

# Integrating Sustainability at the Project Lifecycle's Strategic Entry

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**Abstract:** In response to increasing demands for sustainable development, organizations are progressively integrating sustainability principles into project management practices. This study focuses on the Initiation Phase of the project lifecycle, a critical juncture for embedding environmental, social, and governance (ESG) considerations. Drawing on data from 754 respondents across diverse industries, the study examines current practices, competency gaps, and organisational readiness for sustainable project delivery. Quantitative analysis of survey responses reveals significant discrepancies between the perceived importance of sustainability competencies and their implementation during project initiation. Key gaps include defining sustainability-focused objectives, assessing ESG impacts, and embedding governance mechanisms. Although some organizations demonstrate maturity in strategic ESG integration, findings indicate that many still rely on ad hoc or reactive approaches, often lacking formal roles or clear structures for sustainability. The study underscores the need for dedicated sustainability roles, targeted training, and stronger alignment of governance frameworks with ESG goals. By highlighting the systemic nature of competency gaps and the critical role of organizational support, this research offers practical insights for advancing sustainable project management from the very outset of project planning. The findings demonstrate that ESG-related competency gaps at the project initiation phase are largely systemic rather than incidental, stemming from misalignment between strategic intentions and organisational readiness.

**Keywords:** ESG; project initiation; project design; stakeholder engagement; sustainability; sustainable development

## 1 INTRODUCTION

In the dynamic landscape of contemporary business, companies face increasing scrutiny regarding the environmental and social impacts of their projects. Recent academic discussions in management point to transformative shifts in organisational practices and decision-making processes driven by sustainability, digitalisation and AI-enabled trends, highlighting the growing need for adaptive governance and strategic alignment within contemporary organisations [1].

The imperative for sustainable development has prompted organisations to integrate sustainability into project management practices, treating it as both a strategic and operational priority [2, 3]. Lasting progress towards sustainability requires more than adoption of isolated sustainable initiatives. Genuine impact is achieved by embedding sustainability principles throughout the entire project lifecycle, starting already at the initiation phase [4, 5]. Drawing upon recent literature that emphasizes holistic project governance and ethical project design [6, 7], (e.g., Silvius et al., 2021; Aarseth et al., 2020), this study conceptualizes sustainable project management competencies as multidimensional constructs spanning strategic, systemic, technical, and ethical domains, tailored to specific project lifecycle phases.

It is widely acknowledged that decisions made in the early stages of projects set the trajectory for future sustainability performance [4, 8]. The initiation phase offers a critical opportunity to establish sustainability criteria, define project boundaries, and engage a broad range of stakeholders, including internal teams, clients, local communities, and regulatory bodies [2, 9]. Early and meaningful stakeholder engagement is vital to align project objectives with broader social and environmental goals, while fostering corporate accountability [4, 10].

Moreover, literature underlines the importance of robust risk assessment at the outset of projects, carefully considering environmental, social, and economic risks that may affect sustainability outcomes and corporate reputation [11, 2]. Established frameworks, such as the Logical Framework Approach, demonstrate how

systematic sustainability assessment from the start can not only improve project results but also build resilience in the long-term [3, 12]. Incorporating economic, ecological, and social considerations in corporate project appraisal leads to more robust management decisions [4, 13].

Prioritising sustainability from initiation brings both ethical and tangible business benefits, including improved stakeholder trust, regulatory compliance, and long-term value creation [3, 5, 8].

### 1.1 Rationale and Research Aim

This study examines the integration of sustainability principles, at the initial, strategic entry point of the project lifecycle. Competencies in this phase play a critical role in embedding sustainability at the upstream level of project conception, in alignment with broader organizational objectives and governance frameworks.

The empirical research is based on a cross-sectoral sample of 754 project professionals from Europe, with varied organizational roles, sectoral affiliations, and sustainability structures. The IPA approach is applied to assess the perceived importance and actual implementation of sustainability-related competencies, thereby identifying critical gaps and opportunities for improvement.

Emphasis is placed on evaluating the extent to which sustainability-driven goals, environmental, social and governance (ESG) impacts, and governance mechanisms are incorporated at this early stage.

