
Catalysts for Circular Economy: proactive and reactive forces driving transition

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Abstract: This study examines the organizational transition toward the Circular Economy (CE) by analyzing the catalysts that enable and shape this process. While prior research has identified multiple drivers of CE adoption, limited attention has been given to their interrelationships. Addressing this issue, the study identifies ten key catalysts and applies the DEMATEL method to explore their causal structure and interactions. The findings reveal a distinction between proactive catalysts, such as CE-oriented leadership, institutional pressures, organizational agility, and market demand, and reactive catalysts, including technology adoption, organizational culture, and dynamic capabilities. Results highlight the systemic nature of CE transition, showing that change is driven by the interplay between internal capabilities and external pressures. By offering a structured framework of catalyst interactions, the study contributes to a more nuanced understanding of how organizations can effectively initiate and coordinate circular transformation.

Keywords: Circular Economy; Catalysts; Organizational Change; Circular Business Models

1 Introduction

Over the past decades, the limitations of the linear production and consumption model, characterized by continuous growth, resource overuse, and environmental degradation, have posed significant challenges to sustainable development. In response, the Circular Economy (CE) has emerged as a restorative and regenerative alternative, aiming to decouple economic growth from resource consumption and environmental harm (Geissdoerfer *et al.*, 2017). However, organizations face numerous barriers to adopting Circular Business Models (CBMs) and implementing CE managerial practices, including financial constraints, inadequate technological capabilities, and low consumer and managerial awareness (Urbinati, Franzò and Chiaroni, 2021).

Consequently, implementing the CE in practice requires profound change within organizations. This transformation spans strategic, operational, and cultural dimensions. At the strategic level, firms must rethink value creation and capture mechanisms, shifting from short-term transactional models toward long-term value generation based on durability, reuse, and closed-loop systems (Bocken *et al.*, 2016; Rosário, Lopes and Rosário, 2024). Operationally, this implies redesigning processes, workflows, and supply chain configurations to overcome structural barriers such as silos and legacy systems (Kirchherr *et al.*, 2018). At the same time, successful CE implementation depends on cultural change, including the development of long-term orientations, collaboration, and shared responsibility across the organization (Salvioni and Almicci, 2020).

In this transformation process, catalysts can be understood as the factors, mechanisms, and forces of change that initiate, facilitate, and sustain CE transition processes by creating and maintaining favorable conditions for systemic transformation (Lehtimäki *et al.*, 2023). These catalysts span diverse domains, including technology, innovation, market requirements, management, regulation, and culture, and can originate both internally and externally (Khan, Daddi and Iraldo, 2020; Castro-Lopez, Iglesias and Santos-Vijande, 2023).

Despite these advancements, the literature remains fragmented. Catalysts are often examined as isolated variables, with limited attention to how they interact with one another within organizations (Sarja, Onkila and Mäkelä, 2021; Seles *et al.*, 2022). Emerging studies suggest that CE transition depends not on single enablers, but on the interplay among multiple factors (Lehtimäki *et al.*, 2023; Saari *et al.*, 2024). However, empirical insights into these interdependencies remain scarce.

Acknowledging this issue, this research aims to advance the understanding of organizational CE transitions by systematically examining the catalysts that facilitate corporate's shift toward a CE and, crucially, their interrelationships. Accordingly, the study addresses the following research questions (RQs):

RQ1: What catalysts influence the organizational transition toward a CE?

RQ2: How are these catalysts related to and interacting with each other?

The remainder of the paper is structured as follows: section 2 reviews the relevant theoretical background on CE transitions and catalysts; section 3 outlines the research methodology; section 4 presents the empirical findings; section 5 discusses the results and their implications; section 6 concludes the paper, acknowledges its limitations and suggest future research directions.

2 Theoretical background

Organizational transformation for the Circular Economy

Organizational change is central for companies transitioning from traditional to CE-based business models. Indeed, shifting towards a CBM is not only embedding environmental or technical practices, but demands deeper transformations as rethinking value creation and capture mechanisms, as well as sources of competitive advantage (Bocken *et al.*, 2016).

