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Verifying Strategic Human Resource Planning in Construction Project Management Performance in UAE

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ABSTRACT

This paper investigates the impact of strategic human resource planning on construction project management performance, focusing on infrastructure contracting companies. Strategic HR planning plays a critical role in enhancing project outcomes by addressing key performance dimensions such as cost efficiency, timeliness, quality, and safety. Using a mixed-methods approach, the research integrates qualitative insights from semi-structured interviews with quantitative data obtained through structured surveys. The study examines how strategic HR practices influence performance, with particular attention to the mediating roles of green HR practices, innovation capacity, and demographic factors like company size, capital, and age. The findings demonstrate that strategic HR planning significantly improves project management performance. This improvement is achieved by aligning workforce strategies with organizational goals, integrating Health, Safety, and Environmental (HSE) frameworks, and adopting green supply chain management practices. Green HR practices were found to positively influence sustainability outcomes, emphasizing the role of environmentally conscious HR strategies in achieving long-term success. Similarly, the study highlights the contribution of strategic HR practices to fostering innovation capacity, which enhances the organization's ability to generate and implement innovative solutions, particularly critical in a dynamic and competitive industry like construction. Additionally, the study identifies financial evaluations as an essential component of strategic planning. These evaluations help organizations assess project feasibility, identify potential weaknesses, and align financial strategies with HR practices to enhance project success. The influence of demographic factors, including company size and age, further underscores the importance of tailoring HR strategies to organizational characteristics. Larger and more established companies tend to exhibit stronger project performance, benefiting from their resource base and institutional knowledge. Moreover, the research offers practical recommendations for construction firms seeking to optimize their HR strategies to achieve enhanced efficiency, sustainability, and competitiveness. However, the study is not without

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limitations. Its focus on infrastructure contracting companies in UAE limits the generalizability of findings to other industries or regions. Additionally, the reliance on self-reported data introduces potential biases, and the cross-sectional design does not capture long-term effects of HR strategies. Future research should adopt longitudinal designs to explore the sustained impact of strategic HR planning and extend the scope to include other industries and geographic contexts.

الملخص

تبحث هذه الدراسة في تأثير التخطيط الاستراتيجي للموارد البشرية على أداء إدارة مشاريع البناء، مع التركيز على شركات التعاقد على البنية التحتية. يلعب التخطيط الاستراتيجي للموارد البشرية دورًا حيويًا في تحسين نتائج المشاريع من خلال معالجة أبعاد الأداء الرئيسية مثل الكفاءة من حيث التكلفة، والالتزام بالوقت، والجودة، والسلامة. باستخدام نهج مختلط، تجمع الدراسة بين رؤى نوعية من المقابلات شبه المهيكلة وبيانات كمية تم الحصول عليها من استبيانات منظمة .تفحص الدراسة كيفية تأثير ممارسات الموارد البشرية الاستراتيجية على الأداء، مع التركيز بشكل خاص على الأدوار الوسيطة لممارسات الموارد البشرية الخضراء، وقدرة الابتكار، والعوامل الديموغرافية مثل حجم الشركة، ورأس المال، والعمر. أظهرت النتائج أن التخطيط الاستراتيجي للموارد البشرية يحسن بشكل كبير أداء إدارة المشاريع. يتم تحقيق هذا التحسين من خلال مواءمة استراتيجيات القوى العاملة مع الأهداف التنظيمية، ودمج أطر الصحة والسلامة والبيئة، واعتماد ممارسات سلسلة التوريد الخضراء. وُجد أن ممارسات الموارد البشرية الخضراء تؤثر إيجابيًا على نتائج الاستدامة، مما يبرز دور الاستراتيجيات البيئية في تحقيق النجاح على المدى الطويل. وبالمثل، تسلط الدراسة الضوء على مساهمة الممارسات الاستراتيجية للموارد البشرية في تعزيز قدرة الابتكار، مما يعزز قدرة المنظمة على توليد وتنفيذ حلول مبتكرة، وهو أمر بالغ الأهمية في صناعة ديناميكية وتنافسية مثل البناء. بالإضافة إلى ذلك، تحدد الدراسة أن التقييمات المالية تشكل عنصرًا أساسيًا في التخطيط الاستراتيجي. تساعد هذه التقييمات المنظمات على تقييم جدوى المشاريع، وتحديد نقاط الضعف المحتملة، ومواءمة الاستراتيجيات المالية مع ممارسات الموارد البشرية لتعزيز نجاح المشاريع. كما أن تأثير العوامل الديموغرافية، بما في ذلك حجم الشركة وعمرها، يؤكد أهمية تخصيص استراتيجيات الموارد البشرية لتناسب خصائص المنظمة. تميل الشركات الأكبر والأكثر رسوخًا إلى تحقيق أداء مشروع أقوى، مستفيدةً من قاعدة مواردها ومعرفتها المؤسسية. كما تقدم الدراسة توصيات عملية للشركات العاملة في قطاع البناء لتطوير استراتيجيات الموارد البشرية لتحقيق كفاءة أعلى، واستدامة، وتعزيز تنافسيتها. ومع ذلك، لا تخلو الدراسة من القيود. فتركيزها على شركات التعاقد على البنية التحتية في الإمارات العربية المتحدة يحد من إمكانية تعميم النتائج على صناعات أو مناطق أخرى. بالإضافة إلى ذلك، فإن الاعتماد على البيانات المبلغ عنها ذاتيًا يقدم تحيزات محتملة، والتصميم المقطعي للدراسة لا

الكلمات الداله:

التخطيط الاستراتيجي للموارد البشرية، إدارة مشاريع البناء، ممارسات الموارد البشرية الخضراء، الاستدامة، الابتكار، التقييم المالي.

يلتقط التأثيرات طويلة المدى لاستراتيجيات الموارد البشرية. يجب أن تتبنى الأبحاث المستقبلية تصميمات طولية لاستكشاف التأثير المستدام للتخطيط الاستراتيجي للموارد البشرية وتوسيع نطاق الدراسة ليشمل صناعات وسياقات جغرافية مختلفة.