## 2 LITERATURE BACKGROUND

### 2.1 Embedding Sustainability in Corporate Project Initiation

The imperative for companies to address sustainability at the organizational project level has intensified in recent years, catalyzed by rising stakeholder expectations, global regulatory trends, and a growing recognition of the risks associated with unsustainable business practices [2, 3]. While sustainability was once pursued through fragmented or peripheral initiatives, contemporary research asserts that meaningful and lasting impact is obtained only by

embedding sustainability principles as an intrinsic element of project management - commencing from the very inception of corporate projects [4, 5].

The initiation phase is of foundational importance, as early decisions define project boundaries, objectives, and stakeholder alignments, thus largely determining long-term sustainability performance [4, 8]. Gareis et al. (2012) emphasise that sustainability integration at project initiation sets a trajectory that aligns project outputs with broader corporate and societal goals [4]. This perspective is echoed by Arto et al. (2001), who underscore the strategic significance of 'front-end' management, with early-stage choices shaping value realization, risk exposure, and stakeholder relations well into the project's lifecycle [8].

Recent theoretical advances stress that sustainability at project initiation should be analysed not only from the perspective of explicit contractual requirements but also in terms of stakeholders' implicit expectations. Cornell & Shapiro (2021) highlight that companies create value by selling implicit claims (such as fair treatment of employees or responsible customer relations) at a price higher than the cost of fulfilling them [17]. The integration of sustainability in the early stages of a project requires careful management of these implicit claims, as this directly affects long-term value for shareholders and society. Even in the absence of legal obligations, companies are motivated to maintain their reputation and trust in order to continue offering such claims in the future. This approach also helps to avoid potentially destructive outcomes when poorly defined or illegitimate stakeholder expectations undermine the value of sustainability initiatives [17].

A growing body of literature also recognises the criticality of the interface between the project front-end (typically sales or business development) and project initiation/execution, emphasising that early alignment, joint decision-making, and proper handover mechanisms are pivotal for the integration of sustainability criteria and for long-term project success [16]. Recent studies emphasize that sustainability-oriented project initiation can act as a catalyst for broader organisational transformation, particularly when combined with agile intrapreneurial practices that empower early innovation and strategic alignment [18]. Effective integration in this early interface ensures that sustainability commitments and stakeholder expectations defined at the front-end are not lost or diluted as responsibility transitions from sales to the project team. Practical mechanisms - such as proper handover documentation, involvement of project managers in feasibility and solution design, and cross-functional collaboration serve to align strategic sustainability intentions with operational execution and governance throughout the project life cycle [16]. Furthermore, the literature highlights that failure to properly manage this transition can lead to gaps in knowledge transfer (especially tacit sustainability knowledge), misalignment of priorities, and missed opportunities for sustainability-oriented innovation, all of which may negatively impact both project and organisational objectives [16, 17].

Stakeholder engagement stands out as a critical component during this phase. Engaging internal and external stakeholders, including employees, clients, regulators, and affected communities, not only clarifies project objectives in the light of broader sustainability imperatives but also enhances corporate accountability [4,

9, 10]. Meaningful involvement at initiation enables collective definition of sustainability criteria and fosters buy-in, which is essential for robust project governance and risk mitigation [2, 10]. In particular, the alignment of ESG (environmental, social, and governance) impacts with organisational strategy from the very outset positions companies to anticipate regulatory developments and societal shifts, thereby safeguarding both reputation and operational continuity [3, 5, 14]. Research on ESG reporting practices highlights that improved alignment of ESG factors in business decision-making is increasingly being demanded by investors and stakeholders, signifying a broader market and regulatory push for organisations to demonstrate not just reporting compliance but real sustainability outcomes at all stages, including project initiation [15, 17].

