NEW ERA INTERNATIONAL JOURNAL OF INTERDISCIPLINARY SOCIAL RESEARCHES ISSN 2757-5608

Article Arrival Date
11. 06. 2025

Article Type
Research Article

Article Published Date
20.10.2025

Doi Number: 10.5281/zenodo.17391726

COMPARATIVE EVALUATION OF HUMAN- AND AI-CENTERED DESIGN APPROACHES; A FUTURISTIC INTERIOR SPACE CONCEPT

İNSAN VE YAPAY ZEKA ODAKLI TASARIM YAKLAŞIMLARININ KARŞILAŞTIRMALI DEĞERLENDİRİLMESİ; FÜTÜRİSTİK BİR İÇ MEKAN KURGUSU

Semih Göksel YILDIRIM
Assistant Professor, (Corresponding Author), Department of Architecture, Faculty of Engineering and Architecture, İstanbul Gelişim University, İstanbul, Türkiye; e-mail: sgyildirim@gelisim.edu.tr , ORCID ID: 0000-0002-7832-6575

İbrahim EROL
Assistant Professor, Interior Architecture and Environmental Design Department, Faculty of Fine Arts, İstanbul Gelişim University, İstanbul Türkiye; e-mail: iberol@gelisim.edu.tr
ORCID ID: 0000-0002-3092-7128

Abstract

This study comparatively examines the impact of human-led digital modelling processes and AI-assisted design approaches on the development of a futuristic interior space. The case study, conducted in the entrance and lobby area of the Faculty of Engineering and Architecture of İstanbul Gelişim University in Avcılar, Istanbul, is structured in two main phases. In the first phase, the designer developed a formal and functional concept using conventional software tools; in the second phase, alternative proposals were generated through AI-based visualizations. In the final stage, the outputs obtained from the AI visualizations were integrated into the conventional visual representations. The study reveals that while artificial intelligence provides significant advantages in terms of conceptual richness, aesthetic diversity, and speed, human expertise remains indispensable for ensuring ergonomics, scale accuracy, and detailed technical resolution. The analysis was carried out under the themes of form and aesthetics, process and control, functionality, user experience, and spatial meaning. The findings demonstrate that AI acts as a creative catalyst particularly during the concept development stages; however, the decisive factor in achieving an implementable design output is the contribution of human expertise. In conclusion, the study shows that a hybrid approach holds considerable potential for developing sustainable and original solutions in the interior design of the future.

Keywords: AI design, interior design, futuristic spaces, human-machine interaction.

Özet

Bu çalışma, insan eliyle yürütülen dijital modelleme süreçleri ile yapay zekâ destekli tasarım yaklaşımlarının, fütüristik bir iç mekân kurgusu üzerindeki etkilerini karşılaştırmalı olarak incelemektedir. İstanbul Avcılar' da bulunan İstanbul Gelişim Üniversitesi' ne ait mühendislik ve mimarlık fakültesi giriş ve lobi alanında yürütülen vaka çalışması, tasarım sürecinin iki aşamada ele alınmasına dayanmaktadır. İlk önce, tasarımcı tarafından konvansiyonel yazılımlar kullanılarak biçimsel ve işlevsel bir kurgu geliştirilmiş; ikinci aşamada ise yapay zekâ tabanlı görselleştirmelerle alternatif öneriler üretilmiştir. Son aşamada da, yapay zeka tabanlı görselleştirmelerden elde edilen çıktılar, konvansiyonel görselleştirmelere entegre edilmiştir. Çalışmada, yapay zekânın kavramsal zenginlik, estetik çeşitlilik ve hız avantajı sağladığı; buna karşın ergonomi, ölçek doğruluğu ve teknik detaylandırmada insan deneyimine dayalı kontrolün vazgeçilmez olduğu görülmüştür. Analiz, biçim ve estetik, süreç ve kontrol, işlevsellik, kullanıcı deneyimi ve mekânsal anlam başlıkları altında gerçekleştirilmiştir. Bulgular, yapay zekânın özellikle konsept geliştirme aşamalarında yaratıcı bir katalizör işlevi gördüğünü; ancak uygulanabilir bir tasarım çıktısı elde edilmesi için insan uzmanlığının belirleyici olduğunu ortaya koymaktadır. Sonuç olarak, çalışma hibrit bir yaklaşımın, geleceğin iç mekân tasarımında sürdürülebilir ve özgün çözümler geliştirme potansiyeline sahip olduğunu göstermektedir.

Anahtar Kelimeler: Yapay zekâ tasarımı, iç mekân tasarımı, fütüristik mekânlar, insan-makine etkileşimi.

Introduction

The architectural design process is defined not only as a creative production activity but also as a systematic problem-solving approach (Lawson, 2005). The development stages of design are categorized under five main headings: identifying, defining, and delimiting the subject or problem; collecting comprehensive data on the existing situation; analyzing the information obtained; evaluating and interpreting the findings that emerge; and finally, expressing the design as an integrated synthesis (Cross, 2008; Lawson, 2005). These successive stages demonstrate that the design process does not proceed randomly but rather advances based on specific methodological steps (Zeisel & Eberhard, 2006). Each stage requires the designer to engage in both rational and intuitive modes of thinking, aiming to ensure that the proposed solution meets both functional and aesthetic requirements (Lawson, 2005; Cross, 2011). Thus, the architectural design process represents a multi-layered and interdisciplinary research and development activity that extends from problem definition to the creation of an implementable project (Dorst, 2015).

In general terms, the design process is a product of human creativity and expertise. The concept of *human-centered design* refers to the act of making design decisions based on the designer's intuition, experience, technical knowledge, and aesthetic understanding (Kryssanov, Tamaki & Kitamura, 2001). Today, digital modeling and visualization tools are used to translate the designer's ideas into tangible and presentable outputs. Digital models produced with software such as Autodesk AutoCAD, SketchUp, Rhino, and 3ds Max enable design concepts to be framed in a scaled, detailed, and technically feasible manner. These modeling practices aim to depict user experience, the functionality of the space, and its aesthetic language in accordance with the designer's deliberate choices. Visualization, on the other hand, refers to rendering these models or preparing them as animations for presentation purposes (Novedge, 2025). Therefore, in the classical sense, the digital design process is based on transferring human creativity into digital platforms to produce outputs that can be assessed both technically and aesthetically (Paul, 2021; Tütüncüler & Hoplamaz, 2025).

In this context, the realization of human-centered design depends not only on the digital tools employed but also on a set of defining parameters inherent to the designer. The designer's education, professional background, cultural heritage, aesthetic value judgments, socio-economic environment, and the physical-spatial context all play direct roles in shaping design decisions (Borowa, Almeida & Wiese, 2025). There are also differences between human and machine learning (Sarıkaya, 2024). For example, in architectural education, not only the acquisition of technical skills but also knowledge of art history, the capacity for critical thinking, and observational experiences gained across different geographies significantly influence the formal and conceptual qualities of a design (Önal & Turgut, 2017). Moreover, the surrounding cultural environment and user expectations are crucial dynamics guiding the design process (Bhuvan, Mishra, & Gowda, 2024; Enwin, 2024). Therefore, a design created by human hands should be understood not merely as the result of individual creativity but as the cumulative expression of social, cultural, and environmental interactions (Auernhammer, 2020).

AI-assisted design involves algorithmic systems capable of analyzing, interpreting, and generating new outputs based on the designer's ideas (Sarıca, 2023). Various artificial intelligence (AI) platforms operating on text-to-image models produce visual outputs derived from descriptive prompts provided by the user (Durukan & Türk, 2023). In this context, the human becomes less of a traditional designer and more of a guide or orchestrator (Thampanichwat et al., 2025; Torricelli et al., 2024). The emergence of design thus transforms from a purely technical practice into an act of linguistic and conceptual direction (Torricelli et al., 2024). AI systems, drawing on large pre-trained visual datasets and analysis algorithms, can evaluate thousands of possibilities within seconds, offering aesthetically striking solutions (Derevyanko & Zalevska, 2023; Murray-Rust at al., 2024; Thampanichwat et al., 2025). Research on prompt engineering demonstrates that precisely formulated inputs can significantly enhance the quality, depth, and originality of AI-generated outputs (Louatouate & Zeriouh, 2025; Thampanichwat et al., 2025). This reality elevates the role of the designer to a hyper-strategic position that extends beyond generating ideas, encompassing the training, steering, and critically assessing of AI processes (Tholander & Jonsson, 2023).

In this process, the realization of AI-assisted design also requires the presence of specific parameters. The guiding inputs (prompts) provided by the designer define the conceptual framework of the design, while the visual dataset on which the AI program has been trained, its algorithmic structure, and modeling logic directly influence the content of the design outputs. These parameters include technical details such as the selection of keywords, visual style references, resolution requirements, or the version of the system employed. Therefore, although AI-generated designs may appear autonomous, the underlying human guidance and the technical limitations of the system play a decisive role in shaping the results.

AI image generation models can be significantly influenced by the structure of prompt inputs, which directly affects the quality of the resulting outputs (Liu & Chilton, 2022). Moreover, massive databases such as *DiffusionDB*, containing millions of prompt and image combinations, provide concrete evidence of how inputs shape AI-generated results (Wang et al., 2023). The practice of prompt engineering aims to optimize the aesthetic, compositional, and content quality of outputs through the careful selection of keywords, style references, and technical parameters (Knoth et al., 2024). Therefore, outputs that may appear as examples of the AI's *independent creativity* are, in fact, shaped by a strategic framework defined by humans and the technical capabilities of the system **(**Zeytin, Öztürk-Kösenciğ & Öner, 2024**)**.