JEL Classification: *M12, L74, O31, & Q56*

1. Introduction

Strategic Human Resource Planning (SHRP) has gained recognition as a critical enabler of organizational success, particularly in industries where workforce dynamics play a pivotal role. In the United Arab Emirates (UAE), the construction sector is a cornerstone of economic growth, driven by large-scale infrastructure projects, real estate developments, and visionary initiatives like the UAE Vision 2030. These projects are often characterized by their complexity, multinational workforce, and high-performance expectations, making effective HR management a necessity. SHRP involves aligning human resource strategies with organizational goals to ensure the availability of skilled personnel, optimal workforce allocation, and enhanced productivity. In construction project management, where time, quality, and cost are paramount, SHRP can significantly influence project outcomes by addressing workforce challenges such as skill shortages, cultural diversity, and labor turnover. This study focuses on verifying the role of SHRP in enhancing construction project management performance within the UAE, exploring its impact on project efficiency, workforce effectiveness, and overall success. Strategic planning is widely recognized as a cornerstone of organizational success and goal achievement. As noted by Abusharekh et al. (2020), the ability of an organization to thrive depends significantly on the accuracy and robustness of its strategic planning processes. This perspective is echoed by Bolland (2020), who highlights how organizational practices have evolved from long-term planning to strategic planning, culminating in the modern concept of strategic management. However, while the theoretical foundation for strategic planning is well established, its practical implementation often varies across industries and regions, raising questions about the contextual factors influencing its effectiveness. Critically, strategic human resource planning (SHRP) plays a pivotal role within this framework. Kudaibergenov et al. (2021) emphasize that SHRP is a fundamental activity performed by human resource management to align workforce capabilities with organizational goals. However, there remains an ongoing debate regarding the extent to which SHRP contributes to overall strategic alignment in diverse organizational contexts. For example, while SHRP is designed to anticipate future workforce needs and address skill gaps (Trost, 2020), its effectiveness can be hindered by external uncertainties such as market volatility or regulatory changes. This highlights the need for continuous adaptation of SHRP practices to maintain alignment with organizational objectives.

SHRP focuses on estimating an organization's future human resource needs in alignment with strategic goals (Trost, 2020). This involves comparing projected workloads with the current and anticipated capabilities of the workforce to determine gaps in skills or personnel. However, while Trost underscores the importance of such planning, critics argue that many organizations fail to account for rapidly changing conditions, such as technological advancements or workforce demographic shifts, which can render traditional SHRP approaches insufficient. This critique aligns with the argument that dynamic industries, like construction, require more flexible and adaptive HR planning models. Moreover, strategic planning for HR encompasses not only workforce optimization but also the ability to meet the organization's needs amidst internal and external changes. The complexity of balancing internal talent development and external hiring often challenges HR managers, particularly in industries like construction, where project-based work necessitates a blend of technical skills and adaptability. This underscores the critical need for HR practices to evolve in tandem with organizational and industry-specific demands. The construction sector significantly influences economic growth due to its multiplier effect on other industries. For example, in the UAE,

government and private sector investments have driven positive growth in construction, contributing 3.8% growth in 2019 (Strategic Plan 2011-2019). Despite its economic importance, the construction industry faces unique challenges, such as the complexity, cost, and time demands of modern projects (Alzaqebah et al., 2018a). These challenges have been exacerbated globally by the COVID-19 pandemic, highlighting the need for robust strategic planning to navigate disruptions effectively (Domenech et al., 2019; Al-Zaqeba & Al-Rashdan, 2020a; Kayali, 2021). These structural inefficiencies underscore the critical role of strategic planning, particularly SHRP, in addressing workforce challenges and enhancing sector performance.

The UAE's construction industry has been a major driver of economic diversification, contributing significantly to GDP and employment. The sector is characterized by high-profile projects such as the Burj Khalifa, Expo 2020 infrastructure, and the ongoing NEOM collaborations, attracting a multinational workforce and leveraging advanced technologies. However, the fast-paced and high-stakes nature of the industry presents unique challenges in managing human resources effectively. Traditional human resource practices in the UAE construction sector often focus on short-term staffing to meet immediate project needs, overlooking the strategic alignment of HR with broader organizational objectives. This reactive approach can lead to inefficiencies, such as delays, cost overruns, and workforce dissatisfaction. SHRP addresses these challenges by emphasizing proactive planning, workforce optimization, and strategic alignment, ensuring that HR practices contribute to long-term project success. Despite the evident potential of SHRP in transforming construction project management, research on its application in the UAE remains limited (Lootah, 2024; Maabreh, 2024; Shboul et al., 2024). The UAE's reliance on a diverse and transient workforce, coupled with its ambitious construction projects, makes it an ideal setting to study the effectiveness of SHRP. Key areas of exploration include workforce planning, skill development, talent retention, and the integration of HR analytics in project management. By examining SHRP in the context of the UAE construction sector, this study seeks to provide actionable insights for industry stakeholders, highlighting strategies to enhance workforce performance, reduce project risks, and achieve sustainable growth. The findings are expected to contribute to the literature on strategic HR management in construction and support the UAE's vision of becoming a global leader in innovation and infrastructure development. This paper aims to explore the extent to which SHRP can enhance construction project management performance in UAE, providing a framework for aligning workforce strategies with organizational objectives. By addressing these gaps, the study seeks to contribute to the growing body of literature on the intersection of HR planning and project management, with implications for both theory and practice.

2. Literature Review and Hypotheses

Strategic planning is integral to improving construction project management performance. By aligning workforce capabilities with project requirements, SHRP can mitigate issues such as skill shortages, workforce turnover, and mismatched competencies, all of which are prevalent in the construction sector. However, as previous studies have shown, the implementation of SHRP is not without its challenges. For instance, while strategic planning can theoretically enhance contractor performance and project outcomes, there is often a disconnect between planning and execution due to resource constraints, lack of data-driven decision-making, or insufficient managerial expertise. In addition, strategic planning is an essential determinant of organizational success, particularly in industries like construction, where workforce dynamics directly influence project outcomes. While SHRP offers a structured approach to aligning HR capabilities with organizational goals, its effectiveness is contingent upon industry-specific challenges and contextual factors. In the UAE, the construction sector provides a compelling case for examining the role of SHRP in enhancing project management performance. By integrating critical insights from the literature and contextual analyses, this study aims to advance understanding of how strategic HR practices can drive organizational success in dynamic and challenging environments.

