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Green strategic intent, artificial intelligence capability and behavioral dynamics of achieving circular economy goals in the public sector☆

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ABSTRACT

This study investigates the role of green strategic intent in facilitating the adoption of circular economy practices within public sector organizations. Using the dynamic capability view, we proposed that green strategic intent leads to circular economy practices. We also proposed that artificial intelligence (AI) capability and green learning ambidexterity act as significant underlying mechanisms and leader boundary-spanning behavior as a moderator. Data were collected from 228 managers of various public sector departments in United Arab Emirates (UAE) using a time-lagged design. Our results supported that there is a positive relationship between green strategic intent and circular economy practices. Further, green strategic intent positively influences circular economy practices through AI capability and green learning ambidexterity that act as serial mediators of the green strategic intent-circular economy practices link. Finally, leader boundary-spanning behavior significantly moderates the effects of green strategic intent on AI capability. Our findings offer important insights that can enable public sector organizations to implement circular economy practices.

1. Introduction

The circular economy has emerged as a transformative paradigm for promoting sustainable development in the public sector (Klein et al., 2022; Monciardini et al., 2024). The primary objective of circular economy is to challenge the unsustainable linear models by focusing on the continual recycling, repurposing, repairing, renewing, and optimizing of resources, materials, and processes to reduce waste and maximize resource efficiency (Joensuu et al., 2020; Morseletto, 2020). By implementing circular economy principles, public authorities can improve environmental quality, achieve sustainable goals and foster economic growth (Harris et al., 2021; Marrucci et al., 2021; Obeidat et al., 2023). Nevertheless, integrating circular economy practices continues to be a challenging task (Kua et al., 2024). In contrary to private companies, public organizations often face complex bureaucratic structures and conflicting stakeholder interests, which can impede sustained growth, and influence long-term environmental strategies and sustainable goals.

At the helm of this quest is the green strategic intent as a rhetorical device to challenge conventional thinking. Green strategic intent reflects an organization's long-term commitment and vision to embed environmental responsibility into strategic priorities (Jirakraisiri et al., 2021). It encourages public institutions to align operations with sustainability goals and develop capabilities that support circular economy practices (Ling, 2019). While a handful of studies suggest that green strategic intent can positively drive circular economy practices (Ćwiklicki and Pawełek, 2025; Puglieri et al., 2022), the mechanisms through which green strategic intent drives circular economy practices in the public sector remain enigmatic (Fadeeva and Van Berkel, 2021). Specifically, it remains unclear how merely green strategic intent enables the adoption of circular economy practices by public organizations. Our study seeks to unpack this black box by examining how green strategic intent allows the public authorities to embrace sustainability initiatives and ultimately adopt circular economy practices, as well as

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the boundary conditions that hinder or foster this process.

We draw insights from the dynamic capability view (Teece et al., 1997) to explain how and when green strategic intent promotes circular economy practices. In particular, we introduce artificial intelligence (AI) capability and green learning ambidexterity as key mechanisms through which green strategic intent drives circular economy practices. We theorize that green strategic intent represents a high-order capability that helps organizations sense, seize, and transform in response to environmental challenges. AI capability is explained as an ability of a firm to select, orchestrate, and leverage its AI-specific resources (Mikalef and Gupta, 2021), which in turn contribute to circular economy goals by improving demand forecasting, minimising waste, and optimizing resource flows (Nishant et al., 2020; Kulkov et al., 2024). Similarly, green learning ambidexterity—the capacity to simultaneously exploit existing environmental knowledge and explore new green solutions is vital in enabling public organizations to adapt and innovate sustainably (Chung et al., 2015; Clauss et al., 2021). Due to resource limitations and structural complexity that public institutions often face, fostering green learning ambidexterity enables them to consistently adapt their practices to environmental requirements. Together, these capabilities—AI and green learning ambidexterity—serve as critical mechanisms through which green strategic intent is actualised in practice, enabling a shift toward circular economy models. Moreover, we propose that the influence of green strategic intent on these capabilities is moderated by leader boundary-spanning behavior, which involves actions to acquire external resources, build relationships, and foster collaboration (Salem et al., 2018; Song et al., 2023). Leaders with strong boundary-spanning behaviours are more likely to mobilise support and access critical knowledge, amplifying the impact of strategic intent on capability development.

The current study contributes to the literature on sustainability and circular economy. First, we advance the circular economy literature by introducing a pivotal antecedent (i.e., green strategic intent) of circular economy practices (Bassi and Dias, 2019; Joensuu et al., 2020; Walker et al., 2022) within the public sector. Prior research has largely focused on the outcomes and challenges of circular practices (Khan and Haleem, 2021; Marrucci et al., 2021; Obeidat et al., 2023) often overlooking the strategic drivers that enable such transitions in public institutions. By conceptualizing green strategic intent as a high-order capability that shapes public institutions vision and commitment toward environmental sustainability, our study uncovers how long-term environmental aspirations translate into tangible circular practices. This contributes a novel strategic lens to circular economy research, which has predominantly examined operational and regulatory aspects. Second, our study contributes to the outcomes of green strategic intent. Existing studies suggest that green strategic intent leads to several positive outcomes including green human resource management practices, and green relational capital (Jirakraisiri et al., 2021; Obeidat et al., 2023). We extend this literature by showing that green strategic intent leads to circular economy practices within the public sector context.

Third, this study highlights the key yet overlooked role of AI capability and green learning ambidexterity as mediators of the link between green strategic and circular economy practices. By identifying AI capability and green learning ambidexterity as critical mechanisms, our study unpacks the "black box" of how strategic intent translates into circular economy practices. AI capability enhances resource optimization and waste minimization (Mikalef and Gupta, 2021; Nishant et al., 2020), while green learning ambidexterity enables simultaneous exploitation of existing knowledge and exploration of innovative green solutions (Chung et al., 2015; Clauss et al., 2021). This contribution enriches circular economy scholarship by providing a theoretically grounded explanation of the mechanisms through which high-order strategic intent fosters sustainable practices (e.g., Ćwiklicki and Pawełek, 2025; Puglieri et al., 2022).

