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Integrating Design Management and Innovation Management: A Conceptual Framework for Creative Entrepreneurship

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Abstract

Background: Design management and innovation management have long developed as two closely related yet rarely integrated bodies of knowledge, particularly within the context of creative entrepreneurship.
Objective: This article aims to generalize a four-quadrant design management model (Strategy, Creation, Implementation, Evaluation)-originally grounded in a case study of the Jepara carved-furniture industry-into a cross-context conceptual model applicable to creative industries in general.
Methods: Using a conceptual (theory adaptation) paper approach, this study maps each design management quadrant onto stages of innovation and product development management, and positions creative entrepreneurship as a cross-cutting driving layer.
Results: The result is a conceptual model, the Design-Innovation-Entrepreneurship Integration Model, accompanied by five theoretical propositions explaining the relationships between design management capability, innovation management stages, and creative entrepreneurial orientation toward market-ready innovation outcomes.
Conclusion: The article contributes theoretically by bridging two historically separate bodies of knowledge, and practically by informing entrepreneurship teaching in design and product-development management programs.

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INTRODUCTION

Indonesia's creative industries span crafts, fashion, culinary businesses, interior design, and digital design services and occupy an increasingly strategic position in the national economy (Hendriyana et al., 2025; Utami et al., 2026). Their diversity creates a need for a conceptual framework that can travel across subsectors while remaining operationally meaningful for entrepreneurs, educators, and researchers. A framework derived too narrowly from one subsector may be difficult to transfer unless its structural and context-specific elements are clearly distinguished.

Design is increasingly recognized not merely as an aesthetic element but as a strategic capability that shapes organizational competitiveness amid rapid market change (Ishaq et al., 2026). Academic interest in design thinking has grown rapidly over the past decade, with research mapping its contextual factors, process stages, and organizational outcomes (Rösch et al., 2023). This development reflects a shift from viewing design as an individual creative practice toward treating it as a managerial capability that can be structured and learned.

In the Indonesian context, Mutiara, Irawan, and Supriyatna-Mz (2024) empirically

developed a four-quadrant design management model (Strategy, Creation, Implementation, and Evaluation) through a qualitative case study of the Jepara carved-furniture industry. The empirical study documented how management and design practices were organized in that setting and associated with innovative, competitive products while maintaining local cultural identity. The present article conceptually interprets the structural relationships in that case as a basis for cross-context generalization; this extension is therefore a theoretical proposition rather than an additional empirical finding from the original case.

This condition indicates that design management, as a strategic capability, cannot stand alone without its connection to the product development process and entrepreneurial orientation that serves as the vehicle for design outcomes to actually reach the market. The absence of an explicit conceptual bridge between these three elements risks producing fragmented understanding, where designers understand the creative process but lack understanding of commercialization mechanisms, while product managers understand development stages but lack appreciation for the strategic contribution of the design process itself.

A conceptual gap remains between design management and innovation/product-development management, two disciplinary clusters that are complementary in practice but are not commonly integrated within a single explanatory framework. Existing work has linked research and development activities with systemic innovation management and has emphasized feedback across innovation processes Souza et al. (2022), while established product-development literature provides stage-based accounts of innovation management (Trott, 2008). These streams provide a scientific basis for examining where the two fields correspond and where their functions remain distinct; teaching experience is treated only as a practical motivation, not as evidence that the fields are universally taught separately.

Based on this gap, this article develops a cross-context conceptual framework that extends the previously published quadrant design management model and integrates it with innovation-management stages and creative entrepreneurship. The article aims to: (1) identify functional correspondences—rather than assume full equivalence—between design-management and innovation/product-development stages; (2) position creative entrepreneurship as a cross-quadrant driving layer; and (3) formulate testable theoretical propositions for future empirical research across creative-industry contexts.

The contribution of this article is theoretical-conceptual, namely bridging two disciplinary clusters that have historically developed separately in management literature, while also providing a methodological contribution in the form of a concrete example of how a model born from a single case study can be developed into a cross-context deductive framework. The article is structured as follows: the second section presents a literature review on design management, innovation management, and creative entrepreneurship; the third section explains the methodological approach of the conceptual article used; the fourth section presents the model development; the fifth section formulates theoretical propositions; the sixth section discusses theoretical and practical implications as well as limitations; and the seventh section presents the conclusion.