Another salient dimension is rigorous, multidimensional risk assessment at the initiation stage, incorporating environmental, social, and economic factors [2, 11]. As Wagner (2007) and Brent (2006) note, a comprehensive approach to risk not only limits adverse impacts but also enables companies to identify opportunities for sustainable value creation early in the project lifecycle [5, 11]. The importance of integrating credible, comparable ESG performance measures from the outset is increasingly emphasised as key to redirecting capital flows and enhancing sustainable project initiation practices [15]. At the same time, failure to address integration, both technical and social, across the front-end and initiation phases may compromise risk identification and mitigation processes, challenging the realisation of sustainability goals throughout the project cycle [16, 17].

Recent research by Ssegawa and Muzinda (2025) specifically highlights how project conceptualisation and initiation practices are formalised in various organisations, with key governance frameworks and stakeholder involvement influencing not only resource efficiency and project success, but also project alignment with sustainability and value-adding outcomes [14]. Their findings demonstrate that while formalisation stages such as the business case, feasibility study, and project selection exist across organisations, the terminology, processes, and stakeholder roles can vary widely depending on organisational context, internal/external influences, and governance structures [14]. This further underscores the strategic potential of early project decisions for embedding sustainability, as the documentation, appraisal, and approval phases offer critical opportunities for integrating environmental and social criteria.

## 2.2 Frameworks and Methodologies: Advancing Practice beyond Compliance

Project management literature offers a suite of standards and frameworks for operationalising sustainability within corporate project initiation, though significant variability exists in both conceptual depth and practical application [3, 12]. The Logical Framework Approach (LFA), widely adopted in development projects, stands out as a participatory model actively involving all relevant stakeholders in defining sustainability criteria, appraisal methods, and decision-making processes [12]. Unlike traditional business case analyses, which remain prevalent in corporate settings and focus predominantly on economic criteria, the LFA systematically integrates

economic, ecological, and social dimensions, as well as values such as equity, transparency, and inclusivity [4, 12-14, 16].

Moreover, the effective adoption of such frameworks requires not just formal processes, but also enabling governance structures, integration mechanisms, and inter-organisational collaboration that extends across the sales front-end and project initiation. Empirical case studies underscore that the successful operationalisation of sustainability at this stage is enhanced when both sales and project execution teams collaborate closely, leveraging formal (such as shared documentation and structured handovers) and informal (such as trust-building and knowledge exchange) mechanisms [16]. This is particularly true in complex projects or organisational contexts, where bespoke approaches may be needed to bridge the varying sustainability priorities, terminology, or performance metrics between business development and project management units [16, 17].

Comparative analyses reveal that globally recognised project management standards such as the PMBOK® Guide and PRINCE2 have begun to consider sustainability in initiation processes, for instance through mention of social and environmental aspects within business cases and codes of ethics [2, 3]. However, these frameworks frequently treat sustainability as an adjunct or qualitative addendum, rather than a central criterion embedded within investment analysis and decision gates [2, 3, 14]. The integration of sustainability criteria into formal decision gates is increasingly recognized as essential for effective portfolio governance, reinforcing the need to embed ESG considerations within early-stage project appraisal mechanisms [19]. As noted by Weninger (2012), the lack of explicit, obligatory mechanisms for sustainability integration in these standards creates gaps between formal corporate commitments and operational realities, culminating in inconsistent sustainability outcomes across projects [3].

Cornell & Shapiro (2021) further warn that insufficiently defined or overly broad understandings of ESG and CSR often introduce agency problems, as managers may make decisions that favour certain stakeholder groups at the expense of shareholder value creation [17]. They recommend clearly defining legitimate stakeholders - i.e. those with a business relationship with the company - in order to enhance measurable sustainability outcomes without creating trade-offs for other interest groups or the organisation itself.

Nonetheless, as Arvidsson and Dumay (2022) demonstrate, the increasing volume and quality of ESG reporting, catalysed by evolving EU regulations and shifting investor priorities, has not automatically translated into improved ESG performance, highlighting a persistent gap between the formal adoption of frameworks and real sustainability impact in practice [15]. Their analysis calls for corporate policies and project management methodologies to move beyond a compliance orientation ("reporting for reporting's sake") towards deeper integration of material sustainability criteria in decision gates and project appraisal, supporting more effective and transparent sustainability outcomes [15, 17].