Nevertheless, AI-generated designs often remain independent of—or only loosely connected to—criteria such as spatial scale, ergonomics, and structural feasibility. For this reason, while AI contributes as a creative component within the design process, the outputs frequently require reworking and refinement by human experts (Kızılhan, 2024; Leão, Silva, & Costa, 2024). Ultimately, the interaction between AI and human designers constitutes not only a technical collaboration but also a hybrid and multilayered process that transforms design practices at a conceptual level (Kayaoğlı-Yaman, 2025; Sun, Terzidis, & Chen, 2024).

Futuristic design aims to create an aesthetic and functional spatial language grounded in predictions about the future and advancements in technology. This approach draws not only from the pursuit of innovation but also from the ways social, technological, and cultural changes are reflected in architecture (Portnova, 2023). Organic forms, synthetic materials, parametric geometries, lighting technologies, and elements of digital interaction are the core components of the futuristic design paradigm. Such designs typically respond to an imagination of a *livable future*, though they sometimes incorporate more conceptual meanings within utopian or dystopian scenarios (Nasir, 2024). In technology-focused interior configurations, user experience is prioritized; systems in which lighting, sound, and temperature are controlled by sensors and artificial intelligence adapts dynamically to the environment represent contemporary extensions of this approach (Brown, n.d; Crown, 2025). Aesthetically, a digitized visual language, transparency, surface diversity, and a cinematographic atmosphere stand out as defining characteristics (Nasir, 2024; WPL, 2025). These approaches embody experimental attitudes toward design and illustrate practices that are deeply intertwined with technology.

There are fundamental methodological and conceptual differences between conventional digital design and AI-assisted design (Li et al. 2025). In the former, the designer assumes the role of an active creator and decision-maker, while in the latter, the designer takes on a more guiding, selective, and evaluative role. The central research problem of this study is to examine the extent to which these two different approaches—human-generated digital design and AI-generated design outputs—diverge from each other and in which ways they interact. Parameters such as aesthetics, functionality, user orientation, and technology integration constitute the main axes of this comparative evaluation. At the same time, this problem provides clues about the potential future evolution of the design process. The complementary use of human creativity and the computational capacity of artificial intelligence indicates that design practices are evolving toward a more hybrid and flexible structure.

In this context, the study comparatively examines the aesthetic, functional, and experiential differences that emerge between digitally produced interior designs created by humans and those generated with the support of artificial intelligence. Specifically, in a setting where technology-oriented, futuristic, and utopian spatial concepts are being redefined, the contributions of humans and AI to the design process are analyzed through their distinct roles and modes of production. Within this scope, several key research questions arise: Do AI systems merely function as tools within the design process, or can they be regarded as creative actors capable of generating original content? Should the position of the human designer in this process be defined as that of an active decision-maker, or rather as a strategist who guides and orchestrates the process? Furthermore, how can multilayered criteria such as livability, aesthetic coherence, originality, and ethical responsibility be assessed in interior designs produced by artificial intelligence?

The core hypothesis of this study is that AI-assisted design tools offer qualities distinct from those of traditional digital design processes carried out by humans, particularly in terms of aesthetic creativity, emphasis on technology, and user experience. This hypothesis is based on the assumption that AI systems, operating under human guidance, can provide not only visual diversity but also innovative perspectives in generating spatial perception and atmosphere.

The aim of this study is to illustrate the interior design process within the urban campus structure of a foundation university in Istanbul and to reveal, through disciplinary criteria, the differences between human-centered design and AI-generated outputs. In this context, the main entrance and lobby area on the second floor of Block J, which houses the Faculty of Engineering and Architecture, was addressed with a futuristic and technology-oriented design approach. The same space was redesigned both using conventional digital tools and through AI systems. In this way, the two distinct modes of production were given a comparable framework within a shared context.

The scope of the study involves analyzing the specified interior space through two different design processes. The comparison is conducted based on parameters defined within the theoretical framework, such as aesthetic values, formal consistency, technology integration, and user orientation. The aim is not only to compare these two methods but also to open a discussion about how these approaches can complement each other or diverge within the design process. In this way, the study seeks to establish a disciplinary platform for discussing the creative, technical, and cultural orientations that will shape the future of design.

Materıals & Methods

This section aims to provide a theoretical foundation for the case study of the research by examining, within a disciplinary framework, interior space design processes based on human creativity through digital production alongside AI-assisted design methods. The objective is to establish a theoretical basis that allows for a comparative analysis of both design approaches in terms of their formal, technological, experiential, and conceptual dimensions. In this context, a methodological description is presented through which the evolving dynamics of contemporary interior design can be analyzed, focusing on futuristic interior aesthetics, science fiction-inspired spatial constructs, digital modeling practices, and AI-generated productions.

The evaluation criteria used in this study were developed in accordance with thematic approaches widely discussed in the literature. For example, as highlighted by Pallasmaa (2012) and Lawson (2005), the criteria for aesthetic and formal evaluation emphasize that the formal language of a space, material selection, and sensory atmosphere are among the fundamental components of design. Under the theme of technology integration, Kolarevic (2003) and Oxman (2008) have comprehensively examined how digital design tools impact decision-making processes and how AI-assisted production transforms design paradigms. The theme of spatial meaning and atmosphere has been addressed by Lefebvre (1991) in the context of the social production and representation of space, while Zumthor (2006) underscores the emotional layers that space evokes in the human mind. Finally, the assessments related to user experience and functionality draw upon Norman's (2013) principles of user-centered design and Vischer's (2008) research on the ergonomic and psychological effects of space. In this way, the proposed criteria provide a disciplinary and theoretical foundation for the comparative framework applied in the case study analysis.

This theoretical framework enables the examination of the two design approaches subjected to comparative analysis in the case study—human-centered digital design and AI-assisted production—across four main criteria: form and aesthetics, the design process, spatial meaning, and user-centeredness and functionality. In this respect, the theoretical framework not only offers a conceptual discussion but also establishes a methodological foundation that allows for the systematic analysis of the case study. The evaluation parameters prepared within this context are presented in Table 1 and form the basis for the case analysis.

Table 1. Thematic analysis criteria for the evaluation of futuristic interior designs (Prepared by the authors).

Category		Evaluation Questions
1	Form and Aesthetics	- Does the form and geometric configuration used offer a futuristic aesthetic? - How do the choices of materials, lighting, and colors influence the atmosphere of the space? - Is there a perception of digital or synthetic aesthetics in the design**?**
2	Design Process	- Is the design process based primarily on human creativity or AI guidance? - What tools and production techniques were used during the process? - At which stages did the designer act as an active decision-maker?
3	Spatial Meaning	- Is the spatial configuration utopian or dystopian? Which scenario does it serve? - How do the formal and narrative elements reflect a vision of the future? - How have cinematic/representational effects been incorporated into the design language?
4	User-centered and Functionality	- Does the design respond effectively to user needs? - Have ergonomics, wayfinding, and functional flow been successfully addressed? - To what extent does the design reflect individual differences, cultural context, and social interaction?

2.1 Form and Aesthetic Language

The formal characteristics of futuristic design are shaped around components such as organic forms, digital aesthetics, synthetic materials, and lighting technologies (Colomina & Wigley, 2016). These elements are not merely aesthetic preferences but design strategies that directly reflect the impact of technological developments on spatial perception (Kolarevic, 2003). The futuristic approach goes beyond conceptual projections of the future and allows the reconfiguration of a formal language (Spiller, 2009). Organic forms express an aesthetic sensibility inspired by nature but transcending it (Lynn, 1999). Instead of straight lines, curvilinear, fluid, and asymmetric structures come to the forefront. This formal language departs from traditional geometric approaches, aiming to create a more dynamic, flexible, and adaptive spatial experience (Oxman, 2008). These structures, inspired by natural organisms, can be said to establish a more intuitive relationship between the user and the environment (Hensel, Menges, & Weinstock, 2010). Digital aesthetics represent a visual sensibility that emphasizes the influence of digital production tools on form (Burry, 2011). Through algorithmic modeling, parametric design, and AI-supported form generation, it is possible to create complex, non-repetitive structures (Terzidis, 2006). These forms embody an aesthetic language of the digital age, offering spatial experiences that are both abstract and technologically integrated (Picon, 2010). Form is no longer merely visual but becomes a dynamic datum produced through computational processes (Kolarevic & Malkawi, 2005). Synthetic materials constitute the physical and structural foundation of futuristic design (Addington & Schodek, 2005). Innovative surfaces such as carbon fiber, composite plastics, translucent concrete, and nanomaterials provide unique solutions in terms of both functionality and contemporary aesthetics (Leach, Williams, & Turnbull, 2004). Thanks to these materials, designs become lighter, more permeable, flexible, and sustainable (Fernández-Galiano, 2000). At the same time, they offer users a tactile and visual experience outside the conventional (Pallasmaa, 2012). Lighting technologies function not only as complementary elements in futuristic spatial constructs but also as formal determinants (Zumthor, 2006). LED panels, fiber optic systems, smart lighting solutions, and interactive surfaces can transform the atmosphere of a space instantly (Novak, 1997). These technologies add both visual depth and experiential variety to interiors, further enriching the user's engagement with the environment (Lynn, 1999).