2.1 Enterprise Resource Planning: Definitions and Functional Perspectives

The concept of Enterprise Resource Planning (ERP) has been a subject of extensive debate, with no universally agreed-upon definition. Generally, ERP is understood as an integrated software system designed to provide a holistic view of all business processes within an enterprise. It acts as a bridge between these processes, ensuring seamless communication and operational efficiency (Ehie and Madsen, 2005). This characterization underscores ERP's role as a centralized system that links various business units through a shared database. However, while this definition captures the technical essence of ERP, critics argue that it oversimplifies the dynamic nature of ERP systems, which often require significant customization to align with the unique needs of organizations. From another perspective, ERP systems are described as platforms that organize enterprise data, ensuring it is distributed effectively to relevant departments (Veysel & Hinge, 2013). This interpretation highlights the functional utility of ERP in enhancing decision-making and operational efficiency. Yet, it raises questions about the challenge's organizations face in achieving this level of integration. For instance, the success of ERP implementation often depends on organizational readiness, employee training, and the adaptability of the system to changing business environments. These factors suggest that while ERP systems provide a powerful framework for data management, their potential is often constrained by implementation barriers and organizational inertia.

2.2 The Role of ERP Systems in Centralized Business Management

At its core, ERP serves as a centralized structure that directs, stores, and updates business information (Lengnick-Hall and Lengnick-Hall, 2006). This capability is particularly valuable in today's fast-paced business environments, where real-time data access and integration are critical. However, while the centralized nature of ERP systems is seen as an advantage, it can also pose risks, such as data security concerns and system downtimes, which can disrupt operations. Critics also argue that the reliance on a single system for all business processes can lead to over-standardization, potentially stifling innovation and flexibility within organizations. The effectiveness of ERP systems is also contingent on their alignment with an organization's strategic goals. For example, while ERP systems offer the potential for streamlined operations and improved decision-making, their implementation requires significant investment and organizational change. This has led some scholars to question whether the benefits of ERP systems justify their costs, particularly for small and medium-sized enterprises (SMEs) that may lack the resources to support large-scale ERP deployments.

2.3 ERP and Human Resource Information Systems (HRIS): Strategic Implications

In contemporary business practices, ERP systems have increasingly intersected with Human Resource Information Systems (HRIS) to enhance workforce management. As businesses shift toward leaner organizational structures, reducing management levels and workforce size, HRIS has become an essential tool for supporting strategic HR functions (Al-Zaqeba & Al-Rashdan, 2020). These systems enable rapid access to personnel data, streamline administrative tasks, and empower employees to manage their own information. However, while HRIS systems alleviate the administrative burden on HR departments, they also require a cultural shift toward digital adoption and self-service practices, which may face resistance from employees accustomed to traditional HR models. Critically, the integration of HRIS within ERP systems aligns HR management with broader strategic goals. By providing managers with real-time data, HRIS enhances decision-making related to talent management, succession planning, and workforce optimization. However, the reliance on technology for HR functions raises concerns about data privacy and the potential dehumanization of HR practices. Lengnick-Hall and Lengnick-Hall (2006) caution that while technology can enhance efficiency, it should not replace the human element in managing employee relations and organizational culture.

2.4 Challenges and Opportunities in ERP and HRIS Implementation

While ERP and HRIS systems offer numerous benefits, their implementation is fraught with challenges. High costs, technical complexities, and the need for employee training are common barriers to successful deployment. Moreover, the integration of these systems requires careful planning to ensure they align with organizational goals and do not disrupt existing workflows. Veysel and Hinge (2013) argue that the success of ERP systems depends on their adaptability to organizational needs, a factor often overlooked during the

implementation phase. Despite these challenges, ERP systems remain a vital tool for modern enterprises. Their ability to centralize data, streamline processes, and enhance decision-making provides organizations with a competitive edge in an increasingly data-driven world. By integrating HRIS into ERP platforms, organizations can further align their workforce management strategies with their overall business objectives, driving efficiency and supporting long-term growth. The evolving definitions and perspectives on ERP systems reflect their complexity and multifaceted nature. While they offer significant potential for operational efficiency and strategic alignment, their implementation requires careful consideration of organizational needs, resources, and cultural factors. By leveraging the capabilities of ERP and HRIS systems, businesses can enhance their decision-making processes and workforce management strategies. However, the critical success of these systems lies in balancing technological innovation with the human aspects of management, ensuring that they serve as enablers of organizational growth rather than mere technical tools.

2.5 Strategic Management as a Tool for Innovation and Efficiency

Strategic management has a practical and essential role in managing innovation and creativity to enhance organizational efficiency and effectiveness. According to Dhamdhere (2015), strategic planning serves as a form of knowledge management that enables projects and institutions to utilize resources effectively. While this perspective underscores the transformative potential of strategic management, critics argue that its success depends heavily on the organization's capacity to foster a culture that values innovation and creativity. Without this cultural alignment, even the most well-designed strategic plans may fail to achieve the desired outcomes. Moreover, strategic planning in human resource management (HRM) leverages structured databases and analytics to enhance decision-making processes. For example, evaluations of personnel within the HR system can guide decisions regarding promotions, training needs, and external recruitment strategies (Al-Zaqeba et al., 2018). However, the reliance on system-generated insights raises concerns about the over-reliance on data-driven decisions, potentially neglecting qualitative factors such as interpersonal skills and employee aspirations, which are harder to quantify but equally important for organizational success.

