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PITFALLS IN VALUE OPTIMISATION: CORRIDOR DECISIONS IN A NORWEGIAN HOSPITAL

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ABSTRACT

While the construction industry increasingly prioritises value delivery over the traditional Iron Triangle of cost, time, and scope, the practical mechanisms for optimising value remain under-explored. This paper investigates the decision-making process in a major Norwegian hospital project, specifically examining a contested choice between single- and double-corridor solutions. Through a single-case study comprising document analysis and 19 semi-structured interviews, this research analyses why the project discarded a solution favoured by clinical staff in favour of one that reduced investment costs.

The study identifies that the failure to substantiate the decision as value-optimal stemmed not from a lack of intent but from a lack of methodological capability. An abductively derived framework of three principal pitfalls is proposed: 1) Failure of Identification and Omission (missing factors), 2) Failure of Assessment (the lack of objective quantification leading to subjective bias), and 3) Failure of Weighing (the reliance on unstructured heuristics over formal methods). Using a mechanical analogy, the paper suggests that without quantifying the "Mass" (Attribute Magnitude) of operational factors – whether through empirical data, benchmarking, or simulation – decision-makers cannot correctly assign "Gravity" (Importance). This inevitably leads to precise investment costs dominating the outcome over fuzzy operational considerations.

KEYWORDS

Value optimisation, lean construction, decision-making, hospital design, CBA.

INTRODUCTION

Delivering customer value has always been a core tenet of Lean Construction (Womack & Jones, 1996; Koskela, 2000; Drevland & Lohne, 2017). In recent years, this focus has expanded into wider project management, to the point where value delivery is beginning to supplant the traditional *Iron Triangle* of cost, time, and scope as the primary measure of project success (Atkinson, 1999; Kelly et al., 2014; Turner, 2024). However, while the ambition to deliver optimal value is clear, the practical process of achieving it remains fraught with difficulty.

Unlike cost or time, which are objective and easily measured, value is subjective and multidimensional (Drevland et al., 2018). Optimising value requires decision-makers to navigate complex trade-offs between conflicting objectives, most notably, the tension between minimising immediate investment costs and maximising long-term operational utility (Drevland & Svalestuen, 2013). Theoretically, value optimisation suggests finding a solution that balances these factors perfectly. In practice, however, projects often struggle to maintain

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this balance under budgetary pressure, frequently reverting to cost reduction disguised as value engineering (Bennett & Mayouf, 2021).

Despite the centrality of this concept to Lean Construction, few empirical studies investigate the mechanics of these decisions in real-world projects. To address this gap, this research is guided by the following research question: *What specific failures prevent a project from substantiating decisions as value-optimal when operational attributes are uncertain and the project faces strict budget constraints?*

This paper seeks to answer this question by developing a conceptual model of the principal pitfalls in value-optimising decision-making. The paper explores these challenges through a case study of a major Norwegian hospital project, specifically focusing on the decision-making process for corridor design. By analysing how this decision was made, the paper identifies three specific sources of error in the assessment and weighing of value factors, offering a framework to understand why projects may fail to deliver the value they promise.

THEORETICAL FRAMEWORK

Value: The literature often frames value as a trade-off between benefits received and sacrifices made (Drevland et al., 2018). Unlike market economics, Lean Construction views value subjectively through the lens of stakeholder preference, making it an evaluative judgment rather than an objective measurement (Drevland & Lohne, 2023; Drevland & Tillmann, 2018). Consistent with psychology, evaluative judgment is the cognitive process of assessing preferences and comparing options using multiple information sources (Clemente et al., 2021; Musch & Klauer, 2003).

Deferring to Drevland & Lohne (2023), this paper defines value "as the outcome of an evaluative judgment balancing the benefits gained from an object against the sacrifices required to acquire and use it". The components of this balance – previously termed "get-and-give factors" (Drevland, Lohne, and Klakegg, 2018) or "value drivers" (Kliniotou, 2004) – are referred to in this paper as Value Factors.

