ISSN 0974-763X
UGC-CARE Listed Journal

SOUTH ASIAN JOURNAL OF MANAGEMENT RESEARCH (SAJMR)

Volume 15, Issue No.3 July, 2025

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2025-26
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Published by

CSIBER Press, Central Library Building

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Chhatrapati Shahu Institute of Business Education and Research (CSIBER)

South Asian Journal of Management Research (SAJMR)

Volume 15, Issue No. 3, July 2025

Editor: Dr. Pooja M. Patil

Publisher
CSIBER Press
Central Library
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South Asian Journal of Management Research
(SAJMR)

Volume 15, Issue No. 3 **July, 2025**

C O N T E N T S

Developing a Comprehensive Framework to Foster Employee Engagement for Empowering Organizations in Circular Economy Transitions: An Empirical Study in the Retail Sector

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Abstract

As global momentum toward sustainability accelerates, organizations are increasingly adopting circular economy models that emphasize regeneration, resource efficiency, and reduced waste. However, the human element, particularly employee engagement, remains an underexplored yet critical determinant of successful circular economy implementation. Existing frameworks often prioritize technological enforcement or policy-driven mandates, overlooking the psychosocial and organizational factors that cultivate sustained behavioral change. Addressing this gap, the present study introduces and validates the E.N.G.A.G.E. framework, a novel, employee-centric model designed to identify and examine key organizational drivers that influence employee engagement during circular economy transitions in the Indian retail sector.

The research focuses on six interrelated constructs: Empowerment and Autonomy, Organizational Culture and Norms, Leadership and Management Support, Training and Skill Development, Values Congruence, and Incentives and Recognition. The study leverages a quantitative, cross-sectional design using structured surveys administered to 100 employees from mid-to-large retail firms engaged in sustainability practices. Structural Equation Modeling and Exploratory Factor Analysis were employed to assess construct validity, factor loadings, path coefficients, and the significance of relationships among variables. Findings reveal that Incentives and Recognition emerged as the most influential driver of employee engagement, followed by Training and Skill Development, and Empowerment and Autonomy. In contrast, Organizational Culture, Leadership Support, and Values Congruence had statistically weaker direct impacts. Notably, Employee Engagement demonstrated a strong and significant effect on Circular Economy Transition success, underscoring its mediating role in translating organizational practices into sustainable outcomes. The discussion highlights the strategic importance of tangible motivators such as skill-building initiatives and recognition systems in fostering workforce alignment with Circular Economy goals. It also suggests that softer cultural and leadership elements, while necessary, must be operationalized through visible actions and resource allocation to generate meaningful engagement. This shift from symbolic enablers to actionable interventions marks a critical step in embedding sustainability into organizational DNA. This study contributes original value by positioning employee engagement as a central lever for Circular Economy success and offering a multi-dimensional, theory-backed framework tailored for real-world organizational application. The E.N.G.A.G.E. model bridges traditional human resource paradigms with contemporary sustainability imperatives, offering scholars and practitioners an actionable roadmap for nurturing engaged, future-ready, and environmentally responsible workforces.

Keywords: Circular Economy Transitions; Organizational Factors; Employee Engagement; Retail Sector.

Introduction

The global shift towards sustainable development has amplified the urgency for organizations to adopt circular economy principles, which emphasize minimizing waste, maximizing resource efficiency, and creating regenerative systems (Kandpal, 2024). As the linear take-make-dispose model becomes increasingly unsustainable, businesses, particularly in the retail sector, are under growing pressure to reimagine their operations through a circular lens (Elisha, 2020). However, the success of such transitions is not solely dependent on technological innovations or policy interventions; it heavily relies on the human factor, particularly the engagement of employees who are at the forefront of implementing circular strategies (Allam, 2024). Employee engagement is a critical determinant of organizational change, as engaged employees are more likely to embrace innovation, demonstrate pro-environmental behavior, and contribute proactively to sustainability goals (Albrecht S. L., 2021). Yet, despite growing recognition of the importance of engagement in sustainability transitions, there remains a lack of structured understanding of which organizational factors most effectively drive such engagement, especially in the context of circular economy transition (Bertassini, 2021). There is a lack of empirical research examining how inter-organizational collaboration within circular economy ecosystems influences the co-development of innovative tools, processes, and business models, particularly in relation to

stakeholder intentions, roles, and strategic objectives (De Mattos, 2018). Traditional engagement frameworks often overlook the unique challenges and motivators associated with environmental and circular initiatives (Tura N. H., 2019).

To address this gap, this study introduces and applies the E.N.G.A.G.E. framework, a conceptual model developed to analyze key organizational enablers of employee engagement in circular economy transitions. The framework aims to investigate how specific organizational factors influence employee engagement, which in turn drives successful circular economy transitions, particularly in the retail sector. The retail sector, characterized by complex supply chains, high consumption rates, and significant environmental footprints, serves as a critical focus area for this exploration (Rizet, 2012). This sector's dynamic interaction with consumers and frontline employees makes it an ideal setting to investigate how internal organizational mechanisms can influence staff commitment to circular goals (Münster, 2022). The central research question guiding this study is: How do internal organizational factors influence employee engagement in enabling circular economy transitions, particularly in the retail sector? This research is significant for two main reasons. First, it shifts the focus from technology and regulation to human-centered organizational dynamics, offering fresh insights into how circular principles can be embedded through employee engagement. Second, it provides practical guidance for retail organizations looking to foster sustainable change from within, aligning workforce motivation with environmental goals.