Empirical evidence from Ssegawa and Muzinda (2025) further reveals that selected organisations

implement PCI practices differently, sometimes relying on integrated documents and processes that may or may not sufficiently address sustainability priorities, depending on governance requirements and external influences [14]. This highlights the necessity for clear, structured methodologies if companies intend to systematise sustainability as a core project criterion and not merely a compliance exercise.

### 2.3 Competencies, Implementation Gaps, and Organisational Learning

Despite growing consensus on the necessity of sustainability-oriented project initiation, a significant practice gap persists in most companies. Many rely on established but narrow investment analysis methods and lack systematic processes for incorporating broader sustainability criteria at project inception [2-4]. This deficiency often stems from limited organisational competencies in sustainable project management, insufficient professional development, and the absence of structured mechanisms for cross-functional collaboration and value alignment [4, 8].

Where companies do invest in building sustainability competencies, encompassing stakeholder engagement, robust assessment methods, and governance integration, research demonstrates tangible benefits: improved risk management, better stakeholder relations, enhanced regulatory compliance, and long-term value creation [5, 8, 9, 14]. The need to strategically upskill project management teams and to institutionalise sustainability as a decision-making norm, rather than an afterthought, has thus become central to discourse on advancing corporate project management practice [4, 13]. Evidence from case studies reviewed by Ssegawa and Muzinda (2025) also suggests that developing competencies and adapting governance processes to organizational context contributes to better project outcomes and enables more consistent implementation of sustainability objectives from initiation through execution [14]. Recent empirical studies further confirm that ESG integration gaps in project-oriented workplaces are not incidental but systemic, reflecting misalignment between strategic intent and operational readiness [20]. This pattern is consistent with findings from the climate services literature, which shows that even when advanced analytical tools and data are available, their effective use depends primarily on organisational learning capacities, governance maturity, and the ability to translate information into actionable decision frameworks [21]. In both domains, the central challenge is not the lack of information, but the lack of embedded competencies, clear accountability, and institutionalised processes that enable organisations to transform strategic sustainability goals into operational practice. Consequently, organisational learning and integrated sustainability reporting become effective only when supported by structured capability development and formalised decision-making routines, closing the gap between policy commitments and measurable project and organisational impact [15].

## 3 METHODOLOGY

The principal aim of the survey was to investigate the integration of sustainability principles, including ESG considerations, within project management practices across diverse industries and organisational contexts.

The survey instrument was developed through a rigorous process involving both theoretical foundation and industry expertise. Its construction was refined during a dedicated collaborative session, prior to distribution. Data collection was conducted over a continuous period of six weeks, from 23 December 2024 to 1 February 2025, permitting the capture of contemporary perspectives on sustainable project management.

A total of 754 valid responses were gathered from project management professionals, industry leaders, and academics across multiple sectors. The respondent pool represented a range of roles, countries, organisational sizes, and levels of seniority, thereby ensuring that findings are robust and reflect a diversity of practices and viewpoints.

The survey was structured into five key sections, progressing from general demographic and organisational information to more detailed assessments. The sections included: (1) Respondent background (demographics and professional experience), (2) Organisation background (industry, company size, and sustainability approach), (3) Competencies for Sustainable Project Management (evaluation of core competencies across project lifecycle phases), (4) Future expectations and key challenges (trends, education needs, and barriers), and (5) Additional comments and suggestions. This structure was designed to provide a comprehensive overview of sustainable project management practices and related competencies.

While the overall research provides insights into sustainability integration throughout various aspects of project management, the present study is narrowly focused on analysis of the Initiation Phase. The Initiation Phase is of particular significance as it establishes the foundational conditions for sustainable project delivery. In this section, respondents assessed the importance and organisational performance of key competencies including defining sustainability-focused project objectives, assessing and documenting ESG impacts, aligning sustainability goals with organisational strategy, stakeholder analysis and engagement, integrating sustainability into governance structures, and embedding preliminary sustainability metrics. This portion comprised eight specific questions directly related to sustainability integration at the strategic entry point of the project lifecycle.