Value Optimisation: Building on this definition, value optimisation entails identifying the solution that offers the optimal balance of Value Factors. Because construction projects inherently involve conflicting objectives (e.g., minimising cost versus maximising clinical functionality), optimisation yields a set of Pareto-optimal solutions rather than a single perfect answer. These represent efficient trade-offs where no factor can be improved without degrading another (Deb, 2014). Crucially, the Pareto front does not dictate the "best" choice mathematically. Selecting the value-optimal solution requires explicit evaluative judgment to weigh the differing Value Factors and determine which trade-off yields the highest subjective value. While arriving at the Pareto front is a technical prerequisite, this paper focuses specifically on the second stage: the decision-making process. This paper investigates how decision-makers assess attributes and weigh alternatives to identify a value-optimal choice, and the pitfalls that arise during this process. Given its standing in the Lean Construction community, this paper uses Choosing By Advantages (CBA) as a paradigmatic example of structured decision-making against which the case is analytically evaluated.

Choosing By Advantages (CBA): Because selecting the value-optimal solution relies on subjective evaluative judgment, a structured method is required to transparently process complex trade-offs. In this study, Choosing By Advantages (CBA) serves as the theoretical benchmark for this weighing process. CBA is a decision-making system anchored by the foundational rule that decisions must be based on the importance of advantages (Suhr, 1999). To operationalise the broad Value Factors defined in the previous section, CBA breaks them down using a highly specific vocabulary (Arroyo et al., 2025):

- **Alternatives**: The specific solutions being evaluated (e.g., single- versus double-corridor layouts).

- **Factors**: The specific elements or categories being evaluated, which map directly to the broader Value Factors discussed earlier (e.g., "operational logistics"). In CBA, factors act merely as containers and carry no inherent weight.
- **Criteria**: The rules, standards, or guidelines used to judge the attributes within a factor (e.g., "shorter walking distances are better").
- **Attributes**: The objective facts, performance data, or inherent qualities of an alternative (e.g., “4.5 km of total walking distance per shift”).
- **Advantages**: The beneficial differences between the attributes of two competing alternatives, as judged by the criteria.
- **Importance**: The subjective weight or value assigned specifically to that advantage.

A critical methodological implication of CBA is that decision-makers cannot assign weight to a broad “Factor” (or Value Factor); they can only weigh a specific, proven Advantage. Consequently, if the underlying Attributes are unknown, unquantified, or based purely on conjecture, the Advantage cannot be determined, and no valid weight can be assigned. This “facts-first” approach dictates that without reliable performance data, the decision-making process effectively stalls.

METHODOLOGY

This research employs a qualitative single-case study design (Yin, 2014). The specific case, a major Norwegian hospital project, was selected as a critical case for understanding value optimisation. The project is characterised by high complexity, strict budget constraints, and a documented conflict regarding the choice of corridor solutions. Because opinions on the solution’s value diverged sharply, the underlying mechanisms of the decision-making process became highly visible. Data was collected through a triangulation of document analysis and semi-structured interviews.

To reconstruct the formal decision timeline and identify the official rationale for the corridor choice, the author harvested the project’s public repository. The repository includes the project mandate, steering group minutes, board meeting records, and technical reports. In total, 598 PDF documents were retrieved.

The documents were searched for the keyword stem “korridor*” (corridor), isolating 21 documents that contained substantive discussions or decisions regarding the corridor design. The documents were analysed to map the “official” narrative: the attributes formally recorded, the alternatives presented, and the justification for the final decision in writing.

To understand what actually constituted value according to the stakeholders, and how they viewed the divisions made, 19 semi-structured interviews were conducted. Using a purposive sampling strategy to capture a “360-degree view,” comprising project governance (owners/executives, n=8), functional and technical planners (hospital planners/arctitecht/engineers, n=5), user representatives (clinical staff and patient organisations, n=5), and local government officials (n=1). The informants were highly experienced, with the majority possessing 20–30 years of practice in healthcare or healthcare construction. Interviews were conducted via video conference, lasting between 60 and 120 minutes.

The analysis followed an inductive thematic approach. A single researcher coded the transcripts inductively to identify recurring themes on value perception, decision criteria, and process frustrations; these were then triangulated with the document set. Based on this, abductive reasoning was used to develop a conceptual model of the pitfalls of the principal pitfalls in value-optimising decision-making.