It should be emphasized from the outset that this article does not attempt to produce an entirely new theory, but rather to adapt and generalize existing theory so that it can reach a broader context. This choice is based on the consideration that the development of design management science in Indonesia is still relatively young compared to the more internationally established traditions of innovation management and entrepreneurship, so the effort to bridge the three—rather than building a new theory from scratch—is seen as a more realistic step as well as one that is easier to accumulate with the ongoing line of research.

It should be emphasized that this article is not intended to replace or refute the findings of the previous Jepara design management model, but rather to raise its core structure to a higher level of abstraction. Thus, the continuity of the line of research is maintained: the quadrant model born from the contextual depth of one industry is now conceptually tested on a broader scope, as commonly occurs in the development of mature management theory, where context-specific models are gradually generalized into frameworks that can be adapted across settings without losing the internal coherence of their structure.

The theoretical foundation for this conceptual generalization rests on three complementary literature clusters. First, the design management literature shows a long shift

from the idea of silent design, which reveals that most organizational design activities are carried out by individuals without design degrees, toward its recognition as a strategic capability through the strategy-process-implementation framework and the four powers of design model that measures design value from the perspectives of differentiation, integration, transformation, and business contribution (Borja de Mozota & Wolff, 2019). Diagnostic instruments such as the design management ladder confirm that this capability is a continuum, not binary, while studies on design thinking as a way of thinking that handles complex problems and empirical evidence of the relationship between user-oriented design and product success reinforce the position of design management as a strategic organizational capability Mutiara et al. (2023) that can be formalized even in SMEs with limited resources (Demir et al., 2025).

Second, the innovation-management and product-development literature emphasizes cross-functional integration Mandal (2022) and identifies innovation capability as a driver of SME competitiveness and market performance (Machado-Licona et al., 2026). The cyclical return of market feedback to subsequent development stages shows a structural similarity with the iterative quadrant design-management cycle. Structural similarity, however, does not by itself demonstrate functional equivalence; functional correspondence must be justified by comparing the decision purpose, activities, outputs, and transition criteria of each stage.

Third, the creative entrepreneurship literature shows that design is increasingly recognized as a core part of the entrepreneurial process, not merely a supporting tool, through the design sprint method Magistretti et al. (2023) and the philosophical interpretive framework regarding the design-entrepreneurship relationship (Magistretti et al., 2025). At the individual level, opportunity recognition competence can be developed through design education Tynan (2023), while the creative impulse is emphasized as the main driver of business opportunity formation in creative industry entrepreneurs (Patten & Stephens, 2023). In the Indonesian context, the characteristics and competencies of entrepreneurs are proven to significantly affect the business performance of the creative industry Gunawan (2024), in line with the importance of systematically managing creativity in creative entrepreneurship (Marizar et al., 2022). As a supporting factor, intellectual property protection also contributes to the courage of business actors to innovate Chen (2022), although in-depth discussion of this aspect is outside the main scope of the article.

The three literature clusters have each matured with their own theoretical traditions, but are rarely discussed explicitly in a single framework—a gap that becomes the starting point for the conceptual generalization in this article. This generalization is carried out by raising the core relational structure of the quadrant design management model previously developed through a qualitative case study in the Jepara carved furniture industry, releasing it from elements specifically attached to that context, and integrating it with innovation management and creative entrepreneurship constructs that apply across industries (Mutiara, Irawan, & Marizar, 2024; Mutiara, Irawan, & Supriyatna-Mz, 2024).

METHOD

This article adopts a conceptual-paper approach using a theory-adaptation strategy to extend the quadrant design management model Mutiara, Irawan, & Supriyatna-Mz (2024) to a broader disciplinary and contextual setting. The literature component consists of a purposive narrative synthesis intended to support conceptual integration; it is not presented as a systematic literature review and does not claim exhaustive coverage of all publications. The principal outputs are a theoretically coherent framework and a set of propositions connecting concepts across design management, innovation management, and creative entrepreneurship.

The conceptual development proceeded through five stages: (1) a narrative review of literature on design management, innovation and product-development management, and creative entrepreneurship; (2) a conceptual reanalysis of the previously published quadrant model to distinguish structural elements from context-specific elements; (3) the mapping of stage-level correspondences across the two management literatures; (4) the formulation of theoretical propositions linking the mapped constructs; and (5) an assessment of the theoretical and practical implications, limitations, and directions for empirical testing. Sources were prioritized based on conceptual relevance, recency, and traceability through identifiable publication records and digital object identifiers (DOIs), where available.