Respondents rated each competency using a five-point Likert scale (1 = not relevant/very poor; 5 = essential/excellent). Data were subjected to descriptive and comparative statistical analyses, facilitating the identification of competency gaps between the recognised importance of each sustainability-driven capability and its level of organisational implementation. Further segmentation enabled examination of differences across industries, roles, and organisational profiles.

Ethical standards were upheld throughout the research process, with all responses being anonymous and collected on a voluntary basis. While recognising typical limitations associated with survey research, such as potential self-reporting bias and limitations in sectoral representation, the adopted methodology provides a robust and systematic foundation for examining the extent of sustainability integration at the initiation stage of project management, and for informing relevant educational and professional interventions.

The respondent sample included professionals from multiple countries and a wide range of industries, providing an international perspective on sustainability integration in project management practices. The largest group of respondents consists of mid-level professionals (28.8%) and senior professionals (27.9%). Entry-level specialists make up 18%, while Managers/Directors account for 18.8%. C-level executives represent the smallest group, at 6.5%. The majority of respondents have 1-3 years (25.9%) or 4-7 years (24.8%) of experience. 22.3% have 8-15 years, while 17.2% have more than 15 years. The least experienced group (less than 1 year) accounts for 9.8% of respondents. The survey results indicate that the majority of participants (56.0%) occupy project-level roles, followed by program-level roles (22.0%), portfolio-level roles (11.3%), and other roles (10.7%). As with most survey-based studies, the findings are subject to certain limitations, including reliance on self-reported perceptions and potential differences in respondents' interpretation of sustainability-related competencies. In addition, the applied measurement instrument captures perceived importance and organisational performance rather than objectively verified sustainability practices.

### 3 RESULTS AND DISCUSSION

The integration of sustainability principles into project management requires a clearly defined set of competencies aligned with each phase of the project lifecycle. Previous research highlights that organisational agility and project resilience are critical enablers of holistic project success, both of which are strongly influenced by early-stage governance and sustainability-oriented decision-making [22]. This paper focuses exclusively on the Initiation Phase and presents a structured assessment of competencies relevant to this critical early stage. The aim is to identify which competencies are considered most important, how effectively they are currently implemented in practice, and where the largest gaps exist between expectations and actual performance. Survey participants evaluated a range of sustainability-related competencies along two dimensions: the importance of each competency for sustainable project success, and the level of organizational performance in that area. These assessments offer insights into current capabilities and help define development priorities for embedding sustainability into project management processes. The Initiation phase, which lays the foundation for sustainable project delivery, includes key competencies such as setting sustainability-driven objectives, assessing ESG impacts, and incorporating sustainability into governance structures. As a strategic entry point in the project lifecycle, this phase is crucial for making decisions that shape the project's overall sustainability outcomes.

#### 3.1 Initiation Phase Competency Ratings: Importance vs. Performance

The analysis of key competencies within the Initiation phase reveals notable differences between perceived importance and actual organizational performance.

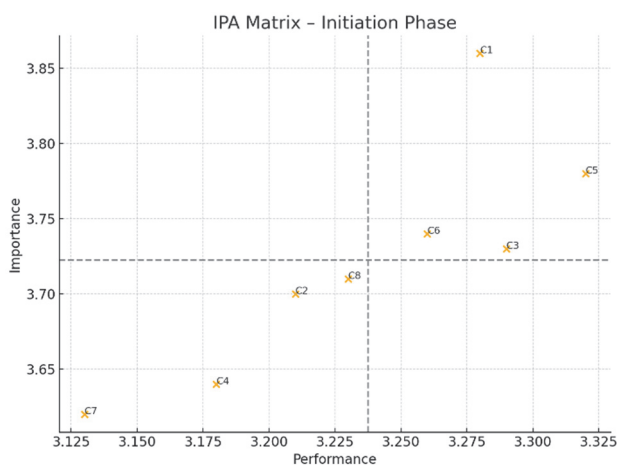
Among all competencies, the highest rated in terms of importance was the ability to define sustainability-focused objectives, with an average score of 3.86, while its performance was rated lower, at 3.28 (Tab. 1). Similarly, aligning sustainability goals with organizational strategies and stakeholder analysis and engagement were considered highly important, scoring 3.78 and 3.73 respectively, though their performance levels were slightly lower, at 3.32 and 3.29.

