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Ethics and Accounting in Architecture.

Accounting for the ethical and economic impact of the design decisions that form our built environment is critical in understanding the outcomes generated by the use of AI in project design and procurement. An architect must anticipate building occupants' spatial reasoning, judgments, and decision-making to use a building (Panagiotis et al, 2022), yet most architects are focused on aspects such as building layout, aesthetics and quality, instead of financial value, worth, capital allowances and other economic measures. Accounting for the financial value of the built environment is made after the architectural design decisions that create that environment have already been made. Whilst it may seem obvious that providing and understanding cost data throughout project development is invaluable in the cost control accounting of design decisions, a methodology in accounting in real-time for the microeconomic outcome of design decisions has yet to be developed.

This research takes an interdisciplinary approach to develop this understanding, generating insights from both accountants and architects in accounting for the impact of architectural design decisions. Understanding the drivers of decision-making when commissioning, designing, and accounting for built environment projects will help in evaluating the success or otherwise of anticipated outcomes.

The increased utilisation of artificial intelligence (AI) in procurement, design and construction has transformed the process of creating our built environment. Computer aided design (CAD) software has evolved into AI-driven algorithm-based design (Generative Design), with Building Information Modelling (BIM) platforms integral to tendering procurement and building maintenance documents.

As we observe the accelerated adoption of AI generated design, and AI decision-making at every interdisciplinary organisational level, there is an increased opacity in how we navigate accountability. This generates questions on how to account for the 'cost', 'value', and 'worth' of design decisions by different stakeholders and how these are measured. From an accountant's perspective, the measurement of 'value' is linked to tangible and intangible assets, and must be measured and presented as a monetary figure. From an architect's perspective, measures of 'value' and 'worth' are also linked to intangible and tangible aspects (such as how something feels, functions, or appears). An understanding of ethics in decision-making supports an understanding of how 'values' are determined, and in understanding the perception and judgements of stakeholders. There is a deficit in the literature on the perception of built environment decision-makers (Plowright, 2014) i.e. those commissioning, designing, accounting the built environment, and consequently this research project adopted a strategy to source primary data from architects and accountants, utilising the algorithmic ethical pathways in decision-making derived from Throughput Model (TPM) theory (Rodgers, 1997, Rodgers, Murray et al, 2023). The TPM utilises four constructs of (1) perception (framing situational conditions), (2) information, (3) judgment (analysis of information), and (4) decision choice. The TPM approach (rooted in insights from cognitive and social psychology) illustrates how alternate ethical pathways to a decision flow as a parallel process instead of a serial process.

The research methodology took an approach of measuring design decisions by firstly deconstructing the complex process of designing a building using a scalable value of the components used in a

building design (from aspects such as how it feels functions and performs, to aspects of cost, sustainability, quality etc.), with indicator variables sourced from professional architectural design process guidance, and property valuation guidance. These variables were incorporated in the TPM (positioned in the constructs of Perception, Information, Judgement, Decision), and then analysed using advanced analytical econometric techniques. Utilising Partial Least Squares Structural Equation Modelling (PLS-SEM), this innovative research approach generated insights on the complex inter-relationships between observed and latent variables influencing the intent and anticipated outcomes of design decisions.

Additional data on the economic and social environment of accountants and architects in practice were drawn out by this project methodology, and were analysed as to the influence of this on respondents' decision-making. This incorporation of primary empirical data on the cognitive processes and decision pathways of accountants and architects manifested both individual and organisational patterns and influences (in terms of positions on cost, value, and worth).

This future-focused interdisciplinary research approach, methodology and techniques, reflects the characteristics of artificial intelligence (AI) frameworks by analysing Professions, Processes, Technology, and reflects an AI design perspective, by utilising Decision Trees & Patterns, Statistical Data, and Graphical Communication, supporting our understanding of accountability in AI generated decision-making.

Abstract References:

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