RESULTS

CASE DESCRIPTION

The case project is a major Norwegian hospital development centred on a new acute hospital to serve a large geographic region. The planned facility is a "megaproject" with a total gross area (BTA) of approximately 134,500 m² and a net functional area of 56,500 m². It is dimensioned for the year 2040 projections, with a capacity of 366 somatic beds (including intensive care) and 190 beds for mental health and substance treatment.

The project timeline can be divided into two main phases relevant to this study.

Concept Development (2021–2023) In the initial concept phase, the project developed an alternative located on a central greenfield site. Estimates for the gross area in this early stage were approximately 119,500 m². This phase established the primary functional programme and applied provisional gross-to-net factors for early calculations. The project planned for a double-corridor layout in the somatic inpatient areas (which comprise over 100,000 m² of the total volume). This solution was developed in close consultation with user groups to handle the complex logistics of the 20 planned operating theatres and the significant bed capacity.

The "Second Opinion" and Value Optimisation (2024). In the spring of 2024, detailed planning revealed that the project's scope had expanded significantly due to updated requirements and errors in earlier estimates, pushing area estimates to over 143,000 m². This ~20% increase caused the cost estimates to exceed the owner's budget ceiling, triggering an extended value-optimisation phase.

To identify necessary cuts, the project owner engaged an external architect to provide a "Second Opinion" (SO). The SO process targeted reducing gross area as the primary lever for cost control. A key recommendation was to switch from the planned double-corridor solution to a more space-efficient single-corridor solution. This measure, alongside other compressions, successfully reduced the gross area by approximately 9,000 m² (down to the current ~135,000 m²). The steering group approved this adjusted concept in autumn 2024.

THE VALUE OF HOSPITAL CORRIDORS

Standard building standards categorise corridors merely as circulation areas – spaces dedicated to movement and access between functions (Standards Norway, 2023). Because their primary defined function is to support movement, which Lean theory categorises as transportation, a non-value-adding activity (Koskela, 2000), facility planning often targets these spaces for reduction. This logic is formalised through metrics such as the Gross-to-Net area factor, in which a high proportion of circulation space is mathematically defined as inefficient. Consequently, corridors are frequently treated as overhead to be minimised. However, while this logic might hold for general-purpose buildings, the interviews reveal that this standard logic becomes highly problematic in a clinical context.

In a clinical context, corridors play several distinct value-adding roles beyond simple transport. They are central to logistics, patient mobilisation, the psychosocial environment, and operational oversight. As detailed below, the design of these spaces is a critical determinant of both patient safety and long-term operational efficiency.

Artery for Logistics and Movement: The foundational function of the corridor remains movement, but in a hospital, this requires specific dimensional attributes. Informants emphasised that corridors must be sufficiently wide to allow two beds to pass—a frequent requirement in units with short lengths of stay.

Furthermore, the corridor design dictates the feasibility of automation. The informants noted that narrow or obstructed corridors can hinder the deployment of Automated Mobile Robots (AMR) for internal transport of equipment. Thus, the spatial geometry directly impacts the hospital's ability to adopt future labour-saving technologies.

Arena for Patient Care and Mobilisation: While not formally categorised as clinical spaces in the architectural programme, informants described corridors as active treatment areas. This is particularly true for patient mobilisation, a key component of recovery. The architecture itself can incentivise movement; for example, a view at the end of a corridor acts as a destination, while rest points (tables or chairs) provide achievable goals for patients. This need is reinforced by the shift toward single-bed rooms with private bathrooms, which, while beneficial for privacy, reduces the natural necessity for patients to leave their rooms.

Perceived safety is a prerequisite for this mobilisation. Informants noted that narrow, dark, or labyrinthine corridors create a sense of insecurity, discouraging patients from leaving their beds. To function as a treatment arena, the corridor must be legible and "self-explanatory."

Social and Psychological Zone: Beyond physical treatment, corridors function as social and psychological zones. Informants highlighted that seating areas in corridors offer a necessary respite for relatives and staff, providing a place to withdraw from the intensity of the patient room. For patients, the corridor offers a change of scenery and an opportunity for social interaction, contributing to a milieu therapy approach.