Critical Gaps and Contradictions in Literature

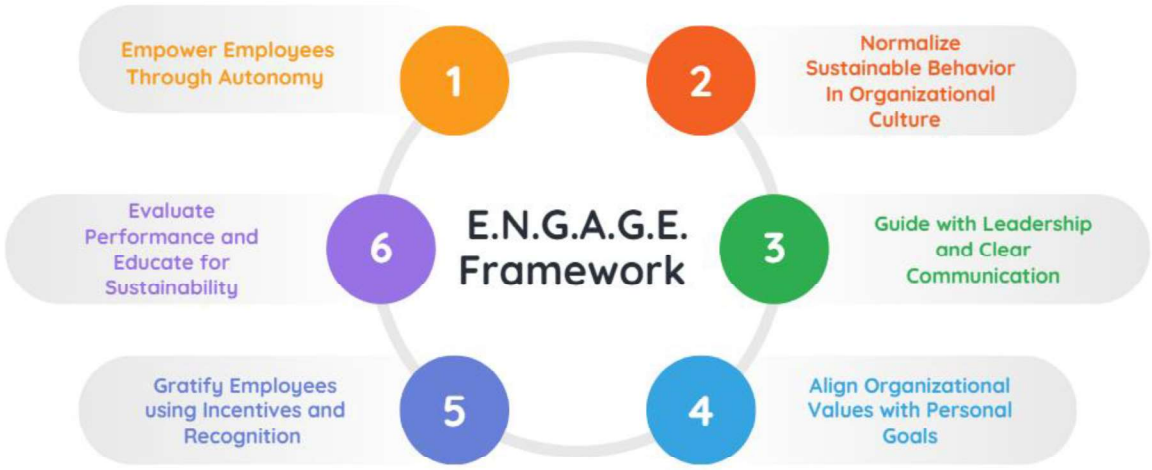
Despite growing scholarly attention on employee engagement, most conventional engagement frameworks are designed around productivity, retention, or job satisfaction in generic organizational contexts (Saks, 2022). These models typically overlook the unique motivations, ethical considerations, and ecological responsibilities that shape employee behavior during sustainability and circular economy transitions (Borrero, 2025) (Pla-Julián, 2019). In particular, traditional frameworks do not adequately capture pro-environmental engagement drivers such as regenerative purpose, climate ethics, or systems thinking elements that are critical in circular economy adoption (Paiva, 2025). Furthermore, existing engagement models rarely address the operational-cultural duality required in circular transitions, especially in sectors like retail where frontline implementation and consumer-facing sustainability practices converge (Tan, 2022). There remains a significant gap in frameworks that integrate circular principles with human resource strategies in a strategic and scalable manner (Abu-Bakar, 2024). This deficiency limits organizations' ability to foster a committed workforce aligned with CE values and operational goals (Chowdhury, 2022).

The ReSOLVE framework, comprising Regenerate, Share, Optimize, Loop, Virtualize, and Exchange, offers strategic pathways for organizations to operationalize circular economy principles (Romero, 2017). However, it has been criticized for being technocentric and structurally top-down, focusing heavily on business models and supply chains while neglecting the human and behavioral dimensions of implementation (Iyer-Raniga, 2019). Scholars argue that ReSOLVE does not sufficiently consider employee mindsets, organizational resistance, or internal culture transformation, which are critical to the long-term success of CE initiatives (Tura N. K., 2019). Moreover, ReSOLVE lacks actionable tools to integrate employees into the CE transition journey, thereby creating a disconnect between strategic intent and executional ownership (Re, 2024). Many organizations adopting CE principles encounter implementation challenges not due to flawed strategies, but because of insufficient employee alignment, training, and motivation (Cantú, 2021). Therefore, a shift is necessary toward engagement-centric models such as the E.N.G.A.G.E. framework, which prioritize behavioral drivers, internal alignment, and human resource integration in the circular economy transition roadmap.

E.N.G.A.G.E. Framework for Circular Economy Transitions

The E.N.G.A.G.E. framework draws its theoretical foundation from a convergence of contemporary circular economy paradigms and established human resource and organizational behavior theories. Just as the ReSOLVE framework for circular business actions, developed by the (MacArthur, 2015), is designed to guide businesses and countries in transitioning towards a circular economy. The E.N.G.A.G.E. framework seeks to provide a strategic, employee-centered pathway for organizations particularly in the retail sector, to embed circular principles by leveraging internal enablers of employee engagement and organizational change. The framework is further guided by the strategic methodology for circular economy road mapping, which emphasizes the integration of systemic thinking, multi-stakeholder engagement, and organizational transformation as foundational pillars for achieving sustainable development and facilitating effective circular transitions. (Abu-Bakar, 2024). According to (Bertassini, 2021), these paradigms recognize that the success of circular strategies is not limited to technological innovation but depends heavily on behavioral and cultural transformation within organizations. To operationalize these ideas, the framework draws from HR and organizational behavior theories that explain how employee engagement can be effectively cultivated to gain a competitive advantage (Albrecht S. L., 2015). These paradigms provide for regenerative, participatory, and holistic organizational change, moving beyond linear efficiency models toward circularity that is deeply embedded in institutional culture and behavior.

Figure 1: E.N.G.A.G.E. for Guiding Employee-Driven Circular Economy Transitions



Source: Author Developed

The framework integrates multiple theoretical perspectives to offer a cohesive approach for driving employee engagement toward circular economy transitions. It is grounded in key principles of Sustainable Human Resource Management (SHRM), emphasizing the alignment of human capital practices, such as training, autonomy, and recognition, with broader organizational sustainability objectives (Khalid Alrashedi, 2024). Self-Determination Theory incites the "Empowerment and Autonomy" dimension by emphasizing intrinsic motivation and individual agency as key drivers of sustained engagement (Deci, 2012). Social Exchange Theory and Organizational Support Theory underpin the framework's focus on leadership, recognition, and support, highlighting the importance of reciprocal trust and perceived organizational care (Cropanzano, 2005), (Eisenberger, 1986). The dimensions "Training and Skill Development" and "Evaluate and Educate" reflect principles from Learning Organization Theory, which advocates for continuous learning, adaptability, and innovation in dynamic work environments (Senge, 1990), (Fillion, 2014). Meanwhile, Value Congruence Theory supports the "Align Values" component, emphasizing the motivational impact of alignment between personal and organizational values (Posner, 2010). Thus, grounded in well-established theories, the E.N.G.A.G.E. model offers a strategically aligned approach to engaging employees in driving sustainability within organizations. The dimensions of the framework have been subsequently discussed in detail in the next section.

Empower Employees Through Autonomy: This dimension focuses on providing employees with the authority, flexibility, and trust to make decisions, propose innovative solutions, and take ownership of sustainability initiatives (Zhou, 2019). Autonomy enhances intrinsic motivation and fosters a sense of responsibility, both of which are critical for embedding circular economy practices into routine operations (VU, 2021).

