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Integrating Organizational Excellence and Circular Economy for Sustainable Business Performance

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Abstract

This PhD thesis explores the integration of Organizational Excellence and Circular Economy principles as a pathway to enhance sustainability in organizations. Using a quantitative approach, the research investigates 449 private sector organizations in Jordan to understand how the alignment of Circular Economy practices with organizational strategies can drive sustainability. The study employs surveys and statistical analyses, including Cronbach's alpha and regression models, to assess the relationships between Circular Economy implementation and various organizational outcomes, such as innovation, efficiency, and customer satisfaction. Key findings indicate that top management support and well-aligned operations are crucial enablers for successful Circular Economy integration, significantly influencing environmental sustainability and overall organizational performance.

The research contributes both theoretically and practically by providing a framework for integrating sustainability into business excellence models like the EFQM, highlighting the importance of Circular Economy in meeting the United Nations Sustainable Development Goals (SDGs), particularly SDG 12 on sustainable consumption and production patterns. The study offers actionable recommendations for policymakers and organizational leaders, emphasizing the need for a systemic approach to embedding Circular Economy principles within operational and strategic processes to achieve long-term sustainability and competitive advantage.

Keywords:

Organizational Excellence, Circular Economy, Sustainability, Innovation, EFQM

1.0. Introduction

In recent years, the alignment between organizational excellence and the principles of the Circular Economy has emerged as a critical area of research. This PhD thesis explores this nexus with a focus on how such alignment can drive sustainability, both within organizations and on a broader global scale. The significance of this research lies in its attempt to bridge traditional notions of organizational excellence with contemporary sustainability demands, as underscored by global trends like the United Nations Sustainable Development Goals (SDGs). The study employs the framework of the European Foundation for Quality Management (EFQM), which in its 2020 iteration integrates sustainability directly into its criteria, thereby reinforcing that true excellence is inseparable from sustainable practices .

Despite the well-established role of organizational excellence models in achieving outstanding performance and stakeholder satisfaction, there remains a notable gap in how these models incorporate sustainability comprehensively. Traditionally, organizational excellence has focused on quality, efficiency, and stakeholder value. However, the evolving global landscape and the pressing need for sustainable development challenge organizations to extend their focus beyond immediate performance outcomes to include long-term sustainability . This thesis addresses this research gap by exploring how Circular Economy principles, a vital component of sustainability, can be integrated within organizational excellence frameworks to create a more resilient and adaptable business model.

Jordan provides a compelling context for this research. With a private sector that is significantly impacted by resource constraints and a burgeoning commitment to sustainable practices, Jordan offers a microcosm for examining how Circular Economy principles can be practically applied across diverse sectors. The country's Vision 2025 emphasizes sustainable development, further underscoring the relevance of this research in aligning national development goals with the global sustainability agenda . Moreover, by focusing on private sector organizations in Jordan, this thesis aims to deliver insights that are both globally relevant and locally applicable, thereby contributing to the broader discourse on sustainable business practices in emerging economies.

While previous research has explored various facets of sustainability and organizational excellence independently, this study advances the literature by specifically examining their intersection within the framework of the Circular Economy. The thesis builds on existing

research by investigating how the implementation of Circular Economy practices impacts organizational performance metrics such as innovation, efficiency, and customer satisfaction. This is achieved through a mixed-methods approach that includes both a comprehensive literature review and an empirical analysis of 449 private sector organizations in Jordan, using statistical tools like SPSS to validate findings .

In summary, this research contributes to both theory and practice by providing a structured model that integrates Circular Economy principles into organizational excellence frameworks. By doing so, it offers a pathway for organizations to achieve sustainability goals while maintaining high performance and stakeholder satisfaction. The findings will have implications for policymakers, industry leaders, and sustainability advocates seeking to foster a more sustainable and resilient global economy.

1.1. Research Problem

The aim of the research is to identify the alignment between organizational excellence and Circular Economy and how the intended alignment may drive the Circular Economy performance and sustainability of organizations and the globe forward.

The idea is important because organizational excellence is an old concept where many organizations are focusing on, whether in the private or public or NGO sectors, while taking into consideration that such a focus will lead them to outstanding performance results and stakeholders' satisfaction (which are the main aims of organizational excellence through the different international models like European Foundation for Quality Management, Malcolm Baldridge …).

However, as per the new trends in the world linked to the United Nations sustainable development goals (United Nations Sustainable Development Goals 2015-2030) and the developments of excellence models like in European Foundation for Quality Management Model 2020 to embed sustainability and United Nations Sustainable Development Goals more clearly; to emphasize the fact that there is no excellence without sustainability; Its clear in the new European Foundation for Quality Management model 2020 that the focus on sustainable

value needs to be managed from initial stages of creating the value, to co-creation of value with stakeholders, to delivery and throughout the usage of value by customers and stakeholders.

Understanding the benefits of linkages between Circular Economy as part of sustainability with organizational excellence to identify how it supports the adoption and implementation of Circular Economy in a comprehensive and sound model that can lead to a structured approach, better performance results, and better targets achievement of organizations towards sustainability and United Nations Sustainable Development Goals accomplishment is what I will focus on in this research; mainly focusing on SDG #12 (Ensure sustainable consumption and production patterns), while also considering all the other sustainable development goals that are all related to Circular Economy, when considering innovation, partnerships and others.

1.2. Research Questions

1. How can organizational excellence practices be integrated with Circular Economy principles to enhance overall organizational sustainability?
2. What are the key enablers to implementing a Circular Economy approach within organizations aiming to achieve organizational excellence (Organizational Excellence: is to achieve outstanding performance results that sustain to the future, while meeting/exceeding stakeholders' expectations)?
3. How does the adoption of Circular Economy practices impact various dimensions of organizational excellence, such as efficiency, innovation, and customer satisfaction?

1.3. Research Objectives

1. To explore the relationship between the adoption of Circular Economy principles and the enhancement of organizational sustainability and excellence.
2. To identify the key enablers that impact the successful implementation of Circular Economy approaches within organizations aiming for excellence.
3. To assess the impact of Circular Economy practices on various dimensions of organizational excellence, including efficiency, innovation, and customer satisfaction.

4. To develop practical frameworks and guidelines for organizations seeking to integrate organizational excellence practices with Circular Economy principles effectively.
5. To provide evidence-based recommendations for policymakers, leaders, and practitioners on fostering sustainability and excellence through the alignment of organizational practices with Circular Economy principles.

1.4. Hypothesis

- Hypothesis Ho 1: There is statistical significance of positive relationship at the level of α=0.05 between alignment of Circular Economy principles and the enhancement of overall organizational sustainability in Jordan private sector.
    - Hypothesis Ho 1.1: There is statistical significance of top management support at the level of α=0.05 to effect Circular Economy alignment and the organizational sustainability enhancement in Jordan private sector.
    - Hypothesis Ho 1.2: There is statistical significance of the aligned organization's operations with Circular Economy principles α=0.05 to achieve environmental sustainability in Jordan private sector.
- Hypothesis Ho 2: There is statistical significance of enablers at α=0.05 has positive influence on organizations implementation of Circular Economy approach in Jordan private sector.
    - Hypothesis Ho 2.1: There is statistical significance of performance management KPIs at α=0.05 has effect role in Circular Economy implementation in Jordan private sector.
    - Hypothesis Ho 2.2: There is statistical significance of partnerships (suppliers and stakeholders) at α=0.05 are drivers that affect implementing Circular Economy at organizations in Jordan private sector.
- Hypothesis Ho 3: There is statistical significance of Circular Economy implementation at α=0.05 positively that affect the dimensions of sustainability of the organization (including innovation, people, customers, partners, and employees) in Jordan private sector.

    - Hypothesis Ho 3.1 a: There is statistical significance of organizations Circular Economy principles implementation (adopting practices) at α=0.05 to improve Circular Economy performance in Jordan private sector.
    - Hypothesis Ho 3.1 b: There is statistical significance of improved Circular Economy performance at α=0.05 that affect sustainability perception of customers in Jordan private sector.
    - Hypothesis Ho 3.2: There is statistical significance at α=0.05 that innovation framework at the organization mediated the effect of people (employees) involvement in the Circular Economy on the Circular Economy principles implementation in Jordan private sector.
- Hypothesis Ho 4.1: There is statistical significance that enablers mediate the Circular Economy principles implementation at α=0.05 to affect the overall circular economy organizational results in Jordan private sector.
- Hypothesis Ho 4.2: There is statistical significance that enablers mediate the Circular Economy Execution at α=0.05 to affect the overall circular economy organizational results in Jordan private sector.
- Hypothesis Ho 5: There is statistical significance that directions mediate the circular economy principles execution at α=0.05 to affect the overall Circular Economy organization results in Jordan private sector.

2.0. Literature Review

2.1. Sustainability

Sustainability, as defined by the United Nations Brundtland Commission in 1987, refers to "meeting the needs of the present without compromising the ability of future generations to meet their own needs." This concept emphasizes the harmonious coexistence of environmental, social, and economic dimensions. It encompasses the responsible use of resources, protection of ecosystems, equitable social development, and economic growth. Sustainability seeks to address pressing global challenges, including climate change, environmental degradation, and resource depletion, while ensuring that progress does not jeopardize the well-being and opportunities of future generations. It is a guiding principle underlying initiative such as the United Nations' Sustainable Development Goals and various frameworks aimed at achieving a balanced and enduring future for both people and the planet (United Nations, 1987).

In the realm of sustainability research, Cordella, M. et al (2023) stresses the importance of a systematic approach that knits together various sustainability assessment tools and indicators, taking into account both the United Nations' Sustainable Development Goals and the Life Cycle Sustainability Assessment framework. Despite the clear relevance of both references in gauging sustainability at different scales, It points to a critical gap—the lack of an integrated methodology that would allow for a unified assessment approach, emphasizing the untapped potential for synergy between the Sustainable Development Goals and Life Cycle Sustainability Assessment.

Backes and Traverso (2022) echoes the sentiment by highlighting the increasing public and academic focus on sustainability as framed by universally recognized goals such as the Sustainable Development Goals, and the need for comprehensive assessment tools like Life Cycle Sustainability Assessment. They also brings attention to the current deficit in the alignment of Life Cycle Sustainability Assessment indicators with the Sustainable Development Goals, which hampers the effective operationalization of global sustainability objectives. Moving forward, (Guinee, J.B., et al (2013) delves deeper into the Life Cycle Sustainability Assessment framework, describing it as an encompassing method that takes into consideration the full spectrum of sustainability—including environmental, social, and economic factors—by

integrating methodologies like Life Cycle Assessment, Life Cycle Costing, and Social Life Cycle Assessment. It underscores Life Cycle Sustainability Assessment's capacity to provide decision-makers with a nuanced understanding of sustainability-related trade-offs and synergies, thereby facilitating more informed decision-making processes. However, despite its comprehensive scope, the challenge remains in effectively tying the insights provided by Life Cycle Sustainability Assessment to the strategic objectives outlined by the Sustainable Development Goals. Troullaki, K., et al (2021) introduces a new dimension by examining the role of Sustainability Science in addressing complex sustainability challenges.

They critique the current state of Life Cycle Sustainability Assessment, noting that it has not fully absorbed the interdisciplinary and holistic ethos of Sustainability Science. The article suggests that enhancing Life Cycle Sustainability Assessment with Sustainability Science principles would yield a more robust, transparent, and socially responsive framework, better suited to tackle the multifaceted nature of sustainability challenges. The collective discourse presents a compelling case for the development of an integrated sustainability assessment approach that can reconcile the methodological rigor of Life Cycle Sustainability Assessment with the strategic breadth of the Sustainable Development Goals, while also incorporating the interdisciplinary insights offered by Sustainability Science. Such an approach would serve as a cornerstone for advancing the objectives of the Circular Economy, which demands a harmonious balance between detailed operational assessments and broad strategic sustainability goals. This suggests a critical need for cross-collaboration among practitioners and academics in the fields of Life Cycle Sustainability Assessment, Sustainability Science, and Sustainable Development Goals policy-making. This collaboration is essential to craft a holistic sustainability assessment framework that not only evaluates the life cycle impacts of products and services but also aligns with the global imperatives of sustainable development.

I explore the pivotal concepts and findings on sustainability and its integral role in the evolving landscape of the Circular Economy. Bhatnagar, R. et al (2022) underscores the paramount importance of sustainability assessment in contemporary business models, particularly as global society increasingly gravitates towards the pursuit of more sustainable and circular economies. It elucidates the multifaceted challenges inherent in the development of sustainable business

practices, ultimately highlighting the tools and processes that can facilitate the comprehensive evaluation of environmental and societal impacts. Notably, it enunciates several guiding principles encompassing the necessity of delineating clear sustainability objectives, the inclusion of diverse stakeholders in the assessment process, the judicious selection of assessment methodologies congruent with an organization's resources and goals, and the imperative to consider the far-reaching consequences of business models, extending beyond direct effects.

Xu, J. (2023) delves into the dynamic interplay between digital transformation and eco-innovation in the context of Chinese manufacturing companies, providing valuable insights into sustainable performance. Through an empirical study involving 210 manufacturing firms in China, the article discerns that both digital strategy and capability wield a constructive influence on different facets of eco-innovation. Furthermore, these eco-innovations serve as a catalyst for enhanced sustainable performance, fostering a symbiotic relationship between digital transformation and sustainable outcomes. This article resonates with practical implications, advocating the integration of digitalization into strategic planning, interdepartmental collaboration, and the judicious utilization of modern digital tools to fortify decision-making processes.

Moreover, it emphasizes the imperative of nurturing eco-innovation within organizational processes, products, and management practices, highlighting the paramount importance of green awareness and cross-organizational strategies to promote knowledge sharing and coordination.

Andrea, H. B. M., et al (2022) embarks on a journey into the realm of sustainability within the sphere of science education, specifically focusing on the integration of the Sustainable Development Goals and their impact on future educators.

Through a poignant case study involving a Slow Sand Filter activity conducted with prospective primary school teachers, this article unveils a practical approach to nurture sustainable awareness and equip teachers with essential skills for their professional growth. The findings illuminate a profound correlation between positive emotions experienced during the Slow Sand Filter activity and participants' belief in its potential to influence their future science teaching methodologies. This unique intervention transcends the boundaries of addressing real-world environmental issues; it also cultivates problem-solving abilities, augments environmental

attitudes, enriches scientific knowledge, and fosters emotional engagement within the realm of science education.

The study further accentuates the linkage between these positive emotions and heightened self-efficacy perceptions, underscoring the pivotal role of emotional aspects in science education. Additionally, the article underscores the need for extensive research to delve deeper into the intricate relationship between emotions and self-efficacy while emphasizing the critical role of teacher training in effectively integrating sustainability principles, thereby equipping future educators to instill these values in their students. This interdisciplinary approach aligns seamlessly with the evolving needs of modern education by fostering critical thinking, creativity, collaboration, and communication skills, all of which are indispensable for tackling the multifaceted sustainability challenges prevalent in today's world.

Tambe, S., et al (2023) brings a fresh perspective to the discourse, delving into the intricate and often challenging connections between science, policy, and practical implementation in the context of sustainability. This article presents a compelling argument that understanding the complexities of conservation efforts and appreciating the significance of scientific input are pivotal for addressing pressing sustainability issues effectively. While various models and approaches have been proposed to navigate these intricacies, such as linear thinking and the consideration of power dynamics, the article underscores their limitations in providing explicit guidance for practical action. In response to this conundrum, the article posits four main categories of sustainability challenges that need to be addressed comprehensively: knowledge gaps, complex situations, dominance by powerful groups, and intractable problems. To overcome these challenges and bridge the gap between science, policy, and practice, the authors advocate the development and implementation of a conceptual framework. Such a framework would serve as a guiding compass, enabling stakeholders to navigate the complexities of sustainability effectively and align their actions with the ever-evolving realities of the contemporary world. The synthesis underscores the interconnected nature of environmental, social, and economic sustainability within the framework of the Circular Economy.

These perspectives emphasize that businesses, educational institutions, and policymakers must adopt a holistic and multidisciplinary approach to address the multifaceted challenges posed by sustainability. For businesses, integrating sustainability assessment into their models and

leveraging digital strategies for eco-innovation are imperative steps towards fostering more environmentally and socially responsible practices. In the realm of education, the emotional engagement of students and comprehensive teacher training play pivotal roles in instilling sustainability values from an early age. Furthermore, bridging science, policy, and practice is not only essential but also achievable through the careful development and application of conceptual frameworks. These frameworks provide a roadmap for addressing complex and dynamic sustainability challenges, ultimately paving the way for a more sustainable and circular future for our global society.

Saulick, P., et al (2023) brings attention to the contemporary call for businesses to integrate sustainable practices into their daily operations, driven by growing awareness of the adverse impacts their activities can have on the environment and society. It introduces the concept of Business Sustainability Performance Assessment as a means to gauge the efficacy of sustainability efforts within businesses. Within this framework, various assessment methods, tools, and techniques are explored, revealing a diverse landscape of approaches utilized to evaluate sustainability performance. However, it is worth noting that the search for a definitive and universally accepted method for conducting such assessments remains ongoing, underscoring the intricate and multifaceted nature of the task at hand. The assessments typically scrutinize how businesses influence the environment, society, and their financial performance, signifying their broad-ranging relevance across diverse industries and sectors. Eikelenboom, M., and Marrewijk, A. V. (2023) shifts the focus to the behavioral aspects of sustainability within organizations, with a particular emphasis on the construction industry's transition towards circular practices. This elucidates the dynamics of collaborative efforts and highlights the potential hurdles that may hinder progress.

Drawing on real-life projects, the research underscores the transformative power of reflection, evaluation, ideation, implementation, and the integration of innovative practices into standard operations. These activities are shown to be pivotal in overcoming challenges and advancing the cause of circular construction, with an emphasis on the need for collective collaboration and a paradigm shift in customary practices. Ba, Y., and Galik, C. S. (2023) delves into the impact of historical industrial transitions on sustainability planning, capabilities, and performance. Drawing from a national survey and decades of employment data in the U.S., the research

unveils a correlation between fluctuations in manufacturing jobs and the success of sustainability initiatives. This underscores the challenges posed by one-size-fits-all sustainability programs and highlights the importance of involving local communities. Moreover, the speed and extent of industrial changes are shown to significantly affect the ability of communities to adapt and plan effectively, particularly impacting vulnerable groups.

The interconnectedness of sustainability planning, capabilities, and outcomes is stressed, emphasizing that improvements in one area can lead to enhancements in others. Stam, K., et al (2023) explores the intricate relationship between learning and sustainability transformations, drawing from the analysis of practical papers. It delves into the concept of learning as the acquisition of knowledge through social interactions and the attribution of significance to gained information. The research reveals the nuanced nature of the relationship between learning and change, which remains somewhat ambiguous. It highlights the need for a more profound exploration of various aspects of learning's role in sustainability transformations, including its types, outcomes, influence within established systems, and by influential figures. The complex interplay between learning and societal change is emphasized, with the research calling for a more comprehensive understanding of this dynamic.

These synthesized insights underscore the multifaceted and interconnected nature of sustainability within the Circular Economy. The perspectives presented here span diverse dimensions of sustainability, from assessment methodologies to behavioral change, economic fluctuations, and the role of learning. As a researcher in the Circular Economy, these findings collectively reinforce the notion that achieving sustainability goals within the Circular Economy requires a holistic and multidimensional approach. It is evident that sustainability encompasses not only environmental considerations but also behavioral, economic, and educational aspects, all of which are intricately interconnected. In the Circular Economy, meaningful progress necessitates a comprehensive understanding of these dimensions and their integration into cohesive strategies and practices. By acknowledging the multifaceted nature of sustainability and adopting a multidisciplinary approach, the Circular Economy can make significant strides towards a more sustainable and resilient future for all.

Ba, Y., Galik, C. S. (2023) delves into the intricate relationship between historical shifts in industrial activities and the concerted efforts of local governments to promote sustainability. It

unravels the nuanced dynamics at play, revealing that communities undergoing significant fluctuations in manufacturing job opportunities often face formidable challenges in sustainability planning. Furthermore, the attainment of sustainability goals, such as energy conservation and recycling, can become elusive in such contexts. This underscores the paramount importance of considering not only the pace but also the magnitude of industrial transitions when conceiving and implementing sustainability initiatives. It underscores the multifaceted nature of sustainability transitions, suggesting that rapid shifts away from traditional industries could potentially complicate local sustainability endeavors.

Moreover, it highlights the significance of bottom-up, community-driven efforts as key drivers for successful sustainable transitions. Importantly, it underscores the need for tailored capacity-building approaches that account for the unique contextual factors at play. Additionally, it intriguingly suggests that reconciling seemingly conflicting priorities, such as economic development and sustainability, can give rise to synergistic solutions. Such insights have far-reaching implications for policymaking and administration, particularly in the context of contemporary legislation geared towards addressing climate and sustainability goals. Furthermore, it offers a potential bridge between sustainability transitions and public management research, pointing towards ways in which sustainable behaviors can be promoted at both individual and organizational levels, while fostering enhanced collaborations across sectors. Gebhardt, L., and Bachmann, N., (2023) embarks on an exploration of how media representations shape public understanding and perceptions of sustainable entrepreneurship, specifically within the vibrant ecosystem of Berlin. This investigation employs the lens of social representations and scrutinizes the portrayal of sustainable entrepreneurial actions and their broader implications for sustainability transitions.

Analyzing newspaper articles spanning a decade, from 2010 to 2020, related to sustainable entrepreneurship, it unveils the significant role played by media in rendering entrepreneurial actions comprehensible and relatable to the wider public. Through the lenses of media, events such as award ceremonies and trade fairs become focal points, shining a spotlight on specific ways in which entrepreneurs contribute to sustainability. An intriguing dimension emerges as sustainable entrepreneurs are categorized into roles such as localists, researchers, advocates,

challengers, and change-makers. These roles are not static but dynamically shaped by media representations, subsequently influencing entrepreneurs' communication strategies and decision-making processes. Thus, this underscores the media's influential role in shaping public understanding of sustainability efforts undertaken by entrepreneurs and illuminates how different entrepreneurial roles can contribute to broader sustainability changes within their respective ecosystems.

Schlüter, L., et al (2023) pivots my attention to the realm of sustainable business model (SBM) innovation, with a particular emphasis on the integration of Systems Thinking principles. They advocate for the incorporation of Systems Thinking into tools designed for sustainability assessment during the nascent stages of sustainable business model innovation. It underscores the pivotal role that a systemic approach plays in comprehending sustainability impacts more effectively and minimizing unintended negative consequences. It passionately champions the cause of enhancing sustainability assessments by effectively infusing key Systems Thinking principles into these assessment tools. The emphasis lies on the collaborative design of such tools, aligning them with a systemic perspective to provide holistic insights into the sustainability implications of evolving business models. This call for integration and adherence to Systems Thinking principles ultimately serves as a powerful lever to bolster sustainability assessments and, in turn, support the development of sustainable business models. It recognizes that a comprehensive grasp of sustainability entails embracing the systemic intricacies of interconnected elements, reflecting the quintessence of Circular Economy principles.

Through Havas, A. (2023) an intriguing perspective is unveiled, one that introduces a novel approach to studying goal-oriented transformative change. This approach seeks to address societal challenges by orchestrating systemic changes that transcend traditional boundaries. goal-oriented transformative change initiates its journey by rallying key stakeholders, individuals, and entities genuinely committed to driving substantive change. It identifies and acknowledges the limitations inherent in existing partial models, urging for an integrated method that holistically considers how technology, economy, and society interact within the transformative landscape. To formulate a comprehensive framework, it identifies four fundamental aspects to be considered: the overarching objective of goal-oriented transformative

change , the diverse forms and levels of change it can potentially encompass, the intricate mechanisms that drive change, and the criteria employed for its evaluation. A meticulous review is conducted, delving into three distinct research strands—Innovation Studies, Social Innovation, and Sustainability Transitions. Each strand is examined with an astute eye, revealing its strengths and weaknesses in contributing to the understanding of goal-oriented transformative change processes. Innovation Studies emerge as a strand primarily focused on business innovation but holding the potential for broader inclusion of actors and a more profound understanding of cognitive influences on innovation processes.

However, Innovation Studies is found to lack a robust ethical dimension and neglects non-commercial impacts, suggesting room for enhancement. Social Innovation, although valuable, is deemed less sophisticated compared to its counterparts—Innovation Studies and Sustainability Transitions research. It tends to underestimate the roles of science, technology, and top-down changes in inducing transformation, and grappling with the measurement and categorization of different levels of change remains a challenge within Social Innovation. Sustainability Transitions, on the other hand, emerges as a strand that champions a normative agenda but may inadvertently overlook various societal and business objectives that guide the trajectory of goal-oriented transformative change . It is sometimes perceived as excessively emphasizing bottom-up learning processes.

However, it lays significant groundwork for understanding transitions from a sustainability perspective. It concludes with a resounding call for the amalgamation of ideas emanating from these distinct strands to foster a comprehensive understanding of goal-oriented transformative change processes. It is suggested that a systematic analysis of various innovation models within these strands, coupled with rigorous testing of the integrated framework within real-life goal-oriented transformative change processes, holds the potential to bring about transformative change that aligns policy goals, fosters the flexibility for policy experiments, engenders normative discussions, and builds the necessary capacities to enact profound transformations. This strategy carries the promise of delivering more effective strategies, not only for different actors but also for public policies at large, thereby addressing the intricate dynamics of change across technology, institutions, and practices.

Baumle, P., et al (2023) propels me into the sphere of knowledge intermediation within the context of sustainability transitions and digitalization. It uncovers a critical gap in the understanding, shedding light on the crucial roles of knowledge intermediation and transition intermediation in fostering effective policymaking. Drawing insights from interviews conducted with German knowledge intermediaries, it meticulously identifies three pivotal functions of knowledge intermediation that actively contribute to socio-technical transitions: information dissemination through events, knowledge exchange facilitated by networking, and implementation support provided through consulting. It unveils the burgeoning and increasingly active role played by knowledge intermediation in regional transitions.

Furthermore, it unravels new functions that extend beyond the traditional scope of knowledge intermediaries, including the identification and monitoring of digital innovation projects geared towards sustainability. The implications of these insights extend beyond mere theoretical understanding; they underscore the fundamental importance of knowledge transfer in addressing complex societal challenges at a regional level. Moreover, this revelation suggests that intermediation must evolve to encompass multiple functions that collectively offer comprehensive support for transitions. Such transitions, encompassing elements of sustainability and digitalization, invariably demand multifaceted intermediation strategies. This, in turn, positions knowledge intermediaries as active facilitators in advancing sustainability transitions and lending support to policy and regional development endeavors.

Collectively, These illuminate various dimensions of sustainability within the Circular Economy. They underscore that sustainability is not a monolithic concept but an intricately woven tapestry of interrelated facets, each demanding its unique considerations and strategies. As a researcher entrenched in the realm of the Circular Economy, these findings reverberate with resonance, affirming the necessity of adopting a holistic and multidimensional approach to address sustainability challenges comprehensively. Sustainability transcends the boundaries of environmental concerns to encompass economic, societal, and communicative dimensions, all inextricably interwoven within the Circular Economy's overarching framework.

The multifaceted nature of sustainability within the Circular Economy becomes palpably evident through the examination of these diverse perspectives. These facets of sustainability traverse historical contexts, media influences, systemic thinking, transformative change, and knowledge intermediation. In the Circular Economy, meaningful progress necessitates a comprehensive understanding of these dimensions and their skillful integration into cohesive strategies and practices. By acknowledging the multifaceted nature of sustainability and embracing a multidisciplinary approach, the Circular Economy stands poised to make significant strides toward a more sustainable, resilient, and inclusive future for all. It is within the intricate interplay of these facets that the promise of sustainable circularity finds its fulcrum, urging to navigate this multifaceted terrain with wisdom, adaptability, and purpose.

2.2. Organizational Excellence

The discourse on business excellence has undergone a significant transformation since its inception in the 1960s, a journey encapsulated in the narrative of Ghicajanua, M., et al (2015), which traces the origins and development of the business excellence concept, underlining its expansion from a focus on profit and operational efficiency to a broader, more inclusive approach that encompasses strategic decision-making, quality management, ethical conduct, corporate culture, and most importantly, social and environmental stewardship. Pioneered by industry experts like Peters, Waterman, Heller, and Collins, and institutionalized through frameworks such as European Foundation for Quality Management and Malcolm Baldrige National Quality Award, business excellence has come to represent an aspirational benchmark that transcends the traditional confines of business metrics to include a company's responsiveness to the socio-economic climate and its capacity for sustainable innovation.

In a similar vein, Jankalova, M. (2012) addresses the acute need for businesses to embrace excellence as a strategy to differentiate themselves in a saturated global marketplace. It posits that in the face of fierce competition, business excellence should be viewed as a dynamic, evolving process rather than a static achievement. It stresses that business excellence cannot be adequately captured through financial indicators alone; it requires a composite view that also takes into account the satisfaction levels of both customers and employees, alongside the quality of processes. It points to the adoption of comprehensive assessment methodologies, such as the

Balanced Scorecard and principles of Total Quality Management, which are instrumental in driving forward a culture of continuous improvement and delivering value to all stakeholders, including shareholders, customers, and the broader society.

Contrastingly, Jankala, R., and Jankalova, M. (2016) hones in on the modern imperative for businesses to extend their scope of excellence to include environmental sustainability and the well-being of the community at large. It emphasizes the European Foundation for Quality Management Excellence Model 2013 as a tool for measuring corporate social responsibility, illustrating how this model has evolved to embed sustainability and Corporate Sustainability Reports into its core criteria. It underscores the importance of such models in evaluating business practices, suggesting that a company's commitment to Corporate Sustainability Reports is as indicative of its excellence as its financial and market performance. This model's alignment with economic, social, environmental, and voluntary Corporate Sustainability Reports facets evidences a paradigm shift towards recognizing the interdependence of business success and societal health. Merging the perspectives paints a comprehensive picture of the trajectory of business excellence, moving from traditional financial and market share metrics to a more expansive framework that also prioritizes environmental integrity and social equity. This progression mirrors the ethos of the Circular Economy, which champions resource efficiency and ecosystem sustainability. For businesses to truly exemplify excellence in the modern era, they must not only deliver robust financial results but also drive innovative practices that are environmentally sound and socially beneficial. As such, the synthesis of these historical and contemporary views on business excellence forms an integral part of the literature, illustrating the shifting paradigms in business strategy that are essential to advancing the principles of the Circular Economy. It provides a rich, textured, underscoring the imperative for businesses to evolve beyond traditional measures and align with the sustainable, socially responsible tenets of the Circular Economy.

In the scholarly discourse on the European Foundation for Quality Management and its role in the pursuit of business excellence, a pronounced emphasis on the human dimension within organizations emerges as a recurring theme. Escrig, A. B., and Menezes, L. M. D. (2015) offers a deep dive into the patterns of European Foundation for Quality Management model adoption,

revealing a methodical process heavily influenced by the People criterion. This criterion's prominence in driving high performance is not incidental but rather indicative of a broader trend where quality management and human-centric approaches are inextricably linked.

The narrative suggests that institutions promoting business excellence models not only equate the importance of various criteria but also scrutinize the interplay between them, advocating for a holistic adoption strategy. This strategy, in turn, is posited to yield better results and foster sustainability-oriented practices within organizations. Building on this, Asgher, U. at al (2015) reinforces the critical role of human factors across various business excellence frameworks, including the European Foundation for Quality Management model. It posits a consistent thread among different excellence awards that highlight the centrality of people within organizational structures. This emphasis is strikingly consistent across diverse cultural contexts, suggesting a shared global understanding of the intrinsic value of human factors in shaping organizational quality and performance.

Further extending this theme, Calvo-Mora, A., et al (2014) articulates the direct impact of Total Quality Management social factors—leadership, openness, flexibility, and continuous improvement—on the effectiveness of quality systems and overall organizational outcomes. It also emphasizes the technical aspects of Total Quality Management, such as process management and partnerships, and their role in mediating the effects of social practices on outcomes. It underscores a synergistic relationship between the social and technical dimensions of quality management, suggesting that both are vital to achieving comprehensive excellence. This dual focus is particularly relevant in the context of sustainability efforts within organizations, where the technical management of resources must be complemented by a culture that values social factors. From the perspective of a researcher in the Circular Economy, these insights collectively suggest a profound link between the human-centric focus in business excellence and the core principles of sustainability and resource efficiency that underpin the Circular Economy. The European Foundation for Quality Management model's integration of human factors is not merely a facet of organizational performance but a fundamental component that aligns with the Circular Economy's emphasis on responsible and sustainable resource management.

By prioritizing human elements, organizations are more likely to adopt practices that not only enhance performance but also advance sustainability goals. This relationship between human-centric quality management and sustainability is essential for businesses aiming to embody the principles of the Circular Economy. This offers a nuanced analysis, asserting that the integration of human factors into business strategies is crucial for catalyzing a culture of sustainability and social responsibility—tenets that are at the heart of the Circular Economy.

The literature pertaining to Total Quality Management within the framework of the European Foundation for Quality Management offers a complex tapestry of how various facets of Total Quality Management converge to sculpt an organization's path to excellence. Irani, Z. et al (2004) delves into the intricacies of organizational culture, stressing the indispensable nature of a culture steeped in customer focus, collaborative teamwork, and unending process betterment. It posits that such a culture, when married with an ethos of innovation, becomes a catalyst for not just achieving but maintaining a competitive stance in an ever-evolving business environment. It points to the notion that an organization's culture is not a peripheral aspect but rather the bedrock of sustained business success, with a direct bearing on the organization's capability to navigate and excel in a fluctuating global milieu. Zárraga-Rodríguez, M., and Álvarez, M. J. (2014) builds on this premise by exploring the intersection of Total Quality Management and information capability.

It elucidates how Total Quality Management frameworks like the European Foundation for Quality Management model can act as vehicles for organizational performance enhancement through an ethos of continual improvement and adept information management. It underscores the concept of Information Orientation as a tripartite construct comprising technology, management prowess, and a values-based approach, positing that the strategic harnessing of information is a lynchpin in the wheel of Total Quality Management practices. This suggests that a strategic alignment of Total Quality Management models with robust information capabilities is not merely an operational advantage but a fundamental requirement for enduring organizational excellence and sustainability. Calvo-Mora, A., et al (2015) the focus shifts to the application of the European Foundation for Quality Management Excellence Model in the realm of knowledge management, asserting that the model serves as an exemplary foundation for initiatives aimed at enhancing business outcomes.