2.2 Design Process

The design process encompasses fundamentally different operational frameworks between digital methods based on human creativity and AI-assisted productions (Lee, Law & Hoffman, 2025; Yıldırım & Demirarslan, 2020). In conventional digital modeling approaches, the designer assumes an active decision-making role at every stage of the process; all technical and aesthetic choices, from conceptual sketching to implementation details, are shaped by experience and intuition. This workflow, conducted through tools such as AutoCAD, SketchUp, Rhino, and 3ds Max, progresses in a sequential and controlled manner across the phases of drawing, modeling, and visualization. Alongside the formal language of design, functional requirements and user expectations also constitute the primary evaluation criteria for the human designer.

In contrast, in AI-assisted design processes, the designer's role evolves from that of an executor to that of a guide and curator (Şenel, 2024; Zeytin, Öztürk-Kösenciğ & Öner, 2024). In algorithmic systems such as Midjourney, DALL·E, and Stable Diffusion, core inputs are defined through textual descriptions (prompts) (Ayaz, 2024; Buldaç, 2024; Noraslı & Dilek, 2024; Özbölük & Söğüt, 2025). These descriptions are interpreted by the AI to rapidly generate thousands of variations (Avcı & Kavut, 2024). In this way, a data-driven layer of creativity is added to the design process; however, the resulting outputs generally remain at the level of data-informed, abstract propositions rather than intuitive solutions (Tatlısu et al., 2025). Human intervention is frequently required to finalize spatial coherence, scale accuracy, and structural configuration (Günay, 2024). Futuristic interior design configurations inspired by science fiction cinema occupy a prominent place among the conceptual references that inform these processes. Cinematic spaces provide patterns that facilitate the translation of technological imaginaries into aesthetic language. Consequently, AI tools function as a kind of visual database both for generating stylistic imagery and for producing experimental forms. Human-centered and AI-assisted design processes differ significantly in terms of the degree of production control, decision-making speed, and the feasibility of implementation (Gül et al., 2024).

2.3 Spatial Meaning

Spatial meaning refers not only to the creation of a physical environment but also to the capacity of design to produce symbolic, cultural, and future-oriented narratives (Carter, 2024). In futuristic interior design approaches, especially those inspired by science fiction cinema, aesthetic and conceptual elements make it possible for the space to represent an ideology or a utopian/dystopian scenario (Demirci, n.d.). Spatial constructs inspired by various science fiction films often visualize atmospheres dominated by technology—either sterile and orderly, or conversely, chaotic and alienating (Carter, 2024; Çiftçi & Demirarslan, 2020; Ek-Bektaş, 2017). In such examples, lighting compositions, reflective surfaces, and parametric geometries offer the user not merely a functional area but an experiential world of storytelling (Carter, 2024; Kaur, 2023).

Recent research emphasizes the importance of context and local cultural references in architectural design. In traditional (human-driven) digital design processes, designers tend to incorporate the unique character, historical heritage, and material language of their location into their projects. For example, Kenneth Frampton's approach of critical regionalism advocates grounding architecture in local culture, climate, and regional building knowledge, thereby resisting the homogenizing effects of globalization. Indeed, meaningful space gains identity through the spirit of place woven with cultural references, historical traces, and collective memory; the designer's training and experience further reinforce this connection by making this spirit visible. Thanks to the designer's contextual sensitivity, historical layers, original material choices, and spatial layout decisions can concretize the narrative of the space (Souza, 2025).

In contrast, spatial narratives in AI-assisted productions often lack this depth. Recent studies indicate that the outputs of generative AI tools are frequently disconnected from context, visually striking on the surface yet shallow in terms of content (Campo-Ruiz, 2025; Souza, 2025). Many AI-generated architectural images circulating in recent years present at first glance impressive utopian or dystopian scenes but adopt a neutral and universal aesthetic that could exist *anywhere*, thereby neglecting authentic elements of local identity (Souza, 2025). Such visuals rely on generalized aesthetic clichés through their rapid and stylized production, leaving contextual originality limited. Indeed, one study revealed that AI-produced architectural concepts are increasingly starting to resemble one another, with one critic describing such a design as *a clichéd collage of everything we have already seen* (Tosic, 2024). As a result, in AI-assisted designs, the unique layers of meaning derived from the local context remain largely constrained.

Another layer of spatial meaning is the creation of a shared vision of the future through formal and narrative elements (Kaur, 2023). Features such as organic forms, fluid spatial transitions, dramatic lighting, and parametric surface designs evoke a strong sense of futuristic experience within the space (Avinç, 2024; Inggs, 2024; Karim, 2024). On the other hand, these elements, which generate a cinematic atmosphere, can also produce a feeling of alienation that conflicts with the user's expectations of the environment (Paans, 2023). Spatial meaning constitutes the ideological and emotional dimension of design (Arslan & Uludağ, 2020). The narrative elements used in the design largely determine which scenario the space serves and the psychological bond it establishes with the user (Cutieru, 2020). In this respect, evaluating spatial meaning is a critical parameter for assessing the originality and impact of futuristic interior design (Sağlam & Çelik, 2023).

2.4 User-centered and Functionality

User-centeredness and functionality are among the fundamental criteria that determine the livability, accessibility, and sustainable use of an interior space (Patil & Raghani, 2025). Although visual aesthetic concerns are prominent in futuristic design approaches, focusing solely on formal creativity can adversely affect the user experience and the overall success of the design (Commo, 2025). Ergonomic resolution of the space, accurate configuration of circulation scenarios, and a level of flexibility capable of responding to different user profiles are critical requirements, particularly in spaces open to social interaction, such as educational buildings (Kurnalı, 2022).

In human-driven digital design processes, the designer's experience and contextual knowledge enable the accurate analysis of user expectations (Aslin, 2024). Elements such as scale, material selection, seating arrangements, wayfinding components, and access points strengthen the functionality of the space by combining the designer's intuition with measurable data (El-Ghazouly & El-Antably, 2021). In human-centered digital modeling processes, user comfort, ergonomics, and circulation flow are carefully considered (Khan & Lucas, 2024).

In contrast, user-centeredness is generally represented at a limited level in AI-assisted productions. Platforms such as Midjourney or DALL·E prioritize the conceptual definitions and aesthetic preferences provided as input, creating impressive spatial atmospheres; however, these outputs often remain abstract in terms of functional details and ergonomic solutions (Albaghajati, Bettaieb, & Malek, 2023; Chen et al., 2023). The adaptability of the generated spaces to real-life scenarios also requires the reinterpretation of AI outputs by human designers. Indeed, transforming AI-generated conceptual designs into structurally feasible and regulation-compliant proposals can largely be achieved through substantial human intervention (Fu, n.d.).

User-centeredness is also closely linked to considering the cultural context and individual differences in design (Doğan, 2021). The human-centered design approach aims to create a sense of identity and belonging in the user by referencing the socio-cultural environment in which the space exists (Campo-Ruiz, 2025). In contrast, designs generated through artificial intelligence often tend to drift away from local references because they develop a style based on global aesthetic norms and an anonymous design language. This situation has led to criticism that a universal design approach can overshadow regional or cultural identity elements and diminish cultural diversity and identity in spaces (Paulus, 2024).

User-centeredness and functionality, meanwhile, are critical parameters that define the experiential quality of design and complement spatial meaning with aesthetic language (Commo, 2025). From this perspective, it becomes evident that both approaches have their own unique advantages and limitations, and that an ideal design process should focus in a balanced way not only on aesthetic quality but also on ergonomics, accessibility, and user experience. A well-designed interior space should not merely appeal visually but should also functionally meet expectations by supporting feelings of comfort, safety, and belonging in users' daily lives (Commo, 2025; IED, 2024).

COMPERATIVE ANALYSIS OF HUMAN- AND AI-ASSISTED INTERIOR DESIGN: A CASE STUDY

This study examines the interior design process of Istanbul Gelişim University campus located in Avcılar, Istanbul, operated as a foundation university that is undergoing a strategic transformation with the goal of becoming a research-oriented institution. The university campus consists of multiple centers dispersed within the urban fabric; these centers sometimes comprise a single building, while in other cases, they consist of several structures located on adjacent or nearby development plots. In this context, the case study focuses on the academic complex known as the *Tower*, which is formed by the integrated structure of Blocks J and K. The Tower houses several faculties, among which the Faculty of Engineering and Architecture is one of the most prominent units. Access to the building is provided through Block J, and the specific area targeted in this study is the main entrance and lobby zone of the Faculty of Engineering and Architecture, situated on the second floor of Block J (Figure 1).