Normalize Sustainable Behavior in Organizational Culture: For circular economy principles to be effectively adopted, sustainability must be deeply embedded within the organizational culture (Bertels, 2010). This entails nurturing common environmental values, encouraging sustainable habits, and building a collective identity committed to responsible resource utilization and sustainable resource management (Jaganjac, 2024).

Guide with Leadership and Clear Communication: Visible and committed leadership, paired with transparent communication, plays a pivotal role in translating circular economy visions into actionable goals (de Faria Enes, 2025). Leaders are instrumental in shaping attitudes, overcoming resistance to change, and modeling the behaviors necessary for sustainable transformation (Thakhathi, 2019).

Align Organizational Values with Personal Goals: Employee engagement increases significantly when there is alignment between personal values and the organization's sustainability mission (Avota, 2015). This alignment nurtures a sense of purpose, strengthens emotional commitment, and encourages employees to actively participate in sustainability initiatives with genuine enthusiasm (Barboza, 2022).

Gratify Employees Using Incentives and Recognition: Acknowledging and rewarding employee contributions to sustainability efforts reinforces desired behaviors and cultivates a culture of appreciation (Odhiambo, 2023). Whether through tangible incentives or symbolic recognition, gratification validates employee efforts and motivates continued involvement in sustainability (Merriman, 2016). Incorporating gamification elements—such as point systems, leaderboards, and eco-challenges—can further enhance engagement by making sustainability goals more interactive, competitive, and enjoyable (Wittayakom, 2025).

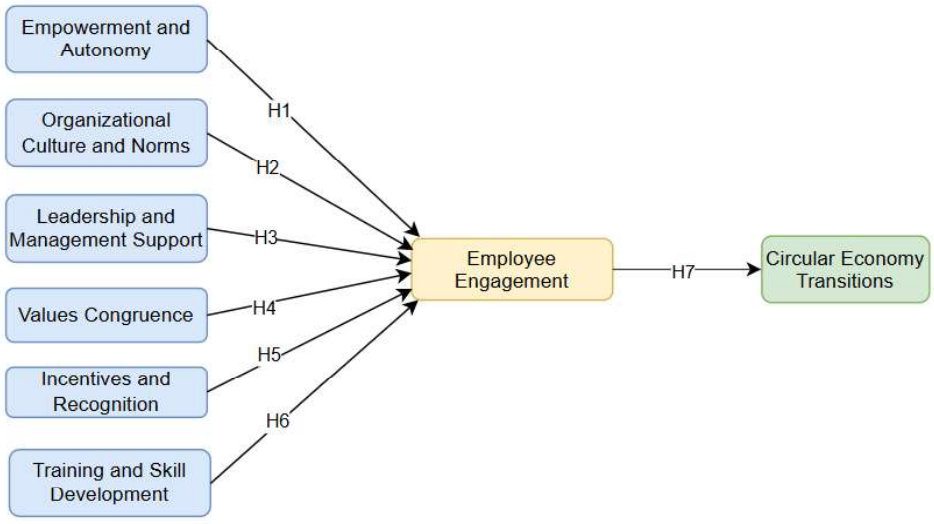
Evaluate Performance and Educate for Sustainability: Continuous education and skills development are essential for preparing employees to operate within circular systems (Sikander, 2024). When integrated with systematic performance evaluations, such educational initiatives not only enhance professional growth and accountability but also reflect the organization's strategic commitment to long-term sustainable capacity building (Bashynska, 2024). Training and development foster adaptive thinking and innovation, enabling the workforce to respond proactively to evolving sustainability challenges and opportunities for building a circular economy (Trevisan, 2025).

In summary, the framework synthesizes insights from established organizational and psychological theories to present a comprehensive, theory-informed approach for enhancing employee engagement aligned with circular economy objectives. It offers a holistic organizational lens through which companies can strategically activate key dimensions to foster a culture of sustainability. Each component serves as a lever for enabling employees to contribute meaningfully to circular initiatives, ultimately strengthening the organization's capacity for sustainable transformation.

Organizational Drivers of Employee Engagement for Circular Economy Transitions

In response to the growing imperative for sustainable development, the study delves into the human-centric dimensions of circular economy transitions by examining the role of internal organizational factors in shaping employee engagement, a crucial yet underexplored catalyst for circular transformation (Castillo, 2025). This study introduces a carefully curated set of variables: Empowerment and Autonomy (EA), Organizational Culture and Norms (OC), Leadership and Management Support (LS), Training and Skill Development (TD), Values Congruence (VC), and Incentives and Recognition (IR), with Employee Engagement (EE) as the mediating variable and Circular Economy Transitions (CET) as the outcome.

Figure 2: Conceptual Framework of Study: Enabling Circular Economy Transitions in Organizations



Source: Author Developed

This unique configuration of the conceptual framework reflects a systems thinking approach, aligning with key circular economy theories and addressing the socio-technical complexity of circular adoption. What sets this study apart is its integrative perspective, shifting the focus from technological or policy-driven levers to the psychosocial and organizational enablers that determine the actual implementation of circular economy transitions at the grassroots level. The originality of the research lies in its holistic model that bridges behavioral, cultural, and

structural dimensions of engagement with circular economy transition outcomes, offering a novel pathway to sustainability that foregrounds the workforce as active agents of change. The variables were deliberately selected for their proven relevance in employee motivation literature and their theoretical grounding in circular economy frameworks, ensuring both conceptual rigor and practical applicability for organizations aiming to embed sustainability.

Hypothesis Development

H1. Empowerment and Autonomy → Employee Engagement

Empowerment and autonomy enhance employees' sense of control, competence, and ownership at work—especially during sustainability-oriented transitions (Lamm, 2015). The circular economy demands innovative problem-solving and decentralized decision-making, both of which are fostered when employees feel empowered (Anshari, 2025). Employees' empowerment plays a pivotal role in enhancing engagement, enabling individuals to align their personal growth with organizational objectives for mutual success (Murray, 2021). Empowered employees who demonstrate strong organizational commitment significantly contribute to workforce sustainability by fostering resilience, innovation, and long-term retention (Bekirogullari, 2019). Empirical studies have consistently found that psychological empowerment increases employee engagement and proactive behavior (Wang, 2021).