The conceptual mapping compared each design-management quadrant with functionally related stages in innovation management, while creative entrepreneurship was positioned as a cross-quadrant mechanism rather than a fifth sequential stage. The mapping was subsequently translated into propositions specifying relationships among constructs and providing a basis for future empirical testing. Within the proposed framework, creative entrepreneurship is expected to influence Strategy through opportunity recognition, Creation through idea recombination and experimentation, Implementation through resource mobilization and persistence, and Evaluation through commercialization and responsiveness to market feedback. Future studies could test these mechanisms using indicators of opportunity recognition, creative impulse, entrepreneurial proactiveness, experimentation, and commercialization speed.

As a conceptual article, the contribution is evaluated not through statistical validity but through the logical coherence of its constructs, the clarity of the operational definitions of its model elements, and the extent to which the model generates testable propositions. Accordingly, the preparation of this article is documented explicitly, from the selection of literature sources and the rationale for mapping constructs to the formulation of propositions. This documentation enables readers and other researchers to trace the reasoning underlying each conceptual claim presented.

The literature sources used in this article were selected according to three criteria. First, sources were drawn from journals or databases that provided access to publications with DOIs, thereby facilitating the verification of publication records. Second, sources were published within the preceding five years to maintain relevance to recent developments in each disciplinary cluster. Third, sources directly addressed at least one of the three main constructs—design management, innovation management, or creative entrepreneurship—or discussed the methodology of conceptual-paper development. Each source was cited in only one discussion section to ensure that arguments drew on diverse bodies of literature rather than relying on repeated citations of the same source across different sections.

The conceptual-paper approach adopted in this article differs from a systematic literature review, which emphasizes the comprehensive identification and mapping of publications on a particular topic. The primary objective of a conceptual paper is not exhaustive literature coverage but the development of a logically rigorous argument that integrates concepts from different disciplinary clusters into a coherent framework. Accordingly, the literature selection in this article was purposive, with sources chosen to support specific stages of the model-development argument rather than to provide exhaustive coverage, as is generally sought in systematic literature reviews.

RESULTS AND DISCUSSION

Results

Generalization of the Quadrant Structure

The original design management model places four quadrants—Strategy, Creation, Implementation, and Evaluation—surrounding the core of design management and moving cyclically from one quadrant to the next (Mutiara, Irawan, & Supriyatna-Mz, 2024). In the generalization model proposed in this article, the cyclical structure is fully maintained as a conceptual bridge connecting the contribution of this article with the previous line of research, while the specific actor elements of the furniture industry are replaced with generic innovation management stages that apply across the creative industry. Table 1 presents the conceptual mapping between the four design management quadrants and innovation/product development management stages that are functionally equivalent.

The innovation management stage terms used in Table 1—opportunity recognition, idea-to-concept development, prototyping and development, and market commercialization—refer to the logic of the stage-gate system that has become standard in innovation management literature for more than three decades, namely the division of the new product development process into sequential stages separated by decision points (gates) as quality control and resource allocation mechanisms. The use of stage-gate logic was chosen because of its generic and cross-industry nature, thus facilitating the mapping of functional equivalence with design management quadrants that are also generic and cross-context.

Table 1
Mapping of Design Management Quadrants to Innovation Management Stages

Design Management Quadrant	Innovation Management Stage	Functional Description
Strategy	Opportunity recognition	Identification of user needs and market opportunities through human-centered design thinking approaches
Creation	Idea-to-concept development	Translation of insights into product concepts through ideation and idea screening processes
Implementation	Prototyping and development	Prototype development and technical-functional testing of products
Evaluation	Market commercialization	Evaluation of product performance and commercialization to market

The mapping in Table 1 does not imply that design management and innovation management are identical disciplines. It identifies functional correspondences only where stages share comparable decision purposes, activities, outputs, and transition logic. For example, Strategy and opportunity recognition both provide an entry point for defining problems and market opportunities, but they retain different disciplinary emphases; the former privileges user and design framing, whereas the latter emphasizes opportunity identification and market feasibility.

The same pattern applies to the pair of Creation quadrant with idea-to-concept development, Implementation quadrant with prototyping and development, and Evaluation quadrant with market commercialization. In each of these pairs, the terms used by the design management tradition emphasize aspects of the creative process and user experience, while the terms used by the innovation management tradition emphasize aspects of technical and commercial feasibility—but both substantially refer to the same series of managerial activities, namely translating ideas into tested concepts, developing those concepts into functioning prototypes, and ultimately assessing market acceptance of the prototype before mass production.