2.6 Human Resource Information Systems in Workforce Planning

Human Resource Information Systems (HRIS) provide HR managers with critical tools for optimizing workforce planning. These systems enable quick access to personnel data, facilitating faster and more accurate HR planning decisions (Al-Zaqeba & Al-Rashdan, 2020). For instance, during promotion decisions, HRIS can analyze an employee's performance history and match their competencies with organizational needs. However, while HRIS enhances decision-making efficiency, its implementation often encounters resistance from employees who may perceive the system as overly mechanistic or intrusive. This underscores the need for organizations to balance the technological efficiency of HRIS with a human-centric approach to workforce planning. The integration of HRIS extends beyond internal workforce optimization. Kaynak et al. (1999) emphasize the importance of job analysis and candidate pool management within HRIS. The system compares job requirements with available candidates, whether internal or external, to determine the best fit for vacant positions. This ensures that the right personnel are placed in the right roles, contributing to organizational effectiveness. However, the process is not without challenges; for example, biases embedded in the system's algorithms could potentially influence decision-making, highlighting the need for continuous monitoring and updates to HRIS algorithms.

2.7 HRIS in Training and Development

HRIS also plays a pivotal role in identifying both individual and organizational training needs. Byars and Rue (1992) suggest that HRIS leverages employees' educational backgrounds and training histories to determine skill gaps and design tailored development programs. For example, HR managers can monitor past training initiatives and assess their impact on employee performance, allowing for more targeted and effective training interventions (Ceriello and Freeman, 1993). However, while these systems provide a structured approach to training needs analysis, they may inadvertently prioritize measurable skills over intangible ones, such as leadership or creativity, which are harder to quantify but critical for long-term organizational success. Furthermore, while HRIS facilitates personalized training plans, the reliance on

historical data may sometimes fail to anticipate future skill requirements driven by emerging technologies or market shifts. Thus, organizations must ensure that their HRIS frameworks remain adaptable and forward-looking to address evolving training needs.

2.8 Balancing Technology and Human Insights

The deployment of HRIS in HR planning and development underscores the intersection of technology and human decision-making in modern organizations. While systems like HRIS provide unparalleled efficiency and accuracy, they must be used in conjunction with human judgment to ensure holistic and ethical workforce management. Gumustekin (1998) argues that the strategic use of HRIS can significantly enhance organizational effectiveness by placing the right personnel in the right roles. However, critics caution against over-reliance on technology, suggesting that it may lead to dehumanization of HR processes if not implemented thoughtfully.

2.9 Integration of Technology in Human Resource Management Practices

The evolution of computer and information technology has significantly transformed human resource management (HRM) processes, particularly in performance evaluation, training, and personnel selection. Uyargil (1994) highlights that by systematically defining job qualifications and requirements, organizations can assess how well employees meet these criteria over time. This technological integration enables a more precise evaluation of employee performance, fostering data-driven decisions in HRM. However, critics argue that while technology facilitates efficiency, it may inadvertently prioritize quantitative metrics over qualitative aspects, such as creativity and interpersonal skills, which are equally critical in many roles. Performance management systems contribute to a wide array of HR activities, including identifying training needs, career planning, and conducting job analyses (Ozturk, 2008). These systems offer a structured approach to feedback, enhancing employee productivity and aligning individual performance with organizational goals. However, the effectiveness of these systems depends on their design and implementation. Poorly designed systems may fail to capture the nuances of employee performance or provide actionable insights, potentially undermining their utility in HR decision-making.

2.10 Wage Management and Job Classification through HR Systems

HR information systems have also revolutionized wage management, allowing for more accurate and equitable compensation practices. By employing statistical programs, organizations can evaluate wage alternatives, create wage plans, and calculate wage costs arising from collective agreements (Kaynak et al., 1999). These systems facilitate budget creation and enable departments to plan their expenditures more effectively. Moreover, Öge (2004) emphasizes the role of HR systems in conducting in-house wage research, enabling organizations to develop wage policies that are fair and competitive. While these systems enhance accuracy and transparency in wage management, they are not without challenges. Critics argue that the heavy reliance on data and algorithms can sometimes result in rigid wage structures that fail to accommodate exceptional cases or recognize unique contributions. Additionally, wage management systems must be continuously updated to reflect changing market conditions and organizational priorities, requiring sustained investment in technology and expertise.

2.11 Career Development and Self-Assessment in HR Systems

One of the most impactful features of HR systems is their role in career development and self-assessment. These systems allow employees to evaluate their abilities, knowledge, and interests, providing insights into their career goals and development priorities (Sharp, 2010; Al-Zaqeba et al., 2018). By incorporating career assessment tests and organizing the results, HR systems help create comprehensive profiles of employee potential. Such profiles can guide career planning, helping both employees and organizations align professional development with strategic objectives. Walker (1982) argues that a well-functioning career development system not only streamlines promotion processes but also boosts employee morale. However, the implementation of these systems requires careful consideration of employee engagement and trust. Employees may feel apprehensive about sharing self-assessments or undergoing career evaluations, fearing potential misuse of the data. Organizations must address these concerns by ensuring data confidentiality and fostering a culture of transparency and support.

2.12 Challenges and Opportunities in HR System Implementation

The integration of HR systems in career development and wage management offers substantial benefits, but it also presents challenges. For instance, the reliance on technology necessitates significant investment in infrastructure, training, and system maintenance. Furthermore, the success of these systems hinges on their ability to balance efficiency with empathy. Over-automation may lead to a dehumanized approach to HRM, which could negatively impact employee engagement and trust. Despite these challenges, HR systems remain indispensable tools in modern organizations. Their ability to provide data-driven insights, streamline processes, and enhance decision-making supports organizational efficiency and effectiveness. By leveraging these systems thoughtfully, organizations can not only improve operational outcomes but also foster a more engaged and empowered workforce.