H2. Organizational Culture and Norms → Employee Engagement

A sustainability-oriented organizational culture creates a shared vision and aligns employee behavior with sustainability values (Negi, 2019). When norms supporting environmental responsibility and collaboration are embedded in the culture, employees are more likely to feel connected and committed to their organization's goals (Bertels, 2010). Moreover, culture change is slow-moving, and without concrete tools or practices, its influence may not manifest as immediate engagement (Roland, 2004).

H3. Leadership and Management Support → Employee Engagement

Cultivating a culture of learning requires visionary leadership that actively promotes continuous skill development, knowledge sharing, and personal growth across all levels of the organization (Ahsan, 2025). Transformational leadership fosters trust and motivation, which are critical for aligning employees with organizational change goals (Cao, 2024). Leaders who model pro-environmental behaviors and integrate sustainability into their strategic vision can significantly influence employee attitudes and engagement (Omarova, 2022).Moreover, perceived organizational support, often shaped by leadership behaviors, has been positively linked to employee engagement, particularly during change initiatives (Jin, 2017).

H4. Values Congruence → Employee Engagement

When employees perceive alignment between their personal values and the organization's sustainability values, they experience a stronger sense of belonging and purpose (Rickaby, 2020). This perceived congruence has been shown to strengthen emotional engagement and commitment to organizational goals (Florea, 2013). Research shows that value congruence enhances intrinsic motivation and psychological well-being, both of which are key drivers of sustained engagement (Li, 2015).In sustainability contexts, congruence between employee values and the organization's ecological mission fosters authenticity, leading to higher participation in green practices (Asante, 2024).

H5. Incentives and Recognition → Employee Engagement

Incentives and recognition reinforce desired sustainable behaviors and signal that the organization values employee contributions (Huber, 2017). Recognition is particularly important in circular economy contexts where innovation and extra-role behaviors are essential (Schepers, 2022).Recognition plays a critical role in motivating discretionary efforts and pro-environmental behaviors, especially in contexts where formal authority may be limited (Lülfs, 2013).Research also indicates that green rewards, gamification, and symbolic recognition boost employee morale, environmental responsibility, and long-term engagement (Haque, 2024).

H6. Training and Skill Development → Employee Engagement

The circular economy transition requires new skills and capabilities (Acerbi, 2024).When organizations invest in training, employees feel more competent and valued, which enhances engagement (Zahra, 2014). Understanding whether organizations invest wisely in employee development is crucial, as evidence suggests that training and development initiatives have a significant impact on organizational learning and innovation, which are foundational for enabling circular economy transitions (Sung, 2014). Addressing knowledge obstacles when transitioning towards a circular economy, particularly from an intra-organizational perspective, is therefore essential, as overcoming internal knowledge gaps can significantly improve employees' readiness to adopt circular practices and contribute meaningfully to sustainability initiatives (Nujen, 2023).

H7. Employee Engagement → Circular Economy Transition Effectiveness
Employee engagement is a critical success factor for organizational change and sustainability initiatives (Vaja, 2018). Engaged employees demonstrate higher levels of creativity, collaboration, and resilience traits essential for implementing CE principles like reuse, redesign, and resource optimization. Their active participation not only facilitates the implementation of sustainable practices but also nurtures a culture of continuous innovation essential for circular transitions (Scipioni, 2021). To support and sustain such engagement, future research and organizational interventions should focus on cultivating meaningful work, particularly through the provision of contextually appropriate job resources that empower employees and align their roles with broader sustainability objectives (Albrecht S. L., 2021).

Research Methodology
This study adopts a quantitative and explanatory research design to empirically examine the relationships between key organizational factors and employee engagement, as well as their subsequent impact on circular economy transitions. The model hypothesized that six organizational factors: empowerment and autonomy, organizational culture and norms, leadership and management support, values congruence, incentives and recognition, and training and skill development served as predictors of employee engagement. Employee engagement was posited as a mediating variable that subsequently influenced the effectiveness of circular economy transitions. A seven-hypothesis model (H1–H7) was developed and analyzed using structural equation modelling (SEM) to assess the direct and indirect relationships among variables.

Population and Sampling
The target population for this study comprised employees working in the Indian retail sector, particularly those employed in mid- to large-sized retail chains involved in sustainability practices. A total of 100 respondents participated in the study, selected using a purposive sampling technique. This non-probability sampling approach was deemed suitable as the study required responses from employees who had sufficient awareness or involvement in organizational sustainability practices or resource management initiatives. Demographic data collected included respondents' age, gender, job role, years of experience, and department, ensuring a diverse and relevant representation of perspectives from operational and managerial roles. This diversity enabled a nuanced exploration of the organizational enablers of engagement in circular economy transitions.
The demographic profile of the study participants reveals a near-balanced gender distribution, with 58% male and 42% female respondents. Age-wise, the majority were young professionals, as 40% of participants were between 20 and 30 years old, followed by 35% in the 31 to 40 age group. Those aged 41 to 50 comprised 15%, while the remaining 10% were over 50 years of age. In terms of job roles, the sample included a diverse range of hierarchical levels: 30% were frontline staff, 28% team leaders, another 30% belonged to middle management, and 12% were senior executives. Regarding years of experience, 34% of respondents had between 2 and 5 years of experience, 28% had 6 to 10 years, 20% had more than 10 years, and 18% had less than 2 years. Departmentally, participants represented various functions, with 35% from Sales and Customer Service, 28% from Operations, 15% from Human Resources, 10% from Strategy and Sustainability, and the remaining 12% from other support roles.

Data Collection and Analysis
Data were collected through a structured questionnaire that was developed using validated scales from existing literature and tailored specifically to the context of the circular economy and employee engagement. The collected data were analyzed using IBM SPSS and SmartPLS software. The analysis began with descriptive statistics to profile the demographic characteristics of the respondents. Construct validity was assessed through Exploratory Factor Analysis (EFA), employing Principal Component Analysis (PCA) with Varimax rotation. Reliability of the scales was evaluated using both Cronbach's Alpha and Composite Reliability (CR) measures. To test the hypothesized relationships within the conceptual model, Structural Equation Modeling (SEM) was conducted. Further, path coefficient analysis was performed, including examination of beta (β) values, t-statistics, p-values, as well as R^2 and f^2 effect sizes to determine the strength and significance of the relationships.