Operational Efficiency and Oversight: Corridor design materially affects the efficiency of the functions it connects. The informants provided concrete examples of how geometry impacts staffing costs. It was noted that a corridor with a 90-degree bend between two bed wards – as opposed to a straight line – would obstruct sightlines. This lack of visual oversight would necessitate an additional nurse on every evening and night shift to maintain patient safety, a recurring cost 365 days a year.

Furthermore, wide and tidy corridors without alcoves facilitate better visual control. Informants argued that clear sightlines reduce the time nurses spend locating patients, thereby converting "hunting time" back into direct patient care.

CORRIDOR SOLUTION DEVELOPMENT AND DECISION PROCESS

The Shift from Double to Single Corridor

In the early concept phase, the project prioritised a *double-corridor layout*, particularly for inpatient areas. Developed in close consultation with user groups, this configuration was intended to separate logistics from patient zones to improve operational efficiency.

However, the budget breach in spring 2024 fundamentally shifted the design priorities. To lead the "Second Opinion" review, the project owner engaged a single, highly experienced hospital architect external to the original design team. This architect identified the double-corridor solution as a primary driver of excess area and recommended a switch to a single-corridor layout to reduce gross area and investment costs. Following this recommendation, the project owner issued guidance to revise the concept.

Notably, the project team successfully pushed back on one aspect of the cost-cutting measures. While the external architect (SO) recommended a narrower corridor width, the project argued that operational requirements – specifically the ability to pass two beds – mandated a wider profile.

> "Second Opinion recommended a narrower corridor to save money, but we chose a 2.40m corridor in somatics as the standard width, because it must be possible to pass two beds." (I7)

Perceptions of the Final Solution

Opinions on the final single-corridor decision were sharply divided. One group of stakeholders, primarily from the hospital organisation, expressed deep concern that the solution would create a cumbersome facility with weaker logistics.

> "These robots that can drive around and deliver equipment don't get into the inpatient areas in the same way as in a double-corridor system." (I11)

> "We, as the hospital trust, believed that two corridors facilitated more optimal operation, but the decision came abruptly. There is, in any case, not a well-anchored assessment behind it." (I13)

Conversely, other informants adopted a pragmatic stance, suggesting that the functional disadvantages were exaggerated and acceptable given the economic reality.

> "If you compare, it was a five-metre difference. It's difficult to justify that you need an extra person on night shift for five metres." (I7)

From the owner's perspective, the outcome was defended as a necessary trade-off between conflicting objectives.

> "There is no definitive answer as to whether a single corridor or a double corridor is best. Sometimes the owner has to cut through and say we do it this way. That is value optimisation: setting considerations against each other and concluding." (I17)

Evidence of Bias and Divergent Perception

The interviews revealed a distinct divergence in how the operational risks were perceived. Informants with clinical backgrounds described the consequences of the single-corridor solution – such as logistical friction –as significant operational burdens. In contrast, decision-makers without such experience tended to view these concerns as manageable trade-offs.

Evidence of this divide was also found in the document study, specifically in the minutes from the Steering Group meeting on March 10, 2025 (Helse Sør-Øst RHF, 2025a). During the treatment of the final concept report, the enterprise union representatives entered a formal protocol note expressing concern regarding the chosen solutions. The note explicitly stated that the strict economic framework had forced the adoption of solutions that would negatively impact working conditions. The representatives specifically criticised the "long single-corridor solutions for somatic wards" alongside concerns regarding solutions for mental health care and locker facilities. Despite this formal objection, the steering group recommended the concept report for approval.

Factors Considered in the Governing Documents and Official Meetings

The document analysis of governing documents and meeting minutes indicated that all the functional aspects mentioned above were addressed at some point. The main programme emphasised, among other things, that somatic inpatient areas needed to support elderly patients, and that corridors could be utilised for mobilisation and socialisation. In mental health care, ample width and ceiling height were important because corridors were used for milieu therapy as part of the socialisation process (Helse Sør-Øst RHF, 2025b).