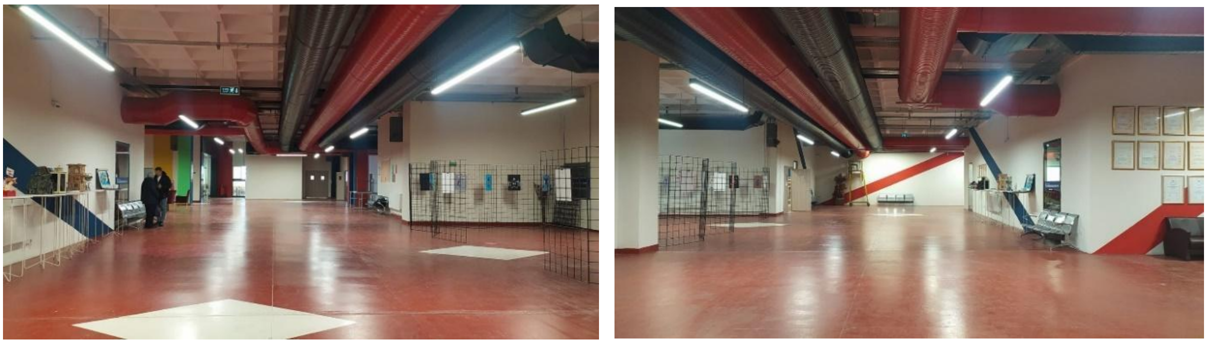


Figure 1. Current view of the second-floor entrance and foyer in Block J (Image credit: The authors)

Block J was structurally adapted for university use by repurposing an industrial building that had previously served as a warehouse or hangar. In line with the university's objective to enhance its scientific research capacity, it became necessary to redesign the faculty entrance area with a futuristic, technology-oriented, and utopian spatial concept. The design process was carried out in two stages. In the first stage, the interior architectural design was developed manually, with digital models and visualizations created by the designers. In the second stage, visualizations of the same space were produced using AI-assisted tools. The results generated by the AI were found to be more compelling, and the implementation projects were subsequently shaped in accordance with these outputs.

This article aims to provide a comparative evaluation of the two design approaches—digital design produced by human effort and design based on AI-assisted visualizations—in terms of aesthetics, functionality, technology integration, and user experience. Table 2, prepared in line with the relevant design parameters, systematically highlights these thematic differences.

Table 2. Thematic comparison of the two design approaches (Prepared by the authors).

Theme	Description
Form and Aesthetics	Form language, lighting, materials, colors, and overall atmosphere
Design Process and Method	The role of humans and/or AI in the process; modes of decision-making
Spatial Meaning and Representation	Utopian/dystopian elements, symbolic meanings, and the relationship established with the user
User-Centricity and Functionality	Ergonomics, spatial use, orientation, and accessibility

Accordingly, a qualitative comparative analysis method was adopted. The analysis process is particularly well-suited for direct comparison, as both designs were developed within the same spatial context—namely, the entrance and lobby area of Istanbul Gelişim University in Avcılar, Istanbul. The evaluation is conducted based on four core themes defined in the theoretical framework: form and aesthetics, design process, user-centricity and functionality, and spatial meaning. Through these themes, both design approaches are analyzed on the basis of visual data and documentation related to the design process. The differences between AI-assisted and human-centered design are assessed using thematic content analysis and visual interpretation methods; criteria such as aesthetic atmosphere, the use of lighting and materials, spatial organization, and functionality are compared in detail. Additionally, differences in decision-making processes are interpreted through the lens of designer inputs and guidance. This methodology not only reveals the strengths and weaknesses of each approach but also provides insights into the potential for a hybrid design model.

3.1 Interior Design Process with Conventional Digital Modeling

The visuals presented in this section illustrate examples of an interior spatial composition designed manually using conventional digital modeling and visualization techniques (Figure 2). In this design, created with software such as Autodesk AutoCAD, SketchUp, and D5, components like lighting, material transitions, the use of vegetation elements, and spatial organization were configured in line with the designer’s technical knowledge and aesthetic preferences. The red and black ventilation ducts located on the ceilings were preserved in their existing state, without any interventions in terms of color or form, and were incorporated as integral parts of the design. This choice contributes to reflecting the character of the existing structure while creating an atmosphere integrated with the new interventions. Details such as the bar-type seating unit, pendant lighting fixtures, and central circulation elements provide functionality and spatial hierarchy. These visuals demonstrate how a manually conducted digital design process can produce comprehensive and feasible outputs in terms of spatial experience, scale, and aesthetic control.

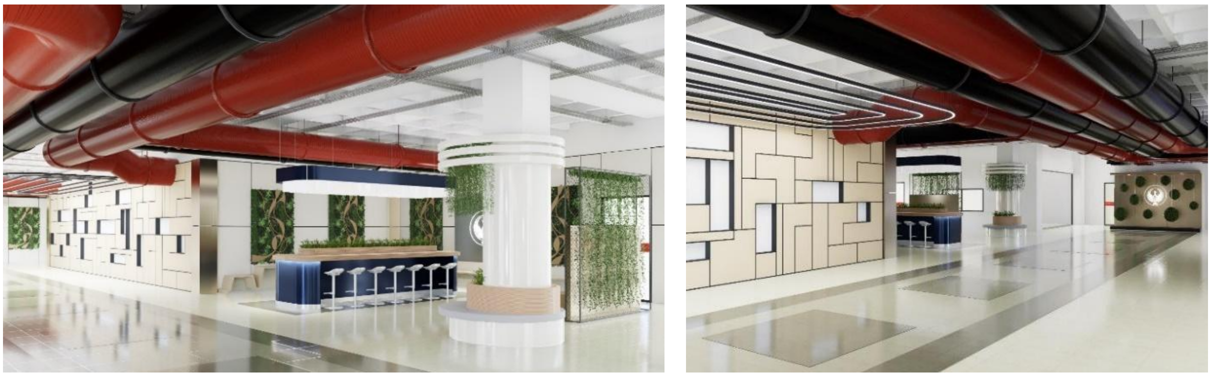


Figure 2. Interior design of the second-floor entrance of Block J, created using conventional modeling techniques (Illustrations drawn by Melek Çelik).

3.2 Interior Design Process with AI-Assisted Visualization

The AI-generated visualizations presented in Figure 3 illustrate a futuristic and high-tech interior design proposal for the entrance lobby of the Faculty of Engineering and Architecture within the university. In the prompts used to generate these images, it was specified that this area is part of a university building and should particularly represent a research-oriented and technology-integrated educational approach. The prompts also emphasized that the space would belong to the architecture and engineering faculty, should reflect the technologies of the future, prominently highlight the role of artificial intelligence in the design, and create an experiential atmosphere that impresses users. These conceptual inputs, interpreted by the AI, materialized in the visuals as holographic human figures, digital information panels, illuminated floor elements, integrated planting units, and scientific interfaces. The prompts for generating these images also included expressions such as *AI themed university entrance interior*, *futuristic architecture faculty lobby, interactive digital panels, transparent surfaces, white and blue neon light, cybernetic wall graphics, clean high-tech interior, glowing surfaces, and modern research environment.* In this context, it is evident that the AI interpreted the parameters defined at both the functional and aesthetic levels, producing a rich and experiential interior atmosphere.

Figure 3. A sample futuristic interior design proposal for the entrance lobby of the Faculty of Architecture and Engineering at a research-oriented university, generated using AI-assisted visualization tools (Illustrations created by Melek Çelik using AI tool).

3.3 Integration of AI-Assisted Design into the Conventional Digital Modeling Process

In this interior design created through the AI-assisted visualization process, particular emphasis was placed on thematic cohesion, and the concept of artificial intelligence was positioned at the core of the spatial composition. The wall panels featured in the visuals were initially produced independently by artificial intelligence and subsequently integrated into the conventional digital modeling process to be incorporated into the final visualization (Figure 4). On these panels, digital brain images, data circuits, and graphics emphasizing *Artificial Intelligence* are intended to evoke a technological awareness in the user. The design has been conceived not merely as an aesthetic composition but also as a conceptual narrative. This proposal, which is visually striking in terms of lighting, texture, and color contrast, demonstrates the potential for integrating visual imagery generated by digital technologies into the spatial environment. Additionally, the decision to preserve the existing red and black ventilation ducts without any color alteration highlights that the design was produced with a respectful coherence toward the physical context. This approach, in which AI-generated content is blended with conventional tools, exemplifies new possibilities for hybrid design practices.

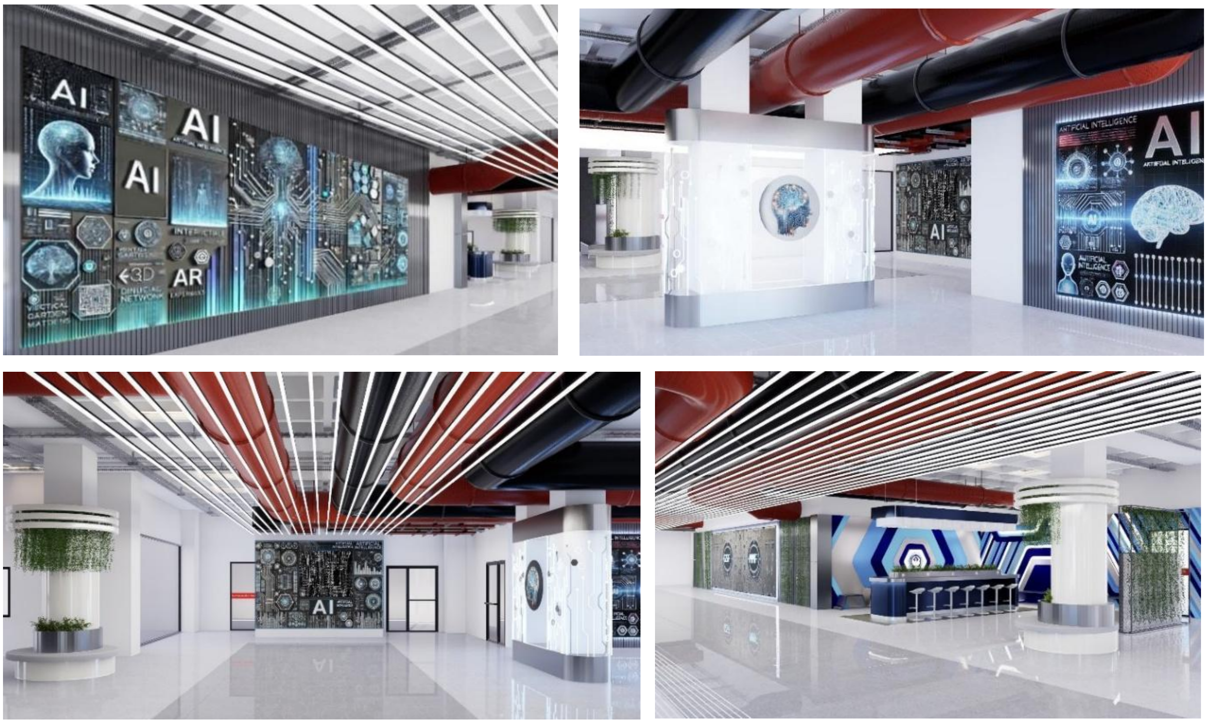


Figure 4. Interior design of the second-floor entrance of Block J, created with the support of artificial intelligence (Illustrations created by Melek Çelik)