**Table 1** Initiation phase competency ratings: importance (I) vs. performance (P)

Competency	Mean I	Mean P
C1 - Define sustainability-focused objectives	3.86	3.28
C2 - Assess and document sustainability impacts	3.70	3.21
C3 - Stakeholder analysis and engagement	3.73	3.29
C4 - Integrate sustainability into governance structures	3.64	3.18
C5 - Align sustainability goals with organizational strategies	3.78	3.32
C6 - Evaluate sustainability-driven project needs	3.74	3.26
C7 - Embed preliminary sustainability metrics	3.62	3.13
C8 - Identify sustainability constraints and assumptions	3.71	3.23

The competency related to evaluating sustainability-driven project needs also ranked high in importance (3.74), yet organizational performance lagged (3.26). Other competencies, such as assessing and documenting sustainability impacts, identifying sustainability constraints and assumptions, and integrating sustainability into governance structures, received importance scores between 3.64 and 3.71, with corresponding performance scores ranging from 3.18 to 3.23. Notably, embedding preliminary sustainability metrics had both the lowest importance score (3.62) and the lowest performance rating (3.13), highlighting a general underdevelopment in this area.

These findings indicate a consistent pattern across all assessed competencies: organizations acknowledge the critical role of sustainability in the early project stages, but there remains a performance gap that indicates opportunities for targeted competency development and capacity building.



**Figure 1** IPA matrix - initiation phase

Across all eight assessed competencies, the mean scores for importance are systematically higher than those for performance, indicating that organizations recognize the relevance of these sustainability-related skills but face

challenges in their practical implementation. The largest discrepancies are observed in competencies such as Define sustainability-focused objectives (gap = 0.58), Integrate sustainability into governance structures (gap = 0.46), and Embed preliminary sustainability metrics (gap = 0.49). These findings suggest that while strategic recognition of sustainability is present, operational and institutional mechanisms for embedding it effectively at the initiation stage remain underdeveloped. This misalignment points to the need for targeted capacity-building, clearer governance frameworks, and the integration of sustainability considerations into early project planning tools and practices. Addressing these gaps is essential to ensure that sustainability is not only acknowledged but also actively implemented from the very outset of the project lifecycle.

### 3.2 Analysis of Industry-Based Competency Gaps in the Initiation Phase

The aim of this analysis is to identify which sectors exhibit the greatest discrepancies between the perceived importance of specific competencies and their actual implementation in practice. To assess the significance of differences in the perceived importance and performance of sustainable project management competencies during the Initiation Phase, the Kruskal-Wallis H test was applied. The findings reveal that there are statistically significant differences ( $p < 0.05$ ) in the following competencies:

- Assess and document sustainability impacts ( $p = 0.014$ )
- Align sustainability goals with organizational strategies ( $p = 0.043$ )
- Evaluate sustainability-driven project needs ( $p = 0.009$ )
- Embed preliminary sustainability metrics ( $p = 0.037$ )

The analysis of average gap values reveals a noticeable disparity between the perceived importance and the actual implementation of sustainable project management competencies. These gaps range from relatively lower values in stakeholder analysis and engagement (0.439), indicating a closer alignment between recognition and practice, to substantially higher values for defining sustainability-focused project objectives (0.580), suggesting that this competency is widely acknowledged as important but remains insufficiently embedded in practical project execution.

Moreover, the greatest variability in responses, as reflected by the highest standard deviation, was associated with the identification of sustainability constraints and assumptions. This pronounced dispersion indicates significant differences in how respondents understand and apply this competency in practice, likely reflecting varying levels of organizational maturity, sector-specific regulatory pressures, and uneven experience with sustainability integration during the early phases of project development. These competencies exhibit significant gaps in perception across different respondents, which may reflect varying levels of organizational maturity in addressing sustainability during the initiation phase. They represent priority areas for capacity development and harmonization.