Finally, the contemporary study signifies that leader boundary spanning behavior in enhancing green strategic intent on AI capability, green learning ambidexterity, and circular economy practices. Prior studies indicate that leader boundary spanning behavior is associated with positive outcomes, such as creativity and performance at workplace (Kim et al., 2022; Liu et al., 2018). By revealing leader boundary spanning behavior as a boundary condition of green strategic intent and AI capability link, we contribute to this stream of literature. Our proposed model is presented in Fig. 1.

2. Theory and hypotheses development

2.1. Dynamic capability view

We use the dynamic capability view to explain the proposed hypotheses, since it is appropriate and robust framework for describing how organizations adjust and change in response to changing external challenges (Teece et al., 1997; Teece, 2007). Resource-based view (RBV) is often criticized for its static focus and limited attention to environmental dynamism (Bowman and Ambrosini, 2003; Wu, 2010), despite it emphasizes the significance of valuable, rare, and unique resources to gain competitive advantage (Barney, 1991).

In contrary, dynamic capability view builds on RBV, but extends it by focusing on how firms develop, reconfigure, and advances internal and external resources to address the environmental changes, thus, making it more appropriate theoretical framework for the current research. Importantly, dynamic capability view highlights how crucial it is to possess knowledge, expertise, and skills that can change a company's present resources, practices, and business operations (Ye et al., 2022). More precisely, the capacity of the business to innovate and adapt in response to the internal and external challenges and changing environment (Gupta et al., 2020). Dynamic capabilities emerge from the business processes, practices, and actions that integrate, develop, and reorganize internal and external expertise and skills to address rapidly changing business settings (Vogel and Güttel, 2013; Wu, 2010).

Dynamic capability comprises three elements: sensing, seizing, and reconfiguring (Teece, 2007). The ability of an organization to investigate and recognize opportunities both inside and outside of its boundaries, as well as across its whole business value network and ecosystem, is referred to as sensing (Teece, 2007). It entails understanding customers' needs as well as company requirements, developing R&D and technology, and being informed and aware of the innovations produced by business partners (Teece, 2007). Businesses regularly seek business possibilities within and outside of their network to gain a competitive edge and drive growth (Gupta et al., 2020). Seizing occurs once the company has sensed the opportunity; it is defined as realizing the opportunity's potential and value (Teece, 2007). It comprises establishing enterprise boundaries and taking proactive measures to capitalize on new trends, changes in the market, and evolving business needs (Teece, 2007). Lastly, reconfiguring includes transforming and reorganizing organizational resources, and structure in response to evolving external environment (Teece, 2007). Reconfiguration is essential to ensure that the business effectively take advantage of identified opportunities and tend to mitigate perceived risks (Vogel and Güttel, 2013). Essentially, the dynamic capability view emphasizes how critical it is to recognize opportunities, act quickly to take advantage of them, and adjust organizational structure or processes to fully utilize the business potential that has been identified.

2.2. Green strategic intent and circular economy practices

Teece (2007) argues that businesses first identify and evaluate the internal and external settings that offer opportunities and emerging trends for sustained growth and meet emerging needs by planning proactive strategic initiatives and actions, altering their organizational structure and operations to take advantage of these business prospects. Indeed, an organization's strategic vision or direction is essential for keeping them informed about markets and business avenues as well as

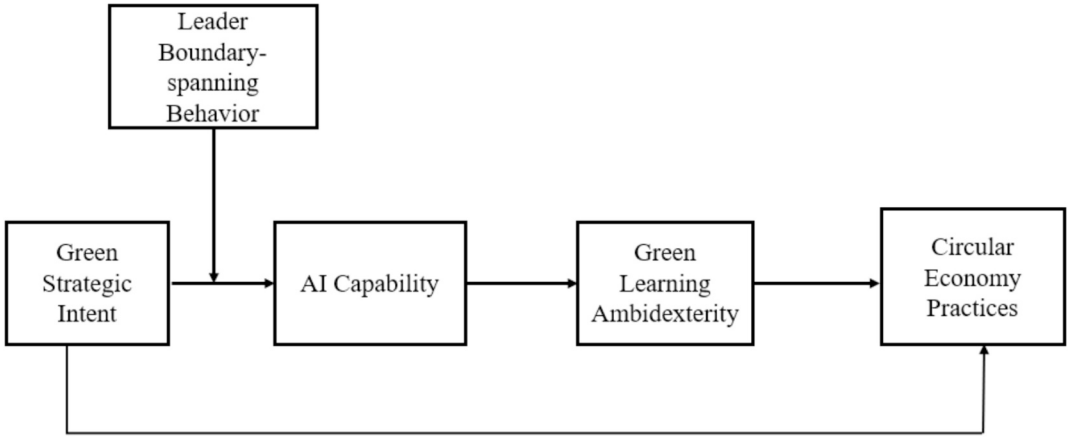

Fig. 1. The proposed model.

for fostering innovation and creativity within the value chain network that supports the success of the company (Khalid et al., 2024). In the current study, we chose green strategic intent since it provides clear future directions, obsession, and commitment to green strategies and environmentally responsible actions across the organization (Jirakraisiri et al., 2021) to address the environmental challenges. The literature clearly shows that long-term success requires identifying opportunities, planning actions to seize them, and adapting and integrating firm operations and activities with the changing business needs and environment (Gupta et al., 2020; Teece et al., 1997). As such, we argue that green strategic intent guides the firm on how to adopt and implement circular economy practices to achieve sustainable development goals, mitigate environmental impact, and optimize the resources in public sectors. It encourages businesses to continuously innovate operations, processes, knowledge, and skills to maintain competitive advantage and accommodate the environmental challenges in the dynamic business environment.