Transitioning to a CBM needs a coordinated organizational transformation, requiring organizations to implement comprehensive changes across three interrelated dimensions: strategic, operational, and cultural. From a strategic perspective, this shift requires a fundamental rethinking of business models, moving from linear models focused on short-term transactions to circular models centered on long-term value creation (Geissdoerfer *et al.*, 2020; Rosário, Lopes and Rosário, 2024). This includes the adoption of service-oriented models, such as product-service systems and sharing platforms, as well as a redefinition of value, emphasizing durability, reuse, and closed material loops (Centobelli *et al.*, 2020); beyond addressing environmental and regulatory pressures, these changes also enhance firms' competitive positioning (Rosário, Lopes and Rosário, 2024). Strategic intent alone is insufficient without corresponding operational restructuring, which consists of changes in how firms organize, coordinate, and execute work, requiring moving beyond CE obstacles such as fragmented workflows, departmental silos, and linear legacies (Kirchherr *et al.*, 2018; Geissdoerfer *et al.*, 2023). Existing barriers – such as rigid organizational structures, functional silos, and legacy systems – often hinder the implementation of circular practices like reverse logistics and material recovery (Urbinati, Franzò and Chiaroni, 2021). Consequently, firms must redesign workflows, roles, and performance systems, fostering cross-functional collaboration, technological integration, and stronger alignment with external partners across the value chain (Khan, Daddi and Iraldo, 2020, 2021). At the same time, limitations in internal capabilities and the challenge of scaling pilot initiatives highlight the need for workforce upskilling, process reengineering, and mechanisms for organizational learning (Kirchherr *et al.*, 2018; Coppola, Vollero and Siano, 2023). Alongside these changes, a shift in organizational culture and mindset is essential to support and sustain circular transformation. Cultural changes act indeed both as prerequisites and drivers of successful CE implementation, moving toward a long-term vision and aligning day-to-day decisions with the principles of CE (Salvioni and Almici, 2020). This requires moving beyond short-term efficiency goals toward a longer-term orientation based on collaboration, responsibility, and continuous value creation. Active stakeholder engagement, leadership commitment, and the alignment of incentive systems play a critical role in reinforcing these cultural changes (Salvioni and Almici, 2020; Tapaninaho and Heikkinen, 2022).

Catalysts fostering Circular Economy transitions

In the context of CE transitions, catalysts can be understood as immediate triggers, distinct from slower-acting structural drivers, that induce, stimulate, and accelerate organizational movement toward circular models by challenging established routines, opening windows of opportunity for experimentation, and enabling the uptake of new practices (Sarja, Onkila and Mäkelä, 2021; Lehtimäki *et al.*, 2023). In this sense, catalysts operate as positive forces that create and maintain favorable conditions for complex sustainability transitions, for example by reframing dominant problem definitions, mobilizing key actors, or reducing the perceived risks associated with abandoning linear modes of production and consumption (Lehtimäki *et al.*, 2023). Sarja, Onkila and Mäkelä (2021) show that, at the firm level, such catalysts typically cluster around three main domains: expectations of economic gains (e.g., profitability improvements, new business models, resource efficiency), perceived threats to business-as-usual (e.g., resource scarcity and price volatility), and internal managerial support (e.g., environmental management systems, waste valorization initiatives, or dedicated sustainability roles). These factors operate internally through resources, capabilities, culture, and leadership, or externally through regulatory and societal pressures, stakeholder demands, and evolving market logics, jointly shaping behaviors and processes for CE adoption (Khan, Daddi and Iraldo, 2020; Castro-Lopez, Iglesias and Santos-Vijande, 2023).

Recent empirical work further expands this picture by highlighting how dynamic capabilities such as sensing, seizing, and reconfiguring function as pivotal catalytic mechanisms that translate environmental pressures and opportunities into concrete circular practices and performance outcomes (Khan, Daddi and Iraldo, 2020; Marrucci, Daddi and Iraldo, 2022). Studies on organizational capabilities and institutional complexity show that institutional pressures and organizational agility co-evolve to drive changes in circular product innovation, production, and recycling processes, suggesting that external catalysts are most effective when combined with internal capability-building (Castro-Lopez, Iglesias and Santos-Vijande, 2023; Arranz, Sena and Kwong, 2024). Parallel research on CE-related innovation capabilities emphasizes eco-innovation, digitalization, and information systems as critical catalysts that both enable new CBMs and mitigate the uncertainty associated with shifting away from linear routines (Bag *et al.*, 2022; Herrero-Luna, Ferrer-Serrano and Pilar Latorre-Martínez, 2022; Sehnem *et al.*, 2022). In particular, AI- and Industry 4.0-enabled solutions are increasingly framed as factors enhancing data-driven resource optimization, predictive maintenance, and traceability (Chauhan, Parida and Dhir, 2022; Lu, Zhao and Liu, 2024; Madanaguli *et al.*, 2024); yet, it is recognized that they interact with organizational capabilities as CE innovation to influence CE implementation (Saari *et al.*, 2024). The literature also underscores the catalytic role of culture and leadership in turning abstract circular ambitions into concrete change through the institutionalization of circular practices (Ali *et al.*, 2022; Re, Sanguineti and Previtali, 2024).

Despite the advancements made, catalysts are still studied as isolated variables, devoting limited attention to how they interact with one another across organizational levels and over time (Sarja, Onkila and Mäkelä, 2021; Seles *et al.*, 2022). However, emerging contributions suggest that effective CE transition depends less on the presence of single enablers but rather on their orchestrated interplay (Lehtimäki *et al.*, 2023; Saari *et al.*, 2024).