Findings and Analysis
Path Coefficient Insights
The results of the Structural Equation Modeling (SEM) analysis indicate varying levels of influence among the six organizational factors on Employee Engagement (EE). *Incentives and Recognition (IR)* emerged as the strongest predictor of EE with a path coefficient of 0.547, suggesting that acknowledgment and rewards for sustainability efforts significantly enhance employee involvement. This was followed by *Training and Skill Development (TD)* ($\beta = 0.218$), indicating that opportunities for upskilling are also crucial for driving engagement.

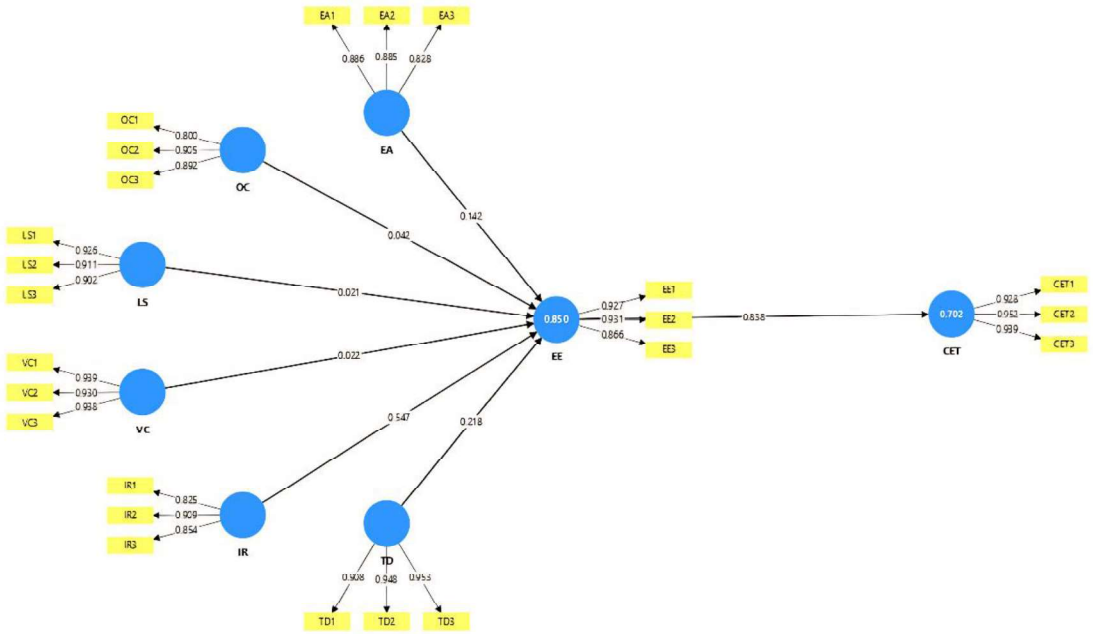
Empowerment and Autonomy (EA) demonstrated a moderate influence (β = 0.142), supporting the idea that giving employees freedom in decision-making positively contributes to their engagement. Meanwhile, *Organizational Culture and Norms (OC)* (β = 0.042), *Leadership and Management Support (LS)* (β = 0.021), and *Values Congruence (VC)* (β = 0.022) had minimal effects, highlighting that without tangible incentives or development opportunities, these softer cultural elements may have a limited direct role in activating engagement.

Table No. 1: Structural Relationships Between Variables – Output from SEM Analysis

Constructs	Path coefficients
EA -> EE	0.142
EE -> CET	0.838
IR -> EE	0.547
LS -> EE	0.021
OC -> EE	0.042
TD -> EE	0.218
VC -> EE	0.022

Furthermore, Employee Engagement showed a strong and significant influence on Circular Economy Transitions (CET) with a path coefficient of 0.838, affirming its role as a vital mediating variable. The high R^2 values observed for EE (0.850) and CET (0.702) underscore the robustness of the model. Specifically, 85% of the variance in EE is explained by the six organizational predictors, while 70.2% of the variance in CET is explained by EE. These findings validate the hypothesized model and stress the importance of a strategically designed incentive system and continuous skill development initiatives. Organizations aiming to succeed in circular economy initiatives should, therefore, prioritize these key levers to foster a deeply engaged and sustainably driven workforce.

Figure 3: Exploring Relationships through SEM Analysis



The findings have significant implications for the proposed framework, highlighting the importance of prioritizing tangible organizational practices over cultural or symbolic elements. The strong influence of incentives and recognition, training, and skill development on employee engagement suggests that organizations aiming to advance circular economy transitions should invest in employee-centric strategies that reward sustainable behavior and build relevant skills. The minimal impact of leadership support, organizational culture, and values congruence implies these factors may be necessary but not sufficient on their own. The framework is thus validated as emphasizing engagement as a key lever for operationalizing circular economy initiatives effectively.

Measurement Model Analysis

Table No. 2: Construct Reliability and Validity

Constructs	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
CET	0.934	0.935	0.958	0.883
EA	0.836	0.841	0.901	0.752
EE	0.893	0.893	0.934	0.825
IR	0.829	0.841	0.898	0.746
LS	0.9	0.902	0.938	0.834
OC	0.834	0.845	0.901	0.752
TD	0.93	0.932	0.955	0.877
VC	0.929	0.929	0.955	0.876

Robust Internal Consistency Reliability: All constructs demonstrated excellent internal consistency, with Cronbach's alpha values ranging from 0.829 (IR) to 0.930 (TD), well above the 0.70 threshold recommended by Nunnally (1978). This indicates that the items within each construct are highly interrelated and measure the intended latent concept reliably.

Strong Composite Reliability (CR): The Composite Reliability (rho_c) values for all constructs range from 0.898 to 0.958, significantly exceeding the minimum cutoff of 0.70 (Hair et al., 2019). This reinforces the internal consistency and reliability of the constructs beyond what Cronbach's alpha alone can confirm, especially in SEM contexts where construct reliability is critical.

High Convergent Validity through AVE: Each construct achieved Average Variance Extracted (AVE) values well above the threshold of 0.50, with the lowest being 0.746 (IR) and the highest 0.883 (CET). This affirms that a substantial proportion of the variance in each construct's indicators is accounted for by the latent construct itself, satisfying Fornell and Larcker's (1981) criterion for convergent validity.

