Theoretical and Applied Technological Science Review

Research Article

Balancing Creativity and Practicality: Decision-Making Models in Architecture

Umme Maisha Khoshboo[1]; Sara Ferdosi Mahi[1]; Maruful Haque[1]; Sabbir Hossen Sahin; Tamanna Ferdous[2]; Md. Limon Hosen[2]; Kazi Abdul Mannan[3]

[1] Department of Architecture,
[2] Department of Interior Architecture
[3] Department of Business Administration
Shanto-Mariam University of Creative Technology
Dhaka, Bangladesh

*Correspondence
Umme Maisha Khoshboo
Email:
maishaumme84@gmail.com

ABSTRACT

Architectural design is inherently a complex process that merges artistic creativity with technical practicality. Architects must balance aesthetic aspirations with functional, economic, environmental, and social constraints, often under tight timelines and diverse stakeholder expectations. This paper examines how decision-making models in architecture mediate between creativity and practicality throughout the design process. Drawing upon theoretical foundations in design thinking, dual-process cognition, and bounded rationality, the study explores the mechanisms architects employ to reconcile imaginative ideation with real-world feasibility. Through a qualitative research approach incorporating semi-structured interviews and case analyses, the paper identifies recurring decision-making patterns and conceptual frameworks that illustrate how architects negotiate competing values in design. Findings suggest that successful architectural decision-making depends on iterative synthesis—an ongoing dialogue between the creative and pragmatic mindsets—supported by collaborative, evidence-based, and reflective practices. The paper contributes to architectural theory by proposing an integrated "Creativity-Practicality Equilibrium Model," providing a conceptual foundation for future empirical studies and pedagogical applications.

Keywords: architecture, creativity, practicality, decision-making, design thinking, qualitative analysis, cognitive models

1. Introduction

Architecture embodies the delicate tension between imagination and constraint. Unlike pure art forms, architectural design is not only an aesthetic pursuit but also a technical and social enterprise requiring compliance with functional, regulatory, and economic realities (Lawson, 2005). Architects act as mediators between visionary aspirations and the material conditions of construction, balancing creativity with practicality throughout the decision-making process (Cross, 2011). The architectural product must be innovative yet buildable, expressive yet safe, inspiring yet contextually grounded.

The challenge of balancing creativity and practicality in design decision-making has long occupied both theorists and practitioners. From Vitruvius's triad of firmitas, utilitas, and venustas—strength, utility, and beauty—to contemporary frameworks of design rationality, architecture has continuously sought equilibrium between opposing forces (Vitruvius, trans. 1914). However, in the twenty-first century, with increasing technological complexity, environmental imperatives, and digital design tools, this balance has become even more critical. Digital modelling, parametric design, and sustainability regulations reshape the cognitive landscape of architectural decision-making (Kolarevic, 2003; Oxman, 2008).

This research explores how architects make design decisions that negotiate between the creative and the practical. While many studies focus on creativity as the primary driver of architectural innovation (Goldschmidt, 2014; Dorst, 2011), fewer have examined how practical reasoning shapes or constrains creative choices. The process is not linear but iterative—designers oscillate between divergent thinking (generating ideas) and convergent thinking (evaluating and refining them) (Csikszentmihalyi, 1996). Understanding this oscillation is essential to theorising how architectural decisions emerge.

The architectural design process is marked by ambiguity, conflict, and compromise. Architects must synthesise multiple criteria—client desires, spatial functionality, aesthetics, sustainability, and structural feasibility—into coherent design solutions. However, decision-making models that explicitly account for the dynamic balance between creativity and practicality remain under-theorised. Traditional rational decision-making theories fail to capture the iterative, non-linear, and interpretive nature of architectural design (Lawson, 2005; Cross, 2011).

This paper seeks to:

- Examine existing theoretical models of decision-making in architecture.
- Identify the cognitive and procedural mechanisms that enable architects to balance creativity and practicality.
- Develop a conceptual model illustrating how architectural decision-making integrates both dimensions.