3 Methodology

For this research, we adopted a mixed-method design based on two steps, namely a systematic literature review (SLR) and a DEMATEL analysis.

First, we conducted a SLR to identify and synthesize CE catalysts discussed in previous literature in a structured manner (Tranfield, Denyer and Smart, 2003). We relied on the Scopus database due to its comprehensive coverage of high-quality, peer-reviewed journals, and we used a set of keywords related to both CE, catalysts and organizational change (Table 1). We did not include limitations in terms of the time frame of the search and of the subject area, considering the interdisciplinary nature of the topic.

Table 1 Search strategy followed for the SLR.

Database	Table heading style
Keywords	Circular*; circular economy; catalyst*; factor*; driver*; organizational; institutional; corporate; business model; strateg*; change; transformation; innovation; integration
Time frame	No filter
Language	English
Subject area	No filter

This search led us to identify 853 articles that we screened following the PRISMA protocol (Figure 1), considering exclusion criteria such as focus on sustainability rather than on CE or lack of generalizable organizational change dimensions, ending with 37 articles fully coherent with the objectives of this study. We iteratively screened the documents following the defined exclusion and inclusion criteria to ensure coherence in the selection. We adopted a conservative approach whereby, in cases of uncertainty regarding a document's retention, we opted to include it and defer the final decision to the subsequent PRISMA stage. Furthermore, when doubts arose concerning the inclusion or exclusion of an article, we engaged in discussions among ourselves to reach a consensus prior to advancing.

With the SLR alone, we could not identify the interrelations among the catalysts emerging from the literature. Therefore, we applied the DEMATEL technique to improve the understanding of the relationships among these factors (Si *et al.*, 2018). This approach has indeed already been adopted in prior studies to examine the interrelationships among CE enablers and drivers (Gue Ivan Henderson V. *et al.*, 2019; Ardakani, Kiani and Babakhanifard, 2024). We based this analysis directly on the catalysts we identified through the PRISMA protocol. We conducted it in collaboration with a medium-sized Italian engineering firm, founded in the 1970s and employing about 100 people, which specializes in designing and manufacturing complete plants. We engaged nine senior experts, all actively involved in projects that facilitate organizational transitions toward circularity across various sectors. We asked them to complete a standardized questionnaire in which, through pairwise comparisons of the catalysts, they rated influences on a scale from 0 (no influence) to 4 (very high influence). We then aggregated their assessments and calculated the average to create our group direct-influence matrix Z . We then normalized Z by dividing all elements by the maximum row sum to obtain the normalized direct-influence matrix X . We then calculated the total influence matrix T using the formula $T = X(I-X)^{-1}$, where I is the identity matrix. This

matrix captures both direct influences and indirect effects that occur among the catalysts. From T , we computed row sums R (influence dispatched by each factor) and column sums C (influence received by each factor). Finally, we generated an influential relation map (INRM). We calculated prominence ($R+C$), to measure each catalyst's total involvement as both a source and recipient of influence, and relation ($R-C$), to determine whether each catalyst primarily drives or receives influence from others.

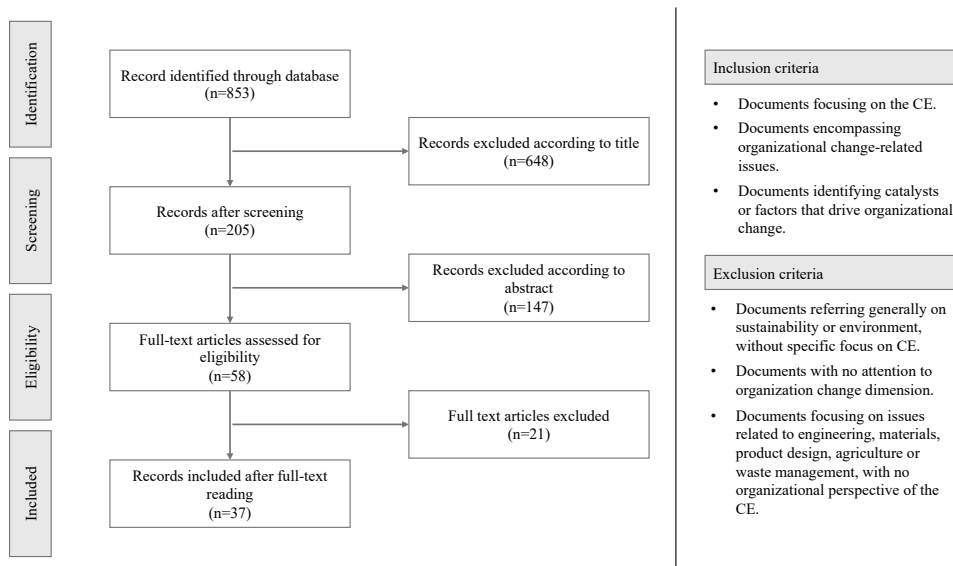


Figure 1 Application of the PRISMA protocol.