Evidence of Instrument Dimensional Precision: Constructs such as Circular Economy Transitions (CET), Training and Skill Development (TD), and Values Congruence (VC) show exceptionally high AVE (>0.87) and CR (>0.95), suggesting refined and precise measurement instruments that capture the constructs' conceptual domain with minimal error variance.

Balanced Psychometric Performance Across Constructs: No construct exhibited problematic reliability or validity metrics, supporting the structural soundness and psychometric rigor of the instrument. The results indicate balanced scale development, with both behavioral (e.g., IR, EE) and cognitive (e.g., VC, LS) constructs performing well.

Suitability for Structural Model Estimation: Collectively, these results affirm the appropriateness of the measurement model for structural equation modeling, providing a statistically sound basis for subsequent hypothesis testing and path analysis within the structural model framework.

Table No. 3: Analysis of Coefficient of Determination (R^2) and Adjusted R^2

Constructs	R-square	R-square adjusted
CET	0.702	0.699
EE	0.85	0.84

Robust Predictive Power: The endogenous constructs CET (Circular Economy Transition) and EE (Employee Engagement) demonstrate substantial explanatory power, with R^2 values of 0.702 and 0.85, respectively. These values indicate that approximately 70.2% of the variance in CET and 85% of the variance in EE are collectively accounted for by the model's predictors, signifying a strong model fit.

Adjusted R^2 Validity: The adjusted R^2 values (0.699 for CET and 0.84 for EE) closely approximate their corresponding R^2 values, underscoring the robustness of the model while accounting for the number of predictors included. This minimal reduction implies that the explanatory variables contribute meaningful variance beyond chance and are not merely inflating model fit due to overfitting.

Implications for Model Predictiveness: The high R^2 and adjusted R^2 values signify the model's high degree of predictive relevance in explaining complex behavioral and organizational phenomena. Specifically, the model demonstrates superior efficacy in capturing the drivers of employee engagement (EE), which in turn likely exerts significant influence on CET outcomes.

Theoretical and Practical Significance: Such explanatory power reinforces the theoretical framework underpinning the relationships among constructs, validating the hypothesized pathways. Practically, this suggests that interventions targeting antecedents of EE can yield pronounced effects on fostering CET, thereby contributing to organizational sustainability goals.

Consideration of Model Complexity: The marginal difference between R^2 and adjusted R^2 also reflects the appropriateness of model complexity, ensuring that the inclusion of predictors does not artificially inflate explanatory power but rather reflects substantive contributions to understanding the endogenous variables.

Table No. 4: Effect Size (f^2) Analysis of Predictors on Endogenous Constructs

Constructs	f-square
EA -> EE	0.018
EE -> CET	2.357
IR -> EE	0.402
LS -> EE	0.001
OC -> EE	0.001
TD -> EE	0.09
VC -> EE	0.001

Strong Effect of Employee Engagement on Circular Economy Transition: The path from EE to CET exhibits an exceptionally large effect size ($f^2 = 2.357$), indicating that employee engagement is a critical determinant of successful circular economy transitions. This magnitude suggests that EE explains a very substantial proportion of the variance in CET, confirming its central mediating role in the model.**Moderate Effect of Incentives and Recognition on Employee Engagement:** The effect size of IR on EE is moderate ($f^2 = 0.402$), demonstrating that incentives and recognition play a meaningful role in enhancing employee engagement within organizations. This aligns with theoretical expectations that recognition motivates higher employee involvement.

Small Effect of Training and Skill Development on Employee Engagement: TD (Training and Skill Development) shows a small but non-negligible effect on EE ($f^2 = 0.09$), indicating that targeted skill enhancement initiatives contribute positively to engagement, although with less impact compared to incentives and recognition.

Subtle but Foundational Role of Empowerment and Autonomy, Leadership Support, Organizational Culture, and Values Congruence: While the direct effects of EA, LS, OC, and VC on EE exhibit small effect sizes ($f^2 \leq 0.018$), their presence within the model highlights the nuanced and potentially foundational role these constructs play in shaping engagement. These findings suggest that their influence may be more indirect, operating through mediating variables or in interaction with other factors, rather than through direct pathways alone. This underlines the complexity of employee engagement and the importance of considering broader relational dynamics within the organizational context.

Table No. 5: Path Coefficients – Mean, STDEV, T Values, p values

Constructs Relationship	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
EA -> EE	0.142	0.171	0.147	0.972	0.331
EE -> CET	0.838	0.835	0.052	15.979	0
IR -> EE	0.547	0.551	0.128	4.264	0
Constructs Relationship	**Original sample (O)**	**Sample mean (M)**	**Standard deviation (STDEV)**	**T statistics (|O/STDEV|)**	**P values**
LS -> EE	0.021	0.032	0.131	0.16	0.873
OC -> EE	0.042	0.015	0.154	0.274	0.784
TD -> EE	0.218	0.229	0.121	1.806	0.071
VC -> EE	0.022	-0.009	0.101	0.218	0.827

Incentives and Recognition → Employee Engagement: Statistically significant and practically relevant, this result highlights the crucial role of rewards, recognition, and appreciation in fostering sustainable employee engagement. *Supports Social Exchange Theory*, which posits that individuals reciprocate positive organizational inputs with greater involvement and commitment.

Training and Development → Employee Engagement: While marginally significant, this path shows a positive and meaningful association, suggesting that investment in upskilling and knowledge-building enhances employees' willingness and ability to engage with sustainability goals.

Empowerment and Autonomy → Employee Engagement: Although not statistically significant, the positive coefficient indicates that autonomous work environments may still foster engagement indirectly or in synergy with other variables like recognition and training.

Organizational Culture, Leadership Support, and Values Congruence: All exhibit positive coefficients, affirming theoretical alignment with the model even if their direct paths are statistically non-significant. These constructs may play a more influential role through interaction effects or indirectly by shaping the organizational climate that supports engagement.

Employee Engagement → Circular Economy Transition (CET): Highly significant and strongly positive, confirming employee engagement as a key enabler of circular economy adoption. The high effect size reflects the centrality of workforce alignment and participation in successful, sustainable transformation efforts.