Strategic intent focuses on long-term but realistic objectives, assist businesses to establish competitive position, succeed in the market, and encourage them to engage in continuous learning and development (Mariadoss et al., 2014). Companies are constantly informed through strategic intent, which provides them with precise guidelines and a pathway to achieve their goals (DeMartino et al., 2012; Seepana et al., 2021). Through green strategic intent, firms can effectively align their business operation and activities with circular economy principles ultimately leading to a more sustainable world. Green strategic intent fosters a culture of sustainability across the firm and ensures that green strategies are embedded throughout the business processes and activities (Khalid et al., 2024). Green strategic intent encourages firms to develop innovative solutions and eco-friendly market offerings (Obeidat et al., 2023), which in turn enable public sectors and organizations to implement circular economy practices. Green strategic intent ensures that resources are optimised and effectively allocated to the business activities (Jirakraisiri et al., 2021) ultimately contributing to circular economy principles. Indeed, companies that prioritize green strategic intent can reduce waste by creating products that are recyclable, remanufactured, repairable, and reused. Thus, it assists public sector organizations in addressing environmental challenges and meeting the diverse needs of the society. This adaptability enables them to seize market opportunities and prioritize continuously adopting sustainable economic practices in public sectors and organizations. Therefore, we argue that green strategic intent positively contributes to circular economy practices. Together, we develop the following hypothesis.

H1. Green strategic intent is positively related to circular economy practices.

2.3. Green strategic intent and AI capability

AI capabilities have the potential to bring changes in society and industries by transforming how tasks are performed, decisions are made, and services are delivered (Allioui and Mourdi, 2023; Dwivedi et al., 2021). Through AI capabilities, firms can innovate and improve their operations, processes, practices, market offerings, and overall performance of the business (Mikalef and Gupta, 2021; Neiroukh et al., 2024). Studies suggest that AI capabilities can enable firms to mitigate waste, reduce energy usage, and optimize their entire value chain, leading to sustainable business practices (Bag et al., 2021; Liu et al., 2023).

Seen through the lens of dynamic capability view, which emphasizes on an organization's ability to identify and seize opportunities and transform resources in response to environmental changes (Teece et al., 1997). Green strategic intent is a higher-order dynamic capability that allows public organizations to invest in AI technologies, predict environmental needs and demands, and modify internal processes accordingly. Consequently, green strategic intent not only acts as a guide to long-range development of environmental strategies, but it also helps public organizations in building AI capabilities that are critical for enabling sustainable transformation and maintaining responsiveness in a dynamically changing environment. Its importance lies in its ability to facilitate learning, innovation, adaptation, research and development (Obeidat et al., 2023) and to help organizations to operationalize circular economy practices. At its core, firms with a focus on green strategies have a clear vision and direction that predict future environmental challenges and enable them to effectively deal with them (Jirakraisiri et al., 2021). Indeed, green strategic intent emphasizes streamlining and optimizing their value chain activities through AI technologies that further assist them in staying ahead of the competitors and addressing the rapidly changing market landscape. With an emphasis on long-term objectives and practical goals (Usman et al., 2024), green strategic intent encourages organizations to develop AI capabilities to seek out market opportunities, transform business operations and activities, and find innovative ways to reduce carbon footprints. Green strategic intent fosters a culture of learning that assists firms in using and optimizing natural resources effectively (Jirakraisiri et al., 2021). Additionally, the firm benefits from green strategic intent, focusing on green technologies and sustainable innovations necessary for implementing the circular economy practices. By encouraging emerging technologies, firms enable employees to develop creative and innovative solutions, ultimately contributing to competitive advantage (Hannola et al., 2018; Makridis and Han, 2021) and making society more environmentally responsible and resilient. Green strategic intent encourages businesses to invest and efficiently allocate resources in developing AI capabilities to improve resource efficiency and reduce carbon emissions, which is essential for implementing circular economy

practices in public sectors.

Through AI capabilities, firms can gain deeper insights into environmental changes by analyzing the vast amounts of climate impact and resource consumption data to reduce inefficiencies in organizational processes and operations. Leveraging AI capabilities enables firms to make more informed decisions and adjust strategies to reduce environmental impact (Bag et al., 2021), leading firms to effectively implement circular economy practices. Indeed, technological capabilities can offer several key benefits to the firm that can assist them in improving their operation, skills, knowledge, and expertise (Khalid et al., 2025; Neiroukh et al., 2024); thus, green strategic intent enables firms to sense and seize market opportunities that align with the firm's environmental goals and create economic value. As such, we argue that green strategic intent may focus on developing AI capabilities and continuously updating these capabilities that contribute to circular economy principles and long-term success. Thus, we propose the following hypothesis.

H2. Green strategic intent is positively related to AI capability.

2.4. AI capability and green learning ambidexterity

Grounded in the dynamic capability view, which focuses on firms must identify emerging risks and opportunities, seize them effectively, and transform their processes and resources to stay competitive in the continuously changing environments (Teece et al., 1997). In this study, AI capability act as a significant enabler by producing actionable insights, optimizing decision-making, and enhancing responsiveness. AI capability support both exploitative and exploratory learning by improving current operations and recognizing new environmental trends and needs.