This study contributes to architectural theory by bridging cognitive design studies and professional practice. It informs educators,

practitioners, and policymakers about how to structure design processes that foster creativity without sacrificing feasibility. It also advances understanding of design cognition, contributing to interdisciplinary debates on decision-making in complex creative fields.

2. Literature Review

The relationship between creativity and practicality in architecture has been explored through various theoretical lenses, from cognitive science to professional practice. This section reviews the major frameworks, identifying gaps that the present study seeks to address.

2.1 Creativity in Architectural Design

Creativity in architecture is often conceptualised as the generation of novel and valuable ideas that respond to contextual challenges (Cross, 2006). Goldschmidt (2014) emphasises that architectural creativity is visual, spatial, and iterative, arising through sketching, modelling, and reflective practice. Donald Schön's (1983) concept of the "reflective practitioner" situates design creativity as a continuous conversation with the materials of the situation. Architects engage in "reflection-in-action," simultaneously thinking and doing, shaping problems as they design.

Csikszentmihalyi's (1996) systems model of creativity further suggests that creative achievements depend on the interplay of individual skill, domain knowledge, and field recognition. In architecture, this translates to balancing personal vision with disciplinary conventions and societal expectations. However, unrestrained creativity risks impracticality—conceptual designs may exceed structural or financial constraints, leading to failure in implementation (Lawson, 2005).

2.2 Practical Constraints in Architectural Design

Practicality in architecture involves considerations of constructability, cost-efficiency, user needs, and environmental performance. These constraints often act as boundary conditions for creativity, guiding design choices within feasible limits (Heylighen, 2000). Practical reasoning involves evaluating trade-offs among competing requirements, often through iterative testing and stakeholder negotiation (Luck, 2007).

Technological advancements have enhanced the architect's ability to visualise, simulate, and evaluate designs early in the process (Kolarevic, 2003). Yet, technology also introduces new complexities—parametric tools may favour optimisation over intuition, potentially constraining creative exploration (Oxman, 2008). Thus, architects must navigate both enabling and limiting aspects of technological practicality.

2.3 Decision-Making in Architecture

Architectural decision-making differs fundamentally from classical rational models. Simon's (1957) theory of bounded rationality suggests that decision-makers operate under constraints of limited information, time, and cognitive capacity,

leading to "satisficing" rather than optimizing behavior. This concept aptly describes architectural design, where multiple valid solutions coexist, and decisions are shaped by judgment, experience, and context (Lawson, 2005).

Dual-process theories of cognition distinguish between intuitive (System 1) and analytical (System 2) thinking (Kahneman, 2011). Architectural design engages both intuitive sketching and ideation, which represent fast, associative thinking, while evaluation of structural or financial feasibility demands slow, deliberate reasoning. Studies of design cognition confirm that expert architects fluidly alternate between these modes (Cross, 2011; Goldschmidt, 2014).

2.4 Existing Models of Design Decision-Making

Several models describe the design decision process. The Design Thinking Model (Brown, 2009) emphasises empathy, ideation, and prototyping as stages of creative problem-solving. The Reflective Practice Model (Schön, 1983) conceptualises design as reflection-in-action. The Integrated Design Process (IDP) framework in sustainable architecture promotes multidisciplinary collaboration and iterative evaluation (Larsson, 2002). However, these models tend to emphasise creativity, collaboration, or sustainability rather than the explicit balance between creativity and practicality.

2.5 Research Gap

While creativity and practicality are recognised as essential dimensions of

architecture, few studies explicitly examine the cognitive and procedural mechanisms that balance them. Most models treat creativity as a driver and practicality as a constraint, rather than viewing them as interdependent components of a unified decision-making system. This study addresses this gap by developing a theoretical model that conceptualises architectural decision-making as an equilibrium between creative ideation and practical realisation.