Creative Entrepreneurship as a Cross-Quadrant Driving Layer

Unlike the original model, which places designers, craftspeople, and business actors within individual quadrants, the generalized framework positions creative entrepreneurship as a cross-quadrant driving layer that operates throughout the cycle. Its mechanism differs by stage: it directs opportunity recognition in Strategy, supports experimentation and opportunity elaboration in Creation, strengthens resource mobilization and persistence in Implementation, and accelerates commercialization and feedback use in Evaluation. These mechanisms provide observable dimensions for future operationalization and allow the cross-quadrant claim to be tested rather than treated only as a descriptive metaphor.

The placement of creative entrepreneurship as a horizontal layer, rather than as a fifth quadrant, is a deliberate conceptual choice. If entrepreneurship were required as an additional stage in the cycle, the model would still maintain the assumption that entrepreneurship is only relevant at a certain point in time—for example only at the time of commercialization. Conversely, by positioning it as a cross-quadrant driving layer, this model confirms that creative entrepreneurial orientation needs to be present consistently from the opportunity recognition stage to the commercialization stage, in line with the view that entrepreneurial competence is cross-stage and cannot be separated from the creative process itself.

Design-Innovation-Entrepreneurship Integration Model

The integration of the three elements above—the design management quadrant cycle, the mapping of innovation management stages, and the creative entrepreneurship layer—forms the conceptual model referred to in this article as the Design-Innovation-Entrepreneurship Integration Model (DIE Model), as depicted in Figure 1. This model confirms three main structural propositions: first, the design management cycle is universal and can be applied across creative industries; second, each design management quadrant has a functional counterpart in innovation

management stages that are already established in management literature; and third, the speed and success of the movement of the cycle is determined by the intensity of creative entrepreneurship inherent in the individual or organization running it.

The name DIE Model was chosen to explicitly reflect the three constituent elements, while implying its derivation from the original design management model that became the basis for its development. This name is also intended to facilitate model identification in future literature, especially for researchers who wish to test the propositions formulated in the following section, without having to refer back to the Jepara furniture industry context that became the origin of its quadrant structure.

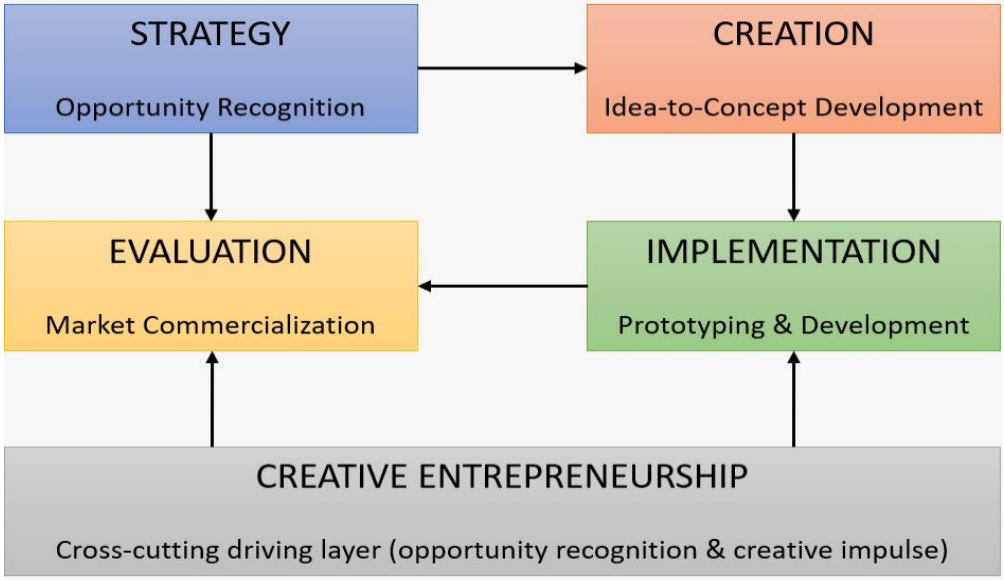


Figure 1. Design-Innovation-Entrepreneurship Integration Model

Model Generalization Boundaries

Although the DIE Model was developed with the aim of cross-context generalization, it is important to emphasize that this generalization is structural, not generalization over all operational details attached to each creative industry. That is, the four-quadrant cycle and creative entrepreneurship layer are assumed to apply generally, but the specific way each stage is carried out—for example the type of user research method at the Strategy stage, or the distribution channel at the Evaluation stage—varies depending on the characteristics of each creative industry subsector, business scale, and the market context faced.