Through a methodical analysis of companies well-acquainted with the European Foundation for Quality Management evaluations, it articulates the suitability of the European Foundation for Quality Management model as a vessel for knowledge management projects, particularly highlighting the salience of process methodologies and the inclusion of suppliers and partners. It paints the European Foundation for Quality Management model as an all-encompassing management system that imparts essential excellence concepts and criteria, which not only guide the implementation of knowledge management initiatives but also their assessment. The RADAR logic scheme, a component of the European Foundation for Quality Management model, is accentuated as a significant influencer in determining the impact of knowledge management on business results, signaling an advantageous blend of Total Quality Management principles and knowledge management practices.

These scholarly discourses collectively underscore the synergistic amalgamation of organizational culture, information management, and knowledge management under the auspices of the European Foundation for Quality Management model and broader Total Quality Management principles as a critical driver for sustainable business excellence. This synthesis suggests that the alignment of these multifarious elements is inextricably linked with the principles of the Circular Economy, which places a premium on resource efficiency, waste reduction, and the sustainable lifecycle management of products and services. As organizations endeavor to reach the pinnacle of excellence in the current economic climate, the incorporation of these various soft and hard Total Quality Management elements within their strategic armamentarium is not just advantageous but imperative. The analysis presented herein offers an extended, rich exploration for the literature on organizational excellence, underscoring the European Foundation for Quality Management model's significant role in championing the tenets of the Circular Economy.

Suárez, E., et al (2017) underscores the versatility of the European Foundation for Quality Management model, revealing its successful application across a spectrum of sectors, including education, tourism, and various business enterprises. This model, acclaimed for its focus on pivotal elements such as strategic orientation and resource management, is shown to significantly boost business outcomes. It proposes an evolution in the European Foundation for Quality Management model's focus, suggesting that an increased emphasis on customer-centric

and strategic components could enhance its utility in bolstering business performance. Recognition through the European Foundation for Quality Management model is associated with elevated performance and reputation, illustrating the model's capacity to influence organizational success positively. Bayo-Moriones, A., et al (2011) presents an empirical study contrasting the impacts of ISO 9000 and European Foundation for Quality Management on innovative work practices.

The findings indicate that European Foundation for Quality Management exerts a stronger positive influence compared to ISO 9000 in the adoption of such practices. It highlights European Foundation for Quality Management's role in enhancing employee involvement in improvement groups and fostering the formation of self-directed teams, particularly for new project initiatives, signifying the model's emphasis on employee empowerment and participative management.

It suggests that European Foundation for Quality Management is conducive to the creation of sustainable work environments that resonate with human resource principles and contribute to overarching business performance. It introduces the Sustainability Excellence Framework (SEF), tailored for industrial companies to enhance their sustainability performance. The framework utilizes a self-assessment tool, grounded in the PDCA (Plan, Do, Check, Act) management method, enabling businesses to evaluate and improve their environmental sustainability measures. Hsien, C., et al (2021) emphasizes the framework's utility in assessing sustainability progress through qualitative and quantitative means, highlighting its role in identifying areas of weakness and strategizing for environmental performance enhancement. Wen, D. (2016) examines the adoption of the Performance Excellence Model in specific regions of China, demonstrating its varied impact on organizational improvement.

It reveals that implementation of this model correlates with differential advancements across organizational facets and that such advancements contribute positively to financial outcomes. The analysis accentuates the role of effective process management as a cornerstone for sustainable development and underscores the need for equitable process enhancement across different categories. Jaegera, A., et al (2014) delves into the shift from Operational Excellence to Operations Excellence, clarifying how Operations Excellence presents a more comprehensive approach for enduring operational success. It discusses the development of an Operations

Excellence assessment framework that acknowledges the significance of enablers such as organizational culture and employee empowerment, thus addressing the previous overemphasis on results rather than the enablers of those results.

This shift is indicative of a growing recognition of the need for adaptability and individualized assessments to achieve operational excellence, emphasizing the imperative for ongoing improvement and long-term sustainability in operations. This underscore the necessity for an integrated approach that combines quality management systems with sustainability objectives. The detailed analysis reveals that frameworks like the European Foundation for Quality Management model, particularly with its potential recalibration towards customer and strategic emphases, align well with the Circular Economy's emphasis on sustainable business practices, resource efficiency, and long-term value creation. This comprehensive examination offers profound insights into the role of quality management systems in enhancing not only operational efficiency and employee engagement but also in promoting environmental stewardship.

The conclusion drawn from these articles is that the European Foundation for Quality Management model, due to its holistic and flexible nature, is particularly apt for organizations striving to achieve sustainability goals within the Circular Economy framework. This extended discourse signifies the critical role of quality management frameworks in championing the principles of the Circular Economy and their application in various industrial and geographical contexts. Taking this into consideration, its important to define organizational excellence as meeting/exceeding the expectations of stakeholders while sustaining outstanding performance results to the future. Results include both internal operational and strategic results, while stakeholders include all personal and entities affected by the organization and affect the organization within the ecosystem that organizations operate in. Organizational excellence involve all aspects of the business and operational model of organizations while ensuring its well interrelated and connected to support smooth operations, agile and mature capabilities, adopting of best practices and continuous improvement across all processes.

2.3. Circular Economy, Sustainability and Excellence

In the pursuit of sustainability, the United Nations Brundtland Commission defined the concept in 1987 as "meeting the needs of the present without compromising the ability of future generations to meet their own needs" (United Nations, 1987). This thesis incorporates this definition and explores the Circular Economy within the framework of the European Foundation for Quality Management, which describes it as an alternative to the traditional linear economy. According to this definition, resources are kept in use for as long as possible, maximizing their value, and recovering and regenerating products at the end of each life cycle (EFQM, 2020).

The Circular Economy, as outlined by Lehmann et al. (2022), is positioned as a transformative system that steers economic growth towards sustainability by redesigning production and consumption patterns to enhance resource efficiency and minimize environmental impact. This approach, which emphasizes robust frameworks, aims to intertwine economic impacts with sustainability. In line with this, Lehmann et al. (2022) emphasize the importance of human capital development, research initiatives, and educational efforts as essential tools for building awareness about Circular Economy principles.

Rodríguez-Espíndola et al. (2022) highlight the role of small and medium-sized enterprises (SMEs) in this discourse. SMEs constitute a significant portion of global economic activity, yet they often lag in sustainable practices, as indicated by a British Chambers of Commerce survey that found many SMEs are not actively engaged in measuring their carbon footprint (British Chamber of Commerce, 2021). This gap in environmental accountability underscores a disconnect between policy and practice, particularly within SMEs. Although the European Union provides clear parameters for defining SMEs based on size and financial criteria (European Commission, 2020), sustainability practices are often not explicitly addressed. This highlights the need for SMEs to bridge the gap between academic and policy-level aspirations for sustainability and the operational realities of businesses.

The necessity for inclusive stakeholder engagement is pivotal, as Ranta et al. (2021) argue, to effectively integrate Circular Economy principles into SME operations. This entails a collaborative approach that involves SMEs, government bodies, and value chains working together to shift from a linear to a regenerative system. Dey et al. (2022) further explore this dynamic by examining Spanish SMEs, uncovering a positive correlation between Circular Economy practices—like product design, procurement, and distribution—and sustainability

outcomes. This research underscores that while SMEs face hurdles in production and distribution processes, embracing an iterative learning process is key to maturing these practices.

Challenges and opportunities vary across regions. In Spain, for instance, Ormazabal et al. (2018) identify reluctance among SMEs to adopt Circular Economy practices due to perceived economic uncertainties and operational difficulties. In contrast, Rodríguez-Espíndola et al. (2022) analyze Mexican SMEs, finding that customer expectations and government support are significant drivers for Circular Economy adoption. These insights suggest that effective government policies and consumer demand can play vital roles in fostering a conducive environment for Circular Economy practices, ultimately enhancing economic, environmental, and social outcomes.

Innovation is central to the Circular Economy, as Rodríguez-Espíndola et al. (2022) and Rantala et al. (2021) advocate for a shift from product-centric to service-centric models. This transition is particularly relevant in the context of the fourth industrial revolution, where data analytics and digital technologies blur the lines between physical and digital spheres. As Santa-Maria et al. (2021) assert, aligning innovation with sustainability requires agile change management, collaboration, and performance monitoring across environmental and social dimensions.

The European Foundation for Quality Management model offers a structured pathway to embed Circular Economy practices within organizations, combining sustainability with excellence and quality principles. As Rincón-Moreno et al. (2021) and García-Sánchez et al. (2021) discuss, performance metrics and strategic resource utilization are crucial for overcoming Circular Economy barriers, such as waste reduction and material reuse. The EFQM model supports an integrated ecosystem approach, where excellence in direction, execution, and results align with Circular Economy principles, laying a foundation for organizational resilience and adaptability.

In summary, transitioning towards a Circular Economy within SMEs and broader organizational frameworks is a multifaceted challenge. It requires a robust blend of innovative methodologies, collaborative stakeholder engagement, and supportive government policies. As the literature highlights, this transition involves navigating complex value chains, fostering a culture of sustainability, and addressing diverse geographic and sectoral challenges. These insights

reinforce the importance of a holistic approach to Circular Economy practices, positioning them as essential for economic viability and environmental stewardship in the long term.

2.4. Circular Economy and Real Options Theory

In an examination of the sustainability practices within the realm of Circular Economy, Rodrigo-González A. et al (2021) outlines the prevalent discord between the objectives of investors and companies, which traditionally prioritize financial returns, and a subset of consumers who are increasingly favoring sustainable practices over mere profit-driven initiatives. This discrepancy highlights a critical alignment issue across the various stakeholders within the value chain. Achterberg, E., and Hinfelaar, J., (2016) presents a constructive response to this alignment challenge by advocating for an integration of real options theory with financial models, thereby potentially uncovering the inherent value of flexibility and uncertainties within Circular Economy activities. It specifically references the Value Hill model, promoting a systemic change from a linear to a circular approach, encompassing reuse, refurbishment, remanufacturing, and recycling, to extend the lifecycle of products.

Rodrigo-González A., et al (2021) delves into the technical application of real options theory, distinguishing between European and American style options and how they can quantitatively measure the sustained value generation in Circular Economy's phases, with an objective of maintaining a positive Net Present Value throughout. Conversely, Vargo, S.L., and Lusch, R. F. (2004) shifts the focus towards critiquing the current financial modeling methodologies and the mindset that underpins them, arguing for a strategic transformation that emphasizes product longevity and integrates services to enhance the product's lifespan and value. This argument is predicated on the service-dominant logic, which suggests a co-creation of value with customers throughout the product's lifecycle. To synthesize these perspectives, the discourse within the Circular Economy highlights a tension between profit maximization and the imperatives of sustainability, calling for a collaborative and flexible approach that integrates financial modeling with sustainability goals.

The adoption of real options theory in financial calculations acknowledges the uncertainties inherent in sustainable practices, aiming to reveal hidden values in product lifecycles and encourage a systemic shift towards the Circular Economy (Achterberg, E., and Hinfelaar, J.

2016). The practical implementation of such theories requires nuanced understanding and application of different financial instruments to ensure value is maintained across all phases of a product's lifecycle (Rodrigo-González A., et al 2021). Ultimately, a broader strategic shift is advocated for, wherein the longevity of products and customer engagement in value creation become central to the business models, challenging traditional financial practices and aligning with the ethos of sustainability (Vargo, S.L., and Lusch, R. F. 2004). In essence, this underscores the need for an evolved business ethos that marries financial viability with environmental stewardship, potentially resolving the conflict between corporate profitability and the sustainability demands of consumers and the environment.

As articulated by Rodrigo-González A., et al (2021), they underscore a transformative shift from a traditional goods-dominant logic to a service-dominant one, which is underpinned by the advent of the 4th industrial revolution. This revolution is characterized by an integration of services management, data management, Big Data, artificial intelligence, and machine learning, which collectively enhance the durability and sustainability of products by leveraging the data-driven insights that these advanced technologies afford. Such a shift is emblematic of the Circular Economy's emphasis on extending the lifecycle of products, thereby reducing waste and promoting resource efficiency. Building upon this foundation, sourced from the work of Kaplan R., and Norton D., (2007), introduces the Balanced Scorecard system as a strategic framework that encompasses four perspectives—financial, customer, internal processes, and learning and growth. These perspectives emphasize the importance of holistic strategic objectives that include, but are not limited to, financial outcomes. The Balanced Scorecard framework aligns with the Circular Economy's systemic thinking by integrating considerations for employee empowerment, process efficiency, customer satisfaction, and ultimately, financial sustainability. It reflects a multidimensional approach to business that mirrors the multifaceted objectives of the Circular Economy.

Further expanding on the implications of the Balanced Scorecard framework, again by Rodrigo-González A., et al (2021), elucidates the synergy between the four perspectives of the Balanced Scorecard and sustainable profit generation. The narrative suggests that investment in human capital, specifically through training, catalyzes improvements in operational efficiency and project execution. This, in turn, enhances product quality and lead times, which positively

impacts customer satisfaction and loyalty, leading to increased market share and financial gains. This interconnectivity echoes the Circular Economy's principle of creating closed-loop systems where resource inputs, waste, emissions, and energy leakage are minimized through slow, closed cycling. Moreover, drawing from the insights of Porter M., and Karmer R., (2006), elevates the conversation by emphasizing the critical role of social responsibility and development in sustainability initiatives. It argues that these aspects are now critical factors in customer decision-making processes and are deeply intertwined with all four perspectives of the Balanced Scorecard. This underlines the concept of social sustainability as a fundamental aspect of the Circular Economy, where economic activities are conducted with a conscious commitment to social well-being and ethical responsibility.

It becomes evident that modern business strategies, increasingly recognize the imperative of aligning economic pursuits with ecological and social stewardship. This convergence is reflected in the adoption of technologies that prolong product lifespans, in strategic frameworks like the Balanced Scorecard that promote organizational resilience, and in the recognition of the intrinsic value of social responsibility. Such a holistic approach to business is emblematic of a Circular Economy's vision, which is not merely content with profit maximization but is dedicated to the establishment of a resilient, adaptive, and sustainable economic system that is capable of thriving within the planet's ecological boundaries and contributing positively to society. This offers a comprehensive backdrop in the field of Circular Economy, providing a robust foundation from which to argue for the integration of these principles into the fabric of modern business operations for enduring and sustainable economic development.

When navigating the intricate relationship between strategic management, agile methodologies, and the utilization of data to refine business operations, specifically within the ambit of the Circular Economy, Klingebiel, R., Ander R. (2015) lays the groundwork by elucidating the principles of the real options theory, underscoring its pertinence in maneuvering uncertainties via a framework of flexibility and step-wise resource dedication. The narrative advocates for a measured approach that resonates with the agile ethos, enabling firms to thrive amid fluctuating market scenarios by strategically scaling their commitments. Progressing to (The KPI Institute,

2023), the narrative broadens to incorporate the imperatives of agility in strategy formulation, underscoring the vitality of responsiveness to external dynamism.

The prose accentuates the need for enterprises to be nimble in their process architectures, technology embracement, and resource redistribution, with an emphasis on fostering a culture imbued with leadership, empowerment, and innovation. It extends to the strategic echelons of business execution (The KPI Institute, 2023). Subsequently, (PMI, 2011) delves into the pragmatic realm of agile project management, once the exclusive domain of software development but now a ubiquitous framework across various sectors. It commends the methodology's minimalistic planning ethos, iterative progression, and pliability, which collectively endorse a continuous deployment and client-centric feedback loop, echoing the sentiments of real options theory and agile strategies outlined previously (PMI, 2011). Shifting the lens to the Circular Economy, Loenen, B., et al (2021) contemplates the criticality of open data, juxtaposing its potential to bolster circular practices against the backdrop of challenges it poses. It recognizes the efficacy of such an approach when data is leveraged in a cyclical manner, thereby fostering an ecosystem of perpetual refinement and stakeholder feedback.
Concluding the series, Zhang M., at al (2022) homes in on the transformative potential of social media analytics within the hospitality industry, articulating how insights garnered from these platforms can enlighten marketing strategies and enhance customer engagement, drawing parallels with the data-centric models discussed by Loenen, B., et al (2021).

In synthesis, when examining the Circular Economy, the interplay between agile management, judicious application of real options theory, and the informed exploitation of data—both open and social media-derived—emerges as a compelling narrative. It present a formidable strategy for businesses to pivot towards more resilient, sustainable models, blending agile project execution with sophisticated data analysis. This resonates with the Circular Economy's ethos, where economic prosperity harmonizes with environmental stewardship and the orchestration of closed-loop systems that minimize waste and advocate resource regeneration.

2.5. Circular Economy and Choice Overload as a component of Behavioral Economics

Choice Overload

In the multifaceted domain of consumer behavior, the phenomenon of choice overload acts as a significant determinant of purchasing patterns. Through Chernev, A., et al (2015), a pivotal observation is made that the probability of a consumer finding a satisfactory product escalates with the increase in available choices, positing that this effect is moderated by a blend of extrinsic and intrinsic factors. Extrinsic factors encompass task-specific elements such as the number of available alternatives, the attributes of these options, time constraints, and the necessity for decision justification, as well as context factors like option similarity and the presence of dominant options within the choice set. On the other hand, intrinsic factors are intimately tied to the consumer's personal knowledge and motivation, culminating in the establishment of an 'ideal point' for decision-making.

This framework stipulates that organizations can leverage these factors to guide consumer choices, thereby influencing behaviors such as choice satisfaction and decision regret. In contrast, Park, J-Y., and Jang, S. (2013) conveys a more nuanced perspective within the tourism industry, identifying a curvilinear pattern where consumer contentment with choices peaks at an assortment size of 22 options. This specific insight further refines it by pinpointing a threshold beyond which the benefit of additional options diminishes, and choice overload begins to resurface. Such industry-specific findings offer a granular understanding of how assortment size can be optimized to mitigate the paradox of choice, subsequently reducing the potential for decision paralysis and fostering more confident consumer behavior.

Delving into the notion of product uniqueness, Sthapit, E. (2018) presents a counterintuitive stance wherein the presence of choice overload is negated in the selection of souvenirs, proposing that a broader spectrum of choices may in fact be desirable in scenarios where uniqueness is a valued attribute. This exception to conventional theories about choice overload underscores the contextual variability in consumer decision-making, suggesting that the attributes of the products themselves can significantly influence the preference for choice quantity. Yun, J., and Duff, B. (2017) introduces another dimension to the discussion by analyzing the impact of categorization on the experience of choice overload. It finds that

taxonomic categorization, which groups products based on inherent characteristics, is more effective at mitigating choice overload than thematic categorization, which groups products based on external themes or narratives. Accordingly, the manner in which options are presented to consumers can profoundly affect their decision-making process, where well-structured taxonomic categorization can lead to higher satisfaction and a greater sense of ease in making choices, thus potentially leading to more decisive and confident consumer actions.

Synthesizing these scholarly perspectives, it becomes evident that choice overload is a multi-dimensional construct influenced by an array of factors, from the number of choices to the method of categorization, and from the intrinsic motivation of the consumer to the unique attributes of the product. These insights are invaluable for designing consumption models that not only prioritize sustainability but also consider the cognitive and emotional bandwidth of the consumer. By understanding and respecting the complexity of choice architecture and its profound influence on consumer behavior, practitioners and theorists in the Circular Economy can endeavor to create systems that not only reduce waste and encourage the reuse of resources but also align with the psychological and practical realities of consumer decision-making. The integration of consumer behavior theories into the development of Circular Economy strategies is not just beneficial but essential, as it ensures that sustainable practices are accessible, attractive, and ultimately adopted by the consumer base, thereby contributing to the holistic success of the Circular Economy.

Changing Behavior for Sustainability

The exploration of Circular Economy within organizational and industrial contexts underscores the complex role of influencing sustainable consumer behavior. Coskun et al. (2015) emphasize that sustainability in product design extends beyond creating eco-friendly products to understanding consumer behavior and its role in product acceptance. Designers, as agents of behavior change, must incorporate strategies targeting and influencing behaviors through iterative design processes. Educational efforts, such as awareness programs and behavior-modifying reward systems, play crucial roles, while social comparison drives sustainable choices by inspiring competition and aspiration.

Ebersbach and Brandenburger (2020) highlight storytelling as a powerful educational tool for promoting sustainable thinking. Storytelling simplifies and humanizes sustainability principles, making them accessible and impactful for all age groups, fostering a shift in perception and behavior. This aligns with broader behavioral approaches and supports a dynamic process where educational, psychological, and design innovations converge to drive sustainable change.

Horng et al. (2022) advocate integrating environmental stewardship into tourism and hospitality education as a foundational step to align future professionals' mindsets with consumer sustainability preferences. Al-Thawadi et al. (2021) discuss Qatar's transportation sector, suggesting that public awareness of the environmental impacts of private vehicle use can gradually shift preferences toward public transit. Borowskia et al. (2020) emphasize using behavioral 'nudges' and social media to promote eco-friendly transportation, fostering behavioral change through iterative communication and feedback mechanisms.

Patwa et al. (2021) explore the unique challenges emerging economies face in adopting Circular Economy practices. These regions struggle with limited resources, varied consumer behaviors, and diverse government policies. The acceptance of remanufactured products and the use of products as services depend heavily on consumer attitudes. The study highlights the importance of the 3R principles (Reduce, Reuse, Recycle) and extended product lifecycles in promoting sustainable consumption, stressing that adaptable, region-specific policies and education are crucial for effective Circular Economy adoption.

Achieving sustainability within the Circular Economy requires a multifaceted strategy involving education, public awareness, and digital engagement to influence behavior. Combining educational empowerment, mass communication, and strategic policy frameworks can shift societal behavior towards environmental sustainability. This integrated approach supports the resilience and effectiveness of the Circular Economy, enabling the sustainable management of resources and ensuring ecological balance for future generations.

2.6. Circular Economy and Gaming Theory

The exploration of Circular Economy in organizational contexts highlights the role of game theory in managing sustainability complexities. Mulazzani and Manrique (2017) demonstrate that game theory supports strategic decision-making amid uncertainties, aligning with

Sustainable Development Goal 17 on partnerships. Bayesian networks help decision-makers anticipate and adapt to market and environmental shifts, optimizing collaboration across organizations.

Alizadeh-Bashan and Taleizadeh (2020) illustrate how game theory complements Circular Economy, especially through the principles of reduce, reuse, and recycle, by analyzing supply chains using evolutionary game theory. The Stackelberg model enhances supply chain coordination, creating a structured decision-making hierarchy that promotes sustainability.

Game theory acts as a bridge between theoretical research and practical Circular Economy implementation by clarifying complex interactions and equipping organizations for flexible, sustainable decisions (Palafox-Alcantar et al., 2020). This approach harmonizes the interests of environmental, economic, and social stakeholders, reinforcing the Circular Economy model. Educational integration of game theory can prepare future leaders for sustainability-oriented decision-making (Whalena et al., 2018).

The textile and fashion industries, with their significant environmental impact, require Circular Economy frameworks. Jia et al. (2020) note that only 20% of textiles are recycled, necessitating fundamental business model changes (Saccani and Bressanelli, 2022). Game theory can help balance sustainability and profitability by aligning stakeholder interests (Rodrigo-González et al., 2021).

Kristoffersen et al. (2021) emphasize that digital transformation presents opportunities for Circular Economy by using data analytics to optimize resources. Suarez-Eiroa et al. (2021) support aligning Circular Economy strategies with sustainability goals through structured operational principles. Reslana et al. (2022) advocate for standardized Circular Economy metrics, underscoring the need for comprehensive frameworks (Castro et al., 2022) that account for regional differences.

In summary, Circular Economy, backed by game theory and systematic frameworks, offers a path to sustainable development by balancing economic growth with environmental stewardship across various industries and practices.

2.7. Circular Economy and Performance

In the academic landscape of Circular Economy research, the examination of how this economic model can be effectively transitioned into, measured, and evaluated is critical. Rinco´n-Moreno,

J., et al (2021)presents an argument that advancing towards a Circular Economy necessitates significant alterations in production, consumption, business models, and value chains. However, it identifies a critical gap in understanding and clarity regarding the metrics for assessing Circular Economy performance, particularly emphasizing the integration of sustainability indicators early in the transition phase. The absence of a standardized methodology for such evaluations poses a challenge to the alignment of Circular Economy initiatives with the Triple Bottom Line, which is essential for navigating the complexities of this multidimensional field. Parallel to this, Kravchenko, M., et al (2020) offers an application-oriented perspective by assessing the potential of Corporate Sustainability Reports as a tool for measuring organizational circularity.

By classifying indicators into relevant aspects of the Circular Economy and observing that a significant majority can be directly measured through Corporate Sustainability Reports, this approach highlights the practical utility of existing corporate disclosures. It also sheds light on the current variability and calls for the development of standardized indicators to foster better transparency and comparability amongst organizations embarking on the Circular Economy journey. Adding a comparative dimension, Ibanez-Fores, V., et al (2022) delves into the impacts of different Circular Economy value sources, like renewable energy and recycling, on sustainable development parameters such as GDP, emissions, and employment across European nations. The differential impacts observed suggest that Circular Economy practices are not a one-size-fits-all solution and must be context-specific, tailored to address unique economic, environmental, and social outcomes in various settings.

Furthering this on standardization, Knäble, D., et al (2022)) discusses the urgent need for clear, actionable metrics at micro, meso, and macro levels to assess the circularity of products and systems. An empirical study within Spanish companies across sectors provides a snapshot of how tailored metrics can offer insights into a company's Circular Economy strategies, suggesting the significant potential for these metrics to be adopted widely for a nuanced assessment of circularity. It becomes evident that while the imperative for Circular Economy is clear, the methods for its implementation and assessment remain fragmented. One must consider that for Circular Economy to be more than a theoretical ideal, there needs to be a harmonious and universally accepted framework for measurement and assessment. Such a framework would

enable organizations to align their strategies with sustainable practices more effectively and allow for benchmarking and sharing of best practices across borders and sectors. This suggests that the journey towards a sustainable, Circular Economy is not only about adopting circular principles but also about developing a cohesive system of evaluation that facilitates comparison, encourages accountability, and fosters an environment of continuous improvement. This represents a call to action to collaboratively develop and refine the tools and indicators that can accurately reflect the nuances of Circular Economy performance, contributing to the overall goal of sustainable development.

In the discourse surrounding the Circular Economy, a critical examination of the measurement and evaluation mechanisms reveals a multidimensional challenge faced by researchers and practitioners. Through addressing the financial evaluation of circular business models, Kanzari, A., et al (2022) emphasizes the significance of developing financial performance assessments that are congruent with the unique nature of circular operations. It reflects a notable research deficit, particularly in the financial evaluation during the early stages of business model development, urging the adaptation of financial tools to effectively encapsulate the full lifecycle of circular business models.

Contrastingly, when pivoting to the broader sustainable development framework within the Circular Economy, it presents a classification system for indicators based on their strategic focus and measurement approach. This classification is particularly relevant to the European context and underscores the discrepancy in the current emphasis on material conservation over function preservation, such as product sharing, revealing a skew in indicator development towards material recycling without adequate coverage of the Circular Economy's comprehensive scope (Moragaa, G., et al, 2019).

Moreover, it lends a practical perspective by analyzing the current state of Circular Economy practices within multinational enterprises through sustainability reports, thereby unearthing a concentration on environmental and economic impacts with a marginal acknowledgment of social dimensions. This exposes the need for explicit recognition of the various underlying assumptions of Circular Economy indicators, which are crucial for shaping the transition toward circular supply chains (Calzolari, T., at al, 2022).

In synthesis, one discerns a consistent call across all accounts for the development of robust, multi-faceted indicators capable of capturing the essence of Circular Economy models. They outline an interdisciplinary approach required to fill the identified gaps. For a meaningful transition to a Circular Economy, the creation and implementation of measurement tools should not only reflect the complex interplay of environmental, economic, and social factors but also support the diverse and holistic nature of circular strategies. The insights suggest an imperative for a harmonized framework that integrates a lifecycle perspective, comprehensive sustainability goals, and an explicit understanding of underlying methodological assumptions to drive forward the Circular Economy. This would enable a more accurate reflection and incentivization of sustainable practices, thereby fostering an effective transition from linear to circular models.

2.8. Circular Economy and business models

This analysis provides a comprehensive exploration of the role of Circular Economy principles within organizational value chains, integrating insights from a range of studies to illustrate the multifaceted impact of Circular Economy practices. Eisenreich et al. (2022) emphasize the diverse implications of Circular Economy across areas such as procurement and reverse logistics. Notably, these authors highlight the evolution of Circular Economy research, particularly in Europe, advocating for a shift from traditional linear frameworks to interconnected models that capture the full scope of circular practices. This evolution is echoed in the work of Brandstrom and Eriksson (2022), who argue that traditional linear models fail to adequately represent the nuances of Circular Economy initiatives, thereby advocating for more integrated approaches that encompass all stages of the value chain.

The review also examines the drivers and barriers to adopting Circular Economy business models, as outlined by Hina et al. (2022). This includes an exploration of both intrinsic factors, such as leadership and innovation, and extrinsic factors, like societal expectations and regulatory frameworks. These findings underscore the importance of a balanced approach that incorporates both internal capabilities and external pressures. Additionally, Heyes et al. (2018) address the unique challenges within the service sector, particularly in the Information and Communication

Technology industry. They suggest that smaller firms in this sector could benefit from frameworks like 'Backcasting and Eco-design' to promote user-centric, rather than product-centric, approaches to sustainability.

In examining consumer-oriented Circular Economy strategies, Bocken and Konietzko (2022) draw attention to the historical focus on business-to-business models, highlighting a gap in consumer-centered approaches. By investigating companies like H&M and IKEA, they underscore the critical role of visionary leadership and a commitment to environmental values in driving Circular Economy strategies. The authors reveal that while much of the literature has traditionally focused on industrial applications, there is growing recognition of the need to engage consumers in these initiatives through strategies such as repair and reuse, which contribute to a broader cultural shift towards sustainability.

Kristoffersen et al. (2021) delve into the convergence of business analytics and Circular Economy, illustrating how digital tools and analytics frameworks can bolster resource optimization and enhance Circular Economy implementation. They advocate for the use of advanced data-driven approaches to navigate the complexities of sustainability, arguing that analytics can facilitate more informed decision-making and ultimately lead to improved organizational performance.

Further supporting the need for structured methodologies, Suarez-Eiroa et al. (2021) propose a tripartite framework for Circular Economy, which includes aligning strategies with operational principles. Their study identifies twelve key operational principles that provide a foundation for assessing the effectiveness of Circular Economy initiatives, highlighting the diversity of governmental approaches and the varying degrees of emphasis on sustainability and resilience across different strategies.

Research by Reslana et al. (2022) underscores the urgency of resource limitations and the need for standardized Circular Economy frameworks. They critique the lack of uniform metrics, which complicates efforts to assess and compare the success of Circular Economy initiatives globally. Similarly, Henry et al. (2021) explore the connections between the Circular Economy and the Sharing Economy, proposing that the Sharing Economy, characterized by peer-to-peer interactions, may function as a subset of the broader Circular Economy.

Finally, Zisopoulos et al. (2022) advocate for a holistic, stakeholder-inclusive approach to Circular Economy, emphasizing that true sustainability requires the balancing of efficiency and resilience. They propose adopting nature-inspired frameworks to enhance the adaptability of Circular Economy systems, aligning with broader ecological principles. Castro et al. (2022) support this by addressing the "rebound effects" that can undermine environmental benefits in Circular Economy applications, arguing for a systemic approach that incorporates geographical, cultural, and technological considerations.

In conclusion, this body of research underscores the need for a multidimensional perspective on Circular Economy, integrating digital transformation, stakeholder engagement, and flexible strategic frameworks. As Circular Economy models continue to evolve, it is crucial for organizations and policymakers to embrace a comprehensive approach that addresses the intricacies of sustainability, fostering resilience, and promoting long-term environmental stewardship.

3.0. Data and Methodology

This chapter describes the methodology of the PhD thesis, the study population and sample, the statistical analyses tests, and the sources of data collection, validity, and reliability of study instrument.

I applied the descriptive analytical method to achieve the purposes of the study. The descriptive method is used to describe the impact of the variables Organizational excellence and and Circular Economy on Sustainability Maturity. The analytical method is used to explain the possible impact of Organizational excellence and Circular Economy on Sustainability Maturity. Furthermore, this study is utilizing an inductive approach, as the study is concerned with the generation of new knowledge emerging from the data testing starting from specific measurements to broader generalizations and conclusions.

In this study, the quantitative approach is adopted because it offers estimates of the large population; evaluate their characteristics with statistical accuracy, and measuring their opinions, and how they react toward a specific case. In addition to its suitability to test the hypotheses, Survey strategy is chosen to conduct an empirical study were the study instrument, the questionnaire, is used to collect the data from a large audience.

The population of the study consists of individual companies from the private sector in the Hashemite Kingdom of Jordan, who can be more independent in choosing their strategies and approaches to handle challenges in their ecosystem without the need to wait for a general governmental direction, or regulation or law.

Selecting Jordan as the focal point for my Ph.D. thesis on the correlation between Circular Economy and organizational excellence to support sustainability direction holds substantial merit. As a researcher, my choice to study this intersection in Jordan is grounded in several factors that enhance the relevance and impact of the research:

Leveraging Jordan’s strategic Middle Eastern location to explore the intersection of Circular Economy practices and organizational excellence. Jordan's diverse economic sectors, including manufacturing, tourism, services, and agriculture, provide a rich context for examining Circular

Economy principles' application and impact across various industries. The country's economic and environmental challenges, such as resource scarcity and waste management, align with the government's Vision 2025 for sustainable development and innovation, offering a backdrop for actionable insights that support national development strategies. Jordan's manageable population size benefits the research's feasibility, enabling effective data collection and engagement with participants for in-depth analysis. The study aims to shed light on the role of sustainability, cultural, and social dynamics in shaping organizational behaviors and the adoption of Circular Economy practices, contributing empirical evidence to inform policies and strategies for sustainable practices. Furthermore, this research is poised to enrich academic discourse on Circular Economy and organizational excellence, especially in the Middle Eastern context, with significant implications for policymakers, industry leaders, and sustainability practitioners in Jordan and beyond.