AI thus promotes green learning ambidexterity by enabling businesses to innovate sustainably and strategically in response to changing market and environmental demands. Indeed, AI capabilities improve existing processes and practices and generate knowledge that eventually aids in discovering potential opportunities and improving the overall business (Schrage et al., 2023). Additionally, AI capability includes encompasses cutting-edge technologies, data management and processing techniques, and technical skills that allow businesses to be proactive and responsive in identifying and seizing market opportunities (Mikalef and Gupta, 2021; Sullivan and Wamba, 2024). As a result, companies can find creative solutions and make better decisions because of AI capabilities to predict and identify market trends and dynamics. Prior studies highlight that AI capabilities create value by providing deeper insights into business needs and demands, competitiveness, and resource usage (Schrage et al., 2023; Wamba-Taguimdje et al., 2020). AI capabilities can automate and optimize various business operations and processes, improving the efficiency of an organization (Benbya et al., 2021), thereby making public sector organizations more agile and responsive to achieve sustained growth and implement the circular economy principle. Additionally, AI capabilities provide timely information about evolving market needs and trends (Mikalef and Gupta, 2021), fostering a culture of continuous learning, strategy development, and adjustments (Huang and Rust, 2021) that ultimately enable firms to improve organizational learning (i.e., exploratory and exploitative learning) by effectively navigating uncertainties, learning from failures, optimize knowledge and skills, and effectively adapting to new situations (Usman et al., 2025). AI capabilities can help firms identify the key areas for improvement, thus contributing to overall learning (Wamba-Taguimdje et al., 2020).

Firms can develop training programs and educate employees on how to effectively use AI in organizational processes and businesses, which in turn encourages both exploratory and exploitative learning (i.e., green learning). Indeed, AI capabilities can provide actionable and market-driven insights that assist in improving existing organizational practices and skills and generating new knowledge to respond to emerging market opportunities and environmental challenges in a timely manner. As such, we argue that AI capabilities facilitate firms in acquiring useful and valuable market-driven insights, leading to taking necessary actions to enhance both explorative and exploitative learning (i.e., green learning). Thus, we propose the following hypothesis.

H3. AI capability is positively related to green learning ambidexterity.

2.5. Green learning ambidexterity and circular economy practices

According to Teece (2007), organizational capabilities are crucial for developing, integrating, and transforming resources in response to a quickly evolving business landscape. From the dynamic capability perspective, green learning ambidexterity serves as a key resource for developing strategic flexibility and adaptive capability in public organizations. More precisely, green learning ambidexterity facilitates businesses to improve and expand their environmental knowledge base, innovate sustainably, and respond proactively to changing environmental needs and demands. Exploratory and exploitative learning assist organizations in improving their existing processes and making them more responsive to the external environment (Khalid et al., 2024), required to integrate circular economy principles in an effective way. Indeed, exploitative and explorative learning encourages improvements and creativity (Li et al., 2010) that may assist public sector organizations in implementing circular economy practices. Additionally, exploitative and explorative learning may enable firms to monitor market developments and integrate innovative tactics (Wang and Zhang, 2022), which in turn support the transition toward circular and sustainable business models.

Prior research highlights that exploitative and explorative learning improves product development performance and success (Li et al., 2010). Notably, both exploitative and explorative learning are crucial to the firm long-term success and performance (Khalid et al., 2024). Organizations can become more flexible and sensitive to market opportunities and adapt to emerging business situations through exploitative and exploratory learning (Usman et al., 2025). Additionally, firms may focus on exploitative and explorative learning by effectively using organizational resources (Ali et al., 2021), which in turn enables firms to develop proactive and environmental-centric strategies that can lead to the implementation of circular economy practices. As such, we argue that firms can balance and integrate two different but complementary logics – exploitative learning and explorative learning (i.e., green learning ambidexterity)- to facilitate embedding circular economy principles into organizational processes. Thus, we propose the following hypothesis.

H4. Organizational green learning ambidexterity is positively related to circular economy practices.

2.6. AI capability and green learning ambidexterity as serial mediators

Grounded in the dynamic capability view, we understand that AI capability and green learning ambidexterity are key tools for gaining competitive advantage and achieving environmental goals because they assist organizations in developing, improving, and modifying resources (Mikalef and Gupta, 2021; Usman et al., 2025) to implement circular economy practices. The dynamic capability view emphasizes that businesses sense opportunities first, seize them through strategic action, and adapt internal and external resources accordingly (Teece et al., 1997). In this study, AI capability and green learning ambidexterity can assist firms to be responsive and proactive in recognizing and seizing opportunities to make an environmentally responsible and resilient world. As such, AI capabilities offer valuable insights into market trends, demands, and preferences (Schrage et al., 2023; Wamba-Taguimdje et al., 2020), while learning ambidexterity ensures that the organization can continuously adapt and evolve its processes and practices to respond to the business changes (Ali et al., 2021). Thus, the underlying premise of our arguments so far has been that green strategic intent provides directions

to gain and acquire the key resources, expertise, and skills (AI capabilities) that are crucial for capturing business opportunities and making timely and market-oriented decisions (Jirakraisiri et al., 2021). In turn, AI capability foster green learning ambidexterity, driving them to have a balanced focus on exploitative and explorative environmental learning, ultimately contributing to circular economy practices. Together, we argue that AI capability and green learning ambidexterity act as serial mediators through which green strategic intent affects circular economic practices. Thus, the following hypothesis is developed.

H5. AI capability and green learning ambidexterity act as serial mediators of the associations of green strategic intent with circular economy practices.

2.7. The moderating role of leader boundary-spanning behavior

Seen through the lens of dynamic capability view, firms need to constantly re-configure and dynamically transform their resources in response to evolving market changes (Barreto, 2010; Teece et al., 1997). Green strategic intent demonstrates the firm's commitment to environment-driven goals and capitalizing on market opportunities to achieve sustainable outcomes. Nevertheless, the effective conversion of green strategic intent into operational capabilities (e.g., AI capabilities) may require leadership behavior that transcends organizational boundaries.