On the other hand, the competencies that did not show statistically significant differences, such as:

- Define sustainability-focused objectives

- Stakeholder analysis and engagement
  - Integrate sustainability into governance structures
  - Identify sustainability constraints and assumptions
- Suggest more consistent perceptions among respondents regarding their importance and current performance. These areas may either be more universally understood or already better embedded into current project initiation practices.

### 3.3 Industries Exhibiting the Greatest Gaps in Sustainability Competencies

The mean rank analysis indicates that industries with higher average rankings tend to exhibit larger gaps in key sustainability competencies. In particular, Real Estate, Media and Entertainment, Non-Profit/NGO, and Biotechnology/Pharmaceuticals consistently show the most pronounced discrepancies, suggesting greater challenges in translating sustainability principles into practice. These differences align with previous research highlighting the influence of governance maturity, regulatory exposure, and performance management systems on early-stage sustainability integration. In contrast, sectors such as Financial Services, Public Sector/Government, and Energy and Utilities report lower mean ranks, reflecting smaller gaps and more established sustainability practices.

**Table 2** Industries with the highest gaps for significant competency

Competency	Industry with the Highest Gap
C2 - Assessing sustainability impacts	Media/Entertainment
C5 - Aligning sustainability goals	Retail/Consumer Goods
C6 - Evaluating sustainability-driven needs	Real Estate
C7 - Embedding sustainability metrics	Transportation/Logistics

Further insights from Tab. 2 reveal sector-specific patterns across individual competencies. The Media and Entertainment sector exhibits the largest gap in assessing sustainability impacts, Retail and Consumer Goods in aligning sustainability objectives with organizational strategy, Real Estate in evaluating sustainability-driven project needs, and Transportation and Logistics in embedding sustainability metrics.

The Kruskal-Wallis test confirms statistically significant differences across industries in these competencies, underscoring uneven levels of sustainability capability during the initiation phase. Overall, the findings indicate that Real Estate, Retail, Media and Entertainment, and Transportation and Logistics face the greatest challenges in systematically embedding sustainability considerations at early project stages. Addressing these gaps requires targeted, sector-specific approaches, including tailored training initiatives, customized sustainability frameworks, and improved performance measurement tools, particularly in metric-intensive industries such as Transportation and Logistics.

### 3.4 Role-Based Differences in Sustainability Competency Gaps

To explore whether sustainability-related competency gaps differ across hierarchical levels within project

management, a Kruskal-Wallis test was employed. This non-parametric test was used to assess variations in reported gaps among professionals operating at the project, program, and portfolio levels. The results indicated that there were no statistically significant differences in competency gaps across the three organizational role levels ( $p > 0.05$ ). This finding suggests that sustainability competency gaps are not confined to a specific level of responsibility within project management structures but are instead consistent across roles.

These results imply that challenges related to sustainability competencies are pervasive throughout project-based organizations, regardless of managerial seniority. In contrast to the industry-specific analysis, which revealed significant variability in competency gaps between sectors, this role-based analysis indicates a uniform distribution of sustainability challenges. Consequently, interventions aimed at improving sustainability competencies should be designed to address the needs of professionals at all levels: project, program, and portfolio rather than being tailored to specific hierarchical positions. This approach may foster a more integrated and organization-wide advancement of sustainability capabilities. Industries such as Biotechnology and Energy exhibit the highest mean sustainability competency gaps, indicating significant challenges in these sectors. In contrast, Education and IT show the lowest gaps, despite having the largest number of respondents. This pattern suggests that the severity of competency gaps is not necessarily linked to the size of the workforce sampled but rather to sector-specific sustainability maturity.

### 3.4 Organizational Factors Influencing Sustainability Competency Perceptions

This section explores how sustainability competency ratings vary in relation to three key organizational variables: years of professional experience, years of organizational operation, and work environment (remote, hybrid, or on-site). The goal is to determine whether these factors are associated with differing perceptions or implementations of sustainability competencies within project management contexts. The analysis revealed statistically significant, albeit weak, positive correlations between years of professional experience and several sustainability-related competencies. Specifically, individuals with more years of experience tended to assign slightly greater importance to defining sustainability objectives, assessing environmental and social impacts, and aligning project goals with sustainability principles. While the associations are modest in strength ( $r$  ranging from 0.093 to 0.113), the results suggest that experience may marginally enhance sensitivity to key sustainability dimensions. However, given the weak correlation coefficients, experience alone does not appear to be a strong determinant of sustainability competency perceptions.