In summary, the choice to study the correlation between Circular Economy and organizational excellence in Jordan is strategically sound. The country's diverse economic landscape, development priorities, regional significance, and commitment to sustainability align well with research objectives. Findings will not only contribute to academic scholarship but also offer actionable insights for organizations, policymakers, and stakeholders in their pursuit of sustainability and organizational excellence.

Selecting the private sector as the focus of the Ph.D. thesis on the correlation between Circular Economy and organizational excellence to support sustainability direction is a strategically astute decision. It holds significant value due to the unique characteristics and dynamics of this sector:

Private Sector

- Market Dynamics and Innovation: The private sector is driven by market dynamics, competition, and innovation. Exploring the correlation between Circular Economy practices and organizational excellence in this context can shed light on how businesses integrate sustainable practices to enhance competitiveness and adapt to changing market demands.
- Decision-Making Autonomy: Private sector organizations often possess greater decision-making autonomy. This enables them to implement Circular Economy strategies and innovative

practices without bureaucratic constraints, potentially leading to faster adoption and experimentation.

- Profit-Driven Motivation: Private companies seek profit while integrating sustainability. The research can unveil how Circular Economy practices align with profitability goals, demonstrating that sustainable business practices can contribute to financial success.
- Scalability and Replicability: The private sector's scalability and replicability potential mean that successful Circular Economy practices can be widely adopted across industries, magnifying the positive impact on sustainability and organizational excellence (Danish Trade Union Development Agency, 2023)

3.1. Research Sample

Based on the aim of this research, the unit of analysis is adopting Circular Economy along with integration with organizational excellence. A control question is presented in the research instrument to make sure that the respondents fit the selection criteria.

Jordan has approximately 150,000 registered private sector companies, the majority of which are classified as micro, small, and medium-sized enterprises (MSMEs). These micro, small, and medium-sized enterprises are critical to Jordan's economy, representing around 98.5% of all registered businesses and employing a significant portion of the workforce.

Most of these private sector companies, particularly micro, small, and medium-sized enterprises, are predominantly located in Amman, the capital city. Amman is the economic hub of Jordan, housing the majority of businesses across various sectors including services, manufacturing, and trade. The city's infrastructure, business environment, and accessibility make it an attractive base for businesses looking to serve both local and regional markets. Amman hosts the largest concentration of businesses in Jordan. Reports have shown that approximately 55-65% of all registered businesses in Jordan are located in Amman, making it the main economic hub of the country. This includes thousands of micro, small, and medium-sized enterprises (MSMEs) spanning sectors such as trade, services, and manufacturing. Based on above figure, it can be estimated that Amman alone accounts for around 82,500 to 97,500 of businesses, given the percentage range mentioned. Comparison to other municipalities; other major cities like Irbid and Zarqa have significantly fewer businesses. Irbid, for instance, has been estimated to host

approximately 10-15% of the country's businesses, while Zarqa accounts for 8-12%. (Department of Statistics of Jordan, Jordan Chamber of Commerce, Leaders International).

To ensure a comprehensive understanding of how Circular Economy principles and organizational excellence apply across different sectors, I targeted a wide array of companies, irrespective of their size, industry, or ownership structure. This broad approach was necessary due to the absence of a centralized communication platform or agency that could distribute the questionnaire to specific types of companies. Generalizing the sample allowed for a more inclusive representation, capturing insights from diverse organizational contexts. This inclusivity is particularly important as the excellence model and Circular Economy principles have universal relevance across various sectors. Additionally, this approach maximized the potential to gather data reflective of the entire spectrum of Jordan's private sector, thereby strengthening the validity and applicability of the findings.

Selecting a sample size of 449 organizations from the private sector in Jordan and mainly from the capital city Amman for the Ph.D. thesis research on the correlation between Circular Economy and organizational excellence to support sustainability direction, is a methodical and well-considered decision taking into consideration that 384 or more measurements/surveys are needed to have a confidence level of 95% that the real value is within ±5% of the measured/surveyed value. Due to the following:

- **Representation and Diversity**

  A sample size of 449 organizations provides a substantial representation of the private sector in Jordan. It allows for capturing a diverse range of industries, sizes, organizational structures, and operational practices. This diversity enhances the generalizability of findings to a broader context, enabling to draw meaningful conclusions that can be applied across sectors (Cochran, W. G., 1977). Cochran's book on sampling techniques is a classic reference in the field of research methodology. It emphasizes the importance of sample size and statistical significance in drawing accurate conclusions from research studies.

- **Statistical Significance**

  A sample size of 449 is considered statistically significant for quantitative research studies. It provides a level of confidence in the reliability of findings and supports the establishment of meaningful relationships between variables. A larger sample size helps mitigate potential biases and increases the robustness of statistical analyses (Pallant, J., 2016). Pallant's manual provides practical guidance on using Statistical Package for Social Sciences (SPSS) for data analysis. It emphasizes the importance of a sufficient sample size to ensure valid statistical results.

- **Addressing Variability**

  Jordan's private sector landscape may exhibit variations in terms of organizational culture, practices, and approaches to sustainability. A larger sample size allows to address these variations and identify patterns, trends, and correlations that might not be apparent with a smaller sample (Hair, J. F., et al. 2019). Hair et al.'s book discusses the significance of sample size in multivariate data analysis, which is crucial when studying complex relationships between variables.

- **Enhanced Validity**

  A larger sample size contributes to enhancing the internal validity of research. It reduces the likelihood of chance results and minimizes the impact of outliers, leading to more accurate and reliable findings. This is particularly important when examining complex relationships between variables (Creswell, J. W., 2014). Creswell's work emphasizes the relationship between sample size, research design, and the validity of study findings across different research methodologies.

- **Informed Decision-Making**

  With a diverse sample of 449 organizations, research findings will provide insights that are valuable not only to the participating organizations but also to policymakers, industry associations, and other stakeholders. A larger sample allows to make informed recommendations that can positively impact organizational strategies and sector-wide initiatives (Roscoe, J. T., 1975). Roscoe's work highlights the importance of sample size in minimizing sampling error and increasing the generalizability of research findings.

- **Addressing Variability in Responses**

  In surveys and questionnaires, we might encounter variations in responses due to factors such as organizational size, industry, and culture. A larger sample size helps in addressing these variations by allowing for subgroup analysis, which can reveal more nuanced insights within

specific categories (Field, A., 2018). Field's book discusses the importance of sample size determination and its impact on statistical power and the reliability of research results.

- **Cross-Validation of Results**

  A larger sample size enables you to cross-validate findings by comparing results across sectors and identifying consistencies or discrepancies. This strengthens the reliability of conclusions and helps you differentiate between factors that are sector-specific and those that are more universally applicable (Fowler, F. J., 2014). Fowler's comprehensive guide to survey research methods emphasizes the necessity of an adequate sample size to ensure reliable and valid survey results.

Selecting a sample size of 449 organizations from the private sector in Jordan is justified by its ability to provide robust and meaningful insights into the correlation between Circular Economy practices, organizational excellence, and sustainability direction. This sample size enables to conduct comprehensive analyses, draw reliable conclusions, and contribute to both academic knowledge and practical applications within the context of Jordan's diverse economic landscape.

The collected data was subjected to coding, followed by computer entry and subsequent processing using the Statistical Package for Social Sciences (SPSS). The researcher adopted a significance level of 0.05% for hypothesis testing. To accomplish the study's objectives and test its hypotheses, a combination of descriptive statistical methods and inferential statistical methods were employed.

3.2. Data Collection Methods

The study relied on two main methods of data collection sources:

Secondary Data Sources

The study's methodology incorporates a wide range of sources—books, scientific journals, university theses, published papers, electronic sources like the Department of Statistics reports, and databases—to ensure a well-rounded exploration of Circular Economy and its link to organizational excellence in sustainability. This multi-faceted approach facilitates a comprehensive understanding by incorporating diverse perspectives and findings from both

theoretical and empirical research. Consulting peer-reviewed literature enhances the credibility and rigor of the study, while electronic and database sources keep it current and relevant, reflecting the latest global research trends. This inclusion of a global perspective ensures the findings account for varied cultural, economic, and environmental contexts.

Utilizing books and related literature lays the theoretical foundation, while journals and case studies provide practical applications. The integration of structured questionnaire data, aligned with the European Foundation for Quality Management (EFQM) and Circular Economy lens, offers primary data insights to support evidence-based conclusions. The study's use of multiple sources strengthens its reliability by triangulating findings and identifying common trends and gaps. This methodological rigor not only enhances the credibility of the research but also inspires innovative analytical approaches and ensures robust, evidence-based outcomes that contribute significantly to the field.

The sample was gathered between January 2023 and January 2024, employing a combination of online and paper-based approaches to ensure maximum participation and coverage. Primarily, email communication was utilized to reach out to companies, particularly targeting managers and upper-level management personnel. Additionally, liaising with associations managing private sector companies in Jordan facilitated access to a broader pool of potential respondents. The questionnaire was strategically designed to target individuals in managerial positions, ensuring that respondents possessed the requisite authority and insight to provide valuable input. While the questionnaire was made accessible to a wide range of individuals within the organizations, emphasis was placed on engaging managers and upper-level management to ensure the relevance and reliability of the collected data. This approach aimed to capture diverse perspectives while prioritizing the insights of key decision-makers within the sampled organizations. Furthermore, it is pertinent to acknowledge that in some instances of paper-based questionnaire distribution, certain questions have remained unanswered. This occurrence will be duly noted and highlighted in the results section of the thesis, where the number of valid questionnaires will be explicitly stated. This transparent reporting ensures the integrity of the data analysis process and provides a comprehensive understanding of the limitations associated with the survey methodology.

Research Instrument

The questionnaire (as in Appendix 1) was developed in English with Five-point Likert scale ranging from: 1, 2, 3, 4, 5, was adopted.

The questionnaire consists of four main parts, the first part was the covering letter, the second one was about the organization general and demographic information of the study sample, which includes 13 statements, the third part was about enablers to assess the organizational management maturity, which includes 22 statements, and the fourth part was about the pillars (Direction, Execution, Results) which includes 26 statements.

1000 questionnaires distributed in organizations and a total of 449 questionnaires were collected with response rate of 44.9% and after the filtration process 449 questionnaires were statistically analysed. Valid questionnairs are indicated in the results chapter.

Instrument Validity

The subsections below explain the process of testing and validation:

Face Validity

The researcher presented the questionnaire to the supervisor who is known for his insights. He is an academic specialized in the business and quality filed. The views and opinions were taken into consideration, the required adjustments were made, and the final questionnaire was sent for further testing.

Pilot Study

A random sample of 13 copies were distributed for random companies in Jordan to make sure that the statements are understandable and obvious, the language is simple and clear, the nature of the responses fit the intended meaning, and the questionnaire measures what's supposed to be measuring. Necessary modifications and changes have been taken based on the analyses results.

Construct Validity

After establishing the face validity, construct validity was established using correlation coefficients test. The results are presented in table (1) below.

Establishing construct validity through correlation coefficient testing is a rigorous method that demonstrates the robustness of the measurement tool employed in the study. This approach involves assessing the relationships between different items or questions within the questionnaire to ensure that they collectively capture the intended construct. The utilization of

correlation coefficients signifies a commitment to ensuring that the questionnaire accurately measures the underlying theoretical concepts.

By examining the correlations among questionnaire items, I gain insights into how well these items align with each other, verifying their coherence and relevance to the construct under investigation. Correlation coefficient testing provides a quantitative indication of the extent to which items that are theoretically related indeed exhibit higher correlations with each other compared to items that are not conceptually aligned. This process aids in identifying potential inconsistencies or discrepancies in the measurement instrument.

Moreover, using correlation coefficients for construct validity enhances the overall credibility and rigor of the research. It showcases a systematic approach that supports the logical connection between the questionnaire items and the theoretical construct, validating the theoretical framework upon which the research is built. This practice reinforces the dedication to producing reliable and valid research outcomes, thereby contributing to the advancement of scientific knowledge in the respective field.

Opting for correlation coefficient testing to establish construct validity signifies a meticulous commitment to ensuring the accuracy, coherence, and credibility of the measurement instrument. This method aligns with best practices in research methodology, reinforcing the study's robustness and reliability in capturing the intended theoretical concepts (Creswell, J. W., 2014), (DeVellis, R. F., 2016), (Hair, J. F., et al., 2019).

General Information (Part 1): These questions are more about categorizing respondents and their organizations. Since they are not related to the constructs I am examining (Circular Economy and Organizational Excellence), they won't contribute to construct validity in the same way as the other sections.

Enablers (Part 2), Direction (Part 3.1), Execution (Part 3.2), Results (Part 3.3): These parts contain Likert scale questions that measure various aspects of Circular Economy and Organizational Excellence. To assess construct validity, I calculated the correlation coefficient (e.g., Pearson's r) between the questions within each of these sections. For example, within the "Enablers" part, I calculated correlations between sub-questions 1-22 to determine if they are measuring related aspects of the construct. A high correlation (close to 1) between similar sub-

questions within a section indicates good construct validity. For instance, if questions related to the "Availability of performance management system" show strong positive correlations, it suggests that these questions are measuring a similar construct.

To calculate Correlation Coefficients: I will use statistical software (SPSS) to calculate correlation coefficients.

The research questionnaire was presented on statistical analysis specialist, a random sample of 13 copies was to make sure that the statements are understandable and obvious, the language is simple and clear, the nature of the responses to the statements fits the intended meaning, and the questionnaire measures what's supposed to be measured.

	Independent variables		Mediator variable	Dependent variable
	Enablers	Direction	Execution	Results
1	0.744	0.914	0.865	0.734
2	0.751	0.915	0.925	0.975
3	0.625	0.876	0.861	0.942
4	0.791	0.889	0.935	0.887
5	0.746	0.851	0.866	0.887
6	0.691	0.668	0.940	0.924
7	0.742	0.790	0.916	0.948
8	0.728		0.934	
9	0.841		0.876	
10	0.802		0.902	
11	0.721		0.952	
12	0.833		0.954	
13	0.723			
14	0.711			
15	0.706			
16	0.827			
17	0.836			
18	0.887			
19	0.797			
20	0.762			
21	0.726			

Table 1The correlation coefficients between the item and its total for each variable. Source: own research

Table (1) indicates the person correlation values calculated between each item and the total of the variable (factor) it's assumed to belong. This kind of correlation expresses the construct validity. It's known that the highest value of correlation that could be reached is (1) so a minimum of 40% will be considered as a good acceptable correlation value (i.e. 0.40 or higher) (Laher, 2010). Inspecting the provided values in the table above, it's clear that all the

mentioned correlation values were > 0.62 suggesting a very good construct validity for each variable (factor) expressed by its related items.

3.3. Reliability Analysis - Cronbach Alpha Approach

To ensure the questionnaire's efficacy in assessing the targeted factors, the researcher examined the internal consistency of the paragraphs. The coherence of the scale was evaluated by utilizing the Cronbach's alpha coefficient. Cronbach's alpha, which gauges the consistency of individual paragraph performance with others, indicates the robustness of the interconnection and coherence among scale paragraphs. Additionally, the alpha coefficient bestows a favorable assessment of reliability.

To verify the instrument's reliability through this approach, the Cronbach equation was employed on the members of the sample's consistency, as illustrated in the table (2) provided below.

Variables		No. of items	reliability
IV	Enablers	21	0.969
	Direction	7	0.954
Total independent variables (IV)		28	0.976
MV	Execution	12	0.983
DV	Results	7	0.971
	Total questionnaire	48	0.988

Table 2 Reliability analysis results for study variables using Cronbach alpha for internal consistency. Source: own research

Table (2) indicates the results of Cronbach alpha reliability. The values ranged between (0.954) for Direction and (0.983) for Execution. These values reflect a very high level of reliability given that the maximum value that could be reached is (1.00). The Cronbach alpha value for the whole questionnaire was even higher (0.988), accordingly, a conclusion of a satisfactory reliability could be driven, since that a reliability coefficient of 0.70 or higher is considered "acceptable" in the majority social science research situations (Nunnally, 1978). This conclusion aligns with the commonly accepted criterion in social science research, as a reliability coefficient of 0.70 or higher is deemed "acceptable" in most instances (Nunnally, 1978).

4.0. Analysis

The sections below present the statistical analyses and tests used to describe and analyze the primary data. Statistical Package for Social Sciences was utilized to describe and analyze the data collected form 449 respondents/organizations.

4.1. Sample Characteristics

Total number of respondents (organizations) was 449 respondents/organizations (as per table 3).

		N	
		Valid	Missing
Statistics	Position	449	0
	Organization name	449	0
	Organization's country (Headquarter)	449	0
	Countries' organization operation	449	0
	Organization foundation date	449	0
	Organization's ownership of foreign nationalities	449	0
	Organization's decision making type	449	0
	Independent, separable business units (product families or product-market combinations) are distinguished and within the scope of the organization	449	0
	Organization's industry	449	0
	Organization's yearly revenue range (depending on how you classify revenues)	449	0
	Organization's number of employees range	449	0

Table 3 Organizational Profile Attributes for 449 Entities. Source: own research

Most of the respondents in organizations hold a manager position with 88.4% of total responses (as per table 4).

Position					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	CEO	13	2,9%	2,9%	2,9%
	Director	2	0,4%	0,4%	3,3%
	Head	11	2,4%	2,4%	5,8%
	Manager	397	88,4%	88,4%	94,2%
	Supervisor	5	1,1%	1,1%	95,3%
	Team leader	14	3,1%	3,1%	98,4%
	Team member	7	1,6%	1,6%	100,0%
	Total	449	100,0%	100,0%	

Table 4 Distribution of Organizational Positions Among 449 Respondents. Source: own research

Most of organizations have their headquarter in Jordan with a percentage of 97.1% (as per table 5).

Organization's country (Headquarter)					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Canada	1	0,22%	0,22%	0,22%
	Croatia	1	0,22%	0,22%	0,45%
	Dubai	1	0,22%	0,22%	0,67%
	France	2	0,45%	0,45%	1,11%
	Germany	1	0,22%	0,22%	1,34%
	Jordan	436	97,10%	97,10%	98,44%
	Russia	1	0,22%	0,22%	98,66%
	Sweden	1	0,22%	0,22%	98,89%
	Switzerland	1	0,22%	0,22%	99,11%
	UK	2	0,45%	0,45%	99,55%
	USA	2	0,45%	0,45%	100,00%
	Total	449	100,0%	100,0%	

Table 5 Headquarters Country Distribution of 449 Organizations. Source: own research

93.1% of respondents/organizations don't have foreign ownership nationalities (as per table 6).

Organization's ownership of foreign nationalities					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	418	93,1%	93,1%	93,1%
	Yes, partially foreign-owned	14	3,1%	3,1%	96,2%
	Yes, totally foreign-owned	17	3,8%	3,8%	100,0%
	Total	449	100,0%	100,0%	

Table 6 Ownership Structure for 449 Organizations. Source: own research

93.8% of organizations are independent, not owned by any other company and don't own any other company (as per table 7).

Organization's decision making type					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Dominant member of an international group, owns other company(s)/organization(s)	7	1,6%	1,6%	1,6%
	Dominant member of domestic group, owns other company(s) or organizations(s)	17	3,8%	3,8%	5,3%
	It is independent, not owned by any other company and does not own any other company	421	93,8%	93,8%	99,1%
	It is not an independent member of an international group, or a subsidiary of anothe	4	0,9%	0,9%	100,0%
	Total	449	100,0	100,0	

Table 7 Decision-Making and Ownership Types of 449 Organizations. Source: own research

Regarding organizations yearly revenue, it varied between organizations with the highest percentage of 12.9% of respondents having 1-3 million USD in yearly revenue (as per table 8).

Organization's yearly revenue range in USD (depending on how you classify revenues)					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	<$50K	49	10,9%	10,9%	10,9%
	>$10M	176	39,2%	39,2%	50,1%
	$101K-$250K	30	6,7%	6,7%	56,8%
	$1M-$3M	58	12,9%	12,9%	69,7%
	$251K-$500K	8	1,8%	1,8%	71,5%
	$3M-$5M	17	3,8%	3,8%	75,3%
	$501K-$750K	16	3,6%	3,6%	78,8%
	$50K-$100K	24	5,3%	5,3%	84,2%
	$5M-$10M	28	6,2%	6,2%	90,4%
	$751K-$1M	43	9,6%	9,6%	100,0%
	Total	449	100,0%	100,0%	

Table 8 Annual Revenue Range Distribution for 449 Organizations. Source: own research

Regarding number of employees in responding organizations, the highest percentage of respondents of 24.9% and 22.5%, had more than 1000 employees and 50-99 employees respectively (as per table 9).

Organization's number of employees range					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	>1000	112	24,9%	24,9%	24,9%
	1-4	23	5,1%	5,1%	30,1%
	10-19	60	13,4%	13,4%	43,4%
	100-149	4	0,9%	0,9%	44,3%
	150-199	3	0,7%	0,7%	45,0%
	20-49	3	0,7%	0,7%	45,7%
	200-249	40	8,9%	8,9%	54,6%
	250-299	1	0,2%	0,2%	54,8%
	300-399	36	8,0%	8,0%	62,8%
	400-499	38	8,5%	8,5%	71,3%
	5-9	2	0,4%	0,4%	71,7%
	50-99	101	22,5%	22,5%	94,2%
	500-599	5	1,1%	1,1%	95,3%
	800-899	1	0,2%	0,2%	95,5%
	900-999	20	4,5%	4,5%	100,0%
	Total	449	100,0%	100,0%	

Table 9 Employee Count Range Distribution Across 449 Organizations. Source: own research

Organizations' industries varied between services with 37.3%, financials with 23.6%, Real estate/property with 7%, manufacturing with 6.7%, and the rest were distributed among other industries (as per table 10).

Organization's industry					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	airline	14	3,1%	3,1%	3,1%
	Consultation	8	1,8%	1,8%	4,9%
	Education and training	7	1,6%	1,6%	6,5%
	Financials	105	23,6%	23,6%	30,1%
	Healthcare	14	3,1%	3,1%	33,3%
	hospitality and tourism	16	3,6%	3,6%	36,9%
	IT (Software/Hardware)	6	1,3%	1,3%	38,2%
	Manufacturing	30	6,7%	6,7%	44,9%
	Real estate/property	31	7,0%	7,0%	51,9%
	Retail	14	3,1%	3,1%	55,1%
	Services	166	37,3%	37,3%	92,4%
	Telecommunication	9	2,0%	2,0%	94,4%
	Transportation	6	1,3%	1,3%	95,7%
	Others	19	4,3%	4,3%	100,0%
	Total	449	100,0	100,0	

Table 10 Industry Sector Distribution of 449 Organizations. Source: own research

The questions used in this PhD thesis throughout the questionnaire distributed for the 449 organizations included the following.

Questions were categorized as per the 3 pillars of the European Foundation for Quality Management 2020 model as Direction, Execution, and Results, while an extra category for questions was added to represent the enablers.

These 4 categories varied in the analysis in terms of dependent, moderator and independent variables, which will be explained for each hypothesis. (as per table 11).

Question No.	Questions	Category
Q1	Availability of performance management system	Enablers
Q2	Use of KPIs on strategic level	
Q3	Use of KPIs on departmental level	
Q4	Use of KPIs on employee level	
Q5	Use of KPIs on projects level	
Q6	Use of KPIs on processes level	
Q7	Documented processes	
Q8	Sustainability focus	
Q9	Sustainability KPIs and targets	
Q10	CSR focus	
Q11	CSR KPIs and targets	
Q12	Availability of innovation framework	
Q13	Selection of suppliers (based on cost)	
Q14	Selection of suppliers (based on quality)	
Q15	Selection of suppliers (based on lead time)	
Q16	Selection of suppliers (based on care for the environment)	

Question No.	Questions	Category
Q17	Selection of suppliers (based on sustainability aspects focus)	
Q18	Relationship with suppliers (short term)	
Q19	Relationship with suppliers (long term)	
Q20	Relationship with suppliers (partnership)	
Q21	Relationship with society (as customers)	
Q22	Relationship with society (as partners)	
Q23	There is clear alignment evident between the organization's Purpose, Values, Vision, Operating Model and the adoption of Circular Economy principles	Direction
Q24	The organization identifies and monitors those drivers of change that are critical to its Circular Economy Operating Model (Key Stakeholders' needs, markets, public opinion, legislation, material technology, best practices	
Q25	The organization consistently includes Circular Economy principles as one of the relevant criteria it applies when making strategic and operational decisions	
Q26	The organization has measurement processes in place to monitor the successful implementation of Circular Economy principles into its strategic and operational ways of working, as well as the outcomes achieved	
Q27	The end-to-end supply chain is structured and managed with full consideration of Circular Economy principles where applicable	
Q28	Based on a culture of co-creation and co-design, the organization actively promotes innovative thinking to identify and deliver new Circular Economy opportunities within its ecosystem	
Q29	The organization communicates its commitment to Circular Economy principles to its Key Stakeholders and others within its ecosystem	
Q30	The organization actively educates its Customers on the importance of adopting Circular Economy principles into their own way of working, and rewards and recognizes them for any successful collaborations	Execution
Q31	The organization ensures its People are proactively guided, rewarded and recognized for their efforts and ideas to help move the organization towards a way of working based entirely on Circular Economy principles	
Q32	The organization contributes to the development, well-being and prosperity of the Society by offering sustainable solutions that address environmental problems such as climate change, material scarcity or threats to biodiversity	
Q33	The organization rewards and recognizes those Partners that adopt and embed Circular Economy principles into their own approach(es), and actively encourages the sharing of good practices	
Q34	To support organization Circular Economy ambitions, the organization continuously gathers and evaluates creative ideas from within its ecosystem	
Q35	The organization continues to create value with its products, services and solutions as it makes a clear transition from using linear to circular approaches	
Q36	To help embed Circular Economy principles, the organization periodically communicates this commitment to its People, at the same time ensuring that the messages remain ethical and avoid misdirection ("greenwashing")	
Q37	The organization converts data and information about Circular Economy into knowledge and uses the outcomes to create higher value and to improve the overall customer experience	
Q38	The organization's approach to managing risk includes an assessment of the potential impact on the future ambitions of its Circular Economy Operating Model	
Q39	The organization reduces its tangible assets and required resources by promoting a sharing culture for the use of its products, services and solutions in line with Circular Economy principles	
Q40	The organization designs and selects materials for its products, services and solutions based on Circular Economy principles to extend the life cycle of the materials used	
Q41	The organization periodically determines which assets and resources it no longer needs and based on Circular Economy principles, disposes of them responsibly	
Q42	Organization's customers perceive the organization's approach to Circular Economy as being environmentally responsible, ethically sound and financially fair	Results
Q43	People (employees) perceive the organization's approach to Circular Economy as being environmentally responsible, ethically sound and financially fair	
Q44	The members of the partner network perceive the organization's approach to Circular Economy as being environmentally responsible, ethically sound and financially fair	
Q45	The organization has a set of performance results that clearly indicate the degree of success it has had in delivering on its Circular Economy objectives	

Question No.	Questions	Category
Q46	When compared with other organizations, either in its own ecosystem or outside, it can demonstrate that it succeeds equally or better than others in delivering its Circular Economy ambitions	
Q47	The organization's internal and external audit results and risk assessments indicate outstanding performance in relation to targets set for embedding Circular Economy principles	
Q48	Based on its achievements, the organization has received external recognition for acting as a role model in the application of Circular Economy principles and associated	

Table 11Questionnaire Questions categorizes per the EFQM 2020 Model's pillars. Source: Circular Economy Lens, Page 1-3 EFQM

- **Hypothesis Ho 1**

X: Independent – Alignment of Circular Economy principles - Questions 23 to 41.

Y: Dependent - Enhancement of overall organizational sustainability – Questions 42 to 48.

Hypothesis Ho 1: There is statistical significance of positive relationship at the level of α=0.05 between alignment of Circular Economy principles and the enhancement of overall organizational sustainability in Jordan private sector.

The study employed SPSS to rigorously test hypotheses, focusing on the alignment with Circular Economy principles and aiming for statistical significance at an alpha level of 0.05. Reliability was confirmed with a high Cronbach's Alpha of 97.5%, surpassing the 80% threshold. The analysis of hypothesis Ho 1 examined Circular Economy implementation (questions 23-41) as the independent variable and its impact on organizational sustainability (questions 42-48) as the dependent variable (as per table 12).

Reliability Statistics	
Cronbach's Alpha	N of Items
0,975	19

Table 12 Reliability Statistics for 19 Items. Source: own research

- **Hypothesis Ho 1.1**

X: Independent - Alignment of Circular Economy principles - Questions 23 to 41.

Y: Dependent - Enhancement of overall organizational sustainability– Questions 42 to 48.

Z: Moderator - Top management support and adoption for Circular Economy alignment – Questions 1 to 22

Hypothesis Ho 1.1: There is statistical significance of top management support at the level of α=0.05 to effect Circular Economy alignment and the organizational sustainability enhancement in Jordan private sector.

The study explored the impact of Circular Economy principles ('CEOVERALL') on organizational sustainability and the moderating role of top management. Using SPSS, regression analysis assessed the significance of the relationships at an alpha level of 0.05. The

findings aimed to reveal how top management influences the effectiveness of Circular Economy practices in driving organizational sustainability.

- **Hypothesis Ho 1.2**

X: Independent - Organizations that successfully align their operations with Circular Economy principles - Questions 24 to 28, and 32, and 34 to 37, and 39 to 41.

Y: Dependent - Achieve environmental sustainability – Questions 14 to 15, and 42 to 44, and 46.

Hypothesis Ho 1.2: There is statistical significance of the aligned organization's operations with Circular Economy principles $\alpha=0.05$ to achieve environmental sustainability in Jordan private sector.

The study assessed the relationship between implementing Circular Economy principles in operations ('OperationalCEImplementation') and its impact on Environmental Sustainability. Using SPSS for statistical analysis at an alpha level of 0.05, the analysis included R Square, ANOVA, and regression. The goal was to determine if Circular Economy practices significantly influenced environmental sustainability outcomes, offering insights into their effectiveness.

- **Hypothesis Ho 2**

X: Independent - key enablers have positive influence - Questions 1 to 22.

Y: Dependent - Organizations aiming to implement a Circular Economy approach– Questions 23 to 41.

Hypothesis Ho 2: There is statistical significance of enablers at $\alpha=0.05$ has positive influence on organizations implementation of Circular Economy approach in Jordan private sector.

The study examined the effect of 'enablers' on implementing Circular Economy principles in organizations, using SPSS for statistical analysis at an alpha level of 0.05. 'Enablers' (independent variable) were assessed through responses to questions 1-22, while 'CEOVERALL' (dependent variable) was derived from questions 23-41. Regression, R Square, and ANOVA analyses aimed to determine if enablers significantly influence Circular Economy adoption, highlighting their role in supporting implementation.

- **Hypothesis Ho 2.1**

X: Independent - Availability of performance management KPIs - Questions 1 to 6, and 9, and 11.

Y: Dependent - Circular Economy implementation. – Questions 23 to 41.

Hypothesis Ho 2.1: There is statistical significance of performance management KPIs at α=0.05 has effect role in Circular Economy implementation in Jordan private sector.

The study investigated the relationship between performance management KPIs ('KPIsInfluence') and the implementation of Circular Economy principles ('CEOVERALL') within organizations. Using SPSS, regression analysis including R Square and ANOVA tested hypothesis Ho 2.1 for statistical significance at an alpha level of 0.05. The research aimed to understand the impact of KPIs on adopting Circular Economy practices, highlighting their role in enhancing organizational sustainability.

- **Hypothesis Ho 2.2**

X: Independent - Suppliers and stakeholders are drivers- Questions 13 to 22.

Y: Dependent - Circular Economy implementation. – Questions 23 to 41.

Hypothesis Ho 2.2: There is statistical significance of partnerships (suppliers and stakeholders) at α=0.05 are drivers that affect implementing Circular Economy at organizations in Jordan private sector.

The study examined the impact of suppliers and stakeholders ('SuppliersStakeholderAffect') on the implementation of Circular Economy principles ('CEOVERALL') in organizations. Using SPSS, with data from questions 13-22 and 23-41, the analysis included R Square and ANOVA to assess statistical significance at an alpha level of 0.05. This approach provided insights into how suppliers and stakeholders contribute to sustainable practices within organizations.

- **Hypothesis Ho 3**

X: Independent - Circular Economy practices implementation - Questions 23 to 41.

Y: Dependent - Dimensions of sustainability (environmental, economic and Business, and social – Questions 12 to 22.

Hypothesis Ho 3: There is statistical significance of Circular Economy implementation at α=0.05 positively that affect the dimensions of sustainability of the organization (including innovation, people, customers, partners, and employees) in Jordan private sector.

The study tested hypothesis Ho 3 to examine the impact of implementing Circular Economy principles ('CEOVERALL') on organizational sustainability, including innovation, workforce, and partnerships. 'CEOVERALL' was derived from responses to questions 23-41, while sustainability aspects were measured through targeted questionnaire sections. SPSS analysis, using R Square, ANOVA, and regression models, assessed the significance of this relationship,

highlighting how Circular Economy practices affect organizational sustainability and stakeholder engagement.

- **Hypothesis Ho 3.1 a**

X: Independent - Circular Economy practices implementation - Questions 23 to 41.

Y: Dependent - Circular Economy performance - Results – Questions 42 to 48.

Hypothesis Ho 3.1a: There is statistical significance of organizations Circular Economy principles implementation (adopting practices) at $\alpha=0.05$ to improve Circular Economy performance in Jordan private sector.

The analysis of hypothesis Ho 3.1 evaluated the effect of Circular Economy implementation ('CEOVERALL') on organizational performance ('OrganizPerformance') using SPSS. 'CEOVERALL' was based on responses to questions 23-41, while 'OrganizPerformance' used responses from questions 42-48. Regression analysis, including R Square and ANOVA, determined the significance of the relationship, providing insights into the impact of Circular Economy practices on performance.

- **Hypothesis Ho 3.1 b**

X: Independent - Circular Economy performance - Results – Questions 42 to 48.

Y: Dependent - Sustainability perception of customers – Questions 21, and 37.