This model also assumes that the organization or individual applying it has minimal access to resources to run the four quadrants sequentially. In practice, micro business actors with very limited resources may need to run several quadrants simultaneously or informally, so the application of the model in that context requires further adjustments that are outside the scope of the conceptual discussion in this article.

Position of the DIE Model in the Design-Driven Innovation Discourse

The DIE Model developed in the previous section is in line with the major current of academic discourse that views design as a driver of radical innovation through changes in the meaning and emotional language of products, not merely through user-centered approaches. The design-driven innovation discourse emphasizes that companies that excel in global competition do not necessarily start their innovation process from observing user needs directly, but rather from a vision of the company regarding new meanings that may be accepted by the wider community. However, the DIE Model provides a slightly different emphasis from that discourse. If the design-driven innovation discourse generally departs from the perspective of large organizations that already have mature research and development capabilities, the DIE model is instead designed to be applicable at more diverse business scales—from individual entrepreneurs to small and medium enterprises—by placing creative entrepreneurship, rather than formal organizational structure, as the main driving mechanism of the innovation cycle.

This difference in emphasis is important for the Indonesian context, where most creative industry actors operate at the micro, small, and medium scale without formal research and development department structures. By making creative entrepreneurship a cross-quadrant driving layer inherent in individuals, the DIE Model offers a framework that is more relevant to the structural realities of domestic creative industries, compared to design-driven innovation models that implicitly assume the availability of larger organizational resources.

Discussion

Theoretical Propositions

Based on the conceptual model developed in the previous section, this article formulates five theoretical propositions as follows.

P1: The higher the design management capability of an organization at the Strategy stage (opportunity recognition), the greater the likelihood that the organization produces product concepts relevant to market needs at the subsequent innovation management stage.

This proposition is based on the argument that design management capability at the initial stage of the cycle functions as a quality filter for information to be processed at subsequent stages. Organizations with weak Strategy capability risk continuing the innovation process based on incorrect understanding of user needs, so that all investment at the Creation and Implementation stages becomes less effective.

P2: Explicit integration between the design thinking process and the idea-to-concept development stage in innovation management will produce more innovative product concepts compared to when the two processes are carried out separately by different organizational units.

The argument behind this proposition is that design thinking and idea-to-concept development essentially handle the same problem from different perspectives, so separating the two into different organizational units has the potential to cause duplication of work as well as loss of insights that should be able to mutually enrich each other if both processes are carried out in an integrated manner by a cross-functional team.

P3: The intensity of creative entrepreneurship—reflected in the creative impulse and opportunity recognition competence of individuals or organizations—moderates the strength of the relationship between design management capability and the success of the overall innovation management cycle movement.

As a moderating variable, creative entrepreneurship is assumed to strengthen the relationship between design management capability and cycle success when its intensity is high, but weaken the relationship when its intensity is low—even though the organization's design management capability remains the same. In other words, superior design capability without adequate entrepreneurial orientation risks never reaching the commercialization stage.

P4: Creative organizations that explicitly integrate the creative entrepreneurship layer into the design-innovation management cycle will achieve faster product commercialization compared to organizations that treat entrepreneurship as a separate function.

This proposition focuses on the speed dimension (speed-to-market) as an indicator of success, assuming that organizations that view entrepreneurship as a separate function will experience coordination barriers each time the output of one quadrant needs to be passed to the next quadrant, while organizations that integrate it horizontally can cut those coordination barriers.

P5: The availability of adequate intellectual property protection strengthens the relationship between the Implementation stage (prototyping and development) and the Evaluation stage (market commercialization) by reducing the risk of product imitation before the organization obtains adequate economic benefits from its creative investment.

This fifth proposition places intellectual property protection as a boundary condition that does not directly drive the cycle, but determines whether the value created through the cycle can be economically maintained by its creator, so it is relevant to consider especially in creative industries with high risk of product imitation.