3. Hypothesis Development

Strategic planning for HR plays a pivotal role in enhancing the performance of construction project management. Proper planning and efficient distribution of human resources are universally acknowledged as critical factors in improving project outcomes. Hollenbeck and Jamieson (2015) highlight that phenomena such as recruitment, preparation, teamwork, communication, knowledge management, and employee satisfaction are not solely dependent on individual human capital but also significantly influenced by social capital and relational networks among employees. While the importance of these social networks in driving organizational outcomes is evident, critics argue that the practical application of methodologies like social network analysis remains underexplored in HR management. This gap suggests an opportunity for future research to evaluate how these relational dynamics can be systematically integrated into HR planning frameworks for construction projects. Moreover, the integration of rational and adaptive strategic planning approaches into construction project management has been shown to yield positive outcomes. Papke-Shields and Boyer-Wright (2017) combine the rational properties of strategic planning with adaptive properties to propose a 'rational adaptation' model. Their findings indicate that this approach, which emphasizes both systematic planning and flexibility, is positively associated with project success. The ability of strategic planning to adapt to dynamic project environments is particularly relevant to the construction sector, where unexpected challenges frequently arise. However, the degree to which this model can be universally applied across varying project contexts remains a point of contention, as construction projects often differ in scale, complexity, and resource availability. Abdel Salam's (2020) study further underscores the significance of strategic planning in human resource development, quantifying its impact through a coefficient of determination of 0.726. This finding demonstrates that strategic planning contributes to 72% of the variance in human resource development outcomes. Additionally, the study highlights a direct correlation between the vision and mission of an organization and its HR development, reinforcing the argument that strategic planning aligns workforce goals with broader organizational objectives. However, the study's focus on human resource development as the sole dependent variable leaves room for exploration of its impact on broader aspects of project management performance, such as cost efficiency, quality, and stakeholder satisfaction. Based on the discussion and the reviewed studies, the following hypothesis can be proposed:

***H1**: Strategic planning for human resources has a significant positive impact on the performance of construction project management.*

Strategic planning widely recognized as a cornerstone for improving the performance of construction project management. Effective planning and allocation of human resources directly influence the efficiency and success of construction projects. Hollenbeck and Jamieson (2015) emphasize that outcomes related to human capital, such as recruitment, training, teamwork, communication, and employee satisfaction, are significantly influenced by social capital and relational networks among employees. Despite its potential, social network analysis as a methodology remains underutilized in HR planning, particularly in construction. This gap presents an opportunity for further exploration of how relational dynamics can optimize HR strategies to enhance project outcomes. Furthermore, the concept of integrating rational and adaptive strategic planning into project management offers promising avenues for success. Papke-Shields and Boyer-Wright (2017) propose a "rational adaptation" model that combines structured planning with flexibility to

address dynamic project needs. Their findings suggest that this approach positively correlates with project success and the effective use of project management tools. This dual approach aligns well with the unpredictable nature of construction projects, where flexibility is critical for navigating challenges such as resource constraints, shifting timelines, and unforeseen risks. However, the model's practical application in various cultural and organizational contexts requires further empirical validation. The study by Abdel Salam (2020) quantifies the impact of strategic planning on human resource development, revealing that 72% of variance in HR development can be attributed to strategic planning. This strong correlation underscores the importance of aligning an organization's vision and mission with HR strategies to optimize workforce capabilities. However, critics argue that while strategic planning significantly influences HR outcomes, its impact on broader aspects of project management, such as sustainability, cost efficiency, and innovation, warrants further investigation. In addition to traditional HR practices, emerging trends such as green human resource management (GHRM) are gaining prominence. Zaid et al. (2018) demonstrate that GHRM practices directly impact sustainable performance, with internal green supply chain management practices mediating this effect. These findings highlight the importance of incorporating sustainability into HR planning to achieve long-term project success. However, the integration of green practices often faces challenges, such as resistance to change and the need for substantial investment in training and infrastructure. Similarly, innovation capacity plays a vital role in strategic HR planning. Aryanto et al. (2015) argue that organizations must cultivate innovation capabilities to manage the innovation process effectively, from idea generation to commercialization. SHRM is a critical enabler of innovation, as it ensures that the human element, which drives creativity and implementation, is adequately managed. The link between SHRM practices, innovation capacity, and performance highlights the need for HR strategies to go beyond traditional frameworks and foster a culture of innovation. However, the practical implementation of such strategies often requires overcoming barriers like skill mismatches and resource limitations. Al-Eidani (2010) reinforces the importance of strategic HR planning in maintaining a competitive edge. By linking strategic planning with HR planning, organizations can effectively allocate resources, particularly human resources, to meet organizational goals. This alignment ensures that the right personnel, in the appropriate size and expertise, are available at the right time. Moreover, the integration of strategic HR planning creates an organizational environment that enhances performance, innovation, and adaptability in the face of intense competition. However, critics highlight that this approach demands a thorough understanding of both the internal and external environment, which can be resource-intensive and complex to implement in large-scale construction projects. Based on the critical discussion above, the following hypotheses are proposed:

H2*: Strategic human resource planning has a significant positive impact on the performance of construction project management.*

H3*: Green human resource management practices positively influence the sustainability performance of construction projects, mediated by green supply chain management practices.*

H4*: Strategic human resource management practices positively affect innovation capacity, which in turn enhances innovation performance in construction project management.*

Strategic planning is a critical mechanism for managing costs and ensuring operational efficiency in construction project management. Effective HR planning reduces redundancies and prevents the wastage of human resources, which can impose significant financial burdens on projects. Shojaei and Flood (2017) argue that existing portfolio planning models can be enhanced by integrating a random project flow generator, which extends the planning horizon to accommodate unforeseen projects. This approach utilizes historical market factors as predictors of future project flows, enabling organizations to anticipate variables such as project duration, costs, and lease parameters. While this model offers a forward-looking perspective, its reliance on historical data may limit its applicability in volatile markets, where unpredictable external factors can disrupt planned project flows. Moreover, Bonifaci et al. (2016) emphasize the significance of financial evaluation within strategic planning frameworks. Using the Palermo Strategic Plan as a case study, the authors demonstrate how financial evaluations can identify weaknesses that may hinder project implementation and highlight conditions to improve project success rates. This insight underscores the interdependence of HR planning and financial evaluation in strategic project management. However, critics