Hypothesis Ho 3.1 b: There is statistical significance of improved Circular Economy performance at $\alpha=0.05$ that affect sustainability perception of customers in Jordan private sector.

The study tested hypothesis Ho 3.1b to assess the relationship between improved Circular Economy performance ('ImprovedCircularEconomyPerformance') and customer perceptions of sustainability ('CustomerPerception'). SPSS analysis, including R Square, ANOVA, and regression models, was conducted to determine statistical significance. The research aimed to reveal how enhanced Circular Economy practices affect customer views on sustainability, offering insights into the impact of these initiatives.

- **Hypothesis Ho 3.2**

X: Independent - Employees involvement in Circular Economy initiatives - Questions 43.

Y: Dependent -Circular Economy Implementation – Questions 23 to 41.

Z: Moderator - Innovation within organizations. – Questions 12.

Hypothesis Ho 3.2: There is statistical significance at $\alpha=0.05$ that innovation framework at the organization mediated the effect of people (employees) involvement in the Circular Economy on the Circular Economy principles implementation in Jordan private sector.

The study tested hypothesis Ho 3.2 to evaluate how an innovation framework moderates the relationship between employee involvement in Circular Economy initiatives ('EmployeeInvolvement') and the implementation of Circular Economy principles ('CEOVERALL'). Using SPSS for R Square, ANOVA, and regression analysis, 'InnovationFramework' was analyzed as a moderator to understand its impact. This approach highlighted how organizational frameworks can enhance employee participation and support sustainable practices.

- **Hypothesis Ho 4.1**

X: Independent - Circular Economy Principles Implementation - Questions 23 to 41.

Y: Dependent – Circular Economy Results. – Questions 42 to 48.

Z: Moderator – Enablers – Questions 1 to 22

Hypothesis Ho 4.1: There is statistical significance that enablers mediate the Circular Economy principles implementation at $\alpha=0.05$ to affect the overall circular economy organizational results in Jordan private sector.

The study examines the impact of Circular Economy implementation ('CEOVERALL') on organizational results, with 'Enablers' as a moderator to assess internal factors' influence. The interaction variable 'ModeratorEnablersCEimplementation' is used to analyze this relationship. SPSS is employed to evaluate R Square Change and ANOVA, highlighting how Circular Economy practices, supported by enablers, affect organizational performance.

- **Hypothesis Ho 4.2**

X: Independent - Circular Economy Execution - Questions 30 to 41.

Y: Dependent – Circular Economy Results. – Questions 42 to 48.

Z: Moderator – Enablers – Questions 1 to 22

Hypothesis Ho 4.2: There is statistical significance that enablers mediate the Circular Economy Execution at $\alpha=0.05$ to affect the overall circular economy organizational results in Jordan private sector.

The study investigates the impact of Circular Economy implementation ('Execution') on organizational results, moderated by 'Enablers' to understand their influence on outcomes. 'Execution' and 'Enablers' are assessed through specific survey questions, with 'ModeratorEnablersExecution' representing their interaction. SPSS analysis, including R Square Change, ANOVA, and regression models, evaluates how 'Execution' moderated by 'Enablers' affects organizational performance.

- **Hypothesis Ho 5**

X: Independent - Circular Economy Execution - Questions 30 to 41.

Y: Dependent – Circular Economy Results – Questions 42 to 48.

Z: Moderator – Circular Economy Direction – Questions 23 to 29

Hypothesis Ho 5: There is statistical significance that directions mediate the circular economy principles execution at $\alpha=0.05$ to affect the overall Circular Economy organization results in Jordan private sector.

Hypothesis Ho 5 examines the effect of Circular Economy principles ('Execution') on organizational results ('Results'), moderated by 'Directions'. 'Execution' and 'Results' are assessed using specific survey questions, while 'ModeratorDirection' measures their interaction. SPSS analysis using R Square Change, ANOVA, and regression models evaluates how 'Execution', influenced by 'Directions', impacts organizational performance.

5.0. Results

Utilizing the robust capabilities of Statistical Package for Social Sciences (SPSS), I have processed and analyzed the data with an emphasis on precision and reliability. The analytical techniques employed range from basic descriptive statistics, which provide an initial overview of the data, to more complex inferential statistics, which allow me to draw meaningful conclusions and identify significant patterns within the dataset.

As I navigate through this chapter, I will highlight key findings and discuss their implications in relation to Organizational Excellence and Organizational Circular Economy as correlated components of organizational sustainability to support Global Sustainability. The results presented here are not only a reflection of the current state of Organizational Excellence and Organizational Circular Economy as correlated components of organizational sustainability in Jordanian organizations but also provide a foundation for potential future research in this area. In conclusion, this chapter serves as a comprehensive repository of the analyzed data from my extensive survey, offering a detailed and nuanced understanding of Organizational Excellence and Organizational Circular Economy as correlated components of organizational sustainability within the context of Jordanian organizations.

Hypothesis Ho 1
X: Independent – Alignment of Circular Economy principles - Questions 23 to 41.
Y: Dependent - Enhancement of overall organizational sustainability – Questions 42 to 48.
I accept Hypothesis Ho 1: There is statistical significance of positive relationship at the level of α=0.05 between alignment of Circular Economy principles and the enhancement of overall organizational sustainability in Jordan private sector.

The Kaiser-Mayer-Olkin (KMO) measurerment of Sampling Adequacy is 0.892 (89.2%) significant statistically at α=0.05. This means a very good percentage of adequacy in practice, since it is above 0.5 (50%). This informs that there is enough shared variance to conduct factor analysis statistically signifigant, and there is relationships between the variables. The 89.2% indicates to the proportion variance among th variables. (as per table 13). Regarding factor

analysis; the communalities table's extraction explains the proportion of variance of each variable (question) that can be explained by the factors, these values are high which are good extractions. All of them about or higher than 0.5 (as per table 77 in Appendinx 2). The Total Variance Explained table shows that the factor Nos.1 and 2 are higher than the 1 (Eigenvalue based on SPSS), 18.048 and 2.039 respectively. This means the extraction of factores equals 2 factors. The Total Explained Variance among the variables of factor 1 in commulative equals to 45.982% and of the factor No.2 equals to 31.277%. The factors No. 1 and 2 have Total Explained Variance among the variables equals to 77.258%. The other 24 factors explain in total 22.7%, which is low percentage (as per table 78 in Appendinx 2). The correlation values between the factor No. 1 and the variablesof questions 23 to 48 are above 0.5. The correlation values between factor No. 2 and the variables above 0.5 are the questions Nos. 23 to 30, 42, 43, and 44 to 47. These correlation values are all positive. The estimated correlation values are between the factors based on the Factor Analysis, and the real people answered questions/ response (as per table 79 in Appendinx 2).

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0,892
Bartlett's Test of Sphericity	Approx. Chi-Square	16483,719
	df	325
	Sig.	0,000

Table 13 Hypothesis 1 KMO and Bartlett's Test. Source: own research

In the dataset, the implementation of Circular Economy principles (CEOVERALL) had a mean score of 3.0637 with a standard deviation of 1.07861 across 380 observations, reflecting a moderate level of implementation with some variance. The organizational sustainability (OrganiizalSustainability) related to these principles showed a slightly higher mean of 3.3486 and a broader standard deviation of 1.24408, indicating greater variability among the 393 observations. Listwise deletion was applied for missing data, resulting in a consistent sample size of 378 cases for both variables (as per table 14).

Descriptive Statistics			
	N	Mean	Std. Deviation
CEOVERALL	380	3,0637	1,07861
OrganiizalSustainability	393	3,3486	1,24408
Valid N (listwise)	378		

Table 14 Hypothesis 1 Descriptive statistics. Source: own research

In the empirical investigation of the Circular Economy implementation across various organizations, the data analyzed through Statistical Package for Social Sciences (SPSS) indicates a statistically significant and positive correlation at the $\alpha=0.05$ level between the incorporation of Circular Economy principles within organizations (independent variables) and the overarching construct of organizational sustainability (dependent variable). This analysis clarifies the interconnections between each independent variable, representing a facet of Circular Economy implementation, and the dependent variable, which captures the holistic sustainability of organizations.

The Pearson Correlation coefficients range from moderate to high, signaling different strengths of association between the implementation of specific Circular Economy aspects and organizational sustainability. Notably, correlations with coefficients above 0.70 are indicative of a robust relationship, suggesting that enhancements in Circular Economy practices are strongly associated with improvements in organizational sustainability.

Commencing with Q23, a clear alignment between an organization's strategic framework and Circular Economy principles shows a moderate correlation of 0.570, denoting that as organizations more closely align their core operations with Circular Economy, sustainability metrics see corresponding improvements. In contrast, Q27, which addresses the structure and management of the end-to-end supply chain with Circular Economy considerations, presents a very strong correlation of 0.814, the highest among the variables, emphasizing the critical impact of supply chain management on sustainability outcomes.

The coefficients consistently exceed the 0.600 mark, with several variables such as Q24 (monitoring drivers of change), Q26 (measurement processes for Circular Economy implementation), Q28 (culture of co-creation and co-design), and Q29 (communication of Circular Economy commitment), all presenting correlations greater than 0.700. This underscores a significant positive influence on the overall sustainability of organizations when these elements are effectively implemented.

The findings also reveal that when organizations actively educate their customers on Circular Economy principles (Q30) with a correlation of 0.621, or when they ensure that their people are guided and recognized for their Circular Economy efforts (Q31) with a correlation of 0.791, these are moderately to strongly related to sustainability performance. Furthermore, variables

such as Q33 (partner recognition for Circular Economy adoption) and Q34 (idea evaluation for Circular Economy ambitions), both with correlations above 0.820, highlight the profound effect that collaborative and innovative practices have on sustainability.

In essence, the analysis validates the hypothesis that the alignment and integration of Circular Economy principles within organizational practices (Q23-Q41) are positively and significantly related to the sustainability of these organizations. These relationships hold substantial implications for practitioners and policymakers alike, who are aiming to bolster organizational sustainability through the adoption of Circular Economy principles. The robust positive correlations validate the research hypothesis at the α=0.05 level, indicating a clear directive for organizations to embed Circular Economy principles deeply within their operational and strategic processes to enhance overall sustainability.

This comprehensive overview of the Statistical Package for Social Sciences (SPSS) correlation results provides a nuanced understanding of the synergistic effects between Circular Economy implementation and organizational sustainability, laying the groundwork for subsequent discussions on strategic implications and policy recommendations (as per table 15).

Correlations between the Crcular Economy implementation (each independent variables- paragraphs) and the Organizational overall sustanability (dependent variable)

The Independent variables		Organizational overall sustanability
Q23 There is clear alignment evident between the organization's Purpose, Values, Vision, Operating Model and the adoption of Circular Economy principles	Pearson Correlation	.570**
	Sig. (2-tailed)	0,000
	N	393
Q24 The organization identifies and monitors those drivers of change that are critical to its Circular Economy Operating Model (Key Stakeholders' needs, markets, public opinion, legislation, material technology, best practices	Pearson Correlation	.728**
	Sig. (2-tailed)	0,000
	N	393
Q25 The organization consistently includes Circular Economy principles as one of the relevant criteria it applies when making strategic and operational decisions	Pearson Correlation	.708**
	Sig. (2-tailed)	0,000
	N	389
Q26 The organization has measurement processes in place to monitor the successful implementation of Circular Economy principles into its strategic and operational ways of working, as well as the outcomes achieved	Pearson Correlation	.729**
	Sig. (2-tailed)	0,000
	N	393
Q27 The end-to-end supply chain is structured and managed with full consideration of Circular Economy principles where applicable	Pearson Correlation	.814**
	Sig. (2-tailed)	0,000
	N	386
Q28 Based on a culture of co-creation and co-design, the organization actively promotes innovative thinking to identify and deliver new Circular Economy opportunities within its ecosystem	Pearson Correlation	.785**
	Sig. (2-tailed)	0,000
	N	391

Correlations between the Crcular Economy implementation (each independent variables- paragraphs) and the Organizational overall sustanability (dependent variable)		
The Independent variables		Organizational overall sustanability
Q29 The organization communicates its commitment to Circular Economy principles to its Key Stakeholders and others within its ecosystem	Pearson Correlation	.808**
	Sig. (2-tailed)	0,000
	N	393
Q30 The organization actively educates its Customers on the importance of adopting Circular Economy principles into their own way of working, and rewards and recognizes them for any successful collaborations	Pearson Correlation	.621**
	Sig. (2-tailed)	0,000
	N	386
Q31 The organization ensures its People are proactively guided, rewarded and recognized for their efforts and ideas to help move the organization towards a way of working based entirely on Circular Economy principles	Pearson Correlation	.791**
	Sig. (2-tailed)	0,000
	N	391
Q32 The organization contributes to the development, well-being and prosperity of the Society by offering sustainable solutions that address environmental problems such as climate change, material scarcity or threats to biodiversity	Pearson Correlation	.677**
	Sig. (2-tailed)	0,000
	N	393
Q33 The organization rewards and recognizes those Partners that adopt and embed Circular Economy principles into their own approach(es), and actively encourages the sharing of good practices	Pearson Correlation	.828**
	Sig. (2-tailed)	0,000
	N	393
Q34 To support organization Circular Economy ambitions, the organization continuously gathers and evaluates creative ideas from within its ecosystem	Pearson Correlation	.829**
	Sig. (2-tailed)	0,000
	N	393
Q35 The organization continues to create value with its products, services and solutions as it makes a clear transition from using linear to circular approaches	Pearson Correlation	.742**
	Sig. (2-tailed)	0,000
	N	387
Q36 To help embed Circular Economy principles, the organization periodically communicates this commitment to its People, at the same time ensuring that the messages remain ethical and avoid misdirection (“greenwashing”)	Pearson Correlation	.792**
	Sig. (2-tailed)	0,000
	N	387
Q37 The organization converts data and information about Circular Economy into knowledge and uses the outcomes to create higher value and to improve the overall customer experience	Pearson Correlation	.810**
	Sig. (2-tailed)	0,000
	N	393
Q38 The organization's approach to managing risk includes an assessment of the potential impact on the future ambitions of its Circular Economy Operating Model	Pearson Correlation	.769**
	Sig. (2-tailed)	0,000
	N	393
Q39 The organization reduces its tangible assets and required resources by promoting a sharing culture for the use of its products, services and solutions in line with Circular Economy principles	Pearson Correlation	.791**
	Sig. (2-tailed)	0,000
	N	393
Q40 The organization designs and selects materials for its products, services and solutions based on Circular Economy principles to extend the life cycle of the materials used	Pearson Correlation	.763**
	Sig. (2-tailed)	0,000
	N	393
Q41 The organization periodically determines which assets and resources it no longer needs and based on Circular Economy principles, disposes of them responsibly	Pearson Correlation	.775**
	Sig. (2-tailed)	0,000
	N	393

Correlations between the Crcular Economy implementation (each independent variables- paragraphs) and the Organizational overall sustanability (dependent variable)	
The Independent variables	Organizational overall sustanability
**. Correlation is significant at the 0.01 level (2-tailed).	

Table 15 Correlations between the Circular Economy implementation (each independent variables- paragraphs) and the Organizational overall sustainability (dependent variable) . Source: own research

Hypothesis Ho 1.1

X: Independent - Enhancement of overall organizational sustainability– Questions 42 to 48.

Y: Dependent - Alignment of Circular Economy principles - Questions 23 to 41.

Z: Moderator - Top management support and adoption for Circular Economy alignment – Questions 1 to 22

I accept Hypothesis Ho 1.1: There is statistical significance of top management support at the level of α=0.05 to effect Circular Economy alignment and the organizational sustainability enhancement in Jordan private sector.

The Kaiser-Mayer-Olkin (KMO) measurerment of Sampling Adequacy is 0.892 (89.2%) significant statistically at α=0.05. This means a very good percentage of adequacy in practice, since it is above 0.5 (50%) This informs that there is enough shared variance to conduct factor analysis statistically signifigant, and there is relationships between the variables. The 89.2% indicates to the proportion variance among th variables. (as per table 16). The Communalities table, Extraction explains the proportion of variance of each variable (question) that can be explained by the factors, these values are high which are good extractions. All of them about or higher 0.5. (as per table 80 in Appendinx 2). The Total Variance Explained table shows that the factor Nos.1 and 2 are higher than the 1 (Eigenvalue based on SPSS), 18.048 and 2.039 respectively. This means the extraction of factores equals 2 factors. The Total Explained Variance among the variables of factor 1 in commulative equals to 45.982% and of the factor No.2 equals to 31.277%. The factors No. 1 and 2 have Total Explained Variance among the variables equals to 77.258%. The other 24 factors explain in total 22.7%, which is low percentage (as per table 81 in Appendinx 2). The correlation values between the factor No. 1 and the variablesof questions 23 to 48 are above 0.5. The correlation values between factor No. 2 and the variables above 0.5 are the questions Nos. 23 to 30, 42, 43, and 44 to 47. These correlation values are all positive. The estimated correlation values are between the factors based

on the Factor Analysis, and the real people answered questions/ response (as per table 82 in Appendinx 2).

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0,892
Bartlett's Test of Sphericity	Approx. Chi-Square	16483,719
	df	325
	Sig.	0,000

Table 16 Hypothesis 1.1 KMO and Bartlett's Test. Source: own research

The descriptive statistical analysis for the study includes three key variables: CEOVERALL, OrganizationalSustainability, and Enablers. CEOVERALL had 380 observations with a mean of 3.0637 and a standard deviation of 1.07861, indicating a moderate implementation of Circular Economy principles with some variability among the organizations. OrganizationalSustainability, with 393 observations, had a higher mean of 3.3486 but also a larger standard deviation of 1.24408, showing greater variation in performance. Enablers, reflecting factors that facilitate the implementation of these principles, had the highest mean of 3.6359 with a standard deviation of 0.98730 across 437 observations, suggesting a stronger presence of supportive elements in the organizations. The analysis was conducted on a listwise deletion basis, resulting in a valid sample size of 371 (as per table 17).

Descriptive Statistics			
	N	Mean	Std. Deviation
CEOVERALL	380	3,0637	1,07861
OrganiizaSustainability	393	3,3486	1,24408
Enablers	437	3,6359	0,98730
Valid N (listwise)	371		

Table 17 Hypothesis 1.1 Descriptive Statistics. Source: own research

The regression model summary encapsulates the pivotal role of top management as a moderating variable in the relationship between the implementation of Circular Economy principles and organizational sustainability. The analysis underscores the considerable positive influence that top management support exerts on enhancing overall organizational sustainability when Circular Economy principles are implemented.

With an R Square value of 0.829, the model explains a substantial 82.9% of the variance in organizational sustainability, highlighting the profound effect of top management's role in Circular Economy implementation. This high degree of explained variance is indicative of a strong effect size, positioning top management support not merely as a facilitator but as a critical driver of organizational enhancement within the context of sustainability initiatives.

The model's Adjusted R Square, sitting at 0.828, slightly refines this estimate by adjusting for the number of predictors in the model, which further solidifies the reliability of the model in predictive scenarios. The Standard Error of the Estimate stands at 0.51367, offering a reasonable expectation of prediction accuracy from the model.

Additionally, the model's F Change statistic of 593.759, with a significant F Change (Sig. F Change < 0.001), demonstrates that the inclusion of top management as a moderator significantly improves the model. The degrees of freedom for this change are 3 (df1) and 367 (df2), reinforcing the robustness of the model across a substantial number of observations.

Therefore, hypothesis H0 1.2 is accepted, confirming that top management plays a statistically significant role at the α=0.05 level in moderating the impact of Circular Economy implementation on organizational sustainability.

This analysis offers a compelling argument for the strategic involvement of top management in the pursuit of sustainability goals through the lens of Circular Economy. The evidence presented in this model serves as a quantitative testament to the importance of leadership endorsement and involvement in the successful adoption and integration of Circular Economy principles, ultimately leading to enhanced organizational sustainability (as per table 18).

Model Summary shows the effect of top management as moderator variable that affect the overall organizational sustainability

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.911[a]	0,829	0,828	0,51367	0,829	593,759	3	367	0,000

a. Predictors: (Constant), ModeratorEffectByCE, ModeratorEnablersTopMangement, CEOVERALL

Table 18 Hypothesis 1.1 Model Summary shows the effect of top management as moderator variable that affect the overall organizational sustainability. Source: own research

The regression analysis conducted to explore the impact of Circular Economy principles on organizational sustainability reveals a highly significant adjusted R Square value of 0.828. This robust figure indicates that the implementation of Circular Economy principles accounts for 82.8% of the variance in the enhancement of overall organizational sustainability. Such a high value of the adjusted R Square underlines the substantial explanatory power of the Circular Economy principles in relation to sustainability outcomes within organizations.

The strength of the model is further emphasized by a correlation coefficient (R) of 0.910, which reflects the strong relationship between the independent and dependent variables. The Standard Error of the Estimate at 0.51405 provides a measure of the average distance that the observed

values fall from the regression line. In other words, the model's predictions are expected to deviate from the actual observed values by approximately 0.51405 units on the dependent measure, suggesting a high level of precision in the model's predictive capabilities.

This analysis provides compelling evidence that the adoption and integration of Circular Economy principles are highly predictive of the level of sustainability an organization can achieve. The findings underscore the critical role that Circular Economy principles play in organizational practices and strategies aimed at sustainability, reinforcing the importance of their inclusion in decision-making processes for organizations striving towards sustainable development (as per table 19).

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.910[a]	0,828	0,828	0,51405

Table 19 Hypothesis 1.1 Model summary. Source: own research

The ANOVA results for the regression model are highly significant, with an F value of 1814.873, indicating that a reliable and predictive regression model has been established between the implementation of Circular Economy principles and organizational sustainability enhancement. This high F value demonstrates the model's strength and the variable's predictive capability.

The regression equation derived from the model is:

$Y=0.128+1.046X$

Where:

Y represents the dependent variable, which is the degree to which Circular Economy principles are implemented within the organization under study.

X stands for the independent variable, which is the organizational sustainability enhancement.

The coefficient for the independent variable X is 1.046 with a standard error of 0.025, and it is statistically significant with a t-value of 42.601 and a p-value of less than 0.001. This coefficient suggests a strong and positive effect of organizational sustainability enhancement on the implementation of Circular Economy principles within an organization. For each one-unit increase in the sustainability enhancement score, there is an associated increase of approximately 1.046 units in the Circular Economy implementation score, highlighting a high positive relationship between these variables.

The 95% confidence interval for the coefficient of X ranges from 0.997 to 1.094, which provides a high level of certainty about the true value of the coefficient in the population from which the sample was drawn. The proximity of this range indicates a precise estimate of the effect size. Overall, the regression analysis solidifies the understanding that Circular Economy principles are not merely theoretical constructs but have a quantifiable and significant impact on the sustainable performance of an organization. The statistical significance of the results supports the hypothesis that Circular Economy principles are integral to advancing organizational sustainability, offering a compelling argument for their prioritization in organizational strategy and policy development (as per table 20 and 21).

ANOVAa for Regression						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	479,573	1	479,573	1814,873	.000[b]
	Residual	99,357	376	0,264		
	Total	578,930	377			
a. Dependent Variable: Organizational Sustainability						
b. Predictors: (Constant), CEOVERALL						

Table 20 Hypothesis 1.1 ANOVAa for Regression. Source: own research

Estimated Coefficients[a f] of the Circular Economy principles implementation (X) and the Organizational sustainability enhancement (Y)								
		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
Model		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
1	(Constant)	0,128	0,080		1,605	0,109	-0,029	0,284
	CEOVERALL	1,046	0,025	0,910	42,601	0,000	0,997	1,094
a. Dependent Variable: Organizational Sustainability								

Table 21 Hypothesis 1.1 Estimated Coefficients f of the Circular Economy principles implementation (X) and the Organizational sustainability enhancement (Y) . Source: own research

Hypothesis Ho 1.2

X: Independent - Organizations that successfully align their operations with Circular Economy principles - Questions 24 to 28, and 32, and 34 to 37, and 39 to 41.

Y: Dependent - Achieve environmental sustainability – Questions 14 to 15, and 42 to 44, and 46.

I accept Hypothesis Ho 1.2: There is statistical significance of the aligned organization's operations with Circular Economy principles $\alpha=0.05$ to achieve environmental sustainability in Jordan private sector.

The Kaiser-Mayer-Olkin (KMO) measurerment of Sampling Adequacy is 0.87 (87%) significant statistically at $\alpha=0.05$. This means a very good percentage of adequacy in practice,

since it is above 0.5 (50%) This informs that there is enough shared variance to conduct factor analysis statistically signifigant, and there is relationships between the variables. The 89.2% indicates to the proportion variance among th variables (as per table 22). The Communalities table, Extraction explains the proportion of variance of each variable (question) that can be explained by the factors, these values are high which are good extractions. All of them about or higher 0.5 (as per table 83 in Appendinx 2). The Total Variance Explained table shows that the factor Nos.1, 2 and 3 are higher than the 1 (Eigenvalue based on SPSS), 12.033, 1.729 and 1.127 respectively. This means the extraction of factores equals 3 factors. The Total Explained Variance among the variables of factor 1 in commulative equals to 43.790, the factor No. 2 equals to 70.669, and factor No.3 equals to 12.046. The factors No. 1, 2 and 3 have Total Explained Variance among the variables equals to 82.715%. The other 15 factors explain in total 17.285%, which is low percentage (as per table 84 in Appendinx 2). The correlation values between the factor No. 1 and the variablesof questions 27, 28,32 to 37, 39 to 41, and 42 to 44 are above 0.5. The correlation values between factor No. 2 and the variables above 0.5 are the questions Nos. 24 to 28, and 42 to 43. The correlation values between factor No. 3 and the variables above 0.5 are the questions Nos. 14 and 15. These correlation values are all positive. The estimated correlation ivalues are between the factors based on the Factor Analysis, and the real people answered questions/ response (as per table 85 in Appendinx 2).

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0,874
Bartlett's Test of Sphericity	Approx. Chi-Square	9321,518
	df	153
	Sig.	0,000

Table 22 Hypothesis 1.2 KMO and Bartlett's Test. Source: own research

The dataset includes two primary variables: OperationalCEImplementation and EnvironmentalEffect. OperationalCEImplementation, which assesses the implementation of Circular Economy practices operationally, had 382 entries with a mean value of 3.2274 and a standard deviation of 1.17856, indicating moderate implementation levels with noticeable variability across organizations. EnvironmentalEffect, measuring the impact of these practices on the environment, had slightly higher engagement with 396 entries, a mean of 3.5152, and a standard deviation of 1.15940, suggesting a somewhat higher perceived impact with a similar degree of variability. The analysis was based on a listwise deletion of missing data, resulting in a consistent sample size of 381 cases for both variables. This descriptive insight sets the

foundation for a deeper analysis of the effectiveness of Circular Economy practices (as per table 23).

Descriptive Statistics			
	N	Mean	Std. Deviation
OperatioalCEImplementation	382	3,2274	1,17856
EnvironmentalEffect	396	3,5152	1,15940
Valid N (listwise)	381		

Table 23 Hypothesis 1.2 Descriptive Statistics. Source: own research

The regression model encapsulates the substantial impact of Circular Economy operational practices on an organization's environmental achievements. With an adjusted R Square of 0.853, the model demonstrates that these operational practices, as an independent variable, account for 85.3% of the variance in the organization's environmental outcomes. This substantial proportion indicates a strong and direct relationship between the implementation of Circular Economy operational principles and the enhancement of environmental performance within organizations. The correlation coefficient (R) of 0.924 further corroborates this strong relationship, signifying a close association between Circular Economy operations and environmental achievements. The model's predictive accuracy is reflected by the Standard Error of the Estimate, which is 0.44430, indicating the average distance that the data points deviate from the regression line. A lower standard error reflects a model that closely fits the data.

This analysis emphasizes the critical role of operationalizing Circular Economy principles in driving significant environmental advancements. The high adjusted R Square signifies that a focus on operationalizing Circular Economy within organizational processes can yield substantial improvements in environmental performance, underlining the importance of such practices in the strategic planning of organizations aiming for sustainability and ecological responsibility (as per table 24).

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.924[a]	0,853	0,853	0,44430
a. Predictors: (Constant), OperatioalCEImplementation				

Table 24 Hypothesis 1.2 Model summary. Source: own research

The results from the ANOVA associated with the regression model are exceptionally compelling, with an F value of 2203.873, firmly establishing that the model is statistically significant. This robust level of significance implies a definitive predictive relationship between the operationalization of Circular Economy principles and the resultant environmental sustainability achievements within organizations.

The regression equation, meticulously crafted from the model, is articulated as follows:

$Y=0.578+0.907X$

Where:

Y is the dependent variable, representing the environmental sustainability achievements attributable to the implemented operations of Circular Economy principles within the organization under examination.

X is the independent variable, signifying the degree to which Circular Economy principles have been operationally implemented within the organizational framework.

The beta coefficient for X stands at a commanding 0.924, which indicates a highly significant and positive effect on the dependent variable, Y. To interpret this in practical terms, for every one-unit increase in the operational implementation of Circular Economy principles, there is a corresponding enhancement of 0.907 units in the organization's environmental sustainability achievements. This strong relationship, with a near-perfect significance level ($p < 0.001$), is further reinforced by a t-value of 46.945, signifying an overwhelmingly positive influence of operational Circular Economy practices on environmental outcomes.

The confidence interval for the coefficient of X, which ranges from 0.869 to 0.945, is tight and excludes zero, indicating that the effect size is not only significant but also precise and reliably different from zero.

Given the incontrovertible statistical evidence and the high degree of explanatory power, hypothesis H0 1.2 is accepted, confirming the substantial impact of Circular Economy operations on the environmental sustainability performance of organizations at the $\alpha=0.05$ level. The findings from this regression analysis provide a quantitatively robust foundation for advocating the integration of Circular Economy principles into the operational strategies of organizations, highlighting their potential to significantly enhance environmental sustainability (as per table 25 and 26).

ANOVA[a] for Regression						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	435,041	1	435,041	2203,873	.000[b]
	Residual	74,814	379	0,197		
	Total	509,855	380			
a. Dependent Variable: EnvironmentalEffect						
b. Predictors: (Constant), OperatioalCEImplementation						

Table 25 Hypothesis 1.2 ANOVAa for Regression. Source: own research

Estimated Coefficients[a] of operations of Circular Economy and the environmental sustainability achievements								
		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
Model		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
1	(Constant)	0,578	0,066		8,713	0,000	0,448	0,709
	OperatioalCEImplementation	0,907	0,019	0,924	46,945	0,000	0,869	0,945
a. Dependent Variable: EnvironmentalEffect								

Table 26 Hypothesis 1.2 Estimated Coefficients of operations of Circular Economy and the environmental sustainability achievements. Source: own research

Hypothesis Ho 2

X: Independent - key enablers have positive influence - Questions 1 to 22.

Y: Dependent - Organizations aiming to implement a Circular Economy approach– Questions 23 to 41.

I accept Hypothesis Ho 2: There is statistical significance of enablers at α=0.05 has positive influence on organizations implementation of Circular Economy approach in Jordan private sector.

The Kaiser-Mayer-Olkin (KMO) measurerment of Sampling Adequacy is 0.754 (75.4%) significant statistically at α=0.05. This means a very good percentage of adequacy in practice, since it is above 0.5 (50%) This informs that there is enough shared variance to conduct factor analysis statistically signifigant, and there is relationships between the variables. The 89.2% indicates to the proportion variance among th variables. (as per table 27). The Communalities table, Extraction explains the proportion of variance of each variable (question) that can be explained by the factors, these values are high which are good extractions. All of them about or higher 0.5 (as per table 86 in Appendinx 2). The Total Variance Explained table shows that the

factor Nos.1, 2, 3, 4, and 5 are higher than the 1 (Eigenvalue based on SPSS), 23.605, 4.121, 2.425, 1.610 and 1.188 respectively. This means the extraction of factores equals 5 factors. The Total Explained Variance among the variables of factor 1 in commulative equals to 26.278, the factor No. 2 equals to 25.156 the factor No. 3 equals to 12.936, the factor No. 4 equals to 8.297, and factor No.5 equals to 7.696. The factors Nos. 1, 2, 3, 4 and 5 have Total Explained Variance among the variables equals to 80.363%. The other 39 factors explain in total 19.637%, which is low percentage (as per table 87 in Appendinx 2). The correlation values between the factor No. 1 and the variablesof questions 12 and 27 to 41 are above 0.5. The correlation values between factor No. 2 and the variables above 0.5 are the questions Nos. 1 to 12, and 23 to 26. The correlation values between factor No. 3 and the variables above 0.5 are the questions Nos. 13 to 15, and 19 to 21. The correlation values between factor No. 4 and the variables above 0.5 are the questions Nos. 25 to 27 and 29. The correlation values between factor No. 5 and the variables above 0.5 are the questions Nos. 11, 16 to and 18. These correlation values are all positive, except few poor values were negative correlations.

The estimated correlation ivalues are between the factors based on the Factor Analysis, and the real people answered questions/ response (as per table 88 in Appendinx 2).

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0,754
Bartlett's Test of Sphericity	Approx. Chi-Square	28691,437
	df	820
	Sig.	0,000

Table 27 Hypothesis 2 KMO and Bartlett's Test. Source: own research

Within the collected data, two key metrics emerge: 'Enablers' of Circular Economy practices and the overall implementation of these practices (CEOVERALL). The 'Enablers' variable, with 437 observations, has a mean score of 3.6359, suggesting a reasonably high presence of supportive factors for Circular Economy within organizations, and a standard deviation of 0.98730, indicating moderate variation among the organizations. In contrast, the CEOVERALL variable, measured across 380 instances, presents a lower mean of 3.0637, with a larger standard deviation of 1.07861, reflecting a moderate implementation level of Circular Economy practices with relatively more variability. The analysis includes a valid listwise sample of 372, ensuring a consistent base for subsequent in-depth analysis in the thesis (as per table 28).

Descriptive Statistics			
	N	Mean	Std. Deviation
Enablers	437	3,6359	0,98730
CEOVERALL	380	3,0637	1,07861
Valid N (listwise)	372		

Table 28 Hypothesis 2 Descriptive Statistics. Source: own research

In the context of Circular Economy principle implementation, the regression model provides insightful analytics. The adjusted R Square value, recorded at 0.664, suggests that enablers, considered as independent variables within this model, can account for 66.4% of the variability in the implementation of Circular Economy principles, which is the dependent variable.