The length of time an organization has been in operation also showed significant, though weak, positive correlations with several sustainability competencies. Older organizations were more likely to emphasize impact assessment, stakeholder engagement, alignment of

sustainability goals, and early integration of sustainability metrics. These findings indicate that organizational maturity may contribute to a greater institutional focus on sustainability, particularly in strategic planning and stakeholder-related processes. Nevertheless, the strength of the correlations remains low, suggesting other organizational factors likely play a more substantial role.

No significant relationships were identified between the work environment (remote, hybrid, or on-site) and perceived competency gaps in sustainability. This suggests that the setting in which employees perform their work does not influence their perception of sustainability capability deficiencies. In other words, sustainability competency gaps appear to be systemic across work environments and are not significantly shaped by the mode of work.

#### 4 CONCLUSION

Prior research indicates that organisational agility and resilience are closely linked to high-performance work practices, underscoring that sustainability integration must be supported by appropriate organisational structures, leadership commitment, and systematic capability development [23]. In line with this perspective, the findings of the present study provide empirical evidence that the integration of sustainability at the initiation phase of the project lifecycle remains uneven and largely underdeveloped across organizational contexts. The analysis reveals a consistent gap between the perceived importance of sustainability-related competencies during the initiation phase and their actual implementation in practice. This discrepancy, observed across all assessed competencies, indicates that sustainability integration at project initiation is not confined to isolated practices or individual shortcomings, but reflects a broader systemic pattern rooted in organisational design and governance arrangements.

The results further suggest that sustainability competency gaps are distributed across project, program, and portfolio levels, with no statistically significant differences detected between hierarchical roles. This finding implies that challenges related to sustainability integration at initiation are embedded throughout project-based organizational structures rather than being associated with specific levels of authority or responsibility. As such, sustainability-related deficiencies appear to originate from organizational systems and governance arrangements rather than from individual roles alone.

Industry-based analysis reveals that while sustainability-related challenges are present across sectors, certain industries - such as real estate, media and entertainment, biotechnology, and logistics - exhibit more pronounced gaps in key initiation-phase competencies. These sectoral variations point to differences in governance maturity, regulatory exposure, and established planning practices, reinforcing the importance of contextual factors in shaping sustainability integration at early project stages.

Organizational characteristics such as professional experience and organizational longevity were found to have only weak positive associations with sustainability

competency perceptions. While more experienced professionals and more mature organizations tend to demonstrate slightly higher sensitivity to sustainability considerations, these effects are limited in magnitude. This suggests that experience and organizational age alone are insufficient drivers of effective sustainability integration and that more deliberate structural and governance-related mechanisms are required. Taken together, the findings indicate that sustainability-related competency gaps at the Initiation Phase are predominantly systemic rather than incidental. They stem from misalignment between strategic sustainability intentions and the organizational capabilities, processes, and governance structures required to operationalize those intentions at the outset of projects. Without formalized roles, clear accountability mechanisms, and structured integration of sustainability into initiation activities, sustainability considerations risk remaining implicit, fragmented, or reactive. By focusing explicitly on the initiation phase, this study contributes to the project management literature by empirically demonstrating the critical role of early-stage competencies in shaping sustainable project trajectories. The results underscore the need to view sustainability integration not as a downstream corrective activity, but as a capability that must be embedded at the strategic entry point of the project lifecycle.

A key limitation of this study lies in its reliance on cross-sectional, self-reported survey data, which captures perceived importance and organisational performance of sustainability-related competencies at a single point in time and may therefore not fully reflect actual practices or their evolution across different organisational and sectoral contexts. Future research could extend these findings by employing longitudinal or mixed-method approaches to examine how sustainability-related competencies at the project initiation phase develop over time and translate into observable governance practices and project outcomes across different industries.

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