3. Theoretical Framework

This study integrates cognitive and design theories to develop a framework explaining how architects balance creativity and practicality. Three complementary theories inform this framework: dual-process cognition, design thinking, and a new conceptual model termed the Creativity-Practicality Equilibrium Model (CPEM).

3.1 Dual-Process Theory

Kahneman's (2011) dual-process model distinguishes between two modes of thinking:

System 1: fast, intuitive, associative, and emotional.

System 2: slow, deliberate, analytical, and logical.

Architectural design involves continuous switching between these systems. Intuitive sketches generate creative ideas, while rational evaluation ensures feasibility (Cross, 2011). Experienced architects integrate both seamlessly, drawing on pattern recognition from past projects (Lawson, 2005).

3.2 Design Thinking

Design thinking offers a structured approach to creative problem-solving, comprising stages of empathising, defining, ideating, prototyping, and testing (Brown, 2009). In architecture, this translates into understanding user needs, generating multiple solutions, and iteratively refining them. Creativity is fostered in ideation, while practicality is assessed during prototyping and testing (Dorst, 2011). Thus, design thinking inherently embodies a cyclical balance between exploration and evaluation.

3.3 The Creativity-Practicality Equilibrium Model (CPEM)

Building on these theories, this paper proposes the Creativity-Practicality Equilibrium Model to conceptualise architectural decision-making as a dynamic system of feedback loops:

- Creative Ideation Phase: Architects engage intuitive and divergent thinking to generate novel ideas.
- Practical Evaluation Phase: Feasibility, functionality, and constraints are assessed.
- Integrative Reflection: Reflection-in-action bridges imagination and reality, producing refined design concepts.
- Collaborative Validation: Feedback from clients, engineers, and users aligns vision with constraints.

This cyclical equilibrium allows both dimensions to inform each other iteratively, resulting in innovative yet viable architectural outcomes.

4. Research Methodology

4.1 Research Design

A qualitative research design was adopted to explore the lived experiences of architects in balancing creativity and practicality. The study is interpretive, focusing on subjective meanings and contextualised decision-making rather than measurable variables (Denzin & Lincoln, 2018).

4.2 Data Collection

Primary data were collected through semi-structured interviews with 15 professional architects from different cultural and institutional backgrounds. Participants were selected based on experience in both conceptual design and project delivery phases. Each interview lasted approximately 60 minutes and was conducted either in person or via video conferencing. Secondary data included analysis of architectural project documents and design portfolios to triangulate insights.

4.3 Sampling

Purposive sampling was used to ensure representation of diverse architectural contexts, including commercial, residential, and institutional projects. Participants ranged from junior designers to senior architects with over 20 years of experience.

4.4 Data Analysis

Data were analysed using thematic analysis (Braun & Clarke, 2006). Interview transcripts were coded to identify recurring themes related to decision-making, creativity, and practicality. Patterns were synthesised into conceptual categories that informed the

5

development of the proposed model. NVivo software was used to assist in coding and organisation.

4.5 Trustworthiness and Validity

Credibility was ensured through triangulation between interview and document data. Member checking was conducted by sharing summaries with participants for feedback. Reflexive journaling was maintained to minimise researcher bias.

4.6 Ethical Considerations

Ethical approval was obtained from the relevant institutional review board. Participants were informed about confidentiality, voluntary participation, and data anonymisation.

5. Findings

Analysis revealed five core themes illustrating how architects balance creativity and practicality in decision-making.

5.1 Iterative Reflection as Cognitive Balance

Architects described design as an iterative conversation between intuition and evaluation. One participant noted, "You start with a sketch, then question how it stands, how much it costs, and whether it makes sense spatially." This reflects Schön's (1983) "reflection-in-action," where practical reflection tempers creative impulses without extinguishing them. The iterative loop enables architects to refine ideas continuously, balancing inspiration and feasibility.