While several hypothesized relationships did not achieve statistical significance at conventional thresholds ($p < 0.05$), the direction and strength of the coefficients offer valuable insights into the underlying dynamics of employee engagement during circular economy transitions. The non-significant p-values for constructs like Empowerment and Autonomy (EA), Organizational Culture and Norms (OC), Leadership and Management Support (LS), and Values Congruence (VC) do not undermine their conceptual relevance. Rather, they suggest that these factors may exert their influence more subtly, potentially through indirect effects, synergistic interactions, or over a longer temporal horizon. For example, while EA did not yield a statistically significant direct effect ($p = 0.331$), its positive coefficient indicates potential relevance when combined with other enablers such as incentives or training. Similarly, the low p-values for IR ($p = 0.000$) and EE → CET ($p = 0.000$) reinforce the robustness of these pathways, validating the central role of tangible rewards and employee alignment in circular transformation success. These results call for a more nuanced understanding of engagement drivers, highlighting the need for integrated strategies that activate both intrinsic and extrinsic motivators within a supportive organizational ecosystem. Future research can explore moderating or mediating variables that may unlock the full potential of these foundational constructs.

4.3 Exploratory Factor Analysis

To assess the underlying structure of the constructs and validate the dimensional integrity of the measurement model, an Exploratory Factor Analysis (EFA) was conducted using Principal Component Analysis (PCA) with Varimax rotation. This statistical procedure was employed to identify latent dimensions and ensure that the items included in the model reflect coherent, interpretable factors aligned with the theoretical framework.

Table No. 6: Communalities Table

Communalities		
	Initial	Extraction
EA1	1.000	.821
EA2	1.000	.818
EA3	1.000	.894
OC1	1.000	.841
OC2	1.000	.894
OC3	1.000	.751
LS1	1.000	.769
	Initial	Extraction
LS2	1.000	.763
LS3	1.000	.715
VC1	1.000	.755
VC2	1.000	.734
VC3	1.000	.847
IR1	1.000	.622
IR2	1.000	.757
IR3	1.000	.645
TD1	1.000	.682
TD2	1.000	.751
TD3	1.000	.768

EE1	1.000	.734
EE2	1.000	.741
EE3	1.000	.761
CET1	1.000	.789
CET2	1.000	.807
CET3	1.000	.790
Extraction Method: Principal Component Analysis.		

All extracted communalities exceeded the minimum threshold of 0.50, indicating that the selected items are sufficiently explained by the underlying factor structure. Communality values ranged from 0.622 to 0.894, with the lowest being IR1 (0.622) and the highest being EA3 and OC2 (0.894). High communalities confirm that a substantial proportion of item variance is accounted for by the extracted components, supporting strong item reliability and construct representation. Constructs such as Empowerment and Autonomy (EA), Organizational Culture (OC), Values Congruence (VC), and Circular Economy Transitions (CET) all exhibited consistently high communalities (>0.75), indicating strong convergent validity and alignment with the theoretical framework. These results affirm the psychometric adequacy of the measurement model and support the advancement of these constructs into the structural equation modelling phase.

Table No. 7: Total Variance Explained

Total Variance Explained									
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	15.741	65.586	65.586	15.741	65.586	65.586	7.026	29.273	29.273
2	1.654	6.891	72.477	1.654	6.891	72.477	5.957	24.820	54.093
3	1.052	4.385	76.863	1.052	4.385	76.863	5.465	22.770	76.863
4	.730	3.043	79.906						
5	.699	2.912	82.818						
6	.603	2.511	85.329						
7	.508	2.115	87.444						
8	.377	1.573	89.017						
9	.330	1.373	90.390						
10	.312	1.302	91.691						
11	.303	1.265	92.956						
12	.271	1.131	94.087						
13	.235	.981	95.067						
14	.226	.942	96.009						
15	.212	.883	96.892						
16	.153	.638	97.530						
17	.142	.591	98.121						
18	.139	.580	98.701						
19	.100	.417	99.118						
20	.084	.351	99.469						
21	.059	.244	99.713						
22	.053	.219	99.932						
23	.016	.068	100.000						
24	-2.009E-16	-8.370E-16	100.000						
Extraction Method: Principal Component Analysis.									

PCA yielded three components with eigenvalues greater than 1, explaining a cumulative variance of 76.863%, which exceeds the standard minimum threshold for social science research. After rotation: Component 1 accounted for 29.273%, Component 2 explained 24.820%, Component 3 contributed 22.770% The high cumulative variance indicates a well-structured factor solution, reinforcing the construct validity of the E.N.G.A.G.E. framework.

Table No. 8: Rotated Component Matrix

Rotated Component Matrix[a]			
	Component		
	1	2	3
EA1			.827
EA2			.831
EA3		.852	
OC1			.832
OC2		.852	
OC3		.720	
LS1	.555	.579	
LS2		.705	
LS3		.630	
VC1			.692
VC2			.688
VC3			.817
IR1	.549		
IR2	.587		
IR3	.706		
TD1	.541	.583	
TD2	.655	.501	
TD3	.652	.532	
EE1	.597		
EE2	.675		
EE3	.675		
CET1	.816		
CET2	.760		
CET3	.748		
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.			
a. Rotation converged in 7 iterations.			

The Rotated Component Matrix, clarifies the factor structure by improving interpretability and minimizing cross-loadings. Each item loaded strongly on one primary component, indicating good discriminant validity and internal coherence within constructs.

- Component 1 clusters items related to Incentives and Recognition (IR), Employee Engagement (EE), and Circular Economy Transitions (CET) representing a behavioral engagement dimension.
- Component 2 groups Leadership Support (LS) and Training and Development (TD) reflecting organizational enablement.
- Component 3 encompasses Empowerment and Autonomy (EA), Values Congruence (VC), and Organizational Culture (OC) emphasizing value-based empowerment and alignment.

These groupings validate the theoretical distinctiveness of the constructs and reflect a sound factor structure consistent with the E.N.G.A.G.E. model.

Discussion

The empirical results of this study shed critical light on how specific organizational factors contribute to employee engagement and, subsequently, how engagement influences the effectiveness of circular economy transitions within the retail sector. The application of the E.N.G.A.G.E. framework reveals a nuanced interplay between behavioral, structural, and cultural elements that shape employee motivation toward sustainability-oriented goals. The strongest predictor of employee engagement emerged as Incentives and Recognition (IR), underscoring the centrality of tangible and symbolic reinforcement in driving sustainability behavior. This aligns with Social

Exchange Theory, suggesting that when organizations reciprocate employee efforts with rewards and acknowledgment, it fosters a culture of trust, commitment, and extra-role behavior. The practical implication is clear: without systems that validate sustainable contributions, employees may lack the motivation to internalize and act upon circular economy principles.