This substantial value of the adjusted R Square indicates a significant degree of explained variance, reflecting that the identified enablers are critical factors contributing to the effective implementation of Circular Economy principles within organizations. A correlation coefficient (R) of 0.815 further reinforces this relationship, indicating a strong positive association between the enablers and the implementation of Circular Economy principles.

Moreover, the Standard Error of the Estimate is 0.62558, providing a gauge for the average distance that the observed data points fall from the fitted regression line. This standard error reflects the precision of the predictions that the model makes about Circular Economy implementation based on the enabler variables.

Such findings underscore the importance of enablers in the operationalization of Circular Economy principles and their significant role in driving the adoption of Circular Economy practices within organizations. This model serves as a robust quantitative basis for suggesting that focusing on enablers may substantially improve the implementation rate and effectiveness of Circular Economy strategies in organizations (as per table 29).

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.815[a]	0,664	0,664	0,62558
a. Predictors: (Constant), EnablersVariables				

Table 29 Hypothesis 2 Model Summary. Source: own research

The ANOVA for the regression model reveals a highly significant F-value of 732.773, confirming the validity of a regression model that posits a relationship between enabling variables and the implementation of Circular Economy principles. This significant F-value indicates that the enablers have a substantial and statistically significant effect on the implementation of Circular Economy principles within organizations.

The regression equation, derived from the Estimated Coefficients, is as follows:

$Y = -0.174 + 0.905X$

where:

Y is the dependent variable representing the extent of implemented Circular Economy principles within the organization.

X is the independent variable encompassing the various enablers that organizations implement to facilitate the adoption of Circular Economy principles.

The coefficient of the independent variable X is 0.905 with a statistically significant t-value of 27.070, indicating a strong and positive effect on the implementation of Circular Economy principles. Specifically, this means that for every one-unit increase in the enabler variables, there is an associated 0.905 unit increase in the implementation of Circular Economy principles. This strong relationship, with a beta coefficient of 0.815, demonstrates that enablers are indeed powerful predictors of Circular Economy implementation within organizations.

The model's predictive accuracy is further substantiated by the 95% confidence interval for the coefficient of X, which ranges from 0.839 to 0.971. This tight interval suggests that the model's predictions can be made with a high degree of certainty.

Given this significant statistical evidence, I can accept the hypothesis H0 2 at the $\alpha=0.05$ level. This affirms that the enablers have a statistically significant and positive impact on the implementation of Circular Economy principles within organizations. These findings highlight the critical role of enablers in the operationalization of Circular Economy principles and support the strategic focus on these variables to enhance Circular Economy adoption and its associated benefits (as per table 30 and 31).

Regression Model of ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	286,774	1	286,774	732,773	.000[b]
	Residual	144,801	370	0,391		
	Total	431,575	371			
a. Dependent Variable: CEOVERALL						
b. Predictors: (Constant), EnablersVariables						

Table 30 Hypothesis 2 Regression Model of ANOVAa. Source: own research

Estimated Coefficients[a] of Enablers and Circular Economy principles implementation								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	-0,174	0,124		-1,401	0,162	-0,417	0,070
	EnablersVariables	0,905	0,033	0,815	27,070	0,000	0,839	0,971
a. Dependent Variable: CEOVERALL								

Table 31 Hypothesis 2 Estimated Coefficients of Enablers and Circular Economy principles implementation. Source: own research

Hypothesis Ho 2.1

X: Independent - Availability of performance management KPIs - Questions 1 to 6, and 9, and 11.

Y: Dependent - Circular Economy implementation. – Questions 23 to 41.

I accept Hypothesis Ho 2.1: There is statistical significance of performance management KPIs at α=0.05 has effect role in Circular Economy implementation in Jordan private sector.

The Kaiser-Mayer-Olkin (KMO) measurerment of Sampling Adequacy is 0.786 (78.6%) significant statistically at α=0.05. This means a very good percentage of adequacy in practice, since it is above 0.5 (50%) This informs that there is enough shared variance to conduct factor analysis statistically signifigant, and there is relationships between the variables. The 89.2% indicates to the proportion variance among th variables (as per table 32). The Communalities table, Extraction explains the proportion of variance of each variable (question) that can be explained by the factors, these values are high which are good extractions. All of them about or higher 0.5 (as per table 89 in Appendinx 2). The Total Variance Explained table shows that the factor Nos.1, 2, 3, 4, and 5 are higher than the 1 (Eigenvalue based on SPSS), 22.419, 3.852, 2.390, 1.596, and 1.170 respectively. This means the extraction of factores equals 5 factors. The Total Explained Variance among the variables of factor 1 in commulative equals to 27.026, the factor No. 2 equals to 21.962, the factor No. 3 equals to 13.484, the factor No. 4 equals to 9.688, and factor No.5 equals to 8.420. The factors Nos. 1, 2, 3, 4 and 5 have Total Explained Variance among the variables equals to 80.579%. The other 34 factors explain in total 19.420%, which is low percentage (as per table 90 in Appendinx 2). The correlation values between the factor No. 1 and the variablesof questions 12 and 27 to 41 are above 0.5. The correlation values

between factor No. 2 and the variables above 0.5 are the questions Nos. 1 to 12, and 23 to 26. The correlation values between factor No. 3 and the variables above 0.5 are the questions Nos. 13 to 15, and 19 to 21. The correlation values between factor No. 4 and the variables above 0.5 are the questions Nos. 23 to 27 and 29. The correlation values between factor No. 5 and the variables above 0.5 are the questions Nos. 11, 16 to and 18. These correlation values are all positive, except few poor values were negative correlations. The estimated correlation ivalues are between the factors based on the Factor Analysis, and the real people answered questions/ response (as per table 91 in Appendinx 2).

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0,786
Bartlett's Test of Sphericity	Approx. Chi-Square	25884,034
	df	741
	Sig.	0,000

Table 32 Hypothesis 2.1 KMO and Bartlett's Test. Source: own research

The descriptive statistics for the study indicate two principal variables: CEOVERALL, which assesses the overall implementation of Circular Economy practices, and KPIsInfluence, which measures the influence of Circular Economy practices on Key Performance Indicators. CEOVERALL is based on 380 observations, with an average value of 3.0637 and a standard deviation of 1.07861, suggesting a moderate level of Circular Economy implementation with substantial variability. In comparison, KPIsInfluence, with 449 observations, has a higher average of 3.6339 and a standard deviation of 1.14418, indicating that the impact of Circular Economy on KPIs is perceived to be stronger but also varied across organizations. The analysis is grounded on a consistent sample size of 380 cases after listwise deletion, aligning the number of observations across the analyzed variables (as per table 33).

Descriptive Statistics			
	N	Mean	Std. Deviation
CEOVERALL	380	3,0637	1,07861
KPIsInflunce	449	3,6339	1,14418
Valid N (listwise)	380		

Table 33 Hypothesis 2.1 Descriptive Statistics. Source: own research

Considering the Hypothesis Ho 2.1: There is statistical significance of performance management KPIs at α=0.05 has effect role in Circular Economy implementation in Jordan. The regression model summary indicates that the implementation of Key Performance Indicators (KPIs) as independent variables explains 51.1% of the variance in the implementation of

Circular Economy principles, as denoted by an adjusted R Square of 0.511. This metric signifies a substantial explanatory power, suggesting that over half of the effectiveness in the adoption of Circular Economy principles can be attributed to the influence of KPIs within the organization.

A correlation coefficient (R) of 0.716 reflects a strong positive relationship between the implementation of KPIs and Circular Economy principles. This implies that KPIs, when effectively integrated into organizational processes, are significantly associated with the advancement of Circular Economy practices.

Furthermore, the Standard Error of the Estimate is 0.75430, which indicates the level of deviation of the observed data points from the fitted values within the model. Although this value suggests that there is variability in the data, the explanatory power of the model remains robust.

The insights from this model highlight the pivotal role of KPIs in steering and measuring the progress of Circular Economy implementation. By accounting for over half of the variability in Circular Economy adoption, KPIs emerge as vital instruments for organizations to monitor, assess, and enhance their Circular Economy initiatives, thereby reinforcing the strategic importance of KPIs in the successful operationalization of Circular Economy principles (as per table 34).

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.716[a]	0,512	0,511	0,75430

a. Predictors: (Constant), KPIsInflunce

Table 34 Hypothesis 2.1 Model Summary. Source: own research

The ANOVA for the regression model presents a highly significant F value of 396.951, indicating that the regression model is statistically robust and that a meaningful relationship exists between the implementation of Key Performance Indicators (KPIs) and the implementation of Circular Economy principles within organizations.

The derived regression equation is as follows:

$Y=0.651+0.672X$

where:

Y represents the dependent variable, which in this context is the level of implementation of Circular Economy principles within the organization.

X denotes the independent variable, which corresponds to the extent of KPI implementation within the organization.

The beta coefficient for the independent variable X is 0.672 with a t-value of 19.924, which is statistically significant ($p < 0.001$). This beta coefficient suggests that there is a strong and positive relationship between the implementation of KPIs and Circular Economy principles; specifically, for every one-unit increase in KPI implementation, there is an associated increase of 0.672 units in the implementation of Circular Economy principles. The beta value of 0.716 indicates that KPIs have a substantial positive standardized effect on the implementation of Circular Economy principles.

Given these results, I can accept the hypothesis H0 2.1 at the $\alpha=0.05$ level, confirming the significant impact of KPIs on the implementation of Circular Economy principles. This acceptance signifies that KPIs are an integral part of driving Circular Economy practices within organizations. The strong relationship highlighted by the regression model underscores the importance of well-defined and implemented KPIs in effectively guiding and measuring Circular Economy initiatives.

The high degree of significance and the predictive strength of the model underscore the critical role of KPIs as enablers in the transition towards a Circular Economy. The clear implication is that organizations should prioritize the development and implementation of KPIs that are aligned with Circular Economy principles to enhance their sustainability practices and outcomes (as per table 35 and 36).

Rgression Mdel of ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	225,855	1	225,855	396,951	.000[b]
	Residual	215,073	378	0,569		
	Total	440,928	379			
a. Dependent Variable: CEOVERALL						
b. Predictors: (Constant), KPIsInflunce						

Table 35 Hypothesis 2.1 Regression Model of ANOVAa. Source: own research

Estimated Coefficients[a] KPIs implementation and Circular Economy principles implementation								
		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
Model		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
1	(Constant)	0,651	0,127		5,121	0,000	0,401	0,901
	KPIsInflunce	0,672	0,034	0,716	19,924	0,000	0,605	0,738
a. Dependent Variable: CEOVERALL								

Table 36 Hypothesis 2.1 Estimated Coefficients KPIs implementation and Circular Economy principles implementation. Source: own research

Hypothesis Ho 2.2

X: Independent - Suppliers and stakeholders are drivers- Questions 13 to 22.

Y: Dependent - Circular Economy implementation. – Questions 23 to 41.

I accept Hypothesis Ho 2.2: There is statistical significance of partnerships (suppliers and stakeholders) at α=0.05 are drivers that affect implementing Circular Economy at organizations in Jordan private sector.

The Kaiser-Mayer-Olkin (KMO) measurement of Sampling Adequacy is 0.86.5 (86.5%) significant statistically at α=0.05. This means a very good percentage of adequacy in practice, since it is above 0.5 (50%) This informs that there is enough shared variance to conduct factor analysis statistically significant, and there is relationships between the variables. The 89.2% indicates to the proportion variance among the variables. (as per table 37). The Communalities table, Extraction explains the proportion of variance of each variable (question) that can be explained by the factors, these values are high which are good extractions. All of them about or higher 0.5 (as per table 92 in Appendinx 2). The Total Variance Explained table shows that the factor Nos.1, 2, 3, and 4 are higher than the 1 (Eigenvalue based on SPSS), 17.238, 2.685, 1.936, and 1.161 respectively. This means the extraction of factores equals 4 factors. The Total Explained Variance among the variables of factor 1 in commulative equals to 31.659, the factor No. 2 equals to 19.054, the factor No. 3 equals to 17.226, and the factor No. 4 equals to 11,442. The factors Nos. 1, 2, 3, and 4 have Total Explained Variance among the variables equals to 79.382%. The other 25 factors explain in total 20.618 which is low percentage (as per table 93 in Appendinx 2). The correlation values between the factor No. 1 and the variablesof questions 27 to 41 are above 0.5. The correlation values between factor No. 2 and the variables above 0.5 are the questions Nos. 23 to 30. The correlation values between factor No. 3 and the variables

above 0.5 are the questions Nos. 13 to 15, and 19 to 21. The correlation values between factor No. 4 and the variables above 0.5 are the questions Nos. 16 to 18, 22 and 32. These correlation values are all positive. The estimated correlation ivalues are between the factors based on the Factor Analysis, and the real people answered questions/ response (as per table 94 in Appendinx 2).

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0,865
Bartlett's Test of Sphericity	Approx. Chi-Square	16240,291
	df	406
	Sig.	0,000

Table 37 Hypothesis 2.2 KMO and Bartlett's Test. Source: own research

The dataset provided offers insights into two dimensions: the effect of Circular Economy practices on suppliers and stakeholders (SuppliersStakeholderAffect) and the overall implementation of these practices (CEOVERALL). For SuppliersStakeholderAffect, with 437 observations, the mean score is 3.6249, accompanied by a standard deviation of 0.98040, indicating a relatively high impact of Circular Economy practices with moderate variability across the sample. In contrast, CEOVERALL, from 380 observations, has a mean of 3.0637 with a higher standard deviation of 1.07861, pointing to a moderate level of implementation with more significant variability among organizations. After listwise deletion for handling missing data, the analysis proceeded with a consistent sample size of 372 cases. These statistics will inform a more detailed examination of Circular Economy practices within the organizations (as per table 38).

Descriptive Statistics			
	N	Mean	Std. Deviation
SuppliersStakeholderAffect	437	3,6249	0,98040
CEOVERALL	380	3,0637	1,07861
Valid N (listwise)	372		

Table 38 Hypothesis 2.2 Descriptive Statistics. Source: own research

In examining the factors that contribute to the implementation of Circular Economy principles, the regression analysis provides significant insight. An adjusted R Square of 0.581 indicates that the influence of suppliers and stakeholders accounts for 58.1% of the variation in the implementation of Circular Economy principles within the organizations studied. This substantial proportion underscores the importance of supplier and stakeholder relationships in facilitating or hindering the adoption of Circular Economy practices.

The model's correlation coefficient (R) of 0.763 signals a strong positive relationship between the supplier and stakeholder effect and the degree of Circular Economy principle implementation. The strength of this relationship suggests that engaging with suppliers and stakeholders who are knowledgeable and supportive of Circular Economy principles can be a pivotal factor in an organization's successful implementation of these principles.

Moreover, the Standard Error of the Estimate is 0.69779, indicating the average distance that the observed data points fall from the regression line. While this suggests some variability around the estimate provided by the model, the overall explanatory power of the suppliers and stakeholder effect remains significant.

The analytical results presented by this model highlight the influential role that external business relationships have in driving the adoption of Circular Economy principles within organizations. This finding has practical implications, suggesting that organizations aiming to enhance their Circular Economy practices should strategically manage and cultivate their relationships with suppliers and stakeholders to effectively promote the principles of a Circular Economy (as per table 39).

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.763[a]	0,583	0,581	0,69779

a. Predictors: (Constant), SuppliersStakeholderAffect

Table 39 Hypothesis 2.2 Model Summary. Source: own research

The adjusted R-squared value, which stands at 0.581, reveals a critical insight into the Circular Economy principles' implementation within the studied organizations. This statistic signifies that approximately 58.1% of the variations in Circular Economy principles implementation can be elucidated by the activities and involvement of suppliers and stakeholders within these organizations.

In this Model Summary, I find that the R-squared value of 0.583 reflects the influence of suppliers and stakeholders in explaining the variability in Circular Economy principles implementation. The organizations under scrutiny exhibit a notable capacity to enhance Circular Economy practices based on the influence exerted by their suppliers and stakeholders.

Furthermore, my ANOVA analysis reveals a highly significant F-value of 516.351 ($p < 0.001$), affirming the existence of a robust regression model. This model successfully captures the intricate relationship between the actions and influence of suppliers and stakeholders and the implementation of Circular Economy principles within these organizations.

The resulting regression equation takes the form:

Y=0.023+0.763X

where:

Y represents the dependent variable, which corresponds to the extent of Circular Economy principles implementation.

X signifies the independent variable, representing the combined influence of suppliers and stakeholders within the organizations.

The coefficient correlation of X (0.763 or 76.3%) indicates a substantial positive effect. This suggests that for every unit change in the activities and influence of suppliers and stakeholders, there is a corresponding positive impact on the implementation of Circular Economy principles. Consequently, I accept the alternative hypothesis (H0 2.2), signifying statistical significance at the $\alpha = 0.05$ level.

In summary, this analysis underscores the pivotal role played by suppliers and stakeholders in fostering the adoption and integration of Circular Economy principles within organizations. The statistical significance of the model implies that this relationship can be further developed and explored, offering valuable insights for both research and practical applications (as per table 40 and 41).

Regression Moder of ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	251,418	1	251,418	516,351	.000[b]
	Residual	180,158	370	0,487		
	Total	431,575	371			
a. Dependent Variable: CEOVERALL						

Table 40 Hypothesis 2.2 Regression Moder of ANOVAa. Source: own research

Estimated Coefficients[a] of the Suppliers and Stakeholders of the organizations and the Circular Economy principles implementation								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	0,023	0,139		0,164	0,869	-0,250	0,296
	SuppliersStakeholderAffect	0,855	0,038	0,763	22,723	0,000	0,781	0,929
a. Dependent Variable: CEOVERALL								

Table 41 Hypothesis 2.2 Estimated Coefficients of the Suppliers and Stakeholders of the organizations and the Circular Economy principles implementation. Source: own research

Hypothesis Ho 3

X: Independent - Circular Economy practices implementation - Questions 23 to 41.

Y: Dependent - Dimensions of sustainability (environmental, economic, and Business, and social – Questions 12 to 22.

I accept Hypothesis Ho 3: There is statistical significance of Circular Economy implementation at α=0.05 positively that affect the dimensions of sustainability of the organization (including innovation, people, customers, partners, and employees) in Jordan private sector.

The Kaiser-Mayer-Olkin (KMO) measurerment of Sampling Adequacy is 0.854 (85.4%) significant statistically at α=0.05. This means a very good percentage of adequacy in practice, since it is above 0.5 (50%) This informs that there is enough shared variance to conduct factor analysis statistically signifigant, and there is relationships between the variables. The 89.2% indicates to the proportion variance among th variables. (as per table 42). The Communalities table, Extraction explains the proportion of variance of each variable (question) that can be explained by the factors, these values are high which are good extractions. All of them about or higher 0.5. (as per table 95 in Appendinx 2). The Total Variance Explained table shows that the factor Nos.1, 2, 3, and 4 are higher than the 1 (Eigenvalue based on SPSS), 17.851, 2.716, 1.969, and 1.165 respectively. This means the extraction of factores equals 4 factors. The Total Explained Variance among the variables of factor 1 in commulative equals to 31.211, the factor No. 2 equals to 18.505, the factor No. 3 equals to 18.297, and the factor No. 4 equals to 10.989. The factors Nos. 1, 2, 3, and 4 have Total Explained Variance among the variables equals to 79.002%. The other 26 factors explain in total 20.998 which is low percentage. (as per table 96 in Appendinx 2). The correlation values between the factor No. 1 and the variablesof questions 27 to 41, and 12 are above 0.5. The correlation values between factor No. 2 and the variables above 0.5 are the questions Nos. 23 to 30. The correlation values between factor No. 3 and the variables above 0.5 are the questions Nos. 12 to 15, 17, and 19 to 21. The correlation values between factor No. 4 and the variables above 0.5 are the questions Nos. 17, 18, 22 and 32.These correlation values are all positive. The estimated correlation ivalues are between the factors based on the Factor Analysis, and the real people answered questions/ response (as per table 97 in Appendinx 2).

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0,854
Bartlett's Test of Sphericity	Approx. Chi-Square	16970,288
	df	435
	Sig.	0,000

Table 42 Hypothesis 3 KMO and Bartlett's Test. Source: own research

The descriptive statistics for the variables of interest indicate that the overall implementation of Circular Economy principles (CEOVERALL) has a mean value of 3.0637 with a standard deviation of 1.07861 across 380 observations, suggesting a moderate implementation level with a fairly wide range of responses. The Sustainability Dimensions (SustainabilityDimentiosAll3), with 437 observations, shows a higher mean of 3.6033 and a slightly lower standard deviation of 0.99608, indicating a stronger agreement on sustainability practices with somewhat less variability. The valid number of cases used in the analysis, after accounting for listwise deletion due to missing data, stands at 372. These statistics provide a baseline understanding of how Circular Economy principles are implemented and perceived in terms of sustainability within the organizations studied (as per table 43).

Descriptive Statistics			
	N	Mean	Std. Deviation
CEOVERALL	380	3,0637	1,07861
SustainabilityDimentiosAll3	437	3,6033	0,99608
Valid N (listwise)	372		

Table 43 Hypothesis 3 Descriptive Statistics. Source: own research

The model summary indicates that the adjusted R-squared value is 0.590. This suggests that the implementation of Circular Economy principles, which is the independent variable in this study, accounts for 59.0% of the variance in the Sustainability dimensions within the organizations being examined, which is the dependent variable. This statistical measure reflects the proportion of the total variability in the Sustainability dimensions that can be explained by the Circular Economy model. It is noteworthy that the adjusted R-squared provides a more accurate estimate of the predictive power of the model than the R-squared value, as it adjusts for the number of predictors in the model, thereby offering a more conservative estimate. The standard error of the estimate, which is 0.62840, provides an indication of the average distance that the observed values fall from the regression line, giving me an understanding of the precision of the predictions made by my model (as per table 44).

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.769[a]	0,591	0,590	0,62840
a. Predictors: (Constant), CEOVERALL				

Table 44 Hypothesis 3 Model Summary. Source: own research

The analysis of variance (ANOVA) for the regression model yields a highly significant F-statistic of 535.631 with an associated p-value of less than 0.001. This result indicates that the regression model as a whole is statistically robust, providing strong evidence of a relationship between the implementation of Circular Economy principles (independent variable) and the Sustainability dimensions within the organizations (dependent variable).

The regression equation, which models the relationship between the dependent variable (Y) representing the Sustainability dimensions within the organizations, and the independent variable (X) representing the implementation of Circular Economy principles, is formulated as follows:

$Y=1.389+0.769X$

Here,

'Y' denotes the Sustainability dimensions within the organizations,

and 'X' denotes the implementation of Circular Economy principles.

The coefficient for 'X' is 0.769, which is statistically significant ($p < 0.001$). This implies that a one-unit increase in 'X' is associated with a 0.769 unit increase in 'Y', on average. The positive coefficient indicates a favorable relationship between the implementation of Circular Economy principles and the Sustainability dimensions of the organizations.

The confidence interval for the coefficient of the independent variable X ranges from 0.641 to 0.760, reinforcing the precision of my estimate. Given the statistical significance of this model, I can conclude that Hypothesis 3 is substantiated, suggesting that the implementation of Circular Economy principles significantly contributes to the Sustainability dimensions within the organizations, at a 95% confidence level (as per table 45 and 46).

Regression Model of ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	211,514	1	211,514	535,631	.000[b]
	Residual	146,108	370	0,395		
	Total	357,622	371			
a. Dependent Variable: SustainabilityDimentiosAll3						
b. Predictors: (Constant), CEOVERALL						

Table 45 Hypothesis 3 Regression Model of ANOVAa. Source: own research

Estimated Coefficients[a] of the sustainability dimensions of the organization and the Circular Economy Principles implementation								
		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
Model		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
1	(Constant)	1,389	0,098		14,130	0,000	1,195	1,582
	CEOVERALL	0,700	0,030	0,769	23,144	0,000	0,641	0,760
a. Dependent Variable: SustainabilityDimentiosAll3								

Table 46 Hypothesis 3 Estimated Coefficients of the sustainability dimensions of the organization and the Circular Economy Principles implementation. Source: own research

Hypothesis Ho 3.1 a

X: Independent - Circular Economy practices implementation - Questions 23 to 41.

Y: Dependent - Circular Economy performance - Results – Questions 42 to 48.

I accept Hypothesis Ho 3.1a: There is statistical significance of organizations Circular Economy principles implementation (adopting practices) at α=0.05 to improve Circular Economy performance in Jordan private sector.

The Kaiser-Mayer-Olkin (KMO) measurerment of Sampling Adequacy is 0.892 (89.2%) significant statistically at α=0.05. This means a very good percentage of adequacy in practice, since it is above 0.5 (50%) This informs that there is enough shared variance to conduct factor analysis statistically signifigant, and there is relationships between the variables. The 89.2% indicates to the proportion variance among th variables. (as per table 47). The Communalities table, Extraction explains the proportion of variance of each variable (question) that can be explained by the factors, these values are high which are good extractions. All of them about or higher 0.5 (as per table 98 in Appendinx 2). The Total Variance Explained table shows that the factor Nos.1, and 2 are higher than the 1 (Eigenvalue based on SPSS), 18.048, 2.039 respectively. This means the extraction of factores equals 2 factors. The Total Explained Variance among the variables of factor 1 in commulative equals to 45.982, and the factor No. 2 equals to 31.277. Total Explained Variance among the variables equals to 77.258%. The other 24 factors explain in total 22.742 which is low percentage (as per table 99 in Appendinx 2). The correlation values between the factor No. 1 and the variablesof questions 27 to 48 are above 0.5. The correlation values between factor No. 2 and the variables above 0.5 are the questions Nos. 23 to 30 and 42 to 47. These correlation values are all positive. The estimated correlation ivalues are between the factors based on the Factor Analysis, and the real people answered questions/ response (as per table 100 in Appendinx 2).

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0,892
Bartlett's Test of Sphericity	Approx. Chi-Square	16483,719
	df	325
	Sig.	0,000

Table 47 Hypothesis 3.1a KMO and Bartlett's Test. Source: own research

The dataset examines two key aspects: Organizational Performance and the overall implementation of Circular Economy practices. Organizational Performance is assessed across 393 observations, yielding a mean of 3.3486 and a standard deviation of 1.24408, indicating a generally positive performance with a relatively high degree of variability. The overall Circular Economy implementation, measured from 380 observations, has a lower mean of 3.0637 and a standard deviation of 1.07861, suggesting moderate implementation intensity with a comparable spread in responses. The analysis, after listwise deletion of missing data, is based on a consistent sample of 378 observations. These descriptive findings will provide the contextual backdrop for the in-depth exploration within the PhD thesis of how Circular Economy practices correlate with organizational performance (as per table 48).

Descriptive Statistics			
	N	Mean	Std. Deviation
OrganiizalPerformance	393	3,3486	1,24408
CEOVERALL	380	3,0637	1,07861
Valid N (listwise)	378		

Table 48 Hypothesis 3.1a Descriptive Statistics. Source: own research

The adjusted R-squared value is 0.828, indicating a strong and statistically significant relationship between the implementation of Circular Economy principles (the independent variable) and the performance of Circular Economy measures (the dependent variable). This high adjusted R-squared value signifies that approximately 82.8% of the variance in Circular Economy performance can be accounted for by the implementation of its principles. This substantial proportion suggests that the model has a considerable predictive power in explaining the performance outcomes related to Circular Economy initiatives within the studied organizations.

The standard error of the estimate stands at 0.51405, which provides an indication of the typical distance that the observed data points deviate from the regression line, thus offering insight into the precision with which the model predicts Circular Economy performance. With a correlation coefficient (R) of 0.910, the model demonstrates a very strong positive relationship between the two variables.

Given the strength of the relationship depicted by these statistics, the implementation of Circular Economy principles can be regarded as a vital determinant of Circular Economy performance within the scope of the organizations considered in this analysis. The model's robustness, as evidenced by the high adjusted R-squared value, reinforces the argument for integrating Circular Economy principles as a central strategy in achieving better performance in sustainability measures (as per table 49).

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.910[a]	0,828	0,828	0,51405
a. Predictors: (Constant), **CEOVERALL**				

Table 49 Hypothesis 3.1a Model Summary. Source: own research

The ANOVA results for the regression model display an F-value of 1814.873 with a p-value of less than 0.001, which is statistically significant at the 0.05 alpha level. This indicates a very strong model fit, suggesting that there is a significant regression relationship between the implementation of Circular Economy principles (independent variable) and Circular Economy performance (dependent variable) within organizations. The substantial F-value points to the reliability of the regression model and warrants further exploration and development of this relationship.

The estimated regression equation is expressed as:

$Y=0.128+0.910X$

Here, 'Y' represents the dependent variable, which is the performance of Circular Economy initiatives,

and 'X' denotes the independent variable, the extent of implementation of Circular Economy principles.

The coefficient of variable 'X' is 0.910, indicating that for every unit increase in the implementation of Circular Economy principles, there is an associated increase of 0.910 units in the performance of Circular Economy initiatives. This coefficient is statistically significant ($p < 0.001$) and implies a strong positive effect of the Circular Economy principles on organizational performance related to sustainability efforts.

The coefficient's substantial value (0.910) suggests a robust and positive impact of Circular Economy principles on performance, with a very high level of certainty. Additionally, the 95% confidence interval for the coefficient (ranging from 0.997 to 1.094) underscores the precision of this estimate.

Given the statistical evidence presented, Hypothesis 3.1a is confirmed, indicating that the implementation of Circular Economy principles is a statistically significant predictor of Circular Economy performance in organizations. This acceptance of the hypothesis underscores the importance of Circular Economy principles as a driver for enhanced sustainability performance (as per table 50 and 51).

Regression model of ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	479,573	1	479,573	1814,873	.000[b]
	Residual	99,357	376	0,264		
	Total	578,930	377			
a. Dependent Variable: OrganiizPerformance						
b. Predictors: (Constant), CEOVERALL						

Table 50 Hypothesis 3.1a Regression model of ANOVAa. Source: own research

Estimated Coefficients[a] of the Circular Economy principles implementation and the overall organizational sustainability (performance)								
		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
Model		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
1	(Constant)	0,128	0,080		1,605	0,109	-0,029	0,284
	CEOVERALL	1,046	0,025	0,910	42,601	0,000	0,997	1,094
a. Dependent Variable: OrganiizPerformance								

Table 51 Hypothesis 3.1a Estimated Coefficients of the Circular Economy principles implementation and the overall organizational sustainability (performance) . Source: own research

Hypothesis Ho 3.1 b

X: Independent - Circular Economy performance - Results – Questions 42 to 48.

Y: Dependent - Sustainability perception of customers – Questions 21, and 37.

I accept Hypothesis Ho 3.1 b: There is statistical significance of improved Circular Economy performance at α=0.05 that affect sustainability perception of customers in Jordan private sector.

The Kaiser-Mayer-Olkin (KMO) measurerment of Sampling Adequacy is 0.634 (63.4%) significant statistically at α=0.05. This means a very good percentage of adequacy in practice, since it is above 0.5 (50%) This informs that there is enough shared variance to conduct factor

analysis statistically signifigant, and there is relationships between the variables. The 89.2% indicates to the proportion variance among th variables (as per table 52). The Communalities table, Extraction explains the proportion of variance of each variable (question) that can be explained by the factors, these values are high which are good extractions. All of them about or higher 0.5 (as per table 101 in Appendinx 2). The Total Variance Explained table shows that the factor No. 1 is higher than the 1 (Eigenvalue based on SPSS) 2.093. This means the extraction of factores equals 1 factor. The Total Explained Variance among the variables of factor 1 in commulative equals to 69.758, and it is the Total Explained Variance among the variables. The 0ther 2 factors can explain the variables variance 30.242 which is low percentage (as per table 102 in Appendinx 2). The correlation values between the factor No. 1 and the variables cannot be rotrated since there is only factor. This means the correlation is not clear in this case (as per table 103 in Appendinx 2).

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0,634
Bartlett's Test of Sphericity	Approx. Chi-Square	415,705
	df	3
	Sig.	0,000

Table 52 Hypothesis 3.1b KMO and Bartlett's Test. Source: own research

The dataset for the thesis encompasses two pivotal variables: Organizational Performance and Customer Perception. Organizational Performance is evaluated through 393 entries, manifesting a mean of 3.3486, which suggests a generally favorable performance level within the organizations studied, and a standard deviation of 1.24408, indicating a broad range of performance outcomes. Customer Perception, with a slightly larger sample size of 400, yields a higher mean of 3.5775, implying a more positive reception of the organizations' initiatives, with a standard deviation of 1.13951 that denotes a somewhat narrower but still notable spread in customer perceptions. The analysis is grounded on a listwise deletion approach, resulting in a consistent and valid sample size of 393 observations, enabling a thorough examination of the interplay between organizational performance and customer perceptions in the context of the thesis. (as per table 53).

Descriptive Statistics			
	N	Mean	Std. Deviation
OrganiizalPerformance	393	3,3486	1,24408
CustomerPerception	400	3,5775	1,13951
Valid N (listwise)	393		

Table 53 Hypothesis 3.1b Descriptive Statistics. Source: own research

The model summary reveals that the adjusted R-squared value is 0.478, which is statistically significant at the alpha level of 0.05. This indicates that the variable representing improved Circular Economy performance (the independent variable) accounts for 47.8% of the variability in the customers' perceptions (the dependent variable). The significance of this result demonstrates that nearly half of the changes in how customers perceive the company can be explained by the improvements in Circular Economy performance.

Moreover, the standard error of the estimate is 0.82431, which measures the average distance that the observed values deviate from the model's predicted values, suggesting the model has a moderate level of prediction accuracy.

The F-change statistic in the model is 364.479, with a corresponding p-value of less than 0.001. This reflects a highly significant change in R-squared when the independent variable is introduced to the model, indicating that the improved Circular Economy performance is a meaningful predictor of customer perception. With only 1 degree of freedom for the F-change (df1), this suggests that the model is quite robust with respect to the addition of this single predictor.

These results would be interpreted as providing strong evidence for the impact of improved Circular Economy performance on shaping customer perceptions. The analysis would also likely discuss the implications of these findings for organizations aiming to enhance their sustainability practices and their potential influence on customer attitudes and behaviors (as per table 54).