Regarding the discussions on single versus double corridors and the final decision, however, several functional aspects were absent. The Steering Group originally approved the double corridor solution (Helse Sør-Øst RHF, 2024a), and the arguments focused primarily on operational economics and efficiency: a double corridor compressed inpatient areas by consolidating support functions in the centre, accommodated proximity needs, and resulted in reduced walking distances (Helse Sør-Øst RHF, 2024a; Helse Sør-Øst RHF, 2024b). Conversely, assessments of corridors as treatment areas and tools for patient mobilisation were scarcely evident as the basis for this decision.

There were also indications of an inadequate basis for decision-making. While the final evaluation identified functional differences regarding logistics and flexibility, these remained qualitative assessments based on group discussions rather than data (Bedre Megaprosjekter, 2024). Furthermore, earlier qualitative assessments in the case documents were described as difficult to understand, and specific simulations were requested to clarify distances, daylight in the core, sightlines, and efficient staff time use (Helse Sør-Øst RHF, 2024a; Helse Sør-Øst RHF, 2024b).

Decision-Making Methodology

Despite the high stakes of the decision, the tools employed to weigh the alternatives were rudimentary. Informants confirmed that no advanced Multi-Criteria Decision Analysis (MCDA) method, such as the Analytic Hierarchy Process (AHP) or the Choosing by Advantages (CBA) method, was utilised. Instead, complex trade-offs were handled through unstructured dialogue and simple "plus/minus" lists.

> "[The process was] so incredibly, sort of, guessing without any methodology for it." (I1)

The Deficit of Data: Conjecture vs. Evidence

A recurring theme in the interviews was frustration regarding the lack of concrete data. Decisions were perceived as based on assumptions rather than on an evidence-based assessment of operational consequences. While Sykehusbygg HF (The Norwegian Hospital Construction Agency) maintains design recommendations, informants noted a lack of empirical or synthetic data on how these configurations perform in practice. Consequently, the debate became a battle of opinions rather than a comparison of facts.

Several informants explicitly requested simulation to quantify the operational impacts of the design choices, but such tools were not employed.

> "I don't understand that, when we have so much game technology, we can't simulate a hospital... Where should the workstations be? Where should medication trolleys be placed so that we save steps?" (I1)

> "For example, the single- and double-corridor issue. We should have been able to put that into some kind of simulation tool, right? Then you find out: What are the differences in costs? What is the difference in the gross-to-net factor? What is the difference in walking distance?" (I2)

The informants believed that modelling nurses' response times, walking distances, and patient flow would have provided a clearer picture of the trade-off between immediate construction savings and long-term staffing costs.

DISCUSSION

The case study illustrates a phenomenon common in large-scale public projects: a stated ambition for value optimisation that, under pressure, often defaults to cost minimisation. While the project owner and stakeholders ostensibly sought the best hospital for the region, the final decision on the corridor solution *de facto* prioritised immediate cost reductions over long-term operational value.

The analysis suggests this was not necessarily due to a lack of intent to deliver value, but rather a lack of *capability* to process value within the decision structure. Drawing on the principles of evaluative judgment and Choosing by Advantages (CBA), a framework of three principal pitfalls is proposed that derail making value decisions: (1) Failure of Identification and Omission, (2) Failure of Assessment, and (3) Failure of Weighing, illustrated in Figure 1.

Figure 1: The Three Pitfalls of Value-Optimal Decisions

While presented sequentially, these pitfalls do not form a strict causal chain; rather, they operate as highly interdependent categories that frequently compound one another.

To elucidate these pitfalls, a mechanical analogy from Newtonian physics is employed. The decision process can be viewed as a balance scale, where value is not an input, but the outcome of the weighing process – specifically, the judgment of the balance between benefits (Gets) and sacrifices (Gives). For a factor to influence this value judgment, it must exert a "force" on the scale. This is termed the Factor Weight (W). In physics, weight is the product of mass and Gravity ($W = m \times g$). By analogy, in decision-making:

$$\textit{Factor Weight (W)} = \textit{Attribute magnitude (m)} \times \textit{Stakholder importance (g)}$$

where m is the estimated performance level of a factor, and g is the subjective importance assigned to it. The formula reveals that a factor contributes zero weight to the decision if either the Mass is considered zero or the Gravity assigned to it is zero.

PITFALL 1: FAILURES OF IDENTIFICATION AND OMISSION (MISSING FACTORS)

The first prerequisite for value optimisation is recognising the factors that contribute to value. If a factor is not placed on the scale, it has zero weight, regardless of its actual importance.