3.4 Comparative Evaluation of Human- and AI-Assisted Interior Design Approaches

Table 3 presents a comparative analysis of human-centered digital design and AI-assisted design approaches in terms of core parameters. The first four criteria are derived from the categories defined in the *Materials and Methods* section. In terms of form and aesthetics, the human-centered design adopts a context-sensitive and balanced language, while AI-assisted outputs generate a more experimental and futuristic expression. Within the design process, the human designer maintains an active decision-making role at all stages, whereas in the AI approach, the designer assumes a more guiding and selective position. Regarding spatial meaning, the human-centered approach integrates the design with the historical and contextual characteristics of the existing structure, while AI-assisted proposals tend toward a more symbolic and theatrical narrative. In terms of user orientation and functionality, the human-produced design demonstrates a high level of adequacy in ergonomics, scale accuracy, and implementation potential. In contrast, AI-generated solutions excel in creating atmosphere and aesthetic impact but tend to remain limited in functional organization. The last two criteria are based on observations made by the authors during the case study and have been included here as relevant considerations. In lighting and overall atmospheric composition, AI demonstrates a strong ability to produce dramatic lighting schemes and striking visual effects, whereas human design creates a more balanced and familiar environment. Regarding feasibility, human-centered solutions, with their technical detailing and scale accuracy, are generally ready to be translated into project documentation, while most AI outputs remain at a conceptual level and require extensive remodeling to become applicable.

Table 3. Comparative analysis of human-centered and AI-assisted design approaches (Prepared by the authors)

Evaluation Criterion	Human-Centered Digital Design	AI-Assisted Design
a. Form and Aesthetics	A controlled aesthetic language in harmony with the context; integration with existing architectural elements; neutral color palettes and balanced material use.	Striking, experiential, and futuristic language; dramatic lighting effects, glossy surfaces, bold color combinations; abstract spatial compositions.
b. Design Process and Methodology	Designer as the active decision-maker, controlling the entire process; intuitive, experience-based solutions; manual modeling and rendering workflows.	Designer in a guiding and selective role; rapid variation generation; automatic visual outputs based on conceptual prompts; requires interpretation and further refinement.
c. Spatial Meaning and Representation	Respectful of the industrial heritage of the building; integrated with the existing fabric; balanced technology-focused future narrative.	Strong conceptual symbolism and assertive future representations; weak contextual relationship with the existing environment; experiential, theatrical spatial compositions.
d. User-Centeredness and Functionality	Functional aspects such as ergonomics, circulation, and wayfinding prioritized; high consistency in applicability and scale; detailed solutions compatible with user scenarios.	Successful in producing experiential atmospheres; limited functional organization; requires human intervention for scale, ergonomics, and everyday usability.
e. Aesthetic Atmosphere and Interaction	Balanced lighting arrangements; familiar atmosphere for users; visual comfort.	Dramatic contrasts; striking light effects; cinematic impact enhancing the aesthetic experience.
f. Feasibility and Realization	Realistic technical details, material selections, and scaling; feasible to implement as a project.	Inspiring but most proposals remain abstract in terms of feasibility; requires extensive human intervention and re-modeling to transform into an implementable project.

It was deemed necessary for the authors to evaluate their observations from the case study on a rating scale. Within the scope of this study, a 1–10 scale was applied as a qualitative assessment system developed to objectively evaluate the design approaches (Table 4). The scale expresses performance in each parameter from low to high: 1 represents the lowest level of success, while 10 indicates the ideal level. The ratings were assigned by the authors, taking into account factors such as the visual materials obtained during the case study, documentation of the design processes, spatial use scenarios, and aesthetic coherence. The main purpose of the scale is to make the strengths and limitations of human-centered digital design and AI-assisted production visible in a comparative manner, creating an evaluation framework that is both numerical and conceptual. This approach aims to minimize subjective interpretations and enable a more systematic analysis in light of disciplinary criteria.

Table 4. Comparative evaluation scores of design approaches (Prepared by the authors)

Parameter	Human-Centered Design	AI-Assisted Design
Form and Aesthetic	7	9
Process and Control	9	6
Spatial Meaning	8	6
User-Centric Experience	8	5
Functionality and Ergonomics	9	5

The high score achieved by the human-centered digital design in the form and aesthetics category stems from the designer's ability to develop original forms grounded in personal experience. In contrast, the AI-assisted design provided aesthetic richness through its capacity to generate a large number of variations. In the process and control parameter, human-driven design stood out due to the complete oversight it allows in decision-making and implementation stages. Conversely, in AI-generated productions, the designer assumed the role of defining inputs and selecting among the generated options. From a functionality and ergonomics perspective, human-produced designs delivered more consistent solutions in terms of scale alignment, usage scenarios, and technical detailing, whereas AI outputs demonstrated limited ergonomic sensitivity. In terms of user experience, both approaches offered balanced potential: AI created inspiring spatial atmospheres, while human design developed alternatives that were more familiar and responsive to user expectations. Regarding the spatial meaning parameter, the capacity of human-centered design to incorporate cultural and contextual layers resulted in a more profound expression, providing a distinct advantage over the stylized but abstract narratives of AI-generated proposals. This assessment was developed based on the findings of the case study and the evaluation criteria defined in the theoretical framework.

FINDINGS AND DISCUSSION

This section discusses the findings obtained through the comparative analysis of the human-centered digital design and AI-assisted design processes conducted within the scope of the case study. The four main parameters used in the study—form and aesthetics, design process, functionality and user-centeredness, and spatial meaning—were systematically evaluated to reveal the potentials and limitations of each approach. The findings were shaped by examining both the visual data and the criteria defined in the theoretical framework. First, in terms of form and aesthetics, it was observed that the AI-assisted design approach offered a clear advantage in generating dramatic lighting effects, striking geometries, and strong visual compositions. Text-to-image tools such as Midjourney were able to create visually compelling, futuristic interior spaces through guided prompts. However, these productions often remained at an abstract narrative level and did not fully respond to the actual needs of spatial organization. In contrast, within the human-centered digital modeling process, the aesthetic language was shaped in a more controlled, context-sensitive, and implementable manner. In particular, scale accuracy, material details, and spatial flow exhibited a more holistic consistency in the project designed by human input.

The comparative radar chart was prepared to visualize the relative performance of human-centered digital design and AI-assisted design approaches in terms of key evaluation criteria (Figure 4). The chart encompasses five main parameters: form and aesthetics, process and control, functionality and ergonomics, user experience, and spatial meaning. The scores achieved by each approach in these criteria are plotted along scaled axes, enabling a holistic comparison of their strengths and weaknesses through the shape and spread of the area. The visual analysis indicates that the human-centered design provides more balanced and implementable outputs in process control, functionality, and spatial meaning, whereas the AI-assisted approach stands out in areas such as formal diversity and aesthetic creativity. This chart serves as an important evaluation tool that both summarizes the findings of the case study and reveals the complementary potentials of the two design methods.