The five propositions form an integrated testable structure. P1 and P2 specify stage-level relationships within the design–innovation cycle; P3 specifies a moderating effect of creative entrepreneurship on the relationship between design-management capability and cycle success; P4 specifies an outcome difference in commercialization speed associated with cross-stage

entrepreneurial integration; and P5 specifies intellectual-property protection as a boundary condition between implementation and commercialization. Accordingly, future empirical models should represent P3 as an interaction term, P4 with a commercialization-speed outcome, and P5 as a conditional effect rather than treating all five propositions as equivalent direct paths.

Theoretical Implications

The DIE Model developed in this article provides a theoretical contribution in the form of an explicit conceptual bridge between design management and innovation management, two disciplinary clusters that have so far developed with relatively separate academic communities, journals, and methodological traditions. By generalizing a model that was originally grounded in one industry context into a cross-context deductive framework, this article also provides a concrete example of how qualitative case-based research findings can be further developed into a theoretical contribution with broader scope without losing the trace of previous scholarship.

Furthermore, the DIE Model also contributes to the methodological debate regarding how knowledge generated from a single case study can be accumulated into more general knowledge. Instead of viewing a single case study as a weakness that limits generalization, this article shows that the contextual depth obtained from the case study can actually become a rich raw material for subsequent conceptual generalization, as long as the researcher explicitly separates structural elements that are general from elements that are context-specific as done in this article.

Practical Implications

For creative-industry actors, the DIE Model offers a diagnostic map for locating barriers in opportunity recognition, concept development, prototyping, or commercialization while assessing whether creative entrepreneurship is integrated across those stages. For higher-education institutions, the same framework can support cross-disciplinary teaching between design, entrepreneurship, and product-development courses without treating teaching experience as evidence for the model's validity.

For industry associations and vocational training institutions that mentor creative business actors, the DIE Model can be used as an initial diagnostic instrument in business assistance programs, for example by asking business actors to map the position of their products or services in one of the four quadrants, then assessing the extent to which their creative entrepreneurial orientation has been integrated horizontally into the entire process. This kind of diagnostic approach is relatively simple to communicate to business actors who do not have a formal academic background in management or design.

Another practical implication relevant to the author's context is the possibility of developing a joint teaching module that can be used in parallel in the Entrepreneurship course in the Interior Design Study Program and the Product Development and Innovation Management course in the Management Study Program. Such a module can use the DIE Model as a shared reference framework, so that students from both study programs can work on cross-disciplinary projects with mutually understood vocabulary and process stages, instead of using different terms to explain process stages that are substantially the same.

Limitations and Directions for Future Research

As a conceptual article, the DIE Model has not been empirically tested on field data. Therefore, the five theoretical propositions formulated in this article need to be further tested through quantitative research in various creative industry contexts, as well as multi-case qualitative research to examine the depth of mechanisms behind each proposed relationship. Future research can also explore the integration of the intellectual property protection layer more deeply into the model, considering that this aspect has only been briefly touched upon in this article and has the potential to become a separate strategic layer as currently being developed by the author in separate research.

Another implication that needs to be underlined is that the DIE Model provides a shared vocabulary for cross-disciplines that have so far used different terms to refer to functionally similar processes. This kind of shared vocabulary is important not only for academic purposes, but also for practical purposes in cross-functional work teams in the creative industry, where designers, product managers, and entrepreneurs often find it difficult to communicate effectively

because they use different reference frameworks even though they are actually talking about the same process stages.

CONCLUSION

This article develops the Design-Innovation-Entrepreneurship Integration Model (DIE Model) by generalizing the structural logic of a four-quadrant design-management model and linking it with innovation-management stages and creative entrepreneurship. The conceptual analysis identifies functional correspondences across stages without claiming disciplinary identity and formulates five propositions concerning stage relationships, moderation, commercialization speed, and intellectual-property conditions.

The contribution is a cross-context conceptual bridge that makes the relationships among design management, innovation management, and creative entrepreneurship explicit and empirically testable. Because the framework remains conceptual, future research should test the proposed mechanisms across creative-industry subsectors, business scales, and organizational settings and should examine the conditions under which the proposed structural correspondences hold.

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AUTHOR CONTRIBUTION STATEMENT

Maitri Widya Mutiara: Conceptualization, Methodology, Investigation, Writing – Original Draft, Writing – Review and Editing; Eddy Supriyatna Mz: Conceptualization, Validation, Writing – Review and Editing, Supervision; Ferdinand: Investigation, Writing – Review and Editing. All contributing authors have examined and approved the final published manuscript.

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