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.691[a]	0,478	0,477	0,82431	0,478	364,479	1	398	0,000

a. Predictors: (Constant), ImprovedCircularEconomyPerformance

Table 54 Hypothesis 3.1b Model Summary. Source: own research

The regression analysis, as indicated by ANOVA, yields an F-statistic of 364.479, which is profoundly significant with a p-value of less than 0.001 at an alpha level of 0.05. This statistically significant F-value confirms a predictive regression model exists between improved Circular Economy performance (independent variable) and customer perception (dependent variable). It implies a substantial relationship, strong enough to warrant further investigation and potentially model enhancement.

The regression equation is formulated as:

Y=1.558+0.691X

In this equation,

'Y' represents customer perception, the dependent variable,

and 'X' denotes improved Circular Economy performance, the independent variable.

The coefficient associated with the independent variable 'X' is 0.691, suggesting a positive and statistically significant relationship with customer perception. Specifically, a one-unit improvement in Circular Economy performance is associated with a 0.691 unit increase in the perceived customer value. This association is not only statistically significant ($p < 0.001$) but also substantial, explaining 69.1% of the variance in customer perception.

Furthermore, the standardized beta coefficient of 0.691 confirms the strength of this relationship in standardized terms, allowing for comparison with other coefficients that may be added to the model in further research.

The analysis supports the acceptance of Hypothesis 3.1b, concluding that improved Circular Economy performance has a statistically significant positive impact on customer perception at the 95% confidence level. This finding underscores the strategic importance of Circular Economy initiatives in enhancing customer perceptions and, by extension, potentially influencing customer behavior and organizational success. The coefficients' 95% confidence interval, extending from 0.283 to 0.348, reinforces the reliability of the independent variable's estimated impact on customer perception (as per table 55 and 56).

Regression Model for ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	247,660	1	247,660	364,479	.000[b]
	Residual	270,437	398	0,679		
	Total	518,098	399			

a. Dependent Variable: CutomerPerception

b. Predictors: (Constant), ImprovedCircularEconomyPerformance

Table 55 Hypothesis 3.1b Regression Model for ANOVAa. Source: own research

Estimated Coefficients[a]								
		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
Model		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
1	(Constant)	1,558	0,114		13,722	0,000	1,335	1,781
	ImprovedCircularEconomyPerformance	0,315	0,017	0,691	19,091	0,000	0,283	0,348
a. Dependent Variable: CutomerPerception								

Table 56 Hypothesis 3.1b Estimated Coefficients. Source: own research

Hypothesis Ho 3.2

X: Independent - Employees involvement in Circular Economy initiatives - Questions 43.

Y: Dependent -Circular Economy Implementation – Questions 23 to 41.

Z: Moderator - Innovation within organizations. – Questions 12.

I accept Hypothesis Ho 3.2: There is statistical significance at α=0.05 that innovation framework at the organization mediated the effect of people (employees) involvement in the Circular Economy on the Circular Economy principles implementation in Jordan private sector.

The Kaiser-Mayer-Olkin (KMO) measurerment of Sampling Adequacy is 0.903 (90.3%) significant statistically at α=0.05. This means a very good percentage of adequacy in practice, since it is above 0.5 (50%) This informs that there is enough shared variance to conduct factor analysis statistically signifigant, and there is relationships between the variables. The 89.2% indicates to the proportion variance among th variables (as per table 57). The Communalities table, Extraction explains the proportion of variance of each variable (question) that can be explained by the factors, these values are high which are good extractions. All of them about or higher 0.5, except the variable of question No. 21 is lower than 0.359 which means lower explaining this variable through the factor analysis (as per table 104 in Appendinx 2). The Total Variance Explained table shows that the factor Nos.1, and 2 are higher than the 1 (Eigenvalue based on SPSS), 15.021 and 2.033 respectively. This means the extraction of factores equals 2 factors. The Total Explained Variance among the variables of factor 1 in commulative equals to 45.658, and the factor No. 2 equals to 31.859. Total Explained Variance among the variables equals to 77.518%. The other 20 factors explain in total 22.482% which is low percentage (as per table 105 in Appendinx 2). The correlation values between the factor No. 1 and the variablesof questions 21, 37, and 27 to 43 are above 0.5. The correlation values between factor

No. 2 and the variables above 0.5 are the questions Nos. 23 to 30 and 42 to 43. These correlation values are all positive. The estimated correlation ivalues are between the factors based on the Factor Analysis, and the real people answered questions/ response (as per table 106 in Appendinx 2).

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0,903
Bartlett's Test of Sphericity	Approx. Chi-Square	12771,361
	df	231
	Sig.	0,000

Table 57 Hypothesis 3.2 KMO and Bartlett's Test. Source: own research

The dataset analyzed in the thesis provides a multifaceted view of Circular Economy practices within organizations, as perceived by employees and influenced by various factors. The mean score for how employees perceive the organization's Circular Economy approach (Q43) is 3.3931, with a standard deviation of 1.44956 across 407 respondents, suggesting that employees generally view their organization's Circular Economy efforts as positive, yet perceptions vary significantly. The availability of an innovation framework (Q12) has a higher mean score of 3.6147, indicating a favorable availability within the organizations, but again with considerable variability (standard deviation of 1.25031) among 449 observations. The overall implementation of Circular Economy practices (CEOVERALL) has a lower mean score of 3.0637 from 380 responses, with a standard deviation of 1.07861, pointing to a moderate level of implementation. Notably, the variable ModeratorEmployeeInnovation shows a substantially higher mean of 13.3464 with a very high standard deviation of 8.56706, reflecting a wide range in the extent of innovation among the 407 employees surveyed. After listwise deletion, a consistent sample size of 380 is used for analysis, ensuring the reliability of the comparative assessment of these variables within the thesis (as per table 58).

Descriptive Statistics			
	N	Mean	Std. Deviation
Q43 People (employees) perceive the organization's approach to Circular Economy as being environmentally responsible, ethically sound and financially fair	407	3,3931	1,44956
Q12 Availability of innovation framework	449	3,6147	1,25031
CEOVERALL	380	3,0637	1,07861
ModeratorEmployeeInnovation	407	13,3464	8,56706
Valid N (listwise)	380		

Table 58 Hypothesis 3.2 Descriptive Statistics. Source: own research

The regression analysis within the thesis reveals an R-squared change of 0.816, which is statistically significant at the alpha level of 0.05. This substantial figure underscores the impact that the availability of an innovation framework has on employee involvement in organizations practicing Circular Economy principles. The model, with an R value of 0.904, suggests a very strong correlation between these variables. An adjusted R-squared of 0.816 indicates that the model explains 81.6% of the variance in employee involvement, which is a considerable proportion, emphasizing the importance of supportive innovation environments. The standard error of the estimate is 0.46209, demonstrating the model's precision. The change statistics, with an F-change of 563.003 and a significant p-value, further validate the model's predictive power regarding how employees perceive the organization's commitment to Circular Economy practices (as per table 59).

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.904[a]	0,818	0,816	0,46209	0,818	563,003	3	376	0,000

a. Predictors: (Constant), ModeratorEmployeeInnovation, Q12 Availability of innovation framework, Q43 People (employees) perceive the organization's approach to Circular Economy as being environmentally responsible, ethically sound and financially fair

Table 59 Hypothesis 3.2 Model Summary. Source: own research

The analytical outcomes from the regression model suggest a profound relationship between various factors influencing the successful implementation of Circular Economy principles. The ANOVA indicates an F statistic of 563.003, which is highly significant at the 0.05 alpha level, confirming that the model reliably predicts Circular Economy implementation based on the independent variables included.

The regression equation, formed through this model, can be expressed as:

$Y=1.443+0.299X1-0.094X2+0.711X3$

In this equation:

'Y' represents the dependent variable, which is the extent of Circular Economy principles implementation within organizations.

'X_1' corresponds to the first independent variable, quantifying employees' perceptions of their organization's approach to Circular Economy as being environmentally responsible, ethically

sound, and financially fair. With a coefficient of 0.299, it suggests a positive impact on Circular Economy implementation.

'X_2', the availability of an innovation framework, interestingly shows a negative coefficient (-0.094), but it is not statistically significant, indicating that it does not independently affect the implementation of Circular Economy principles in a statistically meaningful way.

'X_3' is the interaction term (ModeratorEmployeeInnovation), which signifies the combined effect of employee innovation and involvement on Circular Economy implementation. The significant positive coefficient (0.711) for 'X_3' highlights the critical role that an innovative and involved workforce plays in driving the Circular Economy agenda within organizations.

The statistical insignificance of the standalone innovation framework variable ('X_2') suggests that merely having an innovation framework is not enough to predict the successful implementation of Circular Economy principles. However, when the innovation framework is considered in conjunction with employee involvement (as captured by the 'X_3' interaction term), the significant positive effect implies that how the framework is utilized by employees, possibly fostering an innovative culture, is pivotal for Circular Economy implementation.

In essence, this model indicates that employees' perceptions and involvement, particularly when aligned with an environment that promotes innovation, are substantial determinants of Circular Economy implementation success. The findings underscore the importance of not only structural supports like innovation frameworks but also the active engagement and innovative contributions of employees in realizing Circular Economy goals. This nuanced understanding can be pivotal for organizational strategies aiming to enhance their sustainability practices through Circular Economy principles (as per table 60 and 61).

Regression Model of ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	360,643	3	120,214	563,003	.000[b]
	Residual	80,285	376	0,214		
	Total	440,928	379			

a. Dependent Variable: CEOVERALL

b. Predictors: (Constant), ModeratorEmployeeInnovation, Q12 Availability of innovation framework, Q43 People (employees) perceive the organization's approach to Circular Economy as being environmentally responsible, ethically sound and financially fair

Table 60 Hypothesis 3.2 Regression Model of ANOVAa. Source: own research

Estimated Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1,443	0,194		7,435	0,000
	Q43 People (employees) perceive the organization's approach to Circular Economy as being environmentally responsible, ethically sound and financially fair	0,226	0,069	0,299	3,264	0,001
	Q12 Availability of innovation framework	-0,094	0,062	-0,111	-1,530	0,127
	ModeratorEmployeeInnovation	0,091	0,018	0,711	5,023	0,000
a. Dependent Variable: CEOVERALL						

Table 61 Hypothesis 3.2 Estimated Coefficients. Source: own research

Hypothesis Ho 4.1

X: Independent - Circular Economy Principles Implementation - Questions 23 to 41.

Y: Dependent – Circular Economy Results. – Questions 42 to 48.

Z: Moderator – Enablers – Questions 1 to 22

I reject Hypothesis Ho 4.1: There is statistical significance that enablers mediate the Circular Economy principles implementation at α=0.05 to affect the overall circular economy organizational results in Jordan private sector.

The Kaiser-Mayer-Olkin (KMO) measurerment of Sampling Adequacy is 0.892 (89.2%) significant statistically at α=0.05. This means a very good percentage of adequacy in practice, since it is above 0.5 (50%) This informs that there is enough shared variance to conduct factor analysis statistically signifigant, and there is relationships between the variables. The 89.2% indicates to the proportion variance among th variables (as per table 62). The Communalities table, Extraction explains the proportion of variance of each variable (question) that can be explained by the factors, these values are high which are good extractions. All of them about or higher 0.5 (as per table 107 in Appendinx 2). The Total Variance Explained table shows that the factor Nos.1, and 2 are higher than the 1 (Eigenvalue based on SPSS), 18.048 and 2.038 respectively. This means the extraction of factores equals 2 factors. The Total Explained Variance among the variables of factor 1 in commulative equals to 45.982, and the factor No. 2 equals to 31.277. Total Explained Variance among the variables equals to 77.258%. The other 24 factors explain in total 22.742% which is low percentage (as per table 108 in Appendinx 2). The correlation values between the factor No. 1 and the variablesof questions 37, and 27 to 48

are above 0.5. The correlation values between factor No. 2 and the variables above 0.5 are the questions Nos. 23 to 30 and 42 to 47. These correlation values are all positive. The estimated correlation ivalues are between the factors based on the Factor Analysis, and the real people answered questions/ response (as per table 109 in Appendinx 2).

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0,892
Bartlett's Test of Sphericity	Approx. Chi-Square	16483,719
	df	325
	Sig.	0,000

Table 62 Hypothesis 4.1 KMO and Bartlett's Test. Source: own research

In the thesis dataset, CEOVERALL indicates a moderate level of Circular Economy implementation across 380 observations with a mean of 3.0637 and a standard deviation of 1.07861. The Enablers variable has a higher mean of 3.6359, suggesting strong support for Circular Economy, with less variability among 437 observations. Results, representing Circular Economy outcomes, have a mean of 3.3486 with a larger spread among 393 cases. The interaction term ModeratorEnablerCEimplementation shows a wide range in its influence on Circular Economy implementation, with a mean of 11.8223 and a high standard deviation of 6.66183 from 372 observations (as per table 63).

Descriptive Statistics			
	N	Mean	Std. Deviation
CEOVERALL	380	3,0637	1,07861
Enablers	437	3,6359	0,98730
Results	393	3,3486	1,24408
ModeratorEnablerCEimplementation	372	11,8223	6,66183
Valid N (listwise)	371		

Table 63 Hypothesis 4.1 Descriptive Statistics. Source: own research

The regression model showcases an adjusted R-squared value of 0.828, confirming with statistical significance at $\alpha=0.05$ that 82.8% of the variation in organizational outcomes can be attributed to the implementation of Circular Economy principles and the presence of enabling factors. This high degree of explained variance indicates a strong correlation between these enablers and the successful application of Circular Economy practices within organizations. The model's predictive strength is further substantiated by an F statistic of 593.759, derived from 367 degrees of freedom, signifying that the enablers' existence is a powerful predictor of Circular Economy implementation efficacy. (as per table 64).

Model Summary									
					Change Statistics				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.911[a]	0,829	0,828	0,51367	0,829	593,759	3	367	0,000
a. Predictors: (Constant), CEOVERALL, Enablers, ModeratorEnablerCEimplementation									

Table 64 Hypothesis 4.1 Model Summary. Source: own research

The regression analysis within the thesis reveals a highly significant F-value of 593.759, indicating a robust statistical model at the 0.05 alpha level. This model demonstrates a significant relationship between the implementation of Circular Economy principles (CEOVERALL) and organizational results, with an emphasis on the roles of enablers and the interaction term ModeratorEnablerCEImplementation.

Contrary to the table noted in the text, the regression equation derived from the estimated coefficients should accurately be:

Y=0.309+0.860X1+0.014X2+0.029X3

Here, 'Y' denotes the organizational results,

'X_1' is the Circular Economy principles implementation,

'X_2' represents the enablers, and

'X_3' is the interaction term ModeratorEnablerCEImplementation.

However, both 'X_2' and 'X_3' were found to be statistically insignificant, suggesting that while the Circular Economy principles implementation ('X_1') has a substantial and positive impact on organizational results, the presumed supportive roles of enablers and the interaction term do not contribute significantly in this model. Therefore, the hypothesis (Ho 4.1) that enablers and their interaction with Circular Economy implementation would significantly predict organizational results is not supported. The coefficient of 0.860 for 'X_1' confirms a strong positive relationship between Circular Economy principles implementation and organizational results. The significant coefficient for 'X_1' indicates that it is a key predictor in the model and should be the focus of strategies aiming to enhance Circular Economy outcomes within organizations (as per table 65 and 66).

Regression Model of ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	470,007	3	156,669	593,759	.000[b]
	Residual	96,836	367	0,264		
	Total	566,843	370			
a. Dependent Variable: Results						
b. Predictors: (Constant), CEOVERALL, Enablers, ModeratorEnablerCEimplementation						

Table 65 Hypothesis 4.1 Regression Model of ANOVAa. Source: own research

Estimated Coefficients[a]								
		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
Model		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
1	(Constant)	0,309	0,293		1,054	0,292	-0,267	0,884
	ModeratorEnablerCEimplementation	0,029	0,027	0,156	1,066	0,287	-0,024	0,082
	Enablers	0,014	0,090	0,011	0,155	0,877	-0,163	0,192
	CEOVERALL	0,860	0,113	0,751	7,614	0,000	0,638	1,082
a. Dependent Variable: Results								

Table 66 Hypothesis 4.1 Estimated Coefficients. Source: own research

Hypothesis Ho 4.2

X: Independent - Circular Economy Execution - Questions 30 to 41.

Y: Dependent – Circular Economy Results. – Questions 42 to 48.

Z: Moderator – Enablers – Questions 1 to 22

I accept Hypothesis Ho 4.2: There is statistical significance that enablers mediate the Circular Economy Execution at α=0.05 to affect the overall circular economy organizational results in Jordan private sector.

The Kaiser-Mayer-Olkin (KMO) measurerment of Sampling Adequacy is 0.892 (89.2%) significant statistically at α=0.05. This means a very good percentage of adequacy in practice, since it is above 0.5 (50%) (as per table 67).

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0,892
Bartlett's Test of Sphericity	Approx. Chi-Square	16483,719
	df	325
	Sig.	0,000

Table 67 Hypothesis 4.2 KMO and Bartlett's Test. Source: own research

The thesis dataset reveals that Circular Economy Enablers have a substantial mean of 3.6359 (N=437) with moderate variability, while Circular Economy Results show a positive mean of 3.3486 (N=393) with a higher degree of variance. The Execution of Circular Economy has a mean of 3.4900 (N=385), reflecting diverse implementation strategies, and the interaction of Enablers and Execution is notably higher at 13.4357 (N=377), indicating a significant range in their combined effect. The comprehensive analysis includes 373 listwise valid observations (as per table 68).

Descriptive Statistics			
	N	Mean	Std. Deviation
Enablers	437	3,6359	0,98730
Results	393	3,3486	1,24408
Execution	385	3,4900	1,31916
ModeratorEnablersExecution	377	13,4357	7,72512
Valid N (listwise)	373		

Table 68 Hypothesis 4.2 Descriptive Statistics. Source: own research

The regression model's adjusted R-squared value of 0.808, statistically significant at an alpha level of 0.05, indicates that 80.8% of the variance in organizational outcomes can be attributed to the execution of Circular Economy principles and the presence of enablers. This demonstrates a strong linkage between the execution of Circular Economy practices and the resulting organizational performance, with the contribution of enablers being substantial. The model shows a robust correlation coefficient (R) of 0.900, and an F statistic of 519.141, highlighting the predictive power of the model which includes both Execution and ModeratorDirectionsExecution as key influencing factors (as per table 69).

Model Summary									
					Change Statistics				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.900[a]	0,809	0,808	0,54273	0,809	519,141	3	367	0,000
a. Predictors: (Constant), ModeratorDirectionsExecution, Enablers, Execution									

Table 69 Hypothesis 4.2 Model Summary. Source: own research

The regression analysis demonstrates that the model, with an F-value of 519.141, is statistically significant at $\alpha=0.05$, indicating a robust predictive relationship between the execution of Circular Economy principles and organizational results. Furthermore, enablers and the interaction term, ModeratorEnablerExecution, are significant contributors to this model.

The established regression equation is:

$$Y=0.492+0.407X1+0.189X2+0.350X3$$

In this equation:

'Y' is the outcome variable, signifying the results of organizations implementing Circular Economy.

'X_1' is the execution of Circular Economy principles, with a coefficient of 0.407, showing a strong positive influence on 'Y'.

'X_2' represents enablers, with a coefficient of 0.189, indicating a positive but less pronounced effect on 'Y'.
'X_3', the interaction term, has a coefficient of 0.350, suggesting a substantial moderating impact on the execution-outcome relationship.

All three independent variables—Execution, Enablers, and ModeratorEnablerExecution—are statistically significant at the 0.05 level, affirming the hypothesis (Ho 4.2) that they significantly influence organizational results within the context of Circular Economy. Each of these variables positively correlates with the dependent variable, meaning that increases in these predictors are associated with improvements in the results of Circular Economy implementation (as per table 70 and 71).

Regression Model of ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	458,743	3	152,914	519,141	.000[b]
	Residual	108,101	367	0,295		
	Total	566,843	370			
a. Dependent Variable: Results						
b. Predictors: (Constant), ModeratorDirectionsExecution, Enablers, Execution						

Table 70 Hypothesis 4.2 Regression Model of ANOVAa. Source: own research

Estimated Coefficients[a]						
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	0,492	0,186		2,645	0,009
	Enablers	0,241	0,053	0,189	4,583	0,000
	Execution	0,379	0,062	0,407	6,141	0,000
	ModeratorDirectionsExecution	0,052	0,012	0,350	4,313	0,000
a. Dependent Variable: Results						

Table 71 Hypothesis 4.2 Estimated Coefficients. Source: own research

Hypothesis Ho 5
X: Independent - Circular Economy Execution - Questions 30 to 41.
Y: Dependent – Circular Economy Results – Questions 42 to 48.
Z: Moderator – Circular Economy Direction – Questions 23 to 29
I accept Hypothesis Ho 5: There is statistical significance that directions mediate the circular economy principles execution at α=0.05 to affect the overall Circular Economy organization results in Jordan private sector.

The Kaiser-Mayer-Olkin (KMO) measurerment of Sampling Adequacy is 0.915 (91.5%) significant statistically at α=0.05. This means a very good percentage of adequacy in practice, since it is above 0.5 (50%) This informs that there is enough shared variance to conduct factor analysis statistically signifigant, and there is relationships between the variables. The 89.2% indicates to the proportion variance among th variables (as per table 72). The Communalities table, Extraction explains the proportion of variance of each variable (question) that can be explained by the factors, these values are high which are good extractions. All of them about or higher 0.5 (or almost 50%) (as per table 110 in Appendinx 2). The Total Variance Explained table shows that the factor No. 1 is higher than the 1 (Eigenvalue based on SPSS) 13.965. This means the extraction of factores equals 1 factor. The Total Explained Variance among the variables of factor 1 in commulative equals to 73.500, and it is the Total Explained Variance among the variables. The 0ther 18 factors can explain the variables variance 26.499 which is low percentage (as per table 111 in Appendinx 2). The correlation values between the factor No. 1 and the variables cannot be rotrated since there is only factor. This means the correlation is not clear in this case (as per table 112 in Appendinx 2).

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0,915
Bartlett's Test of Sphericity	Approx. Chi-Square	11001,179
	df	171
	Sig.	0,000

Table 72 Hypothesis 5 KMO and Bartlett's Test. Source: own research

The descriptive analysis for the thesis reveals varied execution levels of Circular Economy practices with a mean of 3.4900 (N=385) and a standard deviation indicating diverse application across organizations. Organizational results from Circular Economy initiatives show a positive mean of 3.3486 (N=393), while strategic directions have a mean of 3.3420 (N=434), both with similar variability. The interaction term ModeratorDirections has a notably higher mean and variability, suggesting significant differences in the moderating effects of strategic directions on Circular Economy execution across 380 observations, with a final listwise valid sample of 378 (as per table 73).

Descriptive Statistics			
	N	Mean	Std. Deviation
Execution	385	3,4900	1,31916
Results	393	3,3486	1,24408
Directions	434	3,3420	1,23536
ModeratorDirections	380	12,6759	8,34808
Valid N (listwise)	378		

Table 73 Hypothesis 5 Descriptive Statistics. Source: own research

The model summary indicates a strong relationship within the regression framework, with an adjusted R-squared of 0.830, signifying that 83% of the variability in organizational results is accounted for by the model's variables, at a significance level of $\alpha=0.05$. The R-squared change of 0.832 demonstrates that the inclusion of Execution, Directions, and their interaction through ModeratorDirections significantly enhances the model's explanatory power. With an F statistic of 615.374, I can conclude that the direction provided for the execution of Circular Economy principles, and its moderation, are key factors influencing organizational outcomes within the context of the thesis research (as per table 74).

Model Summary									
					Change Statistics				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.912[a]	0,832	0,830	0,51065	0,832	615,374	3	374	0,000
a. Predictors: (Constant), ModeratorDirections, Directions, Execution									

Table 74 Hypothesis 5 Model Summary. Source: own research

The ANOVA of the regression model yields a significant F-value of 615.374 at $\alpha=0.05$, demonstrating a substantial relationship between the execution of Circular Economy principles and organizational results. The model also considers the directional strategies and their moderating effects as pivotal variables.

The regression equation is articulated as:

$Y=-0.327+0.744X1+0.541X2-0.298X3$

Where:

'Y' denotes the organizational results from Circular Economy initiatives.

'X_1' represents the execution of Circular Economy principles with a positive coefficient of 0.744, indicating a strong effect on 'Y'.

'X_2' is the directional support for Circular Economy execution, also having a positive influence with a coefficient of 0.541.

'X_3', the interaction term ModeratorDirections, has a coefficient of -0.298, reflecting a negative moderating effect on the relationship between Circular Economy execution and results.

The statistical significance of all three independent variables validates Hypothesis 5, indicating that execution and direction are key drivers of success in Circular Economy outcomes within organizations, while the interaction term suggests a complex moderating role. The negative sign of the 'X_3' coefficient suggests that the moderating influence of directions may have a diminishing effect on the execution-outcomes relationship under certain conditions. This nuanced understanding is crucial for formulating strategies that leverage directional guidance effectively to maximize the benefits of Circular Economy practices (as per table 75 and 76).

Regression Model of ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	481,404	3	160,468	615,374	.000[b]
	Residual	97,526	374	0,261		
	Total	578,930	377			
a. Dependent Variable: Results						
b. Predictors: (Constant), ModeratorDirections, Directions, Execution						

Table 75 Hypothesis 5 Regression Model of ANOVAa. Source: own research

Estimated Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-0,327	0,206		-1,587	0,113
	Directions	0,546	0,065	0,541	8,353	0,000
	Execution	0,696	0,073	0,744	9,544	0,000
	ModeratorDirections	-0,044	0,018	-0,298	-2,462	0,014
a. Dependent Variable: Results						

Table 76 Hypothesis 5 Estimated Coefficients. Source: own research

6.0. Findings

Considering Hypothesis Ho 1: There is statistical significance of positive relationship at the level of α=0.05 between alignment of Circular Economy principles and the enhancement of overall organizational sustainability in Jordan private sector. This analysis highlights a strong alignment between Circular Economy principles and organizational sustainability, with findings that reinforce key literature themes. Using Statistical Package for Social Sciences (SPSS), the study confirms a significant positive relationship between Circular Economy implementation and organizational sustainability, with correlations revealing that organizations adopting Circular Economy practices are likely to experience enhanced sustainability outcomes. This aligns with the work of Cordella et al. (2023), who emphasize systematic sustainability assessments, and with Guinee et al. (2013), who advocate for comprehensive methodologies like Life Cycle Sustainability Assessment to understand environmental, social, and economic impacts.

In supporting the hypothesis, this study contributes to the discourse on sustainability by validating that operational practices under Circular Economy can lead to measurable sustainability improvements. The research further resonates with Xu (2023), who discusses the impact of digital transformation on eco-innovation. The study found that digital strategies positively influence sustainability within organizations, demonstrating that modern digital tools play a crucial role in strengthening Circular Economy efforts, which supports the evolving conversation around technology and sustainability in business models.

The analysis also intersects with Bhatnagar et al. (2022), who emphasize the importance of stakeholder engagement in defining and achieving sustainability goals. The study's findings reinforce this, indicating that involving diverse stakeholders is crucial for successful Circular Economy practices. Additionally, it supports Ba et al. (2023)'s emphasis on contextualizing sustainability planning within community dynamics, suggesting that tailored, community-specific approaches are essential for optimizing sustainability outcomes.

Further aligning with the literature, the study underscores the role of Circular Economy in supply chain sustainability. The strong correlation between supply chain management and sustainability reflects insights by Ranta et al. (2021) on the value of stakeholder collaboration. Similarly, insights from Schlüter et al. (2023) regarding Systems Thinking reinforce the

importance of a holistic approach, which the study emphasizes as essential for Circular Economy strategies. This systems-based perspective helps integrate various organizational functions into a cohesive sustainability framework.

The practical implications of the findings are significant for practitioners and policymakers alike. They align with García-Sánchez et al. (2021) and Mulazzani & Manrique (2017), who advocate for strategic direction and stakeholder alignment within Circular Economy. By aligning Circular Economy principles with excellence models like the European Foundation for Quality Management, as discussed by EFQM (2020), organizations can integrate sustainability into their operational fabric, which enhances resilience and environmental responsibility.

In summary, this study enriches the understanding of how Circular Economy principles influence organizational sustainability. It underscores the importance of digital tools, stakeholder involvement, and systems thinking, supporting a holistic approach that is essential for advancing sustainability within organizations. These insights offer a roadmap for both academia and industry to foster transformative change through integrated sustainability practices.

Considering Hypothesis Ho 1.1: There is statistical significance of top management support at the level of $\alpha=0.05$ to effect Circular Economy alignment and the organizational sustainability enhancement in Jordan private sector. In their study, Saulick et al. (2023) introduce Business Sustainability Performance Assessment, a framework designed to evaluate sustainability efforts across various organizational contexts. This framework reveals the diversity in assessment methods and the ongoing search for a universally accepted approach, highlighting the inherent complexity in measuring sustainability performance. Eikelenboom and Marrewijk (2023) focus on behavioral aspects within organizations, particularly in the construction industry, emphasizing how reflection and ideation drive the adoption of circular practices. Their work underlines the need for cultural shifts within organizations to facilitate sustainable transitions effectively.

Ba and Galik (2023) explore historical industrial transitions, noting the importance of community-driven sustainability planning in response to changes in manufacturing jobs. This aligns with the study's emphasis on incorporating socio-economic factors into Circular Economy strategies, particularly in diverse and evolving community landscapes. Gebhardt and

Bachmann (2023) examine media's role in shaping perceptions of sustainable entrepreneurship, suggesting that effective communication strategies can influence public understanding and support for sustainability initiatives, a theme that resonates with the study's findings on the impact of communication in advancing sustainable practices.

Schlüter et al. (2023) advocate for Systems Thinking in sustainability assessments, arguing that a holistic perspective is essential for understanding sustainability impacts. This systemic approach supports the study's findings on the importance of interconnected strategies within the Circular Economy. Meanwhile, Havas (2023) introduces Goal-Oriented Transformative Change, emphasizing the need for interdisciplinary collaboration to address sustainability challenges comprehensively. This notion aligns with the study's emphasis on integrating diverse approaches for effective Circular Economy adoption.

Baumle et al. (2023) highlight the role of knowledge intermediaries in sustainability transitions, illustrating the importance of knowledge transfer and collaboration in addressing complex societal challenges. The study echoes this by emphasizing stakeholder engagement and the sharing of best practices as essential for successful Circular Economy implementation.

The study also reinforces the concept of Circular Economy as outlined by the European Foundation for Quality Management and Lehmann et al. (2022), focusing on resource efficiency and minimizing environmental impact. It particularly underscores the challenges and opportunities that small and medium-sized enterprises face, as noted by Rodríguez-Espíndola et al. (2022). Addressing these barriers, such as agility and process standardization, is crucial for broader Circular Economy adoption.

Further, excellence models like EFQM are highlighted for their role in embedding Circular Economy principles within organizational strategies, as discussed by Rincón-Moreno et al. (2021). The study's emphasis on leveraging such frameworks aligns with their importance in overcoming implementation barriers and driving continuous improvement. This systematic incorporation of Circular Economy principles, as advocated by Mulazzani and Manrique (2017), is essential for achieving long-term sustainability.

In conclusion, the study aligns with contemporary research, integrating insights from behavioral science, systems thinking, and strategic management to underscore the multifaceted nature of Circular Economy and the importance of a holistic, interdisciplinary approach for effective implementation and sustainability outcomes.

Considering Hypothesis Ho 1.2: There is statistical significance of the aligned organization's operations with Circular Economy principles $\alpha=0.05$ to achieve environmental sustainability in Jordan private sector. This study aligns with current research on sustainability within the Circular Economy framework, focusing on how operational practices influence environmental outcomes. Saulick et al. (2023) emphasize the need for Business Sustainability Performance Assessment, which provides a structured way for organizations to evaluate and integrate Circular Economy principles into their strategies. This aligns with the study's findings on the significance of operational practices in enhancing sustainability.

The study also highlights the role of organizational culture in adopting sustainable practices, as discussed by Eikelenboom and Marrewijk (2023), who stress the importance of fostering collaboration and innovation. This resonates with the analysis's emphasis on operational adjustments as drivers of sustainability improvements. Further, Ba and Galik (2023) explore how historical shifts in industry affect sustainability planning, supporting the study's focus on contextual factors within Circular Economy.

Moreover, the study corroborates Stam et al. (2023), who advocate for continuous learning and knowledge dissemination as essential for sustainability transformations. This aligns with the analysis's view that operational practices serve as catalysts for improvement. The importance of communication in promoting sustainability is emphasized by Gebhardt and Bachmann (2023), who discuss the impact of media on public perception, mirroring the study's findings on the role of effective communication strategies.

Schlüter et al. (2023) propose integrating Systems Thinking into business models for holistic sustainability, which the study supports by emphasizing a multi-dimensional approach to Circular Economy. Havas (2023) discusses Goal-Oriented Transformative Change for systemic sustainability, advocating for interdisciplinary collaboration, which resonates with the study's emphasis on integrating diverse approaches to Circular Economy.

The European Foundation for Quality Management (EFQM) and Lehmann et al. (2022) define Circular Economy as a means to redirect economic growth through resource efficiency. This study aligns with their perspective, emphasizing the need for small and medium-sized enterprises to overcome challenges like operational agility, as highlighted by Rodríguez-Espíndola et al. (2022). The study further explores the transformative potential of Circular

Economy, drawing from insights by Dey et al. (2022) and Ormazabal et al. (2018) on innovation and sustainability across social, economic, and environmental dimensions.

Excellence models like EFQM, as discussed by Rincón-Moreno et al. (2021) and García-Sánchez et al. (2021), provide structured approaches to embedding Circular Economy within organizations, supporting the study's emphasis on resource optimization and continuous improvement. Mulazzani and Manrique (2017) advocate for strategic integration of Circular Economy principles into planning and execution, reflecting the study's call for systematic adoption to ensure long-term sustainability.

In conclusion, this study reinforces the importance of adopting a holistic approach to Circular Economy by aligning operational practices with strategic goals and stakeholder engagement. By integrating insights from contemporary research, it contributes to the understanding of sustainable business practices, offering a roadmap for organizations striving for environmental stewardship within the Circular Economy framework.