Leader boundary-spanning behavior plays a crucial enabling role in this process. Individuals with boundary-spanning behavior engage in internal and external activities to acquire resources, expertise, knowledge, and information and facilitate and build relationships with various departments and organizations to create value for the business (Marrone et al., 2007; Salem et al., 2018). These activities enhance a firm's ability to reconfigure its resources, thus facilitating the development of capabilities like AI that are essential for green strategic intent. Individuals high on boundary-spanning behavior emphasize representation, generic information search, and task performance coordination (Marrone et al., 2022). They encourage creativity (Kim et al., 2022), improve workplace performance (Liu et al., 2018), and actively address the evolving external changes by developing ties with key stakeholders (Van Meerkerk and Edelenbos, 2018). Specifically, when leaders exhibit high boundary-spanning behavior, they are more likely to translate green strategic intent into tangible outcomes by using available resources, expertise, and coordinating cross-functional initiatives. In contrast, when boundary-spanning behavior is low, green strategic intent may not effectively transform into modern technological capabilities. Therefore, we posit that leader boundary-spanning behavior strengthens the positive relationship between green strategic intent and AI capability by improving the firm's dynamic capability to sense, seize, and reconfigure resources for emerging environmental needs and demands. Thus, we propose the following hypothesis.

H6. Leader boundary-spanning behavior positively moderates the relationship between green strategic intent and AI capability, such that the relationship is stronger when leader boundary-spanning behavior is high (vs. low).

3. Method

3.1. Data collection and analysis

Data were collected from managers working in 228 government departments and municipalities across the United Arab Emirates (UAE) through a two-round survey process. We used a network of 400 former students from a major UAE university who were all working for various government agencies and local governments in the country to start gathering data. We reached out to these alumni by phone and email, gave them an explanation of the study's objectives, and asked them to help us by providing us with access to managerial respondents. 321 of the 400 alumni who were contacted consented to help with the data collection.

Every alumnus who consented to take part in the survey received a packet containing a thorough cover letter and the survey form. The cover letter outlined the goal of the research, underlined that participation was entirely optional, and guaranteed respondents that their answers would remain anonymous and confidential. The surveys and cover letters were then delivered by the alumni themselves to managers in their departments or localities. After managers finished the surveys on their own, they gave them back to the alumni, who sent them on to the research team.

Before starting the data collection, the questionnaire was pretested with 20 respondents and three academicians. Data collection occurred in two rounds, separated by a time lag of two weeks. Data about green strategic intent, leader boundary-spanning behavior, AI capability, and demographic variables were collected in round 1. Data about green learning ambidexterity and circular economy practices were collected in round 2. We received 298 and 238 responses in the first and second rounds, respectively. After matching the data from different rounds using unique codes and discarding the responses that were not appropriately filled, we retained 228 responses for hypotheses testing.

To address potential biases, particularly common method bias (CMB) and social desirability bias, we adopted a time-lagged approach, gathering data in two separate rounds with an appropriate time gap between them. According to Podsakoff et al. (2003), this temporal separation of measurement lowers the probability of CMB. Furthermore, the cover letter's guarantees of anonymity and confidentiality deterred respondents from giving socially acceptable responses and promoted candid, deliberate participation. Lastly, in order to improve construct validity, lower measurement error, and lessen response biases, we employed well-established and verified measurement scales from earlier research.

Data were analyzed using structural equation modeling in Mplus (8.8). In our sample, 52.2 % of departments belonged to the local government, while 47.8 % belonged to the federal government. Further, in terms of involvement in public-private partnerships or collaborations with NGOs, 53.9 % had partnerships, while the remaining 46.1 % were currently not in partnerships or collaborations.

3.2. Measures and variables

A five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) was used to assess the constructs. Green strategic intent was assessed by adapting an eight-item scale ($\alpha = 0.93$) of strategic intent by Johnson and Sohi (2001). Sample item: *"Our organization seeks market leadership in green processes and products."* AI capability was assessed by adapting 13 items ($\alpha = 0.80$) from Mikalef and Gupta (2021). *"We have explored or adopted cloud-based services for processing data and performing AI and machine learning"* was a sample item. Green learning ambidexterity was assessed by adapting a ten-item scale ($\alpha = 0.94$) from Chung et al. (2015). Sample item: *"We collect novel information and ideas that go beyond our experience."*. Circular economy practices were assessed by adapting ten items ($\alpha = 0.93$) from Fonseca et al. (2018). *"We consistently promote improvement of productivity and efficiency of work processes in my company"* was a sample item. Leader boundary-spanning behavior was assessed by adapting a six-item scale ($\alpha = 0.92$) from Marrone et al. (2007). *"I reach out to individuals outside of our organization that can offer expertise or ideas about the task at hand"* was a sample item.

3.3. Control variables

We controlled for a few important variables to account for alternative explanations that could influence the relationships under investigation. First, we controlled for the type of government body (federal vs. local government), as prior studies suggest that organizational

structures, decision-making processes, and resource allocations can differ significantly between federal and local entities, potentially impacting managerial practices and responses (Marrucci et al., 2021; Obeidat et al., 2023). Differences in hierarchy, policy scope, and operational flexibility between federal and local agencies could confound the effects we sought to measure.

Second, we controlled for the department's involvement in public-private partnerships or collaborations with non-governmental organizations. Departments engaged in such collaborations may exhibit different levels of stakeholder engagement and innovation adoption compared to those operating solely within traditional government frameworks. Such external partnerships often influence departments' AI capability, learning practices, as well as adoption of circular economy practices.

4. Results

4.1. Means and correlations

Means and correlations are presented in Table 1.

4.2. Measurement model

Confirmatory factor analysis was performed in Mplus (8.8) to assess the measurement model, which included green strategic intent, AI capability, green learning ambidexterity, circular economy practices, and leader boundary-spanning behavior. All items demonstrated significant loadings, and the fit indices – χ^2 (1067) = 1798.19, $\chi 2/df$ = 1.68, TLI = 0.90, CFI = 0.90, and RMSEA = 0.06 – indicated that the proposed model achieved a good fit with the data. Additionally, all variables had average variance extracted (AVE) values above 0.50 (Table 2). The square root of AVE for each construct was greater than its inter-construct correlations, and the maximum shared variances (MSV) for all variables were lower than their respective AVEs (Table 2). These findings establish that the scales used in the study met satisfactory standards for both convergent and discriminant validity.