4 Findings

Catalysts for the Circular Economy identified in the literature

The literature review identifies ten key catalysts that drive organizational transitions toward the CE (Table 2). Within this framework, we distinguish between eight internal catalysts, stemming from the firm's resources, capabilities, and culture and that determine its capacity to launch and sustain CE initiatives, and two external catalysts originating beyond organizational boundaries that steer adaptation and evolution toward circular models. Internally, the identified catalysts are technology adoption, organizational culture, CE-oriented leadership, CE-oriented human resource (HR) management, circular supply chain management, dynamic capabilities, organizational agility, and CE performance monitoring and environmental management systems (EMS). Externally, institutional pressures and market demand emerge.

Table 2 Catalysts for organizational transition to the Circular Economy.

<i>Catalyst category</i>	<i>Catalyst</i>	<i>Description</i>	<i>Exemplary sources</i>
Internal	Technology adoption	Digital technologies enabling efficiency and traceability	(Chauhan, Parida and Dhir, 2022; Samadhiya <i>et al.</i> , 2023; Saari <i>et al.</i> , 2024; Pattanayak <i>et al.</i> , 2025)
	Organizational culture	Shared values fostering collaboration, transparency, and circular thinking	(Ali <i>et al.</i> , 2022; Re, Sanguineti and Previtali, 2024)
	CE-oriented leadership	Leadership driving vision and collaboration for circular transformation	(Klein, Ramos and Deutz, 2022; Hartmann and Long, 2025)
	CE-oriented HR management	HR practices embedding CE-related skills and competencies	(Jackson <i>et al.</i> , 2011; Klein, Ramos and Deutz, 2022)
	Circular supply chain management	Integrated supply chains enabling closed-loop resource flows	(Bag <i>et al.</i> , 2022; Khan <i>et al.</i> , 2024; Neri <i>et al.</i> , 2025)
	Dynamic capabilities	Ability to sense, seize, and reconfigure for CE	(Khan, Daddi and Iraldo, 2020; Scarpellini <i>et al.</i> , 2020; AL-Khatib, 2023)
	Organizational agility	Rapid adaptation and innovation in dynamic environments	(Castro-Lopez, Iglesias and Santos-Vijande, 2023; Erdiaw-Kwasie <i>et al.</i> , 2023)
	CE performance monitoring and EMS	Systems tracking CE and environmental performance	(Marrucci, Daddi and Iraldo, 2022; Seles <i>et al.</i> , 2022; Khan <i>et al.</i> , 2024)
External	Institutional pressures	Regulatory and societal forces driving sustainability compliance and legitimacy	(Zeng <i>et al.</i> , 2017; Arranz, Sena and Kwong, 2024; Sharma, Singh and Tsagarakis, 2024)
	Market demand	Customer demand pushing circular products and CBMs	(Erdiaw-Kwasie <i>et al.</i> , 2023; Mondal, Singh and Gupta, 2023)

For what concerns internal catalysts, digital technologies stand out as potent enablers, with IoT, AI, big data, and blockchain optimizing resource flows, waste reduction, predictive analytics, and supply chain transparency (Chauhan, Parida and Dhir, 2022; Samadhiya *et al.*, 2023; Saari *et al.*, 2024; Al-kahtib, Alghababsheh and Khattab, 2025; Pattanayak *et al.*, 2025). Organizational culture counters silos and short-termism through values like collaboration, systemic thinking, and transparency, reinforced by teams, training, and management to align behaviors with circularity (Ali *et al.*, 2022; Re, Sanguineti and Previtali, 2024). CE-oriented leadership breaks risk aversion and encourages cross-functional collaboration, balancing innovation with stability and forging external partnerships (Klein, Ramos and Deutz, 2022; Hartmann and Long, 2025). CE-oriented HR management complements this by recruiting green-aligned talent, delivering training, and redesigning incentives to reward circular behaviors, embedding CE as a core norm (Jackson *et al.*, 2011; Klein, Ramos and Deutz, 2022). Circular supply chain management restructures hierarchies into integrated units, enabling closed-loop processes via digital tracking for reuse and efficiency (Khan, Daddi and Iraldo, 2020; Neri *et al.*, 2025). Dynamic capabilities, hence sensing opportunities, seizing via investments, and reconfiguring structures, bridge external volatility to CE performance across environmental and financial metrics (Khan, Daddi and Iraldo, 2020; Scarpellini *et al.*, 2020). Organizational agility fosters rapid reconfiguration and innovation amid uncertainty, aligning firms with market evolution (Castro-Lopez, Iglesias and Santos-Vijande, 2023). Finally, CE performance monitoring and EMS provide measured feedback, drive audits and actions for CE-impact realignment (Marrucci, Daddi and Iraldo, 2022; Seles *et al.*, 2022).