5.2 Collaboration and Interdisciplinary Dialogue

Team collaboration emerged as a major factor enabling balance. Architects rely on engineers, planners, and clients to test creative ideas against technical realities. One respondent stated, "The structural engineer is my creative partner—they tell me where imagination meets gravity." Interdisciplinary communication acts as a pragmatic filter for design innovation (Larsson, 2002).

5.3 Constraint as a Catalyst for Creativity

Surprisingly, many participants viewed constraints not as limitations but as creative stimuli. Budget, materials, and regulations often force inventive problem-solving. As one architect put it, "When the site is difficult, creativity becomes sharper." This aligns with Heylighen (2000), who argues that constraints shape creativity by focusing ideation within achievable parameters.

5.4 Digital Tools and Decision-Making Dynamics

Digital modelling and BIM technologies play a dual role. They expand creative exploration but also reinforce rational evaluation through simulations and performance metrics (Oxman, 2008). Architects described a "push-pull" dynamic between visual experimentation and data-driven validation. Parametric tools make trade-offs more visible, integrating creativity with practicality in real time.

5.5 Professional Judgment and Experience

Experienced architects rely on tacit knowledge to intuit feasible solutions quickly. This "expert intuition" bridges dual cognitive modes, where accumulated experience allows intuitive decisions that are nonetheless practical (Lawson, 2005). Judgment becomes a synthesis of memory, reasoning, and situational awareness—an embodiment of the creativity-practicality balance.

6. Discussion

The findings confirm that architectural decision-making is a dynamic, iterative, and collaborative process integrating creativity and practicality. This section interprets the findings through the theoretical lenses outlined earlier.

6.1 Integrating Dual-Process Cognition

The alternation between intuition and analysis observed among architects substantiates the dual-process model (Kahneman, 2011). However, rather than discrete modes, the study suggests a continuous oscillation—creative intuition informs analytical evaluation, which in turn reshapes creative exploration. Expert architects develop "cognitive elasticity," seamlessly transitioning between divergent and convergent thinking (Cross, 2011). This supports the view that creativity and practicality coexist in a cognitive continuum rather than a dichotomy.

6.2 Design Thinking and Reflective Practice

The study's findings align strongly with design thinking theory (Brown, 2009; Dorst, 2011). Empathising and ideating represent creative exploration, while prototyping and testing embody practical reasoning. Reflection-in-action bridges these stages, facilitating iterative feedback loops. The Creativity-Practicality Equilibrium Model formalises this process, emphasising that design innovation arises not despite constraints but because of the creative engagement with them.

6.3 Constraint as an Enabler

Echoing previous studies (Heylighen, 2000), participants viewed constraints as catalysts for creativity. This reframes practicality as an active partner in design thinking. Constraints such as budget, codes, or environmental factors stimulate ingenuity by imposing boundaries within which creativity must operate. This dialectical relationship transforms the constraint from an external barrier into an internalised design principle.

6.4 Technological Mediation

Digital tools alter decision-making dynamics by merging imagination and simulation (Oxman, 2008; Kolarevic, 2003). While technology enhances rational evaluation, it can also risk over-rationalisation, leading to aesthetic homogeneity. The challenge is to maintain creative agency within computational environments. Successful architects use digital tools as partners in exploration rather than mere instruments of optimisation.

6.5 Professional Judgment and Experiential Knowledge

Tacit knowledge—developed through years of experience—serves as an intuitive compass for feasible creativity. As Simon's (1957) concept of bounded rationality implies, architects make decisions under constraints but use heuristics developed from prior projects. This professional judgment transforms bounded rationality into informed creativity. Hence, decision-making in architecture is both analytical and experiential, grounded in embodied knowledge (Lawson, 2005).