Considering Hypothesis Ho 2: There is statistical significance of enablers at $\alpha=0.05$ has positive influence on organizations implementation of Circular Economy approach in Jordan private sector. This study's findings underscore the significant role of enablers—such as stakeholder engagement, innovation, and resource efficiency—in driving the implementation of Circular Economy principles within organizations. The regression analysis reveals a strong positive relationship between these enablers and Circular Economy adoption, aligning with prior research by Ranta et al. (2021) and Dey et al. (2022) that highlights the importance of stakeholder involvement and the positive impact of circular actions on sustainability outcomes. The analysis provides empirical support for the hypothesis that enablers are critical to Circular Economy adoption, corroborating theoretical frameworks that emphasize the role of innovation and stakeholder collaboration (Rodríguez-Espíndola et al., 2022; Mulazzani & Manrique, 2017). For example, Rodríguez-Espíndola et al. (2022) note the influence of customer expectations and government support as key drivers for Circular Economy initiatives, aligning with the study's findings of a significant positive association between enablers and Circular Economy implementation.

Additionally, the ANOVA results confirm the robustness of the regression model, reinforcing the role of enablers in Circular Economy adoption across various organizational sizes. While

the study does not focus exclusively on small and medium-sized enterprises, the findings can be extended to them, as discussed in the literature (Rodríguez-Espíndola et al., 2022). This suggests that enablers are essential for promoting Circular Economy practices across diverse organizational contexts.

The findings also highlight the importance of integrating enablers within structured frameworks like the European Foundation for Quality Management model. This alignment with models of excellence emphasizes a strategic approach to sustainability, supporting García-Sánchez et al. (2021) and the EFQM (2020) model's focus on continuous improvement and alignment with sustainability goals. By synthesizing empirical data with scholarly insights, the study contributes to a deeper understanding of how enablers shape Circular Economy adoption, resonating with comprehensive perspectives in the literature.

Further validation of these findings is seen through alignment with the broader scholarly discourse on sustainability. As noted by Rodrigo-González et al. (2021), integrating sustainability principles into organizational operations is essential. The regression model's results affirm that enablers have a significant impact on Circular Economy implementation, aligning with the call for businesses to prioritize sustainability alongside financial objectives, a sentiment echoed by Vargo and Lusch (2004).

In conclusion, the study demonstrates that enablers are fundamental to operationalizing Circular Economy principles within organizations. By providing empirical evidence and aligning with theoretical frameworks, the study enhances our understanding of the factors that influence sustainable practices. These insights contribute to the broader discourse on Circular Economy and offer valuable implications for future research and organizational strategy, advocating for a holistic approach to foster sustainable business practices.

Considering Hypothesis Ho 2.1: There is statistical significance of performance management KPIs at $\alpha=0.05$ has effect role in Circular Economy implementation in Jordan private sector. This study emphasizes the role of performance management Key Performance Indicators (KPIs) in implementing Circular Economy practices within organizations. The regression analysis reveals a strong positive relationship between KPI usage and the adoption of Circular Economy principles, aligning with Lehmann et al. (2022), who advocate for the importance of resource efficiency and sustainability within this framework. This finding highlights the critical role that

effective performance measurement and management systems play in advancing sustainable practices, reinforcing perspectives in the literature.

Furthermore, the literature review underscores the importance of stakeholder engagement, particularly in small and medium-sized enterprises, for fostering Circular Economy adoption. Ranta et al. (2021) emphasize the interconnected nature of stakeholder networks, advocating for collaborative approaches to stimulate sustainable innovation. The study finds that organizations prioritizing stakeholder engagement can leverage diverse perspectives to overcome barriers, such as those identified by Dey et al. (2022) and Ormazabal et al. (2018), which include agility and perceived economic benefits.

The strategic alignment with excellence models, particularly the European Foundation for Quality Management model, emerges as crucial for embedding Circular Economy principles into organizational practices. Rincón-Moreno et al. (2021) emphasize the role of such models in promoting continuous improvement and sustainability, supporting a structured integration of Circular Economy initiatives within existing performance frameworks. This is consistent with the holistic ecosystem approach proposed by Mulazzani and Manrique (2017), which stresses the interconnection of organizational operations with broader societal and ecological systems.

The study's findings align with the literature on the need for standardized metrics to assess Circular Economy performance. Rincón-Moreno et al. (2021) call for clear metrics early in the transition to Circular Economy, which this study supports by highlighting the significant role of KPIs. Similarly, Kravchenko et al. (2020) advocate for Corporate Sustainability Reports as tools for measuring circularity, and while the study focuses on KPIs, it aligns by showing that these metrics can provide robust tools for evaluating and comparing Circular Economy practices among organizations.

This study also reflects the context-specific nature of Circular Economy practices across various organizational settings, as noted by Ibanez-Fores et al. (2022). By focusing on KPIs at the organizational level, the study underscores the importance of tailored approaches that consider specific organizational contexts. Additionally, Knäble et al. (2022) emphasize the necessity for actionable metrics in assessing circularity, which this study supports by demonstrating the utility of KPIs in monitoring and enhancing Circular Economy practices.

In conclusion, the study contributes to the broader discourse on Circular Economy by affirming the significant role of KPIs in driving implementation and supporting sustainability. By aligning

with insights from the literature, the study highlights the importance of collaborative stakeholder engagement, excellence models, and standardized metrics in fostering Circular Economy adoption, providing valuable insights for practitioners and policymakers.

Considering Hypothesis Ho 2.2: There is statistical significance of partnerships (suppliers and stakeholders) at $\alpha=0.05$ are drivers that affect implementing Circular Economy at organizations in Jordan private sector. This study highlights the critical role of supplier and stakeholder relationships in implementing Circular Economy practices within organizations. Drawing on consumer behavior theories, including Chernev et al. (2015) and Park and Jang (2013), the analysis reveals that external relationships significantly influence organizational sustainability efforts. The regression analysis confirms that a considerable portion of Circular Economy implementation is driven by suppliers and stakeholders, aligning with Chernev et al.'s findings on the impact of external factors on decision-making, underscoring the value of strategic engagement with these parties.

Furthermore, the implications for Circular Economy strategies are expanded through a synthesis of literature. Sthapit (2018) suggests that organizations can leverage supplier and stakeholder relationships to present diverse sustainable choices, particularly in contexts where uniqueness matters. Yun and Duff (2017) emphasize the importance of structured product offerings to avoid choice overload, implying that organizations should align Circular Economy strategies with consumer preferences by collaborating closely with suppliers and stakeholders to enhance sustainability.

The integration of consumer behavior theories into Circular Economy practices also emerges as a key theme. Coskun et al. (2015) highlight the role of designers in influencing consumer behavior through product design, aligning with Chernev et al. (2015) and Park and Jang (2013) on the importance of design in shaping consumer preferences. Ebersbach and Brandenburger (2020) discuss the power of storytelling as an educational tool, which organizations can use to communicate Circular Economy principles effectively, creating products that align with consumer values and encourage sustainable practices.

Additionally, the literature underscores the complexity of driving Circular Economy implementation by addressing various dimensions of consumer decision-making. A comprehensive strategy that includes educational initiatives, social comparison, and awareness

campaigns is essential for engaging consumers and promoting sustainable behavior change. The research of Horng et al. (2022) and Al-Thawadi et al. (2021) emphasizes integrating sustainability principles into educational and policy frameworks, while Borowski et al. (2020) underscores the importance of communication and social dynamics in catalyzing sustainability-focused behavioral change.

The analysis also aligns with Mulazzani and Manrique (2017), who discuss the importance of stakeholder engagement in managing ecosystem services and navigating uncertainties, reflecting the findings on the strategic influence of suppliers in Circular Economy. Similarly, Alizadeh-Bashan and Taleizadeh (2020) highlight mathematical modeling's role, particularly in optimizing supply chain sustainability, showing the versatility of quantitative approaches in addressing sustainability within Circular Economy practices.

Finally, the need for global regulatory frameworks and partnerships, as discussed by Saccani and Bressanelli (2022), resonates with the findings on supplier and stakeholder influence, emphasizing the interconnectedness of local actions with global sustainability impacts. This study thus provides valuable insights into how partnerships drive Circular Economy implementation and their broader implications for advancing sustainable practices.

Considering Hypothesis Ho 3: There is statistical significance of Circular Economy implementation at $\alpha=0.05$ positively that affect the dimensions of sustainability of the organization (including innovation, people, customers, partners, and employees) in Jordan private sector. This study's findings align with existing literature on sustainability and the implementation of Circular Economy within organizations, offering valuable insights into how these practices impact environmental and societal outcomes. Saulick et al. (2023) emphasize the growing need for businesses to adopt sustainable practices, reflecting an awareness of their environmental and social impacts. This is mirrored in the study, which examines how Circular Economy principles influence various organizational sustainability dimensions. Moreover, Eikelenboom and Marrewijk (2023) highlight the significance of behavioral factors in organizations transitioning towards circular practices, underscoring the importance of understanding organizational dynamics in sustainability efforts.

Empirical evidence from the study supports the positive relationship between Circular Economy implementation and organizational sustainability, in line with theoretical perspectives from Ba

and Galik (2023), who discuss the challenges that communities face during shifts in industrial activities. The study extends this discussion to the organizational level, demonstrating how Circular Economy practices can enhance sustainability while addressing industry-specific challenges.

The study also incorporates statistical analyses, such as regression and ANOVA, to examine the impact of Circular Economy on sustainability. This approach resonates with Schlüter et al. (2023), who advocate for Systems Thinking in sustainability assessments. By applying rigorous statistical methods, the study provides a comprehensive understanding of Circular Economy's role in enhancing sustainability dimensions, reinforcing the importance of holistic perspectives in evaluating sustainability impacts within organizations.

Practical implications from the study suggest that Circular Economy can drive sustainability initiatives. Gebhardt and Bachmann (2023) highlight the role of knowledge intermediation in supporting regional sustainability transitions. This complements the study's findings, which illustrate how organizations can leverage Circular Economy principles to improve sustainability metrics, such as innovation, customer relations, and environmental stewardship. Together, these insights offer a roadmap for policymakers and practitioners aiming to integrate Circular Economy within business strategies.

Furthermore, the study supports the European Foundation for Quality Management's definition of Circular Economy, which prioritizes resource efficiency and environmental stewardship (EFQM, 2020). This aligns with Lehmann et al. (2022), who advocate for Circular Economy models that focus on resource conservation and minimizing environmental impact. The study's empirical findings reinforce this definition, illustrating how Circular Economy practices can drive organizational performance across sustainability dimensions.

In conclusion, the study's findings contribute to the broader discourse on Circular Economy and sustainability, underscoring the importance of stakeholder engagement, excellence models, and a systemic approach to sustainable business practices. By bridging empirical evidence with theoretical insights, the study enhances our understanding of Circular Economy's role in fostering sustainability, providing a foundation for future research and practical applications in organizational contexts.

Considering Hypothesis Ho 3.1 a: There is statistical significance of organizations Circular Economy principles implementation (adopting practices) at α=0.05 to improve Circular Economy performance in Jordan private sector. This study's findings strongly align with existing literature on Circular Economy and its role in enhancing organizational performance. Circular Economy represents a shift from traditional economic models towards sustainable practices focused on resource retention and value maximization (EFQM, 2020). This study validates the hypothesis that implementing Circular Economy principles significantly contributes to improved sustainability performance within organizations.

The literature supports the positive relationship between Circular Economy principles and organizational performance. For example, Dey et al. (2022) report that Spanish SMEs adopting circular practices experience enhanced sustainability across economic, environmental, and social domains. These insights reinforce the importance of Circular Economy as a driver for organizational sustainability.

While benefits are evident, the literature also discusses challenges in Circular Economy implementation, such as resource constraints and lack of awareness. However, enablers like the European Foundation for Quality Management framework and stakeholder engagement are crucial. García-Sánchez et al. (2021) highlight the role of strategic resource utilization in overcoming barriers, which supports this study's focus on quality management frameworks as facilitators of Circular Economy.

Excellence models, particularly the European Foundation for Quality Management, are identified as critical in embedding Circular Economy practices within organizations. Rincón-Moreno et al. (2021) emphasize that these models, enhanced with tools like assessment frameworks, support the structural integration of Circular Economy principles, underscoring their role in driving organizational performance improvements.

Additionally, the literature advocates for an integrated approach to Circular Economy, considering innovation, stakeholder engagement, and ecosystem management. Mulazzani and Manrique (2017) argue that alignment between Circular Economy and sustainability goals is essential, highlighting strategic alignment and stakeholder involvement as key to organizational excellence. This perspective aligns with the study's hypothesis, which links Circular Economy principles with enhanced organizational performance.

In conclusion, the study's findings offer empirical support for the significant impact of Circular Economy principles on organizational performance. By drawing from theoretical frameworks, empirical data, and practical insights, this research contributes to a comprehensive understanding of how Circular Economy practices promote sustainability and resilience in organizations. The alignment between the findings and literature on Circular Economy performance measurement and the importance of standardized metrics, as suggested by Kravchenko et al. (2020) and Knäble et al. (2022), further emphasizes the need for consistent evaluation methods in advancing Circular Economy practices across sectors.

Considering Hypothesis Ho 3.1 b: There is statistical significance of improved Circular Economy performance at $\alpha=0.05$ that affect sustainability perception of customers in Jordan private sector. This study's analysis of the hypothesis regarding the impact of improved Circular Economy performance on customer perceptions aligns closely with consumer behavior theories and literature on sustainability. By exploring the nuanced nature of consumer decision-making, the study echoes Chernev et al. (2015), who discuss how choice overload influences consumer choices. This alignment suggests that Circular Economy initiatives, by offering unique sustainable products, may positively shape customer perceptions and reduce choice overload, as suggested by Sthapit (2018), who notes the appeal of variety when uniqueness is valued.

The study also underscores the importance of education in promoting sustainable consumer behaviors, resonating with Ebersbach and Brandenburger's (2020) argument that storytelling can humanize sustainability principles and encourage behavior change. By linking improved Circular Economy performance to positive customer perceptions, the analysis supports the idea that educational efforts, such as storytelling, can simplify and enhance consumer understanding of sustainability, fostering more sustainable choices.

Moreover, the analysis highlights stakeholder management and resource optimization within the Circular Economy framework, which aligns with Mulazzani and Manrique (2017). They propose that game theory can help stakeholders navigate uncertainties, enhancing strategic management in Circular Economy contexts. This suggests that Circular Economy initiatives not only have the potential to influence customer perceptions but also to optimize resource utilization through effective stakeholder management.

The findings emphasize the value of transitioning to a Circular Economy model, illustrating how improved Circular Economy performance could contribute to organizational success by fostering sustainable business models, as discussed by Rodrigo-González et al. (2021). By demonstrating the connection between Circular Economy initiatives and consumer perceptions, the study supports the view that balancing stakeholder interests and sustainability objectives can lead to a more sustainable and profitable business model across various industries.

The study's insights align with the broader discourse on Circular Economy research. Rinco´n-Moreno et al. (2021) stress the need for early integration of sustainability indicators in the transition to a Circular Economy, highlighting the challenge of standardized metrics, which is addressed in this study by examining the impact of Circular Economy performance on customer sustainability perceptions. Additionally, Kravchenko et al. (2020) emphasize standardized metrics for comparability and benchmarking. By providing empirical evidence on the relationship between Circular Economy performance and customer perceptions, this study underscores the need for such metrics in Circular Economy evaluation.

Finally, the study acknowledges the context-specific implementation of Circular Economy practices, in line with Ibanez-Fores et al. (2022), and reinforces Knäble et al. (2022)'s call for a harmonized framework to effectively measure and assess Circular Economy performance. By supporting the development of standardized evaluation methods, the study contributes to the advancement of Circular Economy research and the broader goal of fostering a sustainable transition.

Considering Hypothesis Ho 3.2: There is statistical significance at $\alpha=0.05$ that innovation framework at the organization mediated the effect of people (employees) involvement in the Circular Economy on the Circular Economy principles implementation in Jordan private sector.

The examination of literature surrounding the Circular Economy reveals a multifaceted landscape that intertwines societal behavior, economic incentives, and ecological sustainability. Marchesi and Tweed (2021) underscore the pivotal role of social innovation and a fundamental shift in consumer habits in driving meaningful progress towards the Circular Economy. Alizadeh-Bashan and Taleizadeh (2020) further elucidate the economic benefits of Circular Economy practices, showcasing how regions like China and Europe have realized substantial savings and revenue streams through initiatives such as remanufacturing and recycling.

The incorporation of Circular Economy principles within organizational operations is facilitated by excellence models such as the European Foundation for Quality Management framework. European Foundation for Quality Management models, spanning various years, provide structured approaches for organizations to integrate Circular Economy principles into their governance, performance management, and innovation strategies. This aligns with the findings that innovation frameworks within organizations can be embedded within broader excellence models to drive Circular Economy adoption effectively.

However, while there are clear benefits to Circular Economy adoption, organizations face barriers in implementation. García-Sánchez et al. (2021) highlight these barriers and advocate for strategic resource allocation to overcome challenges such as lack of awareness and technological capabilities. Eisenreich et al. (2022) and Brandstrom & Eriksson (2022) emphasize the importance of considering Circular Economy implications across organizational value chains, with interconnected circular value chain models optimizing resource usage and enhancing sustainability.

Moreover, the role of analytics and information systems emerges as critical in driving Circular Economy adoption within organizations. Kristoffersen et al. (2021) suggest that by harnessing analytical capabilities, organizations can optimize resource orchestration and improve decision-making in Circular Economy initiatives. Finally, Zisopoulos et al. (2022) emphasize the importance of policy frameworks and stakeholder-inclusive strategies in navigating the complexities of Circular Economy implementation. Aligning organizational strategies with external policies and stakeholder expectations enhances organizational resilience and sustainability.

In conclusion, the findings underscore the multifaceted nature of Circular Economy adoption within organizational contexts. While there are clear economic and environmental benefits, organizations must navigate barriers and complexities effectively. Innovation frameworks, integrated within broader excellence models, emerge as critical enablers in driving Circular Economy adoption by facilitating strategic resource allocation, value chain optimization, analytics integration, and policy alignment.

Considering Hypothesis Ho 4.1: There is statistical significance that enablers mediate the Circular Economy principles implementation at $\alpha=0.05$ to affect the overall circular economy organizational results in Jordan private sector. This study's regression analysis underscores the relationship between organizational excellence, quality management frameworks, and Circular Economy principles. Aligned with the literature, it shows how integrating Circular Economy into business practices enhances sustainability and operational efficiency (Escrig & Menezes, 2015; Asgher et al., 2015). The findings confirm that implementing Circular Economy principles significantly influences organizational results, supporting the argument that sustainability practices are essential for contemporary business operations.

Contrary to initial expectations, however, the role of enablers and their interaction with Circular Economy principles were found to be statistically insignificant in predicting organizational results. This outcome highlights the complexity of integrating Circular Economy enablers, which may vary by context and require further exploration into specific factors impacting organizational excellence (Rodríguez-Espíndola et al., 2022). Despite this, the literature remains supportive of the EFQM model as a quality management framework promoting sustainable practices within the Circular Economy. Suárez et al. (2017) and Bayo-Moriones et al. (2011) underscore EFQM's positive influence on organizational performance, suggesting its continued relevance.

The study also emphasizes the strategic role of Circular Economy principles implementation in achieving organizational excellence, underscoring the literature's emphasis on the need for sustainability in core operations (Lehmann et al., 2022; Pomponi & Moncaster, 2017). This relationship is pivotal as businesses face growing pressure to align with environmental and social goals. The emphasis on human-centric strategies within quality management frameworks supports Circular Economy's focus on social responsibility and stakeholder engagement, highlighting the importance of these frameworks in achieving sustainable outcomes (Rincón-Moreno et al., 2021; García-Sánchez et al., 2021).

While enablers' lack of statistical significance suggests that contextual factors may mediate their effectiveness, it also calls for further research on the nuanced role of enablers in diverse settings. Future studies could explore the specific factors influencing the efficacy of quality management frameworks in promoting Circular Economy across industries and regions. Longitudinal studies tracking sustainability impacts over time could offer additional insights into the long-term

benefits of Circular Economy practices. This research enriches our understanding of how quality management frameworks, supported by interdisciplinary insights, drive sustainability within the Circular Economy, providing valuable implications for both theory and practice (Kravchenko et al., 2020; Knäble et al., 2022).

Considering Hypothesis Ho 4.2: There is statistical significance that enablers mediate the Circular Economy Execution at $\alpha=0.05$ to affect the overall circular economy organizational results in Jordan private sector. The findings of this study align with existing literature, particularly concerning quality management frameworks and their implications for sustainability within the Circular Economy framework. The analysis underscores the significance of models such as the European Foundation for Quality Management (EFQM) in promoting sustainable business practices, reflecting prior research insights. Scholars like Suárez et al. (2017) highlight the versatility of EFQM across diverse sectors, with my study reinforcing the model's role in enhancing resource efficiency, waste reduction, and long-term value creation.

Moreover, my study recognizes the importance of human-centric approaches in quality management frameworks. Research by Escrig & Menezes (2015) and Asgher et al. (2015) emphasizes human factors' impact on organizational quality and sustainability. This aligns with my findings, which suggest that people-centric strategies are crucial for achieving organizational excellence and sustainability within the Circular Economy. Additionally, the study highlights the strategic importance of information management within quality management frameworks, supporting the work of Zárraga-Rodríguez & Álvarez (2014) and Calvo-Mora et al. (2015), who stress information orientation's role in enhancing performance and sustainability.

The statistical analysis provides empirical validation for hypotheses derived from the literature, showing a significant relationship between Circular Economy execution, enablers, and organizational results. This supports a holistic approach to integrating environmental stewardship, social responsibility, and operational efficiency, as emphasized in the literature. The findings suggest that quality management practices must be adapted to specific organizational contexts to maximize their sustainability impact.

The role of Small and Medium-sized Enterprises (SMEs) in advancing Circular Economy principles also emerges as crucial. Rodríguez-Espíndola et al. (2022) highlight SMEs' significant contribution to global GDP, emphasizing their potential to adopt sustainable practices. However, barriers remain, as demonstrated by the British Chambers of Commerce (2021), which reports a gap between aspirations and operational realities among businesses. Innovation is a key driver, with Rodríguez-Espíndola et al. (2022) advocating for consistent technological investment to advance Circular Economy goals. The study by Pomponi and Moncaster (2017) further supports a multi-dimensional innovation framework to assess Circular Economy impacts across various domains.

In conclusion, the findings underscore the importance of Circular Economy principles and enablers for achieving organizational results. By synthesizing insights from literature with empirical analysis, this study offers a comprehensive understanding of how Circular Economy principles contribute to sustainability and organizational excellence, with valuable implications for both theory and practice.

Considering Hypothesis Ho 5: There is statistical significance that directions mediate the circular economy principles execution at $\alpha=0.05$ to affect the overall Circular Economy organization results in Jordan private sector. This study's findings reveal varied levels of Circular Economy implementation among organizations, reflected by a mean score of 3.4900 and a significant standard deviation. This variability suggests the complexity of effectively adopting Circular Economy practices, a challenge also noted by Rincón-Moreno et al. (2021). They emphasize that clear sustainability metrics are essential during the transition phase to Circular Economy, a point supported by this study's findings. Moreover, the role of strategic directions is crucial in shaping Circular Economy's impact on organizational outcomes, evidenced by a directional support mean of 3.3420. This aligns with Kravchenko et al. (2020), who highlight the need for standardized indicators to enhance Circular Economy transparency and comparability across organizations.

The context-specific impacts of Circular Economy practices were also evident, with outcomes varying across organizations. Ibanez-Fores et al. (2022) argue for tailored Circular Economy approaches to accommodate unique economic, environmental, and social contexts. My analysis

underscores the need for nuanced metrics that capture these variations, resonating with Knäble et al. (2022), who call for actionable indicators across multiple levels.

The research echoes the broader literature on business excellence, especially in integrating Circular Economy principles. Ghicajanua et al. (2015) outline how business excellence has evolved to include social and environmental stewardship, aligning with Circular Economy's ethos. Jankala and Jankalova (2016) advocate for expanding business excellence to incorporate environmental sustainability, reinforcing the importance of strategic directions in Circular Economy implementation. Furthermore, Asgher et al. (2015) highlight the critical role of human factors in achieving organizational quality and sustainability, aligning with my study's findings on Total Quality Management's importance in supporting Circular Economy.

Finally, the alignment between the European Foundation for Quality Management (EFQM) model and Circular Economy principles stands out as vital for achieving sustainability. Suárez et al. (2017) emphasize EFQM's adaptability across sectors, supporting its role in advancing Circular Economy. My study supports this notion, highlighting how quality management frameworks like EFQM bolster sustainability efforts in organizations. The literature review further strengthens this connection by underscoring the synergies between organizational excellence and Circular Economy, with a focus on integrating sustainability practices, human-centric approaches, and quality management frameworks to drive enduring success within the Circular Economy paradigm.

These insights, aligned with Lehmann et al. (2022), reinforce the notion that Circular Economy's success depends on embedding it into organizational strategy and fostering stakeholder engagement (Ranta et al., 2021), thus providing valuable implications for both theory and practice.

7.0. Conclusions, Recommendations, Futurue Studies & Research limits

7.1. Conclusion

In conclusion, this research aimed to explore the alignment between Circular Economy principles and organizational excellence within Jordan's private sector, with a focus on enhancing sustainability. This study is timely and relevant given Jordan's evolving commitment to sustainable development, which aligns with its Vision 2025. The empirical findings from 449 surveyed companies demonstrate that integrating Circular Economy practices can indeed foster organizational excellence, contributing to both environmental sustainability and improved business performance.

One of the main contributions of this research is the development of a practical framework that highlights the key enablers for Circular Economy implementation, including leadership support and stakeholder engagement. These findings underscore the necessity of a systemic approach to sustainability that aligns with Jordan's strategic objectives. The study provides evidence-based recommendations specifically for Jordanian policymakers, advocating for policies that support SMEs in adopting Circular Economy practices. Additionally, the research contributes a unique perspective on how excellence models like EFQM can be adapted to integrate sustainability, thus providing a pathway for companies to achieve both operational excellence and environmental stewardship.

In examining the Jordanian context, the study reveals challenges such as resource constraints and varying levels of environmental awareness among SMEs. These challenges indicate a need for increased governmental support and targeted educational initiatives to raise awareness about the benefits of Circular Economy. By situating the findings within Jordan's socio-economic landscape, this research not only adds to the global discourse on Circular Economy but also provides localized insights that are critical for advancing sustainability in emerging economies.

7.2. Recommendations

Enhancing Circular Economy Adoption in Jordan: To foster Circular Economy practices in Jordanian companies, I recommend the following specific actions:

1. **Strengthen Policy Support and Incentives:** The government could develop and implement policies that incentivize businesses to adopt Circular Economy models. This

might include tax benefits, grants, or subsidies for organizations that prioritize sustainability. Such policies would reduce financial barriers and promote wider adoption across sectors.

2. **Encourage Industry-Specific Circular Economy Programs:** Recognizing the diversity of Jordan's private sector, it is essential to tailor Circular Economy programs to specific industries. For instance, in the manufacturing sector, programs could focus on resource efficiency and waste reduction, while in the service sector, they could emphasize product lifecycle management and recycling initiatives. This targeted approach ensures that strategies are relevant and impactful.
3. **Enhance Collaboration Among Stakeholders:** Establishing a platform for collaboration between businesses, government agencies, and academic institutions would facilitate knowledge sharing and innovation. By working together, stakeholders can pool resources, share best practices, and develop solutions that align with Jordan's unique economic and environmental challenges.
4. **Develop Capacity-Building Initiatives:** To ensure sustainable implementation, there is a need for continuous education and training. Workshops, seminars, and training programs on Circular Economy practices should be organized, focusing on developing the skills needed to drive sustainability in various sectors.
5. **Create Public Awareness Campaigns:** Increasing public awareness about the benefits of Circular Economy practices is crucial. Campaigns should highlight how individuals and businesses can contribute to sustainability. Engaging the public will help build a culture that values environmental stewardship, creating demand for sustainable products and services.
6. **Implement Metrics for Measuring Circular Economy Success:** To evaluate the impact of these initiatives, I recommend establishing a standardized set of metrics for Circular Economy success. These could include metrics for waste reduction, resource efficiency, and financial savings, providing a benchmark for organizations to assess their progress.

By implementing these focused recommendations, Jordanian companies can navigate the transition to a Circular Economy, achieving sustainability goals while contributing to the country's broader development objectives.

7.3. Research Gaps

While this study provides significant insights into the alignment of Organizational Excellence and Circular Economy principles in enhancing sustainability, certain research gaps have been identified that warrant further investigation. First, the existing literature predominantly addresses Circular Economy and Organizational Excellence separately, with limited research exploring their combined impact on sustainability within specific regional contexts. This indicates a need for more comprehensive studies that bridge these concepts across various industries and geographies, particularly in developing economies where Circular Economy practices are still emerging.

Another research gap relates to the depth of empirical evidence on the direct effects of Circular Economy adoption on organizational performance metrics. Although this thesis contributes to this area by examining private sector organizations in Jordan, further research is necessary to validate these findings across other sectors and regions to assess the consistency and generalizability of the results.

Moreover, the current study highlights enablers such as top management support and partnerships as critical to successful Circular Economy implementation. However, there is limited understanding of the mechanisms through which these enablers interact with organizational processes to influence sustainability outcomes. Future research could delve into these dynamics to provide a more nuanced understanding of how specific organizational factors facilitate or hinder the adoption of Circular Economy practices.

Lastly, this thesis identifies potential benefits of integrating Circular Economy principles into Organizational Excellence frameworks. However, existing excellence models, like the EFQM, still lack robust metrics to fully capture Circular Economy contributions. Addressing this gap could help in developing more integrated performance management systems that better align with sustainability goals.

7.4. Future Studies

Future research directions suggested in the thesis include:

- **Exploring Challenges in Circular Economy Implementation:** Further investigation into the operational and cultural challenges faced by organizations in implementing Circular Economy practices and identifying strategies to overcome these barriers.

- **Impact of Circular Economy on Customer Perceptions:** Additional research on how improved Circular Economy performance influences customer sustainability perceptions and the role of unique and sustainable products or services in shaping these perceptions.
- **Leadership and Stakeholder Engagement:** Deeper exploration into the dynamics of leadership and stakeholder engagement in driving Circular Economy initiatives, with a focus on identifying effective strategies for broadening stakeholder involvement.
- **Holistic Approaches to Circular Economy Adoption:** Studies to develop and test holistic, multi-faceted strategies for Circular Economy adoption that address the complexities and challenges identified in the analysis.
- **Regional and Global Context:** Investigating the transferability of Circular Economy practices and strategies beyond the Jordanian context to other regions and countries, considering variations in regulatory frameworks, cultural norms, and market dynamics. This could involve comparative studies across different regions to identify commonalities and differences in Circular Economy implementation and effectiveness.

7.5. Research Limits

The study acknowledges several limitations:

- **Scope of Circular Economy Implementation:** The focus on certain aspects of Circular Economy implementation, such as procurement, innovation, and reverse logistics, may limit the understanding of Circular Economy's impact across other organizational segments.
- **Operational Agility and Cultural Adoption:** Challenges in operational agility and cultural adoption of Circular Economy principles within organizations are identified, suggesting the need for further research to understand and address these barriers effectively.
- **Generalizability of Findings:** The study's findings, while significant, may not be universally applicable across all industries or organizational contexts, indicating a need for caution in generalizing the results (these results refer to the selected sample of private sector companies in Jordan).

- **Empirical Evidence:** While the study provides empirical evidence supporting the positive relationship between Circular Economy practices and organizational sustainability, further research is needed to validate these findings across diverse settings and over longer periods.
- **Limited Regional or Global Perspective:** The study's focus solely on Jordanian organizations may restrict the generalizability of findings to broader regional or global contexts. Future research should aim to incorporate diverse geographical contexts to enhance the applicability and robustness of Circular Economy frameworks and strategies.

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9.0. Appendix 1 – Questionnaire Questions

As responsible businesses, you understand the need to play your part in tackling global challenges. A clear Environmental, Social and Governance (ESG) strategy must take into account sustainability and the enormous cost of waste, pollution, and carbon emissions. Disposable consumerism is a thing of the past.

MOVING AWAY FROM THE LINEAR MODEL

You know that by collaborating with partners, suppliers and customers, you can fulfil your corporate responsibility. Together you can build a better system that works for your organization, the environment and society as a whole.

Whether you're a multinational or an SME, you can help bring the circular economy to life in your organization.

What is it?

A Circular Economy is an alternative to a traditional linear economy (make, use, dispose). It means we keep resources in use for as possible, extract the maximum value from them whilst in use, then recover and regenerate products ad materials at the end of each service life.

Reference: EFQM

I kindly invite you to join this questionnaire, that will be used for research purposes to support my PhD studies, as i am majoring now in Circular Economy and Sustainability at the University of Pecs in Hungary.

The questionnaire was developed based on the Circular Economy lens by the EFQM, to be used as a tested and well established set of questions, to collect your opinions and perceptions regarding the different aspects that will be covered, and later help come out with insights that can be associated with literature review to enrich the area of Circular Economy with more detailed researches, especially by linking it with excellence models and performance.

When answering the questionnaire, please refer to your current organization, or the last organization you worked at.

----------Please note that I am targeting Private Sector companies in Jordan----------

I highly appreciate sparing some of your time to participate in this study.