Regarding instead external catalyst, institutional pressures (i.e., coercive, normative, and mimetic) compel legitimacy-seeking CE adaptations, from regulatory compliance to stakeholder-driven behaviors (Zeng *et al.*, 2017; Mondal, Singh and Gupta, 2023; Sharma, Singh and Tsagarakis, 2024). Instead, rising market demand for circular products pressures CE adaptation, spurring durable designs and access-based models like product-as-a-service (Bag *et al.*, 2022; Abbate, Centobelli and Cerchione, 2023).

Relationships between catalysts for the Circular Economy

Based on the set of catalysts previously described, through the DEMATEL analysis we investigated the relationships among these factors. According to the DEMATEL methodology, Table 3, Table 4 and Table 5 respectively show the group direct-influence matrix, normalized direct-influence matrix and total influence matrix.

The total influence matrix (Table 5) shows how each catalyst pushes and pulls on the others: rows track the influence exerted from every factor to the others, while columns show the influence received. Higher values mean stronger connections: for instance, the catalyst of institutional pressures consistently scores high across its row, proving its strong impact on other catalysts. Meanwhile, CE-oriented human resources reach higher values in its column, meaning it mostly receives influence from other factors and plays more of a responding role. The numbers along the diagonal capture how factors indirectly influence themselves through the whole network.

Table 3 Group direct-influence matrix.

	Technology adoption	Organizational culture	CE-oriented leadership	CE-oriented HR management	Circular supply chain management	Dynamic capabilities	Organizational agility	CE performance monitoring and EMS	Institutional pressures	Market demand
Technology adoption	0.000	2.667	2.333	2.667	3.222	3.556	3.222	3.222	3.222	3.000
Organizational culture	3.111	0.000	3.333	3.333	3.111	3.111	3.111	2.333	2.778	2.889
CE-oriented leadership	3.333	3.556	0.000	3.333	3.111	3.000	3.111	2.778	2.333	2.778
CE-oriented HR management	3.000	3.000	2.778	0.000	3.000	2.667	3.333	2.111	2.333	3.000
Circular supply chain management	3.222	3.111	3.111	2.556	0.000	3.111	3.111	2.444	2.778	3.333
Dynamic capabilities	3.333	3.111	2.889	2.889	3.000	0.000	3.222	2.333	2.778	3.222
Organizational agility	3.333	3.222	3.000	3.111	3.222	3.333	0.000	2.778	3.000	3.222
Institutional pressures	3.222	3.667	3.556	3.000	2.889	2.889	2.556	0.000	2.778	3.000
Market demand	2.333	3.000	3.222	3.111	2.889	3.222	3.111	3.000	0.000	3.444
CE performance monitoring and EMS	3.222	2.889	2.889	2.778	3.222	2.667	2.778	2.000	2.778	0.000

Table 4 Normalized direct-influence matrix.

	Technology adoption	Organizational culture	CE-oriented leadership	CE-oriented HR management	Circular supply chain management	Dynamic capabilities	Organizational agility	CE performance monitoring and EMS	Institutional pressures	Market demand
Technology adoption	0.000	0.095	0.083	0.095	0.114	0.126	0.114	0.114	0.114	0.106
Organizational culture	0.110	0.000	0.118	0.118	0.110	0.110	0.110	0.083	0.098	0.102
CE-oriented leadership	0.118	0.126	0.000	0.118	0.110	0.106	0.110	0.098	0.083	0.098
CE-oriented HR management	0.106	0.106	0.098	0.000	0.106	0.095	0.118	0.075	0.083	0.106
Circular supply chain management	0.114	0.110	0.110	0.091	0.000	0.110	0.110	0.087	0.098	0.118
Dynamic capabilities	0.118	0.110	0.103	0.103	0.106	0.000	0.114	0.083	0.098	0.114
Organizational agility	0.118	0.114	0.106	0.110	0.114	0.118	0.000	0.098	0.106	0.114
Institutional pressures	0.114	0.130	0.126	0.106	0.102	0.102	0.091	0.000	0.098	0.106
Market demand	0.083	0.106	0.114	0.110	0.102	0.114	0.110	0.106	0.000	0.122
CE performance monitoring and EMS	0.114	0.102	0.102	0.098	0.114	0.095	0.098	0.071	0.098	0.000

Table 5 Total influence matrix.