6.6 Toward a Unified Model of Decision-Making

Synthesising these insights, the Creativity-Practicality Equilibrium Model can be described as a dynamic spiral:

Idea Generation (Creative Divergence) →Feasibility Evaluation (Practical Convergence) →Reflective Integration (Cognitive Equilibrium) →Collaborative Validation (Social Negotiation) →Refinement (Iterative Synthesis).

Each loop refines both creativity and practicality, gradually converging on an optimised yet imaginative solution. The process is recursive, not linear—embodying both flexibility and control.

6.7 Implications for Practice and Education

The study's implications extend beyond theory. In practice, architectural firms can enhance design quality by fostering interdisciplinary dialogue and reflective

feedback loops. In education, design studios should cultivate awareness of the creativity-practicality interplay through iterative prototyping, stakeholder interaction, and reflective critique (Schön, 1983). Understanding decision-making models enables students to design imaginatively yet responsibly.

7. Conclusion and Recommendations

This study investigated how architects balance creativity and practicality in decision-making, combining theoretical analysis and qualitative findings. Results show that architects engage in iterative reflection, interdisciplinary collaboration, and constraint-driven innovation to achieve equilibrium between imagination and feasibility. The proposed Creativity-Practicality Equilibrium Model conceptualises this process as a dynamic cognitive and procedural system integrating dual-process thinking, design reflection, and collaborative validation.

Theoretical Contributions:

The study extends design cognition theory by articulating a unified model that positions creativity and practicality as co-evolving forces rather than opposites. It enriches architectural decision-making theory with a nuanced understanding of reflective equilibrium.

Practical Implications:

Architects and design educators can apply these insights to structure workflows that encourage experimentation while

maintaining accountability to real-world constraints. Organisations can foster balanced decision-making through interdisciplinary collaboration and iterative design review.

Limitations and Future Research:

The qualitative scope limits generalizability. Future studies could employ mixed methods or longitudinal analysis to test the model's applicability across contexts. Quantitative measures of decision-making efficiency and creativity outcomes may provide further validation.

In conclusion, balancing creativity and practicality is not a compromise but a synthesis—the essence of architectural excellence. Understanding and formalising this balance enriches both theory and practice, ensuring architecture remains simultaneously visionary and grounded.

References

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. Qualitative Research in Psychology, 3(2), 77–101.

Brown, T. (2009). Change by design: How design thinking transforms organisations and inspires innovation. HarperCollins.

Cross, N. (2006). Designerly ways of knowing. Springer.

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

Csikszentmihalyi, M. (1996). Creativity: Flow and the psychology of discovery and invention. Harper Perennial.

Denzin, N. K., & Lincoln, Y. S. (2018). The Sage handbook of qualitative research (5th ed.). SAGE Publications.

Dorst, K. (2011). The core of "design thinking" and its application. Design Studies, 32(6), 521–532.

Goldschmidt, G. (2014). Linkography: Unfolding the design process. MIT Press.

Heylighen, A. (2000). In search of beauty: A semiotic approach to aesthetic evaluation in design. Design Studies, 21(3), 263–285.

Kahneman, D. (2011). Thinking, fast and slow. Farrar, Straus and Giroux.

Kolarevic, B. (2003). Architecture in the digital age: Design and manufacturing. Spon Press.

Larsson, N. (2002). The integrated design process: Report prepared for Natural Resources Canada. Natural Resources Canada.

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

Luck, R. (2007). Using artifacts to mediate understanding in design conversations. Building Research & Information, 35(1), 28–41.

Oxman, R. (2008). Digital architecture as a challenge for design pedagogy:

Khoshboo et al. 2026

Theory, knowledge, models, and medium. Design Studies, 29(2), 99–120.

Schön, D. A. (1983). The reflective practitioner: How professionals think in action. Basic Books.

Simon, H. A. (1957). Models of man: Social and rational. Wiley.

Vitruvius. (1914). The ten books on architecture (M. H. Morgan, Trans.). Harvard University Press.

Khoshboo et al. 2026