4.3. Hypotheses testing

As presented in Table 3, green strategic intent demonstrated a positive relationship with circular economy practices *(B = 0.33, SE = 0.06, p < .01; 95 % CI [0.21, 0.45])*, supporting hypothesis 1. Additionally, the findings revealed that green strategic intent was positively associated with AI capability *(B = 0.16, SE = 0.05, p < .01; 95 % CI [0.06, 0.26])*, and AI capability, in turn, had a positive relationship with green learning ambidexterity *(B = 0.28, SE = 0.08, p < .01; 95 % CI [0.12, 0.43])*, thereby supporting hypotheses 2 and 3. Moreover, organizational green learning ambidexterity was found to have a significant positive association with circular economy practices *(B = 0.18, SE = 0.07, p < .01; 95 % CI [0.05, 0.31])*, providing support for hypothesis 4. Furthermore, the relationship between green strategic intent and circular economy practices was serially mediated by AI capability and green learning ambidexterity *(B = 0.04, SE = 0.02, p < .01; 95 % CI [0.01, 0.07])*, as well as the relationship with green activism *(B = 0.05, SE = 0.02, p < .01; 95 % CI [0.02, 0.10])*, confirming hypothesis 5.

To test hypothesis 6, the interaction between green strategic intent and leader boundary-spanning behavior was examined. The results indicated a significant positive effect of this interaction on AI capability *(B = 0.13, SE = 0.05, p < .01; 95 % CI [0.04, 0.22])*, as shown in Table 3. Fig. 2 illustrates the characteristics of this moderated relationship: the link between green strategic intent and AI capability was significant when leader boundary-spanning behavior was high *(B = 0.27, SE = 0.06, p < .01; 95 % CI [0.14, 0.40])* but was insignificant when leader boundary-spanning behavior was low *(B = 0.01, SE = 0.07, ns; 95 % CI [−0.13, 0.15])*. These findings support hypothesis 6.

Table 2
Discriminant validity and convergent validity.

Construct	1	2	3	4	5	AVE	MSV	ASV
1. GSI	**0.74**					0.64	0.13	0.07
2. AI capability	0.25	**0.77**				0.57	0.10	0.07
3. GLA	0.24	0.29	**0.74**			0.62	0.10	0.06
4. CEP	0.36	0.32	0.31	**0.76**		0.62	0.13	0.09
5. LBSB	0.10	0.15	0.12	0.16	**0.79**	0.68	0.03	0.02

Notes. N = 228. AVE = Average variance extracted. MSV = Maximum variance shared. ASV = Average variance shared. Bolded values on the diagonals of columns 2 to 6 are the square root values of AVE. GSI = Green strategic intent. CEP = Circular Economy Practices. GLA = Green Learning Ambidexterity. LBSB = Leader boundary-spanning behavior.

Table 3
Hypotheses results.

	B	SE	95 %CI	
			LL	UL
Total effects				
GSI → CEP	0.33**	0.06	0.21	0.45
Direct Paths				
GSI → CEP	0.26**	0.06	0.14	0.38
GSI → AI capability	0.16**	0.05	0.06	0.26
AI capability → GLA	0.28**	0.08	0.12	0.43
GLA → CEP	0.18**	0.07	0.05	0.31
Indirect Paths				
GSI → AI capability → GLA → CEP	0.01**	0.006	0.001	0.02
Moderated Path				
LBSB * GSI → AI capability	0.13**	0.05	0.04	0.22
GSI → AI capability (High LBSB)	0.27**	0.06	0.14	0.40
GSI → AI capability (Low LBSB)	0.01	0.07	−0.13	0.15

Hotel sample N = 228. B = Unstandardized coefficient, SE Standard error, Bootstrapping specified at 5000 with 95 % confidence interval. CI = Confidence interval. LL = lower limit. UL = Upper limit. GSI = Green strategic intent. CEP = Circular Economy Practices. GLA = Green Learning Ambidexterity. LBSB = Leader boundary-spanning behavior.

Table 1
Means and correlations.

Construct	Mean	SD	1	2	3	4	5	6
1. GSI	3.19	1.16						
2. AI capability	3.08	0.89	0.21**					
3. GLA	2.98	1.08	0.24**	0.27**				
4. CEP	3.03	1.12	0.34**	0.27**	0.29**			
5. LBSB	3.10	0.99	0.11	0.13*	0.11	0.16*		
6. Type			0.01	−0.05	0.00	0.12	−0.03	
7. Partnership			0.03	0.09	0.09	0.09	0.11	0.03

Notes. $N = 228$. * $p < .05$. ** $p < .01$ level (2-tailed). *$p < .05$ level (2-tailed). SD = standard deviation. GSI = Green strategic intent. CEP = Circular Economy Practices. GLA = Green Learning Ambidexterity. LBSB = Leader boundary-spanning behavior. Type = Local government (1) and Federal government (2). Partnership = Involvement in public-private partnerships or collaborations with NGOs (1 = No and 2 = Yes).