	Technology adoption	Organizational culture	CE-oriented leadership	CE-oriented HR management	Circular supply chain management	Dynamic capabilities	Organizational agility	CE performance monitoring and EMS	Institutional pressures	Market demand	Sum (R)
Technology adoption	1.979	2.064	1.983	1.975	2.053	2.055	2.047	1.747	1.867	2.058	19.828
Organizational culture	2.076	1.975	2.008	1.993	2.048	2.039	2.042	1.719	1.851	2.051	19.802
CE-oriented leadership	2.098	2.102	1.918	2.007	2.063	2.051	2.057	1.744	1.852	2.063	19.955
CE-oriented HR management	1.949	1.946	1.872	1.768	1.922	1.904	1.926	1.609	1.727	1.931	18.554
Circular supply chain management	2.059	2.053	1.982	1.950	1.928	2.019	2.021	1.705	1.833	2.043	19.593
Dynamic capabilities	2.061	2.052	1.975	1.959	2.023	1.919	2.024	1.701	1.832	2.039	19.585
Organizational agility	2.156	2.150	2.069	2.056	2.123	2.118	2.014	1.793	1.923	2.134	20.536
Institutional pressures	2.109	2.121	2.045	2.012	2.071	2.062	2.055	1.667	1.878	2.084	20.104
Market demand	2.068	2.085	2.019	1.999	2.055	2.056	2.055	1.749	1.774	2.081	19.941
CE performance monitoring and EMS	1.954	1.942	1.875	1.857	1.928	1.904	1.909	1.605	1.739	1.835	18.548
Sum (C)	20.509	20.490	19.746	19.576	20.214	20.127	20.150	17.039	18.276	20.319	

Figure 2 displays the relation between and the importance of different catalysts. The horizontal axis shows the overall importance of the factors (R+C), where a higher score means higher importance of the catalyst in fostering CE transition. The vertical axis shows the relation (R-C) between the factors: a positive score means that the catalyst influences other catalysts, while a negative score means that catalyst responds to the influence of others. The importance values highlight that organizational agility holds the highest influence within the network, closely followed by technology adoption and organizational culture. These high scores underscore that these catalysts have a central role in facilitating organizational transitions toward CE implementation. Furthermore, from the computation of the relation, we define four catalysts as “proactive catalysts” that initiate and drive CE change: CE-oriented leadership, organizational agility, institutional pressures, and market demand. Their positive net scores show they influence other factors more than they are influenced themselves: so, they ignite and speed up the shift to circular practices. Instead, we define the remaining six catalysts as “reactive catalysts” that embed and sustain CE practices within organizational structures: technology adoption, organizational culture, CE-oriented human resources, circular supply chain

management, dynamic capabilities, and CE performance monitoring and EMS. These show negative net scores, meaning that they react to other catalysts' influence more than they lead.

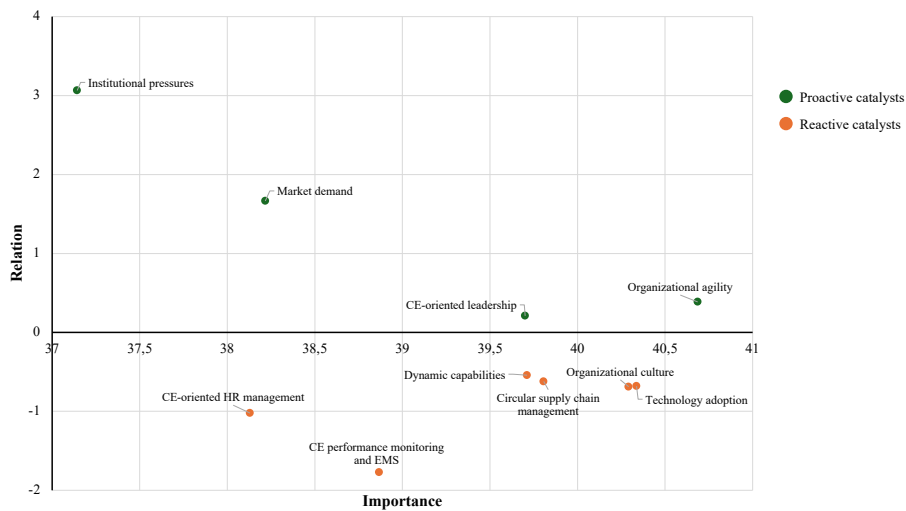


Figure 2 Influential relation map representation.

5 Discussion

Building on the interplay between internal and external forces, the findings highlight that CE transitions are driven by a set of interconnected catalysts that operate systemically rather than independently. These relationships are shown in Figure 3.

Among internal drivers, CE-oriented leadership emerges as a central proactive catalyst, shaping organizational direction and enabling the integration of sustainability across functions. Leadership not only articulates a clear strategic vision and aligns resources with CE goals, but also acts as a bridge between internal capabilities and external expectations (Erdiaw-Kwasie *et al.*, 2023; Hartmann and Long, 2025). Its influence extends across multiple domains. First, leaders actively promote the adoption of digital and green technologies which enhance resource efficiency and enable circular innovation (Khan *et al.*, 2024). Second, leadership fosters a sustainability-oriented organizational culture by embedding circular values into daily practices and HR management processes (Klein, Ramos and Deutz, 2022). Moreover, leadership promotes collaboration across supply chains and ensuring that CE performance monitoring and EMS evolves into strategic mechanisms for continuous improvement (Kristensen and Mosgaard, 2020; Klein, Ramos and Deutz, 2022).