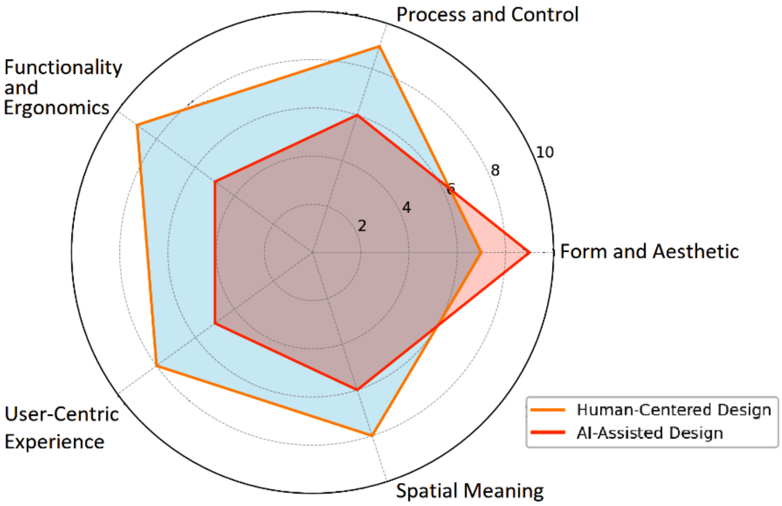
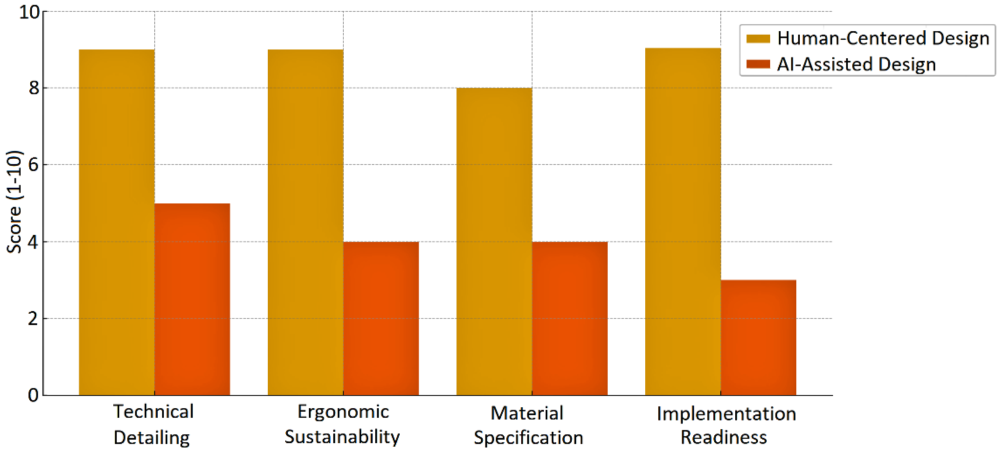


Figure 4. Comparative performance of both design approaches (Prepared by the authors).

Table 5 presents the comparative evaluation of the feasibility of human-centered and AI-assisted designs in terms of technical detailing, ergonomic suitability, material specification, and readiness for implementation.

Table 5. Implementation readiness comparison between design approaches (Prepared by the authors).



4.1 The Role and Limitations of Artificial Intelligence in the Interior Design Process

The most significant role of artificial intelligence in interior design is its capacity to rapidly generate a wide range of alternatives. The ability to produce numerous aesthetic variations in a short time provides substantial potential to enrich the designer's creative process. However, a key finding of this study is that AI-generated outputs remain limited in terms of spatial feasibility, scale accuracy, and user experience. While these visuals often offer high aesthetic value, they tend to represent abstract proposals with respect to criteria such as ergonomics, material performance, and building physics. This demonstrates that AI cannot yet act as an independent design agent and that its outputs cannot be transformed into implementable projects without integration with human expertise and conventional modeling processes. In summary, although AI-assisted design offers valuable contributions as a creative tool, it inevitably requires significant reworking to achieve practical applicability.

4.2 The Role of the Designer in the Use of Artificial Intelligence in Interior Design

The findings indicate that the use of artificial intelligence significantly transforms the role of the designer. In the conventional process, the designer occupies a position as the direct creator and decision-maker at every stage of the design. In contrast, within AI-assisted production, the designer increasingly assumes the role of a conceptual guide and a selective actor who curates the results. The quality of the prompts becomes the main factor defining the framework of the outputs generated by AI. However, this also means that part of the designer's control is transferred to the algorithmic production process. Qualitative assessment results reveal that the designer's experience and critical interpretation skills are indispensable for transforming AI suggestions into an applicable design strategy. Thus, although AI serves as a supportive element in design practice, it cannot yet constitute an autonomous production model independent of the designer's intellectual and technical guidance.

Overall, this comparative assessment demonstrates that AI-assisted approaches offer high aesthetic and conceptual potential. However, in terms of feasibility and user-centered considerations, human-centered design knowledge still plays a decisive role. This situation provides an important insight suggesting that hybrid modeling approaches may find broader applications in design disciplines in the near future.

Conclusion

This study was conducted to evaluate the transformation brought about by digital technologies and AI-assisted production tools in interior design from a disciplinary perspective. The initial hypothesis posited that artificial intelligence could enhance aesthetic creativity and conceptual diversity, yet parameters such as functionality and user-centeredness would still largely depend on human expertise and experience. The case study carried out in the entrance and lobby area of Istanbul Gelişim University in Avcılar, Istanbul substantiated this hypothesis, revealing both the potentials and limitations of the two different design approaches.

In the first phase of the study, the design prepared using human-driven digital modeling tools demonstrated high performance in terms of strong contextual coherence, scale accuracy, and ergonomic criteria. Thanks to the designer's intuitive and critical decision-making abilities, the resulting solutions produced high-quality outcomes in organizing spatial flow, guiding users, and establishing a balanced aesthetic atmosphere. In contrast, during the AI-assisted production phase, the use of systems such as Midjourney enabled the rapid creation of impressive and experimental visualizations. In particular, dramatic lighting compositions, holographic panels, cyber-aesthetic elements, and futuristic symbols significantly enhanced the perceptual impact of the space. However, these proposals often lacked applicable technical details and remained limited to the conceptual level.

The results of the comparative analysis demonstrate that both approaches possess complementary characteristics. Human-centered digital design is a production method that prioritizes user expectations, emphasizes functional solutions, and provides a technical infrastructure ready for project implementation. In contrast, AI-assisted design serves as a creative catalyst, particularly in the conceptual design phases, by enabling the exploration of new ideas, expanding aesthetic variations, and rapidly testing different scenarios. This finding has reinforced the hybrid model proposed at the outset of the study and has revealed that collaboration between humans and artificial intelligence will be an inevitable trend in the future of design processes.

An important aspect of the findings is the transformation of the designer's role. In human-centered processes, the designer is defined as an agent who guides all production phases with the identity of a decision-maker and implementer. In AI-assisted approaches, however, the designer evolves into more of a strategic curator and interpreter. In particular, the quality of prompt writing has directly determined the outcomes produced by AI algorithms, making the designer's ability to conceptually guide the process critically important.

However, in all cases, it has been observed that the final decision-making and the transformation of the design into an implementable outcome still rely on human expertise. This finding demonstrates that AI currently has limited potential to act as an autonomous design agent. Notably, during revision processes, AI-assisted productions have shown a significant constraint. When the AI is instructed to modify only certain parts of an existing visual, the algorithm's data processing logic often initiates a holistic regeneration process rather than performing localized corrections, generating an entirely new variation that recreates the overall composition. This situation results in a substantial loss of flexibility for projects aiming to preserve the original design's color scheme, spatial hierarchy, or formal character. Therefore, it has been concluded that AI-supported systems still lag behind human-centered digital design tools in terms of revision capability, making a hybrid approach a critical necessity to achieve technical and aesthetic coherence.

In conclusion, the hypothesis of this research has been largely validated. AI systems offer striking advantages in terms of aesthetic diversity, speed, and experimental vision. However, in the domains of spatial meaning, ergonomics, revision flexibility, and technical feasibility, they still require the guidance of human expertise to be completed effectively. Particularly, the hybrid modeling practice developed in the case study demonstrated that when the conceptual production capacity of AI is combined with the control of the human designer, a more comprehensive and feasible interior design outcome can be achieved from a disciplinary perspective.

The study also highlights the necessity for designers to improve their skills in prompt development, data-driven evaluation, and critical interpretation in parallel with the advancement of AI tools. In conclusion, the interaction between humans and artificial intelligence should not be seen merely as a technical collaboration, but rather as a transformative domain that redefines design practices. The potential and responsibilities introduced by this domain should continue to be discussed with a critical perspective within the disciplines of architecture and interior design.

This study has provided a significant comparative basis by focusing on the formal, functional, and experiential outputs of human-centered and AI-assisted design approaches. However, the parameters employed in this case study also constitute a valuable framework for future research. First, the topic of user interaction and feedback requires a comprehensive analysis of data derived from real users experiencing the proposed designs. In future studies, the effects of the proposed interior configurations on user satisfaction, perceptual comfort, and spatial belonging could be examined in greater depth. Additionally, cultural and social contextual alignment will be an important focus area, particularly for investigations questioning the extent to which AI-generated designs align with local cultural values, spatial identity, and societal expectations. In this way, the capacity of abstract and universal aesthetic approaches to generate meaning within a cultural context can be better understood. Systematically addressing these issues will contribute to a new line of inquiry that further advances the shared potential of artificial intelligence and human creativity.

In addition, as one of the limitations of the study, it should be noted that the comparative evaluation scores presented in Table 4 were determined based on the authors' experience and professional observations. Although the expertise gained through the researchers' own design practice constitutes a valuable reference point for the depth of the case analysis, the generalizability of these ratings remains limited. Therefore, it is recommended that the success criteria of human-centered and AI-assisted design approaches be systematically tested with the participation of a broader group of users, particularly through surveys and focus group studies involving professional designers, interior space users, and potential stakeholders. Such a quantitative evaluation process would enhance the objectivity of the parametric ratings, enable comparisons of perceptions and priorities across different user profiles, and contribute to the validity of the research by strengthening methodological diversity.

ACKNOWLEDGMENT

The authors would like to express their special thanks to Melek Çelik, who contributed to the production of visual documents and assisted us in conducting this research.

INFORMATION NOTES

The conceptual design for the renovation of the 2nd floor entrance and foyer areas of İstanbul Gelişim University Block J was carried out by Semih Göksel Yıldırım, İbrahim Erol, and Melek Çelik.