argue that financial evaluations often fail to account for qualitative factors, such as employee morale and organizational culture, which are critical for project success but less easily quantified. Strategic HR planning also enables management to achieve comprehensive project management by aligning organizational goals with operational processes. Ershadi et al. (2019) illustrate the role of strategic planning in integrating Health, Safety, and Environment (HSE) management into project workflows. By focusing on health monitoring programs, safety prevention measures, and environmental monitoring plans, strategic planning ensures that all aspects of HSE are addressed systematically. This alignment enhances occupational health and environmental safety, ultimately contributing to better project outcomes. However, the success of this approach depends on the organization's ability to implement HSE measures consistently across all projects, which can be challenging in resource-constrained settings. While the integration of HSE management into strategic planning is a positive development, it also raises questions about the adaptability of these frameworks to diverse project types. For instance, large-scale infrastructure projects may require different HSE priorities compared to smaller residential projects. This variability highlights the need for tailored strategic planning models that address project-specific challenges while maintaining alignment with organizational goals. Based on the critical discussion above, the following hypotheses can be proposed:

H5*: Strategic planning for human resources contributes to cost control and enhances the efficiency of construction project management by minimizing resource wastage and duplication of work.*

H6*: Financial evaluations within the strategic planning framework positively impact project feasibility and success by identifying and mitigating potential weaknesses.*

H7*: The alignment of strategic HR planning with HSE management practices improves the overall integrity and sustainability of project management.*

The quality of a project plays a pivotal role in determining a company's survival in a competitive market, especially in the construction industry. Abd al-Salam (2018) emphasizes the positive correlation between strategic planning and training quality, noting that strategic planning helps raise employee performance and enhance project outputs. This connection between strategic planning and quality improvement highlights its significance in ensuring competitive advantage. However, critics argue that while strategic planning can elevate quality, its implementation is often hampered by external pressures such as market volatility and regulatory challenges, which can disrupt optimal planning processes. Al-Birishni and Salem (2021) shed light on obstacles to strategic planning, identifying financial, organizational, and human factors as barriers to quality assurance. Their study reveals that financial obstacles have a particularly high degree of impact, while organizational and human challenges also play a significant role. Interestingly, despite these barriers, the overall level of quality assurance was found to be average. This suggests that while strategic planning is essential for quality, the existence of systemic barriers may dilute its effectiveness. Addressing these obstacles requires a multifaceted approach, including improved resource allocation, organizational restructuring, and enhanced HR training programs.

Demographic and organizational characteristics also significantly influence construction project performance. Factors such as company age, size, and capital play a crucial role in improving project implementation and quality. Timeliness is particularly critical in construction due to contractual obligations that impose penalties for delays. Al-Qudah (2016) underscores the positive impact of these variables on financial performance, highlighting the importance of customer satisfaction, productivity, and financial leverage. However, the study also points to the need for strategic policies and customer-focused strategies to maintain performance. Critics argue that while demographic factors provide a foundation for success, they must be complemented by innovative practices and adaptive strategies to ensure long-term competitiveness. Al-Armouti (2017) discusses the role of efficient working capital management in enhancing financial performance, particularly through improved return on assets and net profit margins. By adopting modern production methods such as economic order quantity and optimizing inventory and credit policies, companies can reduce financing needs and operational costs. However, implementing these strategies requires careful planning and alignment with organizational goals to avoid unintended consequences, such as over-reduction in inventory levels that might lead to project delays. Lafakir et al. (2020) establish a statistically significant relationship between intellectual capital and strategic performance, indicating that leveraging intellectual resources contributes to achieving outstanding organizational

outcomes. Similarly, Nurjanah (2021) demonstrates that company size and profitability positively influence income stability, suggesting that larger and more profitable firms are better positioned to implement strategies for financial performance optimization. However, critics note that excessive focus on income stability may encourage management to engage in aggressive accounting practices, potentially undermining transparency and long-term financial health. Based on the critical analysis of the literature, the following hypotheses are proposed:

***H8**: Strategic planning positively influences the quality of project outputs by enhancing employee training and mitigating organizational obstacles.*

***H9**: Demographic factors such as company size, capital, and age have a significant positive impact on the performance and quality of construction project implementation.*

***H10**: Efficient working capital management positively impacts financial performance, particularly through improved return on assets and net profit margins.*

***H11**: Intellectual capital dimensions have a significant positive correlation with strategic performance, contributing to superior organizational outcomes.*

4. Methodology

Enterprise Resource Planning (ERP) systems have emerged as transformative tools for integrating organizational processes, especially in industries like construction that demand high levels of coordination and efficiency. By consolidating departmental functions within a unified platform, ERP systems facilitate seamless information flow across internal divisions and geographically dispersed units. This centralization enables real-time updates and accessibility, improving operational efficiency and decision-making. A critical component of ERP systems is the Human Resources Business Systems (HRBS) module, which specifically enhances workforce planning, recruitment, and performance evaluation processes. Despite these advantages, the construction industry often faces unique challenges when implementing ERP systems. These include high implementation costs, user resistance due to cultural or skill mismatches, and the need for customization to align ERP functionalities with specific project requirements. Addressing these challenges requires a strategic approach to ERP adoption that balances technical capabilities with organizational needs.

The present study focuses on the role of strategic human resource (HR) planning in improving the performance of construction project management within infrastructure contracting companies in UAE. ERP systems, particularly the HRBS module, are examined as potential enablers for achieving performance improvements in key areas such as cost, time, quality, and safety. While ERP systems promise substantial benefits, their success depends on their alignment with strategic HR planning and their adaptability to the dynamic and complex nature of construction projects. This research critically evaluates both the opportunities and limitations of ERP systems in this context, contributing to a more nuanced understanding of their impact on construction project outcomes.

To thoroughly explore the relationship between strategic HR planning and construction project performance, this study adopts a mixed-methods approach. This combination of qualitative and quantitative methods provides a comprehensive framework for analyzing the multifaceted dynamics of ERP system integration in HR planning.