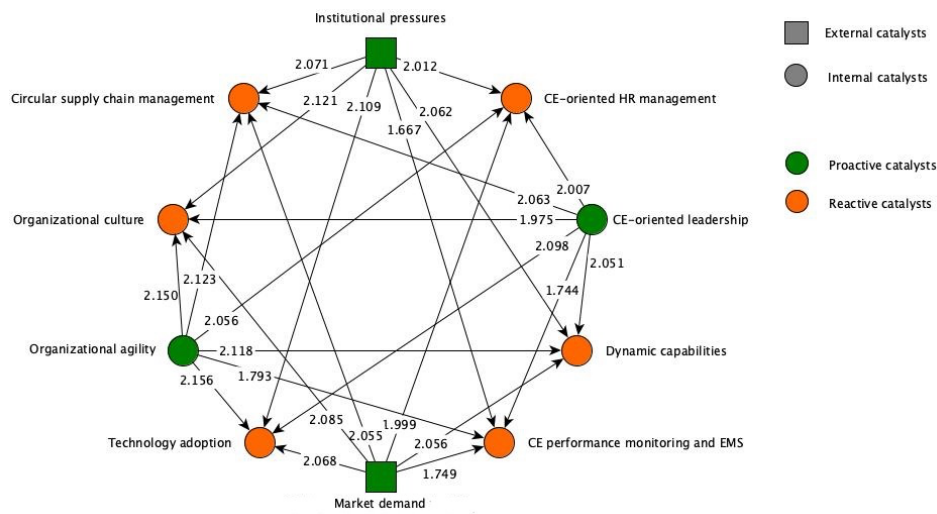


Figure 3 Influence of proactive catalysts on reactive catalysts.

Complementing leadership, organizational agility is another proactive catalyst that determines how effectively firms respond to both internal ambitions and external pressures. Agility reflects the organization's ability to rapidly adapt processes, reallocate resources, and implement CE practices in dynamic environments (Castro-Lopez, Iglesias and Santos-Vijande, 2023). It facilitates the adoption of advanced technologies and, in turn, is reinforced by them, creating a mutually strengthening relationship (Mrugalska and Ahmed, 2021). It also reshapes HR management into a more adaptive and continuous learning-oriented function, enhances responsiveness and coordination within circular supply chains, and strengthens dynamic capabilities by enabling faster sensing and reconfiguration processes (Sun *et al.*, 2022; Mirji, Patil and Mane, 2023). Furthermore, agility enhances and improves the effectiveness of CE performance monitoring and EMS (Fernando and Saththasivam, 2017).

Reactive internal catalysts further reinforce CE adoption. Technology adoption plays a pivotal role by enabling data-driven decision-making, improving efficiency, and supporting innovation in CBMs (Khan, Ahmad and Majava, 2023; Quayson *et al.*, 2023; Al-kahtib, Alghababsheh and Khattab, 2025; Sasso, Filho and Ganga, 2025). Organizational culture, when aligned with sustainability values, fosters collaboration, systemic thinking, and long-term orientation, making circular practices part of the organizational identity. CE-oriented HR management translates strategic intent into workforce capabilities and behaviors, embedding circular thinking through recruitment, training, and performance systems (Jackson *et al.*, 2011; Nayal *et al.*, 2023). Similarly, circular supply chain management operationalizes circularity by restructuring supply chain processes toward closed-loop systems and fostering collaboration and transparency (Meier, Gruchmann and Ivanov, 2023; Neri *et al.*, 2025). Dynamic capabilities enable firms to adapt strategically by sensing opportunities, seizing them, and reconfiguring resources, thereby sustaining competitiveness in changing environments (Khan, Daddi and Iraldo, 2021; Al-Khatib, 2023; Shao *et al.*, 2023). Finally, CE performance monitoring and EMS translate sustainability goals into measurable actions, embedding

accountability and continuous improvement into organizational routines (Mondal, Singh and Gupta, 2023).

Alongside these internal factors, institutional pressures represent a powerful external and proactive catalyst that compels organizations to align with regulatory, normative, and competitive expectations. These pressures extend beyond compliance, acting as triggers for systemic transformation. For instance, regulatory and societal demands accelerate the adoption of advanced technologies and data-driven practices (Bag *et al.*, 2022), while also shaping HR management (Bornay-Barrachina *et al.*, 2023) and promoting the adoption of sustainable supply chain strategies and collaborative practices (Zeng *et al.*, 2017). Additionally, they drive the implementation of CE performance monitoring and EMS as structured mechanisms for environmental accountability (Yuning *et al.*, 2024).