The authors declare no conflict of interest.

REFERENCES

Addington, M. & Schodek, D. (2005). *Smart materials and new technologies: For the architecture and design professions.* Burlington: Architectural Press.

Albaghajati, Z.M., Bettaieb, D.M. & Malek, R.B. (2023). Exploring text-to-image application in architectural design: insights and implications. *Architecture, Structures and Construction, 3*, 475–497.

Arslan, S., & Uludağ, Z. (2020). Re-structuring the space in language: Place names, collective memory and ideology. *İdealkent, 11*(31), 1422-1455.

Aslin, A. (2024, Nov. 13). *The importance of user-centered design in architecture*. Deejos, retrieved from https://blog.deejosengineers.com/detail/the-importance-of-user-centered-design-in-architecture.html, dated May 10, 2025.

Auernhammer, J. (2020). Human-centered AI: The role of human-centered design research in the development of AI. *Proceeding of Synergy - DRS International Conference 2020*, (pp. 1315-1333) Brisbane, Australia.

Avcı, E., & Kavut, İ.E. (2024). Creation of the sketching phase in architectural design with artificial intelligence. *Journal of Interior Design and Academy, 4*(1), 43-61.

Avinç, G.M. (2024). The use of text-to-image generation artificial intelligence tools for the production of biophilic design in architecture. *Black Sea Journal of Engineering and Science, 7*(4), 641-648.

Ayaz, O. (2024). An insight into the evaluation of Midjourney artificial intelligence-assisted image generation model in the interior design process. (Tez No. 888253) [Yüksek Lisans Tezi, Mimar Sinan Güzel Sanatlar Üniversitesi. Ulusal Tez Merkezi].

Bhuvan, M, Mishra, S., & Gowda, N.N. (2024). Study on influence of cultural values and traditions on interior design practices. *International Journal of Trends in Emerging Research and Development, 2*(6), 226-232.

Borowa, K., Almeida, R.R., & Wiese, M. (2025). Debiasing architectural decision-making: An experiment with students and practitioners. *International Conference on Software Architecture 2025 (ICSA 2025)*, retrieved from https://arxiv.org/abs/2502.04011.

Brown, S. (n.d.). *The smart home revolution: Blue Heron's intelligent, adaptive homes.* Blue Heron, retrieved from https://blueheron.com/the-smart-home-revolution-blue-herons-adaptive-homes/, dated June 01, 2025.

Buldaç, M. (2024). Use of artificial intelligence tools in the experimental design process; Outcomes of a course model in interior design education. *Anadolu University Art & Design Journal, 14*(2), 69-91.

Burry, M. (2011). *Scripting cultures: Architectural eesign and programming. Wiley.*

Campo-Ruiz, I. (2025). Artificial intelligence may affect diversity: architecture and cultural context reflected through ChatGPT, Midjourney, and Google Maps. *Humanities & Social Sciences Communications, 12*(24), 1-13.

Carter, A. (2024). *Dystopian interior design in movies and the beauty of brutalism*. Kooihaus, retreieved from https://kooihaus.com/dystopian-interior-design-movies/, dated May 1, 2025.

Chen, J., Wang, D., Shao, Z., Zhang, X., Ruan, M., Li, H., & Li, J. (2023). Using artificial intelligence to generate master-quality architectural designs from text descriptions. *Buildings*, *13*(9), 2285.

Colomina, B., & Wigley, M. (2016). *Are we human? Notes on an archaeology of design*. Zürich: Lars Müller Publishers.

Commo (2025). *Balancing aesthetics and functionality in interior design*. Retrieved from https://commoworks.com/balancing-aesthetics-and-functionality-in-interior-design/journal/, dated April 20, 2025.

Cross, N. (2011). *Design thinking: Understanding how designers think and work*. Berg Publication.

Cross, N. (2015). *Engineering design methods: strategies for product design, (5th ed.)*. Wiley.

Crown, (2025, May 1). *AI powered lighting controls; the future of automated commercial spaces*. Crown Lighting Group, retrieved from https://crownlightinggroup.com/the-future-of-automated-commercial-spaces/, dated June 01, 2025.

Cutieru, (2020). *Speculative architecture: Where are the contemporary equivalents of the 60s and 70s radical visions?* ArchDaily, retrieved from https://www.archdaily.com/951803/speculative-architecture-where-are-the-contemporary-equivalents-of-the-60s-and-70s-radical-visions, dated May 1, 2025.

Çiftçi, S.K. & Demirarslan, D. (2020). Cyberpunk genre and interior space analyses of cyberpunk movies. *IBAD Journal of Social Sciences, special issue*, 62-83.

Demirci, E. (n.d.). *The future of srchitecture: Utopias, dystopias, heterotopias*. Rethinking the Future, retrieved from https://www.re-thinkingthefuture.com/narratives/a6319-the-future-of-architecture-utopias-dystopias-heterotopias/, dated May 1, 2025.

Derevyanko, N., & Zalevska, O. (2023). Comparative analysis of neural networks Midjourney, Stable Diffusion, and DALL-E and ways of their implementation in the educational process of students of design specialities. *Scientific Bulletin of Mukachevo State University; Series -Pedagogy and Psychology*, *9*(3).

Doğan, C. (2021). Factors that affecting human-centered interior design. (Tez No. 679806) [Yüksek Lisans Tezi, Mimar Sinan Güzel Sanatlar Üniversitesi. Ulusal Tez Merkezi].

Dorst, K. (2015). *Frame innovation: Create new thinking by Design*. MIT Press.

Durukan, A., & Türk, R.D. (2023). The effect of verbally transmitted data on visualisation potential in artificial intelligence perception: Traditional Turkish house example. *International Journal of Social and Humanities Sciences Research (JSHSR)*, *10*(102), 3569-3580.

Ek-Bektaş, E.H. (2017). A look at science fiction movies in terms of cinema space. *Journal of Architecture and Life*, *2*(2), 201-218.

El-Ghazouly, Y., & El-Antably, A. (2021). Using digital duman models to evaluate the ergonomic comfort of interior layouts and furniture design. *Technology/Architecture + Design*, *5*(2), 225-240.

Enwin, A.D. (2024). The influence of culture and heritage on interior aesthetics. *Global Journal of Engineering and Technology Advances (GJETA)*, *19*(1), 113-122.

Fernández-Galiano, L. (2000). *Fire and memory: On architecture and energy*. MIT Press.

Fu, T. (n.d.). *The intersection of AI and architecture: Innovations and limitations*. Asia Business Outlook, retrieved from https://www.asiabusinessoutlook.com/industry-experts/the-intersection-of-ai-and-architecture-innovations-and-limitations-nwid-6130.html, dated June 1, 2025.

Gül, L.F., Delikanlı, B., Üneşi, O., & Gül, E.Ö. (2024). Employing generative AI models in architectural design education: Our insights from the studio experience. *XVIII. Mimarlıkta Sayısal Tasarım Ulusal Sempozyumu,* Balıkesir: Balıkesir Üniversitesi Yayınları.

Günay, M. (2024). Artificial Intelligence and Originality in Design. *ART/icle: Journal of Art and Design*, *4*(3), 449-469.

Hensel, M., Menges, A., & Weinstock, M. (2010). *Emergent technologies and design: Towards a biological paradigm for architecture*. Routledge.

IED (2024, Sep. 9). *Human-centered interior design; what it means the challenges and opportunities*. IED Istituto Europeo di Design S.p.A, retrieved from https://www.ied.edu/news/human-centred-interior-design-what-it-means-the-challenges-and-the-opportunities, dated May 10, 2025.

Inggs, A. (2024, June 1). *Set phasers to stun*. The World of Interiors, retrieved from https://www.worldofinteriors.com/story/science-fiction-design-from-space-age-to-metaverse, dated June 10, 2025.

Karim, M. (2024, Dec. 3). *From straight to curved: 8 parametric interior spaces*. Parametric Architecture, retrieved from https://parametric-architecture.com/8-parametric-interior-spaces, dated June 10, 2025.

Kaur, M.D. (2023, Oct. 6). *Designing tomorrow: An in-depth analysis of futuristic interior design*. Cindrebay School of Design, retrieved from https://blog.cindrebay.com/designing-tomorrow-an-in-depth-analysis-of-futuristic-interior-design/, dated May 10, 2025.

Kayaoğlu-Yaman, D. G. (2025). The use of artificial intelligence tools in early design stages in interior design education. *International Journal of Communication and Art*, *6*(14), 65-78.

Khan, R.A.J., & Lucas, J. (2024). *Building environments for human experiences: An in-depth exploration of human-centric design*. eJournal of SSRN, retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4893106, dated April 15, 2025.

Kızılhan, T. (2024). A comperative study on AI versus human design in communication design education. *Etkileşim, 15*, 196-218.

Knoth, N., Tolzin, A., Janson, A., & Leimeister, J.M. (2024). AI literacy and its implications for prompt engineering strategies. *Computers and Education: Artificial Intelligence, 6*(2024), 100225.

Kolarevic, B. (2003). *Architecture in the digital age: Design and manufacturing*. Taylor & Francis.

Kolarevic, B., & Malkawi, A.M (2005). *Performative architecture: Beyond instrumentality.* London: Spon Press.

Kryssanov, V.V., Tamaki, H., & Kitamura, S. (2001). Understanding design fundamentals: How synthesis and analysis drive creativity, resulting in emergence. *AI in Engineering*, *15*(4), 329-342.