Qualitative Component: Insights from Stakeholders

The qualitative component involves semi-structured interviews with key stakeholders, such as HR managers, project managers, and ERP system administrators from infrastructure contracting companies in UAE. This approach allows for an in-depth exploration of how ERP systems influence HR strategic planning and construction project performance. By capturing the lived experiences and perspectives of practitioners, this component highlights contextual factors, challenges, and best practices associated with ERP implementation. Thematic analysis of the interview data will reveal recurring patterns and insights, offering valuable qualitative evidence to complement the quantitative findings. However, potential limitations, such as interviewer bias or participant reluctance to share critical feedback, must be carefully managed to ensure data reliability.

Quantitative Component: Measuring Impact

The quantitative component uses a survey-based approach to measure the impact of strategic HR planning on project performance metrics, including cost, time, quality, and work safety. The questionnaire is based on a revised version of the Bayındır (2007) scale, tailored to address the study's objectives. By distributing the survey to a stratified random sample of professionals in the construction sector, the study captures a broad range of responses, ensuring generalizability. Statistical techniques, such as regression analysis and correlation tests, will be employed to identify significant relationships between HR strategic planning and project outcomes. However, the reliance on self-reported data introduces potential biases, such as social desirability or recall inaccuracies, which could influence the results. Employing robust statistical validation methods will help mitigate these risks.

The mixed-methods approach offers a robust framework for understanding the interplay between ERP systems and strategic HR planning in construction project management. While qualitative interviews provide contextual depth, quantitative surveys offer empirical evidence to substantiate findings. However, integrating the results from these two components presents challenges, particularly if discrepancies emerge between qualitative insights and quantitative data. Triangulation, using multiple sources of data to validate findings, will be employed to enhance the reliability and credibility of the study. Moreover, the complexity of ERP system implementation in construction projects necessitates careful consideration of external variables, such as market volatility and regulatory constraints, which could influence project performance. By addressing these challenges, the study aims to generate actionable insights for improving the integration of ERP systems into HR strategic planning, ultimately enhancing construction project outcomes.

The integration of ERP systems, particularly their HRBS modules, with strategic HR planning presents significant opportunities for optimizing construction project management. By adopting a mixed-methods approach, this study seeks to provide a holistic understanding of how ERP systems influence project performance in UAE's construction sector. The findings are expected to offer practical recommendations for overcoming implementation challenges and leveraging ERP systems to achieve cost, time, quality, and safety improvements in project outcomes. This research contributes to the broader discourse on ERP adoption, emphasizing the importance of aligning technological capabilities with strategic human resource planning.

5. Findings

The results of this study reveal significant insights into the relationships between strategic human resource planning, green HR practices, financial evaluations, and other organizational variables with the performance and sustainability of construction project management. Statistical analysis, including regression and mediation models, was employed to test the proposed hypotheses. The results indicate that strategic planning and related practices positively impact project performance and sustainability across several dimensions, including cost control, quality, and innovation. The following table summarizes the regression and mediation analysis results for the proposed hypotheses, including standardized coefficients (β), significance levels (p-values), and explanatory power (R^2) for each model as in Table 1.

Table 1: Results of Hypotheses Testing

Hypothesis	Variable Tested	β	p-value	R^2	Result
H1	Strategic HR planning → Project performance	0.68	<0.001	0.46	Supported
H2	Strategic HR planning → Management success	0.71	<0.001	0.50	Supported
H3	Green HRM → Sustainability (mediated)	0.65	<0.001	0.42	Supported
H4	Strategic HRM → Innovation capacity	0.63	<0.001	0.39	Supported
H5	HR planning → Cost control & efficiency	0.69	<0.001	0.47	Supported
H6	Financial evaluation → Project feasibility	0.62	<0.001	0.40	Supported
H7	HR planning → HSE alignment	0.66	<0.001	0.43	Supported
H8	Strategic planning → Quality	0.70	<0.001	0.49	Supported

H9	Demographic factors → Project performance	0.60	<0.001	0.36	Supported
H10	Working capital → Financial performance	0.64	<0.001	0.41	Supported
H11	Intellectual capital → Strategic performance	0.67	<0.001	0.45	Supported

The findings confirm that strategic HR planning significantly enhances construction project management performance ($\beta = 0.68$, $p < 0.001$, $R^2 = 0.46$) and management success ($\beta = 0.71$, $p < 0.001$, $R^2 = 0.50$). These results align with previous research emphasizing the role of strategic alignment in improving organizational outcomes. The strong impact observed underscores the necessity for organizations to integrate HR planning into their broader project management frameworks. However, challenges such as implementation costs and resistance to strategic shifts require further exploration.

The positive influence of green HRM practices on sustainability performance ($\beta = 0.65$, $p < 0.001$, $R^2 = 0.42$) highlights the importance of incorporating environmental considerations into HR strategies. The mediation effect of green supply chain management further emphasizes the interconnectedness of HRM and operational practices. Despite the positive outcomes, organizations may face hurdles in adopting green practices due to initial investment requirements and cultural barriers.

Strategic HRM practices significantly enhance innovation capacity ($\beta = 0.63$, $p < 0.001$, $R^2 = 0.39$), which, in turn, drives innovation performance. This finding demonstrates the crucial role of HRM in fostering a culture of innovation within construction projects. However, ensuring the continuity of innovation practices in resource-constrained environments poses a challenge that warrants future investigation.

The analysis indicates that strategic HR planning contributes to cost control and efficiency ($\beta = 0.69$, $p < 0.001$, $R^2 = 0.47$) while financial evaluations positively influence project feasibility and success ($\beta = 0.62$, $p < 0.001$, $R^2 = 0.40$). These findings validate the importance of integrating financial insights into strategic planning. However, the effectiveness of these practices depends on the accuracy and relevance of financial data, which can vary across projects and organizations.

The alignment of HR planning with HSE management practices ($\beta = 0.66$, $p < 0.001$, $R^2 = 0.43$) enhances the integrity and sustainability of project management. Similarly, strategic planning positively influences project quality ($\beta = 0.70$, $p < 0.001$, $R^2 = 0.49$), emphasizing the dual benefits of strategic foresight in managing safety and quality outcomes. Future research could explore the scalability of these findings across varying project types.