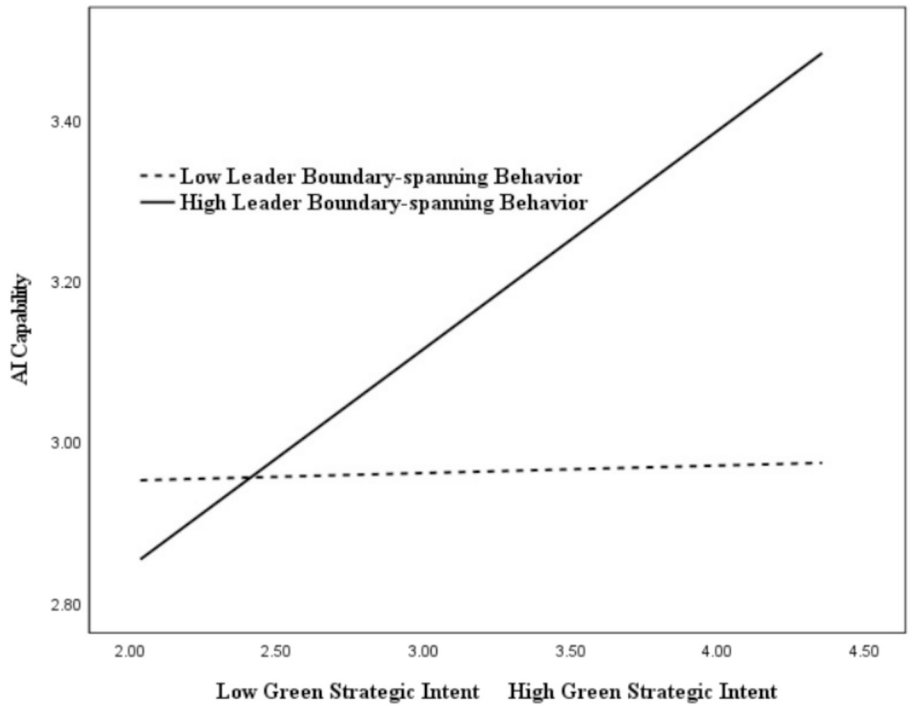

Fig. 2. Leader boundary-spanning behavior as a moderator of the link between green strategic intent and AI capability. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

5. Discussion

The aim of this study was to understand how and when green strategic intent enables public sector organizations to implement circular economy practices. Using the dynamic capability view, we examined significant underlying mechanisms and a boundary condition on the association between green strategic intent and circular economy practices. Data were collected using a time-lagged design; the results revealed a positive relationship between green strategic intent and circular economy practices. Additionally, the study demonstrates that green strategic intent positively influences circular economy practices through AI capability and green learning ambidexterity that acts as serial mediators of the green strategic intent-circular economy practices link. The study also revealed that leader boundary-spanning behavior significantly moderated the effects of green strategic intent on AI capability.

5.1. Theoretical contributions

First, this research advances the literature on the antecedents of circular economy practices (Bassi and Dias, 2019; Joensuu et al., 2020; Walker et al., 2022) within the public sector context. While prior studies have identified factors such as green empowerment, legislative frameworks, and organizational integration (Joensuu et al., 2020; Khan and Haleem, 2021; Marrucci et al., 2021; Obeidat et al., 2023), the role of long-term strategic orientation has been largely overlooked. We bridge this gap by highlighting green strategic intent as a key driver of circular economy principles. In doing so, we move beyond structural or policy-level enablers and focus on the role of top management vision and commitment in directing environmental transformation.

Second, our study contributes to the emerging literature on the societal implications of green strategic intent (Karra, 2021; Usman et al., 2024). While previous studies have focused on its outcomes, such as green human resource practices, and relational capital (Jirakraisiri et al., 2021; Obeidat et al., 2023), we extend this stream by demonstrating that green strategic intent not only influences internal organizational capabilities and skills but also translates into system-level sustainability outcomes (circular economy practices) within the public sector organizations.

Third, we deepen understanding of the mechanisms through which green strategic intent influences circular economy principles by introducing AI capability and green learning ambidexterity as serial mediators. Prior literature has recognised the role of AI in making firms competitive, agile, and enhancing market responsiveness (Nishant et al., 2020; Wamba et al., 2024), and green learning ambidexterity in supporting innovation (Wang et al., 2020), sustainable performance (Huang and Huang, 2024), and operational efficiency (Úbeda-García et al., 2022). By highlighting the significant role of firm expertise, resources, and skills (i.e., AI capabilities and green learning ambidexterity) as a mechanism underlying the green strategic intent-circular economy practices, we extend the limited literature of organizational resources and capabilities in the public sector and highlights how public sector organizations adapt and innovate to achieve sustainable goals.

Lastly, we introduce leader boundary-spanning behavior as a key boundary condition in our framework. While earlier research has linked boundary-spanning behavior with creativity and performance in the workplace (Kim et al., 2022; Liu et al., 2018). The current study is the first to incorporate the construct of leader boundary-spanning behavior in the context of green strategic intent, AI capability, and circular economy practices.

5.2. Practical implications

First, our research findings offer insights into how public sector organizations can encourage circular economy principles through green strategic intent. The findings demonstrate that green strategic intent plays a key role in implementing circular economy practices and making society more environmentally responsible and resilient. Thus, managers of public sector organizations seeking to address environmental challenges must develop a comprehensive and well-defined plan that includes creative and innovative solutions to deal with environmental challenges within a society, ultimately contributing to circular economy

principles. Moreover, public sector organizations with a focus on green strategic intent tend to achieve sustained growth and long-term success and must empower employees to engage in activities that assist them in promoting sustainable practices and making the citizens more environmentally responsible. For this purpose, top management can develop teams comprising individuals from various departments and the public with the aim of working together to identify the environmental challenges and suggest radical and eco-friendly solutions to bring changes and make the overall society more resilient. Also, they can foster a culture that fosters learning to implement the circular economy principles. They can co-create market offerings to deal with environmental changes and for the overall benefit of society. Additionally, managers can adjust and improve their business processes and practices to implement circular economy practices. Thus, all these activities make firms more agile, adaptable, and competitive, which in turn contribute to circular economy practices.

