL AND PRACTICAL SIGNIFICANCE**

The proposed collaboration model demonstrates significant practical applicability for the furniture and design sector, particularly in relation to SMEs, family-owned manufacturing companies, creative professionals, and higher education institutions. The framework addresses operational challenges associated with fragmented communication, insufficient workflow transparency, limited coordination mechanisms, and the absence of standardized collaboration procedures within interdisciplinary project environments.

From an organizational perspective, the proposed process-oriented framework may support more efficient coordination of collaborative activities between designers, architects, manufacturers, developers, and educational

institutions. The integration of communication tools, workflow structures, and centralized project documentation within a shared digital environment may contribute to reducing implementation delays, improving project transparency, and limiting errors resulting from fragmented information exchange.

The proposed model may also strengthen the operational capabilities of SMEs and smaller manufacturing entities that frequently lack access to advanced project management infrastructures and formalized collaboration systems. By introducing adaptable and process-oriented collaboration mechanisms, the framework may support improved participation of smaller organizations in interdisciplinary projects and innovation-oriented business networks.

An important practical dimension of the framework concerns the integration of higher education institutions with real-world industry environments. The proposed collaboration structure may support project-based learning, internships, consultations, workshops, and collaborative prototyping activities involving students, educators, and external stakeholders. Such integration may contribute to strengthening practical competencies, facilitating knowledge transfer, and improving the alignment between educational processes and industry expectations.

The framework additionally demonstrates potential for scalability and broader implementation within other creative and production-oriented sectors requiring interdisciplinary cooperation and distributed workflow coordination. The proposed platform environment may also provide a foundation for future commercialization models, including subscription-based digital collaboration services and implementation-oriented consulting solutions supporting process standardization and collaborative project management within SMEs and creative-sector organizations.

## **CONCLUSIONS AND LIMITATIONS**

The study has several limitations resulting from its exploratory and implementation-oriented character. The proposed framework is based primarily on preliminary qualitative findings and stakeholder consultations conducted within the Polish furniture and design sector. Further empirical validation involving larger stakeholder groups, pilot implementations, and longitudinal evaluation will be required in future stages of the research process.

The proposed research contributes to the development of digitally supported collaboration models connecting the furniture industry, design sector, and higher education institutions. By integrating process management, communication workflows, and collaboration tools within a unified digital environment, the project aims to address existing organizational and communication barriers affecting SMEs and family businesses.

The implementation potential of the project lies in its ability to support structured cooperation between designers, manufacturers, architects, developers, and

academia, improving transparency, reducing implementation time, and enhancing project coordination. The proposed framework may also strengthen knowledge transfer and practice-oriented education through internships, joint prototyping, and industry-based learning activities.

Future research should focus on pilot implementation, user-experience evaluation, KPI validation, and longitudinal assessment of collaboration efficiency within digitally mediated interdisciplinary environments. The developed model is intended as a scalable solution that may be adapted to other creative and production-oriented sectors, supporting innovation, digital transformation, and the long-term competitiveness of Polish enterprises in European and global markets.

#### ACKNOWLEDGEMENT

This research is conducted within the framework of an implementation doctorate programme funded by the Ministry of Science and Higher Education in Poland at Bydgoszcz University of Science and Technology under the supervision of Rafał Drewniak, Associate Professor.

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