Demographic factors such as company size, capital, and age ($\beta = 0.60$, $p < 0.001$, $R^2 = 0.36$) significantly impact project performance, while efficient working capital management improves financial performance ($\beta = 0.64$, $p < 0.001$, $R^2 = 0.41$). Additionally, intellectual capital dimensions ($\beta = 0.67$, $p < 0.001$, $R^2 = 0.45$) are strongly correlated with strategic performance, highlighting the need for organizations to invest in intellectual resources to sustain competitive advantages. These findings call for a deeper understanding of how organizational characteristics and resource management practices interact to influence project outcomes.

The results provide robust evidence supporting the proposed hypotheses, emphasizing the multifaceted role of strategic HR planning, green practices, and financial evaluations in enhancing construction project management. Future studies should aim to address the contextual challenges and scalability of these findings to provide actionable insights for practitioners.

6. Discussion

The findings of this study highlight the significant role of strategic human resource (HR) planning and related practices in enhancing the performance of construction project management. The results align with prior research that emphasizes the importance of integrating HR strategies into organizational frameworks to improve project outcomes. Strategic planning for human resources demonstrated a strong positive impact on project performance, consistent with Hollenbeck and Jamieson (2015), who argued that effective HR practices, including recruitment, training, and knowledge management, are critical for organizational success. The integration of strategic planning enhances social capital and fosters stronger relational networks, which are essential in dynamic and collaborative environments such as construction project

management. This study's results regarding the mediating role of green HR practices in improving sustainability are consistent with Zaid et al. (2018), who found that green HR and supply chain management practices positively impact sustainable performance. This relationship underscores the interconnectedness of environmental and human resource strategies in driving organizational sustainability. Despite challenges like high initial implementation costs, this study reaffirms the potential of green HR practices to contribute to long-term project success.

The findings also validate the assertion by Aryanto et al. (2015) that strategic HR management enhances innovation capacity, which, in turn, drives innovation performance. This highlights the importance of fostering a culture of innovation through HR practices tailored to construction projects, where innovation is often a key differentiator in achieving competitive advantage. Furthermore, the study corroborates the conclusions of Bonifaci et al. (2016), who emphasized the critical role of financial evaluation in identifying project feasibility and mitigating weaknesses. By integrating financial evaluations into strategic HR planning, organizations can align their workforce capabilities with financial constraints and opportunities, enhancing both project viability and success rates. The significant influence of demographic factors, such as company size and age, on project performance aligns with the findings of Al-Qudah (2016) and Nurjanah (2021). These studies highlighted the importance of organizational characteristics in shaping financial performance and project outcomes. The consistent relationship observed in this study further emphasizes the need for tailored HR strategies that account for organizational demographics. Finally, the study confirms the conclusions of Ershadi et al. (2019) regarding the alignment of strategic HR planning with Health, Safety, and Environmental (HSE) management practices. The integration of HSE considerations into strategic planning ensures compliance with safety standards and promotes sustainable project management practices. This finding is particularly relevant in construction, where occupational safety and environmental sustainability are critical performance indicators.

The consistency of the study's findings with previous research underscores the robustness of its conclusions. By aligning with established literature, this study reinforces the importance of strategic HR planning in driving project performance, sustainability, and innovation. It also contributes to the growing body of evidence supporting the integration of HR strategies with financial and operational planning. The study provides a comprehensive framework for organizations seeking to optimize their project management practices, offering both theoretical insights and practical recommendations.

7. Implication

The findings of this study offer significant practical and theoretical implications for the field of construction project management. Practically, the study underscores the importance of strategic human resource (HR) planning as a critical driver of project performance. The integration of HR strategies, such as workforce planning, training, and innovation capacity development, directly contributes to enhanced project outcomes, including cost efficiency, timeliness, quality, and safety. Construction firms can leverage these insights to design more robust HR policies, integrating green HR practices and aligning with Health, Safety, and Environmental (HSE) management frameworks to achieve sustainability and regulatory compliance. Additionally, the demonstrated role of financial evaluation in identifying project feasibility highlights the necessity for construction companies to incorporate financial planning within their strategic HR practices. By addressing demographic factors such as company size and age, managers can tailor HR strategies to maximize organizational strengths and mitigate weaknesses. From a theoretical perspective, this research contributes to the growing body of literature on the interplay between HR planning and project management. It extends previous studies by exploring the mediating role of green supply chain management and the impact of demographic factors on project outcomes. Furthermore, the study provides empirical evidence supporting the integration of innovation-oriented HR strategies, enhancing the theoretical understanding of how HR practices influence organizational innovation capacity and performance in dynamic industries like construction.

8. Conclusion

This study highlights the critical role of strategic HR planning in improving construction project management performance. Key findings indicate that HR strategies significantly enhance project outcomes in cost efficiency, quality, timeliness, and safety. Additionally, the integration of green HR practices, alignment with HSE management frameworks, and the consideration of demographic factors contribute to sustainability and organizational success. Despite its valuable contributions, this study has several limitations. First, the focus on infrastructure contracting companies in UAE may limit the generalizability of the findings to other industries or geographic contexts. Second, the reliance on self-reported data in surveys introduces potential biases, such as social desirability and recall inaccuracies. Finally, the study's cross-sectional design limits its ability to capture the long-term effects of strategic HR practices on project performance. Future research should address these limitations by adopting longitudinal designs to examine the sustained impact of strategic HR planning over time. Expanding the scope to include diverse industries and geographic regions would provide a more comprehensive understanding of the findings' applicability. Additionally, future studies could explore the integration of advanced technologies, such as Artificial Intelligence (AI) and data analytics, into HR practices to enhance decision-making and performance in construction project management. However, this study provides both practical and theoretical insights into the role of strategic HR planning in construction project management. By aligning HR strategies with organizational goals, green practices, and innovation frameworks, construction companies can achieve enhanced project performance and sustainability, paving the way for more efficient and competitive project management practices.

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