Beyond structural or policy-level enablers, our findings highlight the technological capabilities, particularly AI, as key enablers for translating green strategic intent into the implementation of impactful sustainable practices. Our findings highlight the key role of AI capability in supporting public sector organizations' transformation toward circular economy principles. AI capabilities significantly boost organizational agility and innovation by allowing public sector organizations to respond more proactively to changing environmental conditions. To optimize business operations and produce innovative solutions that support environmental goals, managers must effectively develop and integrate cutting-edge emerging technologies like artificial intelligence (AI), big data, and the Internet of Things. By using these digital tools, businesses can gain a greater understanding of stakeholder needs, market shifts, and environmental trends, which will help them implement the principles of the circular economy. They effectively predict the customer's expectations and rescue the market risk by allowing public sector organizations to customize their products in line with market-specific insights. AI capabilities facilitate firms in exploring and developing new avenues to make society more responsible and environmentally friendly. Emerging digital technologies allow companies to get detailed and meaningful feedback from a variety of stakeholders on environmental issues. Apart from improving operational efficiency and producing innovative outcomes, AI capabilities promote openness, responsiveness, and public participation, all of which contribute to broader societal and economic growth. Public enterprises are better able to solve local environmental issues, work with stakeholders, and co-create value through sustainable initiatives as they become more data-driven. AI also enables the development of open innovation ecosystems, where governmental, commercial, and private entities collaborate to create solutions for common problems. This change improves public trust, institutional performance, and the local economy's resilience and competitiveness. Therefore, it is critical that managers and legislators invest in AI capabilities and infrastructure for their companies. Incorporating artificial intelligence (AI) into strategic planning allows public firms to improve organizational performance and better align technical advancement with sustainability-driven aims.

Similarly, green learning ambidexterity can enable firms to improve their existing knowledge, information, skills, and expertise and acquire new ones. Thus, this enables public sector organizations to efficiently allocate resources to green processes and activities to deal with rapidly changing environmental situations. With green learning ambidexterity, employees learn new skills and expertise to improve their existing products and develop new market solutions that contribute to circular economy principles. Additionally, green learning ambidexterity makes business processes efficient, improves partnerships, and introduces environment-centric innovation, ultimately leading to the implementation of circular economy practices. Managers in public sectors should integrate green competency frameworks and develop cross-functional teams to implement circular economy practices throughout the organizational processes. Furthermore, tools like eco-budgeting and resource-mapping can guide efficient investment in green initiatives which in turn foster a culture of experimentation and continuous learning enabling firms to adopt modern circular economy practices. Indeed, striking a balance between exploitative and explorative learning can drive innovation, improve existing and acquire new knowledge, maintain competitive advantage, and contribute to circular economy practices.

Our findings regarding the moderating role of leader boundary-spanning behavior also have key managerial implications. The findings indicate that public sector organizations should consider leaders' individual differences while focusing on the circular economy principles. Leaders who exhibit high boundary-spanning behavior actively take part in business activities that help them to acquire resources, knowledge, and expertise as well as cultivate connections with various to seize market opportunities and adapt to the quickly shifting environment. Thus, by creating organizational policies and clear guidelines that are necessary for putting circular economy principles into practice, such leaders can make a difference. They can clearly define the role of employees and empower them by allocating the necessary resources to adopt circular principles. Additionally, leaders high on boundary-spanning behavior pay more attention and effectively implement circular economy practices that align with overall environmental goals and tactics for the betterment of society. Thus, public sector organizations need to employ leaders who are high on boundary-spanning behavior since they add value to the organizations and bring changes that align with circular economy principles. They also help companies come up with suitable ways to lessen the environmental problems. Leaders who actively engage in organizational activities can acquire valuable resources, improve collaboration with stakeholders, and promote information exchange to address societal and environmental challenges. To leverage and promote boundary-spanning conduct from leaders, public institutions should focus cross-functional collaboration, promote involvement in external sustainability networks, and engage continuously in leadership development. Furthermore, incorporating leader boundary-spanning behavior into leadership development and performance evaluation frameworks can improve organizational flexibility, creativity, and the effective execution of circular economy principles in challenging public sector settings.

5.3. Limitations and future research directions

We should highlight a few of our study's strengths. This research examined the model using a time-lagged research approach. Therefore, favorability bias and potential common method variance were taken into account in the current study. Despite this strength in the study design, our research still has some limitations. First, even with our data collection strengths, which rule out common procedure bias, it is impossible to draw causal inferences. Thus, it is strongly recommended that future research employ longitudinal designs. Second, our sample is limited to public organizations in the UAE, which may restrict the generalisability of findings to other countries. Comparative studies across diverse institutional and cultural settings are encouraged to validate the current model. Third, we focus on green strategic intent as an organizational-level construct. Future studies could explore other leadership-constructs such as spiritual leadership (Usman et al., 2024), transformational leadership (Khan et al., 2018) entrepreneurial leadership (Bani-Melhem et al., 2025), and managerial latitude (Khalid et al., 2024) to examine their impact on circular economy practices. Also, future studies could examine the comparison of various leadership styles and managerial approaches in terms of their influence and implementation of circular economy practices to offer further insights into the phenomenon and facilitate public sector organizations in designing environmentally responsible and resilient strategies. Finally, AI capability and green learning ambidexterity serve as a key mechanism in this study, future studies could integrate additional factors such as such as digital readiness, institutional support, and organizational culture to

gain deeper insights of circular economy practices in the public sectors.

CRediT authorship contribution statement

Nadia Zahoor: Validation, Supervision, Resources, Conceptualization, Writing – review & editing, Writing – original draft. **Muhammad Usman:** Validation, Software, Methodology, Investigation, Formal analysis, Data curation, Conceptualization, Writing – original draft. **Adeel Khalid:** Validation, Project administration, Methodology, Investigation, Conceptualization, Writing – original draft. **Mohamed Gamal Aboelmaged:** Validation, Software, Conceptualization, Writing – review & editing, Writing – original draft. **Naveed Yasin:** Validation, Software, Conceptualization, Writing – review & editing.

Declaration of competing interest

None.

Data availability

Data will be made available on request.

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