Similarly, market demand acts as an external proactive catalyst by exerting pressure on firms to meet evolving customer expectations. This demand not only drives eco-innovation and technology adoption (Yu and Zeng, 2024) but also leads to the development of transparent supply chains and certified suppliers (Abbate, Centobelli and Cerchione, 2023). It also reinforces the adoption of CE performance monitoring and EMS as a means of demonstrating environmental accountability and maintaining competitiveness in global markets (Nguyen *et al.*, 2023).

Overall, these findings confirm that CE transition is not driven by isolated factors but by a network of mutually reinforcing catalysts (Sarja, Onkila and Mäkelä, 2021; Lehtimäki *et al.*, 2023). Indeed, these catalysts do not operate in isolation: rather, they influence one another in complex and dynamic ways. Proactive catalysts act as initiators, providing direction, motivation, and momentum, while reactive catalysts respond by embedding circular practices into the organizational structure, routines, and processes. Internal drivers determine the organization's readiness and capacity for change, while external forces create the conditions that shape and stimulate internal transformation. This systemic perspective underscores that successful CE adoption depends on the alignment and coordination of multiple organizational dimensions, rather than on single, independent interventions (Geissdoerfer *et al.*, 2017; Graessler *et al.*, 2024).

This study offers two original contributions to the CE literature: (i) it systematizes prior fragmented findings into a coherent set of catalysts shaping the transition from linear to CBMs; (ii) it advances a novel conceptual distinction regarding the role and interaction of these catalysts. Specifically, the study distinguishes between proactive catalysts (e.g., CE-oriented leadership, institutional pressures, organizational agility, and market demand), which initiate and directionally shape organizational change, and reactive catalysts (e.g., technology adoption, organizational culture, and CE performance monitoring and EMS), which embed, operationalize, and stabilize circular practices. Importantly, this distinction goes beyond a categorization of "drivers" versus "enablers". Rather than representing static roles, proactive and reactive catalysts are understood as functionally interdependent elements, which interact among each other to different extents within a dynamic transition process.

The findings also offer clear practical implications for managers, organizations, and policymakers by providing a structured framework to prioritize actions and design targeted CE strategies. For practitioners, the study identifies which catalysts exert the strongest systemic influence and how their interactions shape transition pathways. In particular, the results suggest that organizations can build initial momentum by strengthening proactive levers before scaling reactive mechanisms. This sequencing logic

provides a more actionable roadmap than approaches treating all factors as equally important or simultaneous. Moreover, the framework can function as a diagnostic tool, enabling organizations to assess their readiness for CE transition by identifying gaps between activating forces and embedding mechanisms. For policymakers, the findings reinforce the role of institutional pressures as critical triggers of systemic change, highlighting the importance of consistent and supportive regulatory environments in accelerating CE adoption. Overall, by reframing catalysts as part of a dynamic and interrelated system rather than isolated factors, this study offers both theoretical and practical insights into how circular transformation can be more effectively initiated, coordinated, and sustained.

6 Conclusion

This study aims to explore how organizations transition toward the CE by examining the interplay of multiple catalysts shaping this process. Developing a SLR based on the PRISMA protocol, we built a list of ten internal and external catalysts fostering the organizational transition toward the CE, answering our RQ1. Drawing on DEMATEL analysis, we gained insights related to our RQ2, finding that CE adoption is not driven by isolated catalysts but by a highly interdependent network of factors.

A key contribution of this research lies in identifying and empirically supporting a distinction between proactive catalysts, such as CE-oriented leadership, institutional pressures, organizational agility, and market demand, which initiate and guide change, and reactive catalysts, including technology adoption, organizational culture, CE-oriented HR management, circular supply chain management, dynamic capabilities, and CE performance monitoring and EMS, which operationalize and sustain circular practices within organizational structures. This distinction provides a more process-oriented understanding of CE transition, showing how strategic direction and operational embedding are dynamically linked rather than sequentially independent. In particular, organizational agility, technology adoption, and organizational culture emerge as the most influential elements within the catalyst network, highlighting their role as key leverage points for accelerating systemic transformation toward CBMs.

Despite these contributions, the study presents several limitations that should be acknowledged. First, the scope of catalysts is constrained to those identified through the literature review, and other relevant factors may further shape CE transitions. Second, the methodological approach relies on DEMATEL and expert judgment, which introduces subjectivity and captures relationships at a single point in time, limiting the ability to assess changing or non-linear interactions. Importantly, the empirical analysis is based on the perspectives of nine experts from a single organization. While their insights provide depth and contextual relevance, this relatively small and homogeneous sample may limit the generalizability of the findings. Additionally, the context-specific nature of the study suggests that the identified relationships may vary across industries, organizational sizes, and geographical settings. Future research can build on these findings by expanding the range of catalysts considered, employing a larger and more diverse sample, and adopting longitudinal approaches to capture the evolution of catalyst interactions over time. Comparative studies across sectors and contexts would further enhance the robustness and applicability of the framework.

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