In the case project, the initial document analysis suggests that the project team *did* identify the relevant factors. Concepts such as "arena for patient care," "logistics," and "social space" were present in the early programming documents. However, as the process moved toward the critical "single vs. double corridor" decision, these factors were excluded from the decision documents. They effectively became "ghost factors". In the governing documents, mobilisation/social space/logistics are stated aims; in the corridor decision basis, these aims are largely absent or reduced to general statements, while area/cost dominate the recorded justification.

PITFALL 2: FAILURE OF ASSESSMENT

The most significant finding in this case relates to the second term of the equation: the Mass (m) or Attribute Magnitude. To weigh a factor against investment cost, one must know its magnitude. For investment cost, the "Mass" is estimated relatively precisely in currency (NOK). However, for operational factors, the "Mass" was often unknown.

While several informants specifically pointed to a lack of simulation as a shortcoming, this represents a broader failure of assessment. The project lacked *any* objective quantification of the operational attributes. There was no reliance on empirical data from comparable hospitals, no calculation of walking distances based on layout analysis, and no evidence-based design metrics used to validate the "Second Opinion" claims.

In the absence of objective data, the "Mass" of a factor ceases to be a fact and becomes a projection of the decision-maker's bias. As illustrated in Figure 1, a factor's weight can be artificially inflated (a lead weight) or deflated (a helium balloon) depending on the observer's perspective.

The case study highlights a marked divergence in how different stakeholders assessed the same factors. Informants with a clinical background instinctively assigned a "heavy mass" to issues like sightlines and logistics, perceiving them as significant operational risks. Conversely, board members without clinical experience, lacking the sensory data of simulation or practice, perceived these same factors as lighter concerns. Consequently, matters considered significant issues by clinicians were downplayed by decision-makers without such experience. Without a quantified Attribute (*m*), the decision-makers were forced to rely on heuristics, rather than verified performance data.

The formal protocol note from the union representatives starkly illustrates the subjectivity of the assessment. The clinical employees assigned enough mass to the operational risk to enter a formal dissent, suggesting that they perceived significantly more mass here than the other steering group members.

PITFALL 3: FAILURE OF WEIGHING

Even if all factors are identified and their attributes correctly assessed, a value-optimal decision requires the correct assignment of importance or *Gravity* (*g*). In the terminology of Choosing By Advantages (CBA), this Gravity corresponds directly to the Importance of Advantages—the subjective weight assigned to the beneficial difference between two attributes. Assigning this importance is the core domain of the decision-making method.

The case reveals a reliance on informal "plus/minus" lists and unstructured dialogue rather than on structured Multi-Criteria Decision Analysis (MCDA) methods such as CBA. Herbert Simon's concept of *bounded rationality* is pertinent here. Simon (1955) argues that, when faced with complex decisions, individuals are constrained by available information, time, and their cognitive capacity. Consequently, complex problems are often oversimplified to make them comprehensible.

Structured decision-making tools act as cognitive scaffolding to alleviate this strain. For example, CBA breaks down a complex choice into a series of anchored comparisons based on attributes, preventing the decision-maker from being overwhelmed. Without such tools, stakeholders often resort to *satisficing*. A term coined by Simon (1955) to describe the strategy of searching only until a solution meets a minimum acceptability threshold, rather than searching for the optimal solution.

The data suggests this dynamic dominated the final decision process. The budget breach was uncovered at the end of the concept phase, triggering a "Second Opinion" process with a clear mandate to reduce the area. This mandate effectively acted as a "satisficing threshold"—simplifying the complex optimisation problem into a binary constraint: *cut area to meet budget*. This forced the project team to abandon their preferred double-corridor concept.

In the subsequent workshop, where the project team's revised solution (now also a single corridor) was weighed against the Second Opinion's recommendations, the discussion remained overly focused on gross area and cost. In the absence of a structured weighing process (depicted as the broken scale in Figure 1, the *Gravity* applied to Investment Cost was absolute. Because the operational superiority of the project team's layout was not clearly quantified (Pitfall 2), they struggled to defend the functional area against the pressure to cut.