Training and Skill Development (TD) was the second most significant factor, reinforcing the notion that competence-building is a crucial driver of engagement. The circular economy requires new skills, ranging from systems thinking to green logistics, and organizations that invest in employee development are better positioned to create an empowered and innovative workforce. These findings echo Self-Determination Theory, which posits that the feeling of competence enhances intrinsic motivation and engagement.

Interestingly, Empowerment and Autonomy (EA) had a positive but modest effect on engagement, and constructs such as Organizational Culture (OC), Leadership and Management Support (LS), and Values Congruence (VC) showed very small or statistically insignificant effects. This may indicate that while these elements create the foundation for sustainability, they are not sufficient on their own to trigger engagement unless backed by actionable mechanisms. It suggests a potential "value-action gap," where employees may align ideologically with sustainability but require direct stimuli like skills training or recognition to engage fully.

This also reflects a broader insight: symbolic or passive enablers need to be operationalized through concrete strategies. Leadership commitment, for example, may be ineffective if not coupled with visible actions, participatory communication, or alignment of performance goals with sustainability targets. Similarly, a strong organizational culture must manifest in daily practices, resource allocation, and accountability structures to meaningfully influence engagement.

The high R^2 values (EE: 0.85, CET: 0.702) and large effect size of Employee Engagement → CET ($f^2 = 2.357$) clearly demonstrate that engaged employees are vital catalysts in translating circular strategies into successful outcomes. Their creativity, adaptability, and willingness to embrace new processes are essential for embedding CE practices into core business functions.

From a systems perspective, the E.N.G.A.G.E. framework offers a powerful lens for rethinking HRM strategies within sustainability agendas. It validates the idea that employee engagement is not just a soft metric but a strategic enabler for organizational transformation. To transition effectively toward a circular economy, businesses must go beyond compliance and technology adoption; they must foster a culture of ownership, reward behavior change, and equip their people to thrive in a regenerative paradigm.

In summary, the findings stress the importance of designing integrated, employee-centered approaches to sustainability. They call for a shift from rhetoric to action—from espousing green values to embedding them into incentive systems, learning programs, and everyday decision-making processes. Organizations that recognize this shift and act accordingly are more likely to achieve resilient, inclusive, and impactful circular transitions.

Conclusion

Theoretical Contribution

This study makes several significant contributions to organizational and sustainability literature by introducing and empirically validating the E.N.G.A.G.E. framework a novel, employee-centered model for understanding the organizational antecedents of employee engagement during circular economy transitions. By bridging concepts from Self-Determination Theory, Social Exchange Theory, Sustainable Human Resource Management, and Learning Organization Theory, this research extends existing engagement models beyond conventional domains such as productivity or job satisfaction to the more complex, values-driven context of environmental sustainability.

The findings confirm that while soft enablers like organizational culture, leadership support, and values congruence are important, they do not singularly drive engagement unless supported by concrete practices such as incentives and skill development. Furthermore, the strong mediating role of employee engagement between organizational factors and CET effectiveness validates its theoretical centrality in enabling sustainable organizational transformation. The research thus fills a critical gap in circular economy literature by elevating the human dimension as a cornerstone of effective CE implementation in the retail sector.

Practical and Managerial Implications

For practitioners, especially retail leaders and HR managers, this study provides a strategic blueprint for fostering a workforce that is engaged, proactive, and aligned with circular economy goals. The results clearly indicate that incentives and recognition, along with training and development, are the most impactful levers for activating employee engagement. Organizations aiming to transition towards circular models should invest in structured reward systems that acknowledge sustainable behavior and create learning pathways that build green skills across all levels of the workforce.

Moreover, while empowerment, leadership support, and cultural alignment are foundational, they must be operationalized through transparent communication, participatory decision-making, and integration into daily tasks and performance metrics. Embedding the E.N.G.A.G.E. framework into HRM strategy can help

organizations move from policy to practice, creating an enabling environment where employees feel valued, capable, and motivated to contribute meaningfully to sustainability goals.

Limitations of The Current Study

While this study provides valuable insights, several limitations warrant consideration. First, the use of purposive sampling and a relatively small sample size (n = 100) drawn from the Indian retail sector may limit the generalizability of the findings across industries and cultural contexts. Future research should adopt larger, more diverse samples and potentially incorporate longitudinal data to track engagement and circular outcomes over time.

Second, although the study establishes robust structural relationships, it does not capture potential moderating or mediating variables such as employee personality traits, perceived organizational justice, or environmental awareness levels. Incorporating these factors could deepen our understanding of the psychological mechanisms driving engagement in sustainability initiatives.

Third, while the E.N.G.A.G.E. model was validated quantitatively, qualitative research, such as interviews or case studies, could enrich the framework by exploring nuanced employee perceptions, motivational narratives, and organizational change dynamics in real-world circular economy settings.

Future studies could also apply this framework in other high-impact sectors like manufacturing, logistics, or hospitality, and explore digital tools such as gamification and AI-based learning platforms as enablers of engagement in CE transitions.

Future Research Directions

The future scope of this study offers multiple avenues for further research and practical application. While the E.N.G.A.G.E. framework has been validated within the Indian retail sector, future studies can expand its applicability across different industries such as manufacturing, logistics, hospitality, and technology, as well as across varied cultural and geographic contexts. Longitudinal research can help track how employee engagement evolves throughout CE transitions, while the inclusion of mediating or moderating variables such as environmental awareness, psychological capital, or perceived organizational justice could provide deeper insights into engagement dynamics. Qualitative and mixed-methods approaches may uncover richer, context-specific perspectives on employee experiences, complementing quantitative data. Additionally, integrating digital enablers like gamification, AI-powered learning platforms, and real-time feedback tools presents opportunities to scale and personalize engagement strategies. Future research should also examine how organizational engagement efforts align with broader ESG and sustainability policies, ensuring coherence between internal practices and external mandates. Replicating the study across larger and more diverse samples will improve generalizability, and refining the measurement tools can enhance practical usability.

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