Kurnalı, M. (2022). Interior ergonomics in micro spaces. *International Journal of Engineering Research and Development*, *14*(3), 20-31.

Lawson, B. (2005). *How designers think: The design process demystified, (4th ed.).* Routledge.

Leach, N., Williams, C., & Turnbull, D. (2004). *Digital tectonics*. Wiley-Academy.

Leão, C.P., Silva, V, & Costa, S. (2024). Exploring the Intersection of Ergonomics, Design Thinking and AI/ML in Design Innovation. *Applied System Innovation*, *7*(4), 65.

Lee, S.Y., Law, M., & Hoffman, G. (2025). When and how to use AI in the design process? Implications for human-AI design collaboration, *International Journal of Human–Computer Interaction*, *41*(2), 1569-1584.

Lefebvre, H. (1992). *The production of space*. Blackwell.

Li, Y., Chen, H., Yu, P., & Yang, L. (2025). A review of artificial intelligence in enhancing architectural design efficiency. *Applied Science*, 2025, 1476.

Liu, V., & Chilton, L. B. (2022). Design guidelines for prompt engineering text-to-image generative models. *Proceedings of the 2022 CHI Conference on Human Factors in Computing Systems*, *CHI 22*, (pp. 1-23). New York: Assocation for Computing Machinery.

Louatouate, H., & Zeriouh, M. (2025). Role-based prompting technique in generative AI-assisted learning: A student-centered quasi-experimental study. *Journal of Computer Science and Technology Studies*, *7*(2), 130–145.

Lynn, G. (1999). *Animate form*. New York: Princeton Architectural Press.

Murray-Rust, Lupetti, M.L., Nicenboim, I., & Hoog, W. (2024). Grasping AI: experiential exercises for designers. *AI & Society (2024) 39*, 2891–2911.

Nasir, O. (2024, Sep. 21). *Neo-futurism in architecture: Bold designs for tomorrow's cities*. Parametric Architecture, retrieved from https://parametric-architecture.com/neo-futurism-in-architecture, dated June 01, 2025.

Noraslı, M., & Dilek, H.Y. (2024). Transformation of descriptive expression into space: Analytical examination of artificial intelligence and student projects. *Yedi Journal of Art, Design & Science (Digitalism in Art Special Issue)*, 101-113.

Norman, D. (2013). *The design of everyday things*. New York: Basic Books.

Novak, M. (1995). Transmitting architecture: The transphysical city. *Proceeding of the 6th International Symposium on Electronic Art Conference - ISEA 95 (pp. 219-225)*, Montreal, Canada.

Novedge, (2025, Jan. 15). *Design software history: evolution of rendering techniques in architectural design: From early graphics to AI-driven solutions*. Novedge Digital Design Software, Retrieved from https://novedge.com/blogs/design-news, dated January 15, 2025.

Oxman, R. (2008). Digital architecture as a challenge for design pedagogy: theory, knowledge, models and medium. *Design Studies*, *29*(2), 99–120.

Önal, G.K., & Turgut, H. (2017). Cultural schema and design activity in an architectural design studio. *Frontiers of Architectural Research*, *6*(2), 183-203.

Özbölük, Z., & Söğüt, M.A. (2025). Text to image: A creative transformation in furniture design with artificial intelligence. *IDA: International Design and Art Journal, 7*(1), 123-134.

Paans, O. (2023, May 22). *Sterile spaces, synthetic humans, and disentanglement: High modernism and our alienation from nature*. Medium, retrieved from https://bobhannahbob1.medium.com/sterile-spaces-synthetic-humans-and-disentanglement-high-modernism-and-our-alienation-from-162c0821d9dc, dated June 10, 2025.

Pallasmaa, J. (2012). *The eyes of the skin: Architecture and the senses*. Wiley.

Patil, A., & Raghani, S. (2025). Designing accessible and independent living spaces for visually impaired individuals: a barrier-free approach to interior design. *International Journal of Equity Health, 24*(1),137, 1-26.

Paul, C. (2021, June 24). *Evolution of 3D modeling in architecture and design: a 30-year retrospective*. Archicgi, retrieved from https://archicgi.com/cgi-news/evolution-of-3d-modeling-retrospective/, dated May 1, 2025.

Paulus, C. (2024, July 24). *Why parametric design is the future of the architecture; flexibility and innovation*. Illustrarch, retrieved from https://illustrarch.com/parametric-design/31259-why-parametric-design-is-the-future-of-architecture.html, dated May 10, 2025.

Picon, A. (2010). *Digital culture in architecture: An introduction for the design professions.* Birkhäuser.

Portnova, T.V. (2023). Futurism concept in the design and architectural solutions of the 20th and early 21st centuries. *Civil Engineering and Architecture, 11*(3): 1125-1136.

Sağlam, B., & Çelik, T. (2023). Mimarlık ve ütopya; Yapay zeka ile üretken tasarım denemeleri. *Mimarlık Dergisi, 429*, 59-64.

Sarıca, S. (2023). Integration of artificial intelligence applications into experimental design workshop courses; evaluation from a student perspective. *The Journal of Academic Social Science, 147*, 358-388.

Sarıkaya, B.F. (2024). Conceptual review of artificial intelligence; Differences between human And machine learning. *The Turkish Online Journal of Design Art and Communication (TOJDAC), 14*(3), 648-659.

Souza, E. (2025, May 2). *This is not architecture: Resisting the illusion of AI design*. ArchDaily, retrieved from https://www.archdaily.com/1029469/this-is-not-architecture-resisting-the-illusion-of-ai-design, dated June 10, 2025.

Spiller, N. (2009). *Digital architecture now.* London: Thames & Hudson.

Sun, M., Terzidis, K., & Chen, J. (2024). Facilitation or inhibition: The influence of generative artificial intelligence on design reasoning for modular structures. *Proceedings of the IASS 2024 Symposium Redefining the Art of Structural Design, Redefining the Art of Structural Design*, Zurich Switzerland: IASS.

Şenel, N.E. (2024). Investigation of artificial intelligence usage in architectural visualization tools. (Tez No. 901714) [Yüksek Lisans Tezi, İstanbul Kültür Üniversitesi. Ulusal Tez Merkezi].

Tatlısu, E., Bağlı, H.H., Turan, A.Z., Hamurcu, A., Eser, A.,Avcı, S.K. (2025). Yapay zeka çağında endüstriyel yaşam; Uygulamalar ve eğitim üzerine etkileri. *Öneri Dergisi, 20*

(MX Yaratıcı Endüstriler Çalıştayı 2024: Yapay Zeka Çağında Yaratıcı Endüstriler Özel Sayısı), 154-188.

Terzidis, K. (2006). *Algorithmic Architecture*. London: Architectural Press.

Thampanichwat, C., Wongvorachan, T., Sirisakdi, L., Chunhajinda, P., Bunyarittikit, S., & Wongmahasiri, R. (2025). Mindful architecture from text-to-image AI perspectives: A case study of DALL-E, Midjourney, and Stable Diffusion. *Buildings 2025*, *15*(6), 972.

Tholander, J. & Jonsson, M. (2023). Design ideation with AI - sketching, thinking and talking with generative machine learning models. *Proceeding of DIS '23 Conference,* (pp. 1930-1940). Pitsburgh.

Torricelli, M., Martino, M., & Baronchelli, A., Aiello, L.M. (2024). The role of interface design on prompt-mediated creativity in generative AI. *Proceedings of the 16th ACM Web Science Conference WEBSCI 24* (pp. 235-240). WEBSCI.

Tosic, J. (2024). Re-creating genius loci: AI-generated design trends as architectural concepts and methods. *Conference: On Architecture — Shaping the City through Architecture*, (pp. 229-234). Belgrade.

Tütüncüler, T., & Hoplamaz, B. (2025). AI in architectural plan development: The example of Stanislas Chaillou's 'AI + Architecture: Towards a New Approach' case study. *Modular Journal*, *8*(1), 299-315.

Vischer, J. C. (2008). Towards an environmental psychology of workspace: how people are affected by environments for work. *Architectural Science Review*, *51*(2), 97–108.

Wang, Z. J., Montoya, E., Munechika, D., Yang, H., Hoover, B., & Chau, D. H. (2023). DiffusionDB: A large-scale prompt gallery dataset for text-to-image generative models. *Proceedings of the 61st Annual Meeting of the Association for Computational Linguistics*, (pp. 893-911).

WPL (2025, Jan. 27). *Discover the latest lighting trends from CES 2025*. WPL Interior Design, retrieved from https://www.wpldesign.com/discover-the-latest-lighting-trends-from-ces-2025/, dated June 01, 2025.

Yıldırım, B., & Demirarslan, D. (2020). Evaluation of benefits of artificial intelligence applications to the design process in interior architecture. *Humanities Sciences (NWSAHS)*, *15*(2), 62-80.

Zeisel, J., & Eberhard, J.P. (2006). *Inquiry by design: Environment / behavior / neuroscience in architecture, interiors, landscape, and planning.* W. W. Norton & Company.

Zeytin, E., Öztürk-Kösenciğ, K., & Öner, D. (2024). The role of AI design assistance on the architectural design process: An empirical research with novice designers. *Journal of Computational Design*, *5*(1), pp. 1–30.

Zumthor, P. (2006). *Atmospheres: Architectural environments - Surrounding objects*. Birkhäuser Architecture.