However, the case offers a telling exception that validates the theory. The project team *did* succeed in rejecting the Second Opinion's recommendation for narrower corridors, successfully arguing for a 2.4m standard to ensure two beds could pass. In this specific instance, the operational "mass" (the physical width of two beds) was concrete and undeniable. Consequently, the decision-makers were able to assign the correct *Gravity*, and the functional need tipped the scales against the cost savings. This suggests that had *other* operational factors (like walking distance) been defined with equal clarity, the decision outcome might have been different.

Crucially, a robust methodology can mitigate these failures. Utilising a structured method like CBA could have helped ensure that the advantages of the alternative layouts were clearly verbalised and weighed against the cost savings, rather than "fuzzily described" in discussion By making trade-offs explicit, the method serves as a quality-control mechanism, mitigating the risk that the "gravity" of the budget crushes legitimate functional needs by default.

FINAL REMARKS

It is important to note that while this study identified significant flaws in the decision-making process, there is no definitive evidence that the final single-corridor solution is inherently "wrong." The selected solution may, in the long run, prove to be optimal. However, if so, this result would be a fortuitous coincidence rather than the outcome of rigorous analysis and value optimisation.

The critical danger lies in the imbalance caused by Pitfall 2 (Failure of Assessment). By failing to assess and weigh pertinent operational factors properly, the project risks trading a one-time saving for a recurring liability. Informants estimated that the total investment cost equates to only 1.5 to 2 years of the hospital's operational costs. Given this ratio, a decision that saves investment capital but degrades operational efficiency represents a significant long-term risk. To prioritise the immediate construction budget without quantifying the impact on the lifecycle operational budget is to pursue a false economy, where minor short-term gains create disproportionate long-term operational waste.

CONCLUSION

This study examines the gap between the industry's ambition to deliver value and the practical reality of cost minimisation. Through the analysis of the case, the paper identified that the failure to substantiate the corridor decision as value-optimal stemmed from a lack of methodological capability, categorised into three specific pitfalls: 1) Failure of Identification and Omission, 2) Failure of Assessment, and 3) Failure of Weighing.

By applying a Newtonian analogy (*Weight = Mass × Gravity*), this research suggests that a value-optimal decision is not verifiable when the *Mass* (operational attributes) remains unknown. In the absence of quantified evidence, such as simulation or parametric analysis, operational consequences remain subjective opinions that are easily outweighed by the hard facts of investment costs. Furthermore, without structured decision-making methods like CBA. stakeholders lack the cognitive scaffolding to resist *satisficing*, leading to decisions driven by budget constraints rather than value.

To avoid these pitfalls, owners must quantify operational 'Mass' to match the rigour of cost estimation. In practice, this requires establishing a minimum viable level of evidence in early design phases by replacing heuristics with targeted tools: benchmarking comparable facilities, conducting spatial analysis for walking distances, and deploying basic simulation to test logistical flows. Because total investment equates to only 1.5 to 2 years of operational costs, prioritising immediate savings without quantifying lifecycle impacts constitutes a false economy, risking disproportionate long-term waste

This single-case study is analytical rather than statistically generalisable. The highly conflictive nature of the project introduces potential recall bias in the retrospective interviews, which captured a broad cross-section of roles but did not employ a formal thematic saturation protocol. Finally, the keyword-based document retrieval ("korridor*") inherently risks omitting relevant evidence that lacked this exact term (false negatives).

Building upon the limitations of this single-case study, future research should empirically test the proposed three-pitfall framework across a broader spectrum of public megaprojects and diverse project delivery contexts to establish wider generalizability. To specifically address the "Failure of Assessment," there is a critical need for cross-disciplinary studies investigating the

practical integration of advanced simulation tools – such as digital twins, parametric modelling, and evidence-based design metrics – into early-stage decision-making to objectively quantify the "Mass" of operational value factors. Furthermore, action research that implements structured methodologies, notably Choosing By Advantages (CBA), in live project environments would yield highly valuable insights. Such longitudinal studies could systematically assess whether formal cognitive scaffolding effectively mitigates satisficing behaviour under strict budget constraints, thereby verifying how projects can prevent short-term investment costs from disproportionately dominating lifecycle value decisions.

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