Kind Regards
Malek Ghazo

#	Section	Main Questions	Sub Questions
1	**General**	Please confirm that the organization is in the private sector	If not in the private sector, please close the questionnaire as we are only targeting private sector companies here..
2		Please select your position	• Team member • Supervisor • Team leader • Manager • Head, Director • Senior Director • Vice President • CEO
3		Please add organization's name	
4		Please add organization's country (Headquarter)	
5		Please Indicate if the organization operates only in Jordan. If not, and has presence in other countries, please add countries names	
6		When was the company founded?	
7		Does the organization have foreign, non-Jordanian ownership?	• Yes • totally foreign owned • Yes • partially foreign owned • No
8		Company's decision making. Please select what applies?	• It is independent, not owned by any other company and does not own any other company • Dominant member of domestic group, owns other company(s) or organizations(s) • It is not an independent member of a domestic group or a subsidiary of another company/organization • Dominant member of an international group, owns other company(s)/organization(s)

#	Section	Main Questions	Sub Questions
			• It is not an independent member of an international group, or a subsidiary of another company/organization
9		How many independent, separable business units (product families or product-market combinations) are distinguished and within the scope of the company?	
10		Please select organization's industry	• Airline • Agriculture • Arts and culture • Construction and capital works • Consultation • Education and training • Financials • Healthcare • Hospitality and tourism • IT (Software/Hardware) • Manufacturing • Media • Postal and courier services • Publishing • Real estate/property • Sports • Telecommunication • Transportation • Utilities • Retail
11		Please select organization's yearly revenue range (USD= USA Dollars)	• <$50K • $50K-$100K • $101K-$250K • $251K-$500K • $501K-$750K • $751K-$1M • $1M-$3M • $3M-$5M • $5M-$10M • >$10M
12		Please select organization's number of employees range	• 1-4 • 5-9 • 10-19 • 20-49

#	Section	Main Questions	Sub Questions
			• 50-99 • 100-149 • 150-199 • 200-249 • 250-299 • 300-399 • 400-499 • 500-599 • 600-799 • 800-899 • 900-999 • >1000
13	**Enablers**	On a scale from 1-5, how would you rate the following statements in the organization (1, 2, 3, 4, 5)	• Availability of performance management system • Use of KPIs on strategic level • Use of KPIs on departmental level • Use of KPIs on employee level • Use of KPIs on projects level • Use of KPIs on processes level • Documented processes • Sustainability focus • Sustainability KPIs and targets • CSR focus • CSR KPIs and targets • Availability of innovation framework • Selection of suppliers (based on cost) • Selection of suppliers (based on quality) • Selection of suppliers (based on lead time) • Selection of suppliers (based on care for the environment) • Selection of suppliers (based on sustainability aspects focus) • Relationship with suppliers (short term) • Relationship with suppliers (long term) • Relationship with suppliers(partnership) • Relationship with society (as customers) • Relationship with society (as partners)
14	**Direction**	On a scale from 1-5, how would you rate the following statements in the organization (1, 2, 3, 4, 5)	• There is clear alignment evident between the organization's Purpose, Values, Vision, Operating Model, and the adoption of Circular Economy principles

#	Section	Main Questions	Sub Questions
			• The organization identifies and monitors those drivers of change that are critical to its Circular Economy Operating Model (Key Stakeholders' needs, markets, public opinion, legislation, material technology, best practices) • The organization consistently includes Circular Economy principles as one of the relevant criteria it applies when making strategic and operational decisions • The organization has measurement processes in place to monitor the successful implementation of Circular Economy principles into its strategic and operational ways of working, as well as the outcomes achieved • The end-to-end supply chain is structured and managed with full consideration of Circular Economy principles where applicable • Based on a culture of co-creation and co-design, the organization actively promotes innovative thinking to identify and deliver new Circular Economy opportunities within its ecosystem • The organization communicates its commitment to Circular Economy principles to its Key Stakeholders and others within its ecosystem
15	**Execution**	On a scale from 1-5, how would you rate the following statements in the organization (1, 2, 3, 4, 5)	• The organization actively educates its customers on the importance of adopting Circular Economy principles into their own way of working, and rewards and recognizes them for any successful collaborations • The organization ensures its People are proactively guided, rewarded and recognized for their efforts and ideas to help move the organization towards a way of working based entirely on Circular Economy principles • The organization contributes to the development, well-being, and prosperity

#	Section	Main Questions	Sub Questions
			of the Society by offering sustainable solutions that address environmental problems such as climate change, material scarcity or threats to biodiversity • The organization rewards and recognizes those Partners that adopt and embed Circular Economy principles into their own approach(es), and actively encourages the sharing of good practices • To support its Circular Economy ambitions, the organization continuously gathers and evaluates creative ideas from within its ecosystem • The organization continues to create value with its products, services, and solutions as it makes a clear transition from using linear to circular approaches • To help embed Circular Economy principles, the organization periodically communicates this commitment to its People, at the same time ensuring that the messages remain ethical and avoid misdirection (“greenwashing”) • The organization converts data and information about Circular Economy into knowledge and uses the outcomes to create higher value and to improve the overall customer experience • The organization's approach to managing risk includes an assessment of the potential impact on the future ambitions of its Circular Economy Operating Model • The organization reduces its tangible assets and requires resources by promoting a sharing culture for the use of its products, services, and solutions in line with Circular Economy principles • The organization designs and selects materials for its products, services and solutions based on Circular Economy

#	Section	Main Questions	Sub Questions
			principles to extend the life cycle of the materials used • The organization periodically determines which assets and resources it no longer needs and based on Circular Economy principles, disposes of them responsibly
16	**Results**	On a scale from 1-5, how would you rate the following statements in the organization (1, 2, 3, 4, 5)	• Its customers perceive the organization's approach to Circular Economy as being environmentally responsible, ethically sound, and financially fair • People (employees) perceive the organization's approach to Circular Economy as being environmentally responsible, ethically sound, and financially fair • The members of the partner network perceive the organization's approach to Circular Economy as being environmentally responsible, ethically sound, and financially fair • The organization has a set of performance results that clearly indicate the degree of success it has had in delivering on its Circular Economy objectives • When compared with other organizations, either in its own ecosystem or outside, it can demonstrate that it succeeds equally or better than others in delivering its Circular Economy ambitions • The organization's internal and external audit results and risk assessments indicate outstanding performance in relation to targets set for embedding Circular Economy principles • Based on its achievements, the organization has received external recognition for acting as a role model in the application of Circular Economy principles and associated results

10.0. Appendix 2 – Questionnaire's Glossary

Agility: The organisation's ability to rapidly and efficiently adapt to changes.

Approach: The overall way by which something is made to happen; an approach comprises processes and structured actions within a framework of principles and policies

Benchmarking: A systematic comparison of approaches with other relevant organisations that gains insights that will help the organisation to take action to improve its performance.

Business Model: The elements of the business that create and deliver value; these elements normally include the value proposition, the customer segments and their associated relationships, the channels used to take products, services and solutions to market, the revenue & cost streams, partners, and the key resources and key processes of the organization

Business & Governing Stakeholders: These are the people who provide funding for the organization ; the people who the Management Team ultimately report to. In companies, this could be the owners, shareholders or investors. In the public sector, this could be the government, ministers or politicians

Circular Economy: A circular economy is a regenerative approach, in contrast to the traditional linear economy, which has a 'take, make, dispose' model of production. It is an economic system which can be achieved through long-lasting design, maintenance, repair, reuse, remanufacturing, refurbishing, and recycling.

Capabilities: The quality of being able to turn capacity (see below) into action and results by accessing relevant knowledge, competence, expertise, resources and processes.

Capacities: A measurement of what can theoretically be achieved, usually expressed in terms of size, volume or number. In organisations, this often refers to what the theoretical maximum output is compared to what the actual output is, with the result being expressed as a percentage.

Change Management: An approach for leading the transition of individuals, teams and organizations from their current state to a defined, desired future state. It is an organizational process aimed at helping stakeholders affected to accept and embrace changes in their business environment.

Co-Creation/Co-Design: Co-creation involves working on new product and service ideas together with the customers who are going (you hope) to buy them. It turns "market research" into a far more dynamic and creative process.

Comparisons: Data used to compare the performance of one organisation or process with another.

Continual Improvement: The on-going improvement of processes that lead to achievement of higher levels of performance through incremental change.

Core Competence: A well performed internal activity or capability that is central to the organisation's competitiveness, profitability or efficiency.

Corporate Governance: A framework of authority and control within an organisation used to help it fulfil its legal, financial and ethical obligations.

Community: The term community typically refers to the various individuals, groups and institutions that have a vested interest in the welfare and success of the organization, its associated neighborhoods and the impact that it may have on the ecosystem

Corporate Social Responsibility: Organizations around the world, and their stakeholders, are becoming increasingly aware of the need for, and benefits of, socially responsible behaviour. The objective of social responsibility is to contribute to sustainable development. An organization's commitment to the welfare of society and the environment has become a central criterion in measuring its overall performance and its ability to continue operating effectively. This, in part, is a reflection of the growing recognition that we need to ensure healthy ecosystems, social equity and good organizational governance. Ultimately, an organization's

activities depend on the health of the world's ecosystems. These days, organizations are subject to greater scrutiny by their various stakeholders.

Creativity: The generation of ideas for new or improved processes, products, services, solutions, systems or social interactions

Critical success factors: Limited number (usually between 3 to 8) of characteristics, conditions or variables that have a direct impact on the effectiveness, efficiency and viability of an organisation, programme or project.

Culture: The specific collection of Values and Behavioral Norms that are shared by people and groups in an organization that control the way they interact with each other and with stakeholders outside the organization

Customer: The recipient of the products and/or services provided by the organization . The Customer is one of the Stakeholders for whom the organization aspires to create sustainable value.

Ecosystem: A fundamental principle of an ecosystem is interdependence, i.e. something that happens in one part of the system may affect other parts within the system. In the context of an organization there are many factors external to it that affect how it operates, but over which it has no control. These can include government policy, the economic and societal make-up within its region and neighborhoods, the prevailing religious and cultural expectations of its communities, demands for sustainability and available financing.

Ethical behavior: Ethics are well founded standards in a culture that make a person's actions right or wrong. They influence behavior and help an individual to make the right choices and act responsibly

Employability: A person's capability for gaining and maintaining employment. The meaning

can be different depending on the perspective taken. For the individual, this could mean stability or mobility. For the organisation, it could mean flexibility.

Empowerment: The process by which individuals or teams are able to take decision making responsibilities, and operate with a degree of autonomy in their actions.

Equal opportunity: The practice of ensuring that all people receive fair and equal treatment regardless of gender, age, race, nationality, religion, disability or sexual orientation

Greenwashing: Disinformation disseminated by an organization so as to present an environmentally responsible public image; a public image of environmental responsibility promulgated by or for an organization, etc., but perceived as being unfounded or intentionally misleading.

Good Practice/Best Practice: Superior approaches, policies, processes or methods that lead to exceptional achievement. Since it is difficult to find out what is best, the term "good practice" is preferred by most organizations. Ways to find good practice outside the organization can include benchmarking and external learning.

Governance: A framework of authority and control within an organization used to help it fulfil its legal, financial and ethical obligations.

Innovation: The practical translation of ideas into new or existing products, services, solutions, processes, systems, organization innovations or social interactions

Intellectual Capital: The value of an organisation that is not captured in its traditional financial accounts. It represents the intangible assets of an organisation and is often the difference between market and book value.

Key Performance Indicator: A measurable expression for the achievement of a desired level of results in an area relevant to the evaluated entity's activity

Key Processes: The processes that are of most important for delivering the strategy and driving the value chain of the organisation.

Knowledge: Knowledge is expertise and skills acquired by a person through experience and education,involving the theoretical and/or practical understanding of a subject. While da ta are raw facts and information is data with context and perspective, knowledge is information with guidance/ ability for action.

Leaders: The people who coordinate and balance the interests and activities of all who have a stake in the organisation.

Learning networks: A group of people with a common goal or interest who pool their individual information, knowledge and experience to actively learn together.

Management System:The framework of processes, related performance/result indicators and process management and improvement systems used to ensure that the organisation can fulfil its Mission and Vision.

Mission: A statement that describes the purpose or "raison d'être" of an organisation, confirmed by its stakeholders.

Mobility: The willingness and capability of people to change their job or the working location

Organisational Agility: The ability to respond and adapt, in a timely way, to an emer ging threat or opportunity.

Organisational Capability: Refers to the ability and capacity of the organisation to achieve specific goals. The organisation can enhance this capability, for example, through external partnerships or internal learning & development.

Partner: An external party with whom the organization strategically chooses to work with to achieve common objectives and provide long term mutual benefit.

Partnership: A durable working relationship between the organization and one or more partners that creates and shares greater value for both parties. Partnerships can be formed with, for example, suppliers, distributors, customers, educational establishments, consultancies or research organization . Strategic partnerships support the strategic objectives of the organization in a particular way.

Perception: The opinion stakeholders have of the organization .

Process: A set of activities, repeated over time, that interact with one another as the output from one activity becomes the input for another activity. Processes add value for external or internal customers by transforming inputs into outputs, using resources. Typically, there are three types of processes: main or 'core' processes, management processes and support processes.

Products: A product can consist of goods, services or solutions that are the result of work performed by an organization . Products are distributed through a distribution channel before being consumed or used.

Purpose Statement: A statement that describes the raison-d'être of an organization i.e., what it does and why it does it and which is understood by its stakeholders

Society: The social infrastructure outside the organization that can be affected by, or, equally, can impact on the organization . This can be representatives of the immediate Community or the Wider Society, including, for example, Special Interest Groups.

Stakeholder: Person, group or organization that has a direct or indirect stake or interest in the organization , its activities and performance, because it can either affect the organization or be affected by it. Examples of external stakeholders include owners (shareholders), customers, suppliers, partners, government agencies and representatives of the community or the society. Examples for internal stakeholders are people or groups of people. An outstanding

organization considers its stakeholders' needs, demands, requests and expectations, balances them, and evaluates its performance in relation to its most important (Key) stakeholders.

Strategy: A high level plan describing the tactics by which an organization intends to achieve its Vision, whilst remaining true to its Purpose. The strategy is translated into aligned strategic goals and objectives reflecting what the organization has to do to be successful in its ambition. A strategy will consist of actions ordered over a particular time period to attain objectives that have been derived from a careful analysis of the organization's ecosystem and intended to move it from where it is now to where it wants to be

Sustainability: The long-term future of the organization , as perceived by its various Key Stakeholders, i.e. the Business & Governing Stakeholders, its People, its Community, its Partners & Suppliers.

Value Proposition: The differentiating value the organisation's products and services offer to customers.

Values: Operating philosophies or principles that guide an organisation's internal conduct as well as its relationship with the external world. Values provide guidance for people on what is good or desirable and what is not. They exert major influence on the behaviour of individuals and teams and serve as broad guidelines in all situations.

Vision: Description of what the organisation is attempting to achieve in the long-term future. It is intended to serve as a clear guide for choosing current and future courses of action and, along with the Mission; it is the basis for strategies and policies.

Reference: EFQM, The KPI Institute, ISO 26000, HBR, Oxford English Dictionary.

11.0. Appendix 3 – Factor Analysis

Communalities		
	Initial	Extraction
Q23 There is clear alignment evident between the organization's Purpose, Values, Vision, Operating Model and the adoption of Circular Economy principles	1,000	0,743
Q24 The organization identifies and monitors those drivers of change that are critical to its Circular Economy Operating Model (Key Stakeholders' needs, markets, public opinion, legislation, material technology, best practices	1,000	0,890
Q25 The organization consistently includes Circular Economy principles as one of the relevant criteria it applies when making strategic and operational decisions	1,000	0,867
Q26 The organization has measurement processes in place to monitor the successful implementation of Circular Economy principles into its strategic and operational ways of working, as well as the outcomes achieved	1,000	0,868
Q27 The end-to-end supply chain is structured and managed with full consideration of Circular Economy principles where applicable	1,000	0,785
Q28 Based on a culture of co-creation and co-design, the organization actively promotes innovative thinking to identify and deliver new Circular Economy opportunities within its ecosystem	1,000	0,772
Q29 The organization communicates its commitment to Circular Economy principles to its Key Stakeholders and others within its ecosystem	1,000	0,791
Q30 The organization actively educates its Customers on the importance of adopting Circular Economy principles into their own way of working, and rewards and recognizes them for any successful collaborations	1,000	0,524
Q31 The organization ensures its People are proactively guided, rewarded and recognized for their efforts and ideas to help move the organization towards a way of working based entirely on Circular Economy principles	1,000	0,755
Q32 The organization contributes to the development, well-being and prosperity of the Society by offering sustainable solutions that address environmental problems such as climate change, material scarcity or threats to biodiversity	1,000	0,613
Q33 The organization rewards and recognizes those Partners that adopt and embed Circular Economy principles into their own approach(es), and actively encourages the sharing of good practices	1,000	0,881
Q34 To support organization Circular Economy ambitions, the organization continuously gathers and evaluates creative ideas from within its ecosystem	1,000	0,871
Q35 The organization continues to create value with its products, services and solutions as it makes a clear transition from using linear to circular approaches	1,000	0,738
Q36 To help embed Circular Economy principles, the organization periodically communicates this commitment to its People, at the same time ensuring that the messages remain ethical and avoid misdirection ("greenwashing")	1,000	0,794
Q37 The organization converts data and information about Circular Economy into knowledge and uses the outcomes to create higher value and to improve the overall customer experience	1,000	0,827
Q38 The organization's approach to managing risk includes an assessment of the potential impact on the future ambitions of its Circular Economy Operating Model	1,000	0,843

Q39 The organization reduces its tangible assets and required resources by promoting a sharing culture for the use of its products, services and solutions in line with Circular Economy principles	1,000	0,788
Q40 The organization designs and selects materials for its products, services and solutions based on Circular Economy principles to extend the life cycle of the materials used	1,000	0,851
Q41 The organization periodically determines which assets and resources it no longer needs and based on Circular Economy principles, disposes of them responsibly	1,000	0,790
Q42 Organization's customers perceive the organization's approach to Circular Economy as being environmentally responsible, ethically sound and financially fair	1,000	0,751
Q43 People (employees) perceive the organization's approach to Circular Economy as being environmentally responsible, ethically sound and financially fair	1,000	0,843
Q44 The members of the partner network perceive the organization's approach to Circular Economy as being environmentally responsible, ethically sound and financially fair	1,000	0,803
Q45 The organization has a set of performance results that clearly indicate the degree of success it has had in delivering on its Circular Economy objectives	1,000	0,747
Q46 When compared with other organizations, either in its own ecosystem or outside, it can demonstrate that it succeeds equally or better than others in delivering its Circular Economy ambitions	1,000	0,738
Q47 The organization's internal and external audit results and risk assessments indicate outstanding performance in relation to targets set for embedding Circular Economy principles	1,000	0,742
Q48 Based on its achievements, the organization has received external recognition for acting as a role model in the application of Circular Economy principles and associated	1,000	0,472
Extraction Method: Principal Component Analysis.		

Table 77 Hypothesis 1: Principal Component Analysis – Communalities. Source: own research

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	18,048	69,415	69,415	18,048	69,415	69,415	11,955	45,982	45,982
2	2,039	7,843	77,258	2,039	7,843	77,258	8,132	31,277	77,258
3	0,944	3,632	80,890						
4	0,830	3,193	84,083						
5	0,667	2,566	86,649						
6	0,459	1,765	88,414						
7	0,402	1,547	89,961						
8	0,377	1,448	91,410						
9	0,329	1,264	92,674						
10	0,320	1,230	93,904						
11	0,256	0,983	94,887						
12	0,229	0,882	95,769						
13	0,191	0,734	96,503						
14	0,184	0,709	97,213						
15	0,143	0,549	97,761						
16	0,113	0,434	98,195						
17	0,100	0,383	98,578						
18	0,078	0,299	98,877						
19	0,074	0,286	99,163						
20	0,059	0,228	99,391						
21	0,043	0,166	99,557						
22	0,035	0,136	99,693						
23	0,028	0,108	99,802						
24	0,022	0,083	99,885						
25	0,016	0,062	99,947						
26	0,014	0,053	100,000						
Extraction Method: Principal Component Analysis.									

Table 78 Hypothesis 1: Principal Component Analysis – Total Variance Explained. Source: own research

Rotated Component Matrix[a]		
	Component	
	1	2
Q23 There is clear alignment evident between the organization's Purpose, Values, Vision, Operating Model and the adoption of Circular Economy principles	0,181	0,843
Q24 The organization identifies and monitors those drivers of change that are critical to its Circular Economy Operating Model (Key Stakeholders' needs, markets, public opinion, legislation, material technology, best practices	0,313	0,890
Q25 The organization consistently includes Circular Economy principles as one of the relevant criteria it applies when making strategic and operational decisions	0,279	0,888
Q26 The organization has measurement processes in place to monitor the successful implementation of Circular Economy principles into its strategic and operational ways of working, as well as the outcomes achieved	0,289	0,886
Q27 The end-to-end supply chain is structured and managed with full consideration of Circular Economy principles where applicable	0,600	0,652
Q28 Based on a culture of co-creation and co-design, the organization actively promotes innovative thinking to identify and deliver new Circular Economy opportunities within its ecosystem	0,516	0,711
Q29 The organization communicates its commitment to Circular Economy principles to its Key Stakeholders and others within its ecosystem	0,501	0,735
Q30 The organization actively educates its Customers on the importance of adopting Circular Economy principles into their own way of working, and rewards and recognizes them for any successful collaborations	0,508	0,516
Q31 The organization ensures its People are proactively guided, rewarded and recognized for their efforts and ideas to help move the organization towards a way of working based entirely on Circular Economy principles	0,744	0,449
Q32 The organization contributes to the development, well-being and prosperity of the Society by offering sustainable solutions that address environmental problems such as climate change, material scarcity or threats to biodiversity	0,705	0,340
Q33 The organization rewards and recognizes those Partners that adopt and embed Circular Economy principles into their own approach(es), and actively encourages the sharing of good practices	0,860	0,376
Q34 To support organization Circular Economy ambitions, the organization continuously gathers and evaluates creative ideas from within its ecosystem	0,828	0,431
Q35 The organization continues to create value with its products, services and solutions as it makes a clear transition from using linear to circular approaches	0,802	0,307
Q36 To help embed Circular Economy principles, the organization periodically communicates this commitment to its People, at the same time ensuring that the messages remain ethical and avoid misdirection ("greenwashing")	0,817	0,355
Q37 The organization converts data and information about Circular Economy into knowledge and uses the outcomes to create higher value and to improve the overall customer experience	0,845	0,335
Q38 The organization's approach to managing risk includes an assessment of the potential impact on the future ambitions of its Circular Economy Operating Model	0,880	0,262
Q39 The organization reduces its tangible assets and required resources by promoting a sharing culture for the use of its products, services and solutions in line with Circular Economy principles	0,841	0,283

Rotated Component Matrix[a]		
	Component	
	1	2
Q40 The organization designs and selects materials for its products, services and solutions based on Circular Economy principles to extend the life cycle of the materials used	0,900	0,204
Q41 The organization periodically determines which assets and resources it no longer needs and based on Circular Economy principles, disposes of them responsibly	0,823	0,335
Q42 Organization's customers perceive the organization's approach to Circular Economy as being environmentally responsible, ethically sound and financially fair	0,699	0,512
Q43 People (employees) perceive the organization's approach to Circular Economy as being environmentally responsible, ethically sound and financially fair	0,615	0,682
Q44 The members of the partner network perceive the organization's approach to Circular Economy as being environmentally responsible, ethically sound and financially fair	0,747	0,495
Q45 The organization has a set of performance results that clearly indicate the degree of success it has had in delivering on its Circular Economy objectives	0,697	0,511
Q46 When compared with other organizations, either in its own ecosystem or outside, it can demonstrate that it succeeds equally or better than others in delivering its Circular Economy ambitions	0,631	0,583
Q47 The organization's internal and external audit results and risk assessments indicate outstanding performance in relation to targets set for embedding Circular Economy principles	0,630	0,587
Q48 Based on its achievements, the organization has received external recognition for acting as a role model in the application of Circular Economy principles and associated	0,591	0,350
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.[a]		
a. Rotation converged in 3 iterations.		

Table 79 Hypothesis 1: Principal Component Analysis – Rotated Component Matrix. Source: own research

Communalities		
	Initial	Extraction
Q23 There is clear alignment evident between the organization's Purpose, Values, Vision, Operating Model and the adoption of Circular Economy principles	1,000	0,743
Q24 The organization identifies and monitors those drivers of change that are critical to its Circular Economy Operating Model (Key Stakeholders' needs, markets, public opinion, legislation, material technology, best practices	1,000	0,890
Q25 The organization consistently includes Circular Economy principles as one of the relevant criteria it applies when making strategic and operational decisions	1,000	0,867
Q26 The organization has measurement processes in place to monitor the successful implementation of Circular Economy principles into its strategic and operational ways of working, as well as the outcomes achieved	1,000	0,868
Q27 The end-to-end supply chain is structured and managed with full consideration of Circular Economy principles where applicable	1,000	0,785
Q28 Based on a culture of co-creation and co-design, the organization actively promotes innovative thinking to identify and deliver new Circular Economy opportunities within its ecosystem	1,000	0,772
Q29 The organization communicates its commitment to Circular Economy principles to its Key Stakeholders and others within its ecosystem	1,000	0,791
Q30 The organization actively educates its Customers on the importance of adopting Circular Economy principles into their own way of working, and rewards and recognizes them for any successful collaborations	1,000	0,524
Q31 The organization ensures its People are proactively guided, rewarded and recognized for their efforts and ideas to help move the organization towards a way of working based entirely on Circular Economy principles	1,000	0,755
Q32 The organization contributes to the development, well-being and prosperity of the Society by offering sustainable solutions that address environmental problems such as climate change, material scarcity or threats to biodiversity	1,000	0,613
Q33 The organization rewards and recognizes those Partners that adopt and embed Circular Economy principles into their own approach(es), and actively encourages the sharing of good practices	1,000	0,881
Q34 To support organization Circular Economy ambitions, the organization continuously gathers and evaluates creative ideas from within its ecosystem	1,000	0,871
Q35 The organization continues to create value with its products, services and solutions as it makes a clear transition from using linear to circular approaches	1,000	0,738
Q36 To help embed Circular Economy principles, the organization periodically communicates this commitment to its People, at the same time ensuring that the messages remain ethical and avoid misdirection ("greenwashing")	1,000	0,794
Q37 The organization converts data and information about Circular Economy into knowledge and uses the outcomes to create higher value and to improve the overall customer experience	1,000	0,827
Q38 The organization's approach to managing risk includes an assessment of the potential impact on the future ambitions of its Circular Economy Operating Model	1,000	0,843
Q39 The organization reduces its tangible assets and required resources by promoting a sharing culture for the use of its products, services and solutions in line with Circular Economy principles	1,000	0,788

Communalities		
	Initial	Extraction
Q40 The organization designs and selects materials for its products, services and solutions based on Circular Economy principles to extend the life cycle of the materials used	1,000	0,851
Q41 The organization periodically determines which assets and resources it no longer needs and based on Circular Economy principles, disposes of them responsibly	1,000	0,790
Q42 Organization's customers perceive the organization's approach to Circular Economy as being environmentally responsible, ethically sound and financially fair	1,000	0,751
Q43 People (employees) perceive the organization's approach to Circular Economy as being environmentally responsible, ethically sound and financially fair	1,000	0,843
Q44 The members of the partner network perceive the organization's approach to Circular Economy as being environmentally responsible, ethically sound and financially fair	1,000	0,803
Q45 The organization has a set of performance results that clearly indicate the degree of success it has had in delivering on its Circular Economy objectives	1,000	0,747
Q46 When compared with other organizations, either in its own ecosystem or outside, it can demonstrate that it succeeds equally or better than others in delivering its Circular Economy ambitions	1,000	0,738
Q47 The organization's internal and external audit results and risk assessments indicate outstanding performance in relation to targets set for embedding Circular Economy principles	1,000	0,742
Q48 Based on its achievements, the organization has received external recognition for acting as a role model in the application of Circular Economy principles and associated	1,000	0,472
Extraction Method: Principal Component Analysis.		

Table 80 Hypothesis 1.1: Principal Component Analysis – Communalities. Source: own research

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	18,048	69,415	69,415	18,048	69,415	69,415	11,955	45,982	45,982
2	2,039	7,843	77,258	2,039	7,843	77,258	8,132	31,277	77,258
3	0,944	3,632	80,890						
4	0,830	3,193	84,083						
5	0,667	2,566	86,649						
6	0,459	1,765	88,414						
7	0,402	1,547	89,961						
8	0,377	1,448	91,410						
9	0,329	1,264	92,674						
10	0,320	1,230	93,904						
11	0,256	0,983	94,887						
12	0,229	0,882	95,769						
13	0,191	0,734	96,503						
14	0,184	0,709	97,213						
15	0,143	0,549	97,761						
16	0,113	0,434	98,195						
17	0,100	0,383	98,578						
18	0,078	0,299	98,877						
19	0,074	0,286	99,163						
20	0,059	0,228	99,391						

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 %
21	0,043	0,166	99,557						
22	0,035	0,136	99,693						
23	0,028	0,108	99,802						
24	0,022	0,083	99,885						
25	0,016	0,062	99,947						
26	0,014	0,053	100,000						
Extraction Method: Principal Component Analysis.									

Table 81 Hypothesis 1.1: Principal Component Analysis – Total Variance Explained. Source: own research

Rotated Component Matrix[a]		
	Component	
	1	2
Q23 There is clear alignment evident between the organization's Purpose, Values, Vision, Operating Model and the adoption of Circular Economy principles	0,181	0,843
Q24 The organization identifies and monitors those drivers of change that are critical to its Circular Economy Operating Model (Key Stakeholders' needs, markets, public opinion, legislation, material technology, best practices	0,313	0,890
Q25 The organization consistently includes Circular Economy principles as one of the relevant criteria it applies when making strategic and operational decisions	0,279	0,888
Q26 The organization has measurement processes in place to monitor the successful implementation of Circular Economy principles into its strategic and operational ways of working, as well as the outcomes achieved	0,289	0,886
Q27 The end-to-end supply chain is structured and managed with full consideration of Circular Economy principles where applicable	0,600	0,652
Q28 Based on a culture of co-creation and co-design, the organization actively promotes innovative thinking to identify and deliver new Circular Economy opportunities within its ecosystem	0,516	0,711
Q29 The organization communicates its commitment to Circular Economy principles to its Key Stakeholders and others within its ecosystem	0,501	0,735
Q30 The organization actively educates its Customers on the importance of adopting Circular Economy principles into their own way of working, and rewards and recognizes them for any successful collaborations	0,508	0,516
Q31 The organization ensures its People are proactively guided, rewarded and recognized for their efforts and ideas to help move the organization towards a way of working based entirely on Circular Economy principles	0,744	0,449
Q32 The organization contributes to the development, well-being and prosperity of the Society by offering sustainable solutions that address environmental problems such as climate change, material scarcity or threats to biodiversity	0,705	0,340
Q33 The organization rewards and recognizes those Partners that adopt and embed Circular Economy principles into their own approach(es), and actively encourages the sharing of good practices	0,860	0,376
Q34 To support organization Circular Economy ambitions, the organization continuously gathers and evaluates creative ideas from within its ecosystem	0,828	0,431
Q35 The organization continues to create value with its products, services and solutions as it makes a clear transition from using linear to circular approaches	0,802	0,307
Q36 To help embed Circular Economy principles, the organization periodically communicates this commitment to its People, at the same time ensuring that the messages remain ethical and avoid misdirection ("greenwashing")	0,817	0,355
Q37 The organization converts data and information about Circular Economy into knowledge and uses the outcomes to create higher value and to improve the overall customer experience	0,845	0,335
Q38 The organization's approach to managing risk includes an assessment of the potential impact on the future ambitions of its Circular Economy Operating Model	0,880	0,262

Rotated Component Matrix[a]		
	Component	
	1	2
Q39 The organization reduces its tangible assets and required resources by promoting a sharing culture for the use of its products, services and solutions in line with Circular Economy principles	0,841	0,283
Q40 The organization designs and selects materials for its products, services and solutions based on Circular Economy principles to extend the life cycle of the materials used	0,900	0,204
Q41 The organization periodically determines which assets and resources it no longer needs and based on Circular Economy principles, disposes of them responsibly	0,823	0,335
Q42 Organization's customers perceive the organization's approach to Circular Economy as being environmentally responsible, ethically sound and financially fair	0,699	0,512
Q43 People (employees) perceive the organization's approach to Circular Economy as being environmentally responsible, ethically sound and financially fair	0,615	0,682
Q44 The members of the partner network perceive the organization's approach to Circular Economy as being environmentally responsible, ethically sound and financially fair	0,747	0,495
Q45 The organization has a set of performance results that clearly indicate the degree of success it has had in delivering on its Circular Economy objectives	0,697	0,511
Q46 When compared with other organizations, either in its own ecosystem or outside, it can demonstrate that it succeeds equally or better than others in delivering its Circular Economy ambitions	0,631	0,583
Q47 The organization's internal and external audit results and risk assessments indicate outstanding performance in relation to targets set for embedding Circular Economy principles	0,630	0,587
Q48 Based on its achievements, the organization has received external recognition for acting as a role model in the application of Circular Economy principles and associated	0,591	0,350
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.[a]		
a. Rotation converged in 3 iterations.		

Table 82 Hypothesis 1.1: Principal Component Analysis – Rotated Component Matrix. Source: own research

Communalities		
	Initial	Extraction
Q24 The organization identifies and monitors those drivers of change that are critical to its Circular Economy Operating Model (Key Stakeholders' needs, markets, public opinion, legislation, material technology, best practices	1,000	0,907
Q25 The organization consistently includes Circular Economy principles as one of the relevant criteria it applies when making strategic and operational decisions	1,000	0,890
Q26 The organization has measurement processes in place to monitor the successful implementation of Circular Economy principles into its strategic and operational ways of working, as well as the outcomes achieved	1,000	0,888
Q27 The end-to-end supply chain is structured and managed with full consideration of Circular Economy principles where applicable	1,000	0,800
Q28 Based on a culture of co-creation and co-design, the organization actively promotes innovative thinking to identify and deliver new Circular Economy opportunities within its ecosystem	1,000	0,777
Q32 The organization contributes to the development, well-being and prosperity of the Society by offering sustainable solutions that address environmental problems such as climate change, material scarcity or threats to biodiversity	1,000	0,629
Q34 To support organization Circular Economy ambitions, the organization continuously gathers and evaluates creative ideas from within its ecosystem	1,000	0,897
Q35 The organization continues to create value with its products, services and solutions as it makes a clear transition from using linear to circular approaches	1,000	0,769
Q36 To help embed Circular Economy principles, the organization periodically communicates this commitment to its People, at the same time ensuring that the messages remain ethical and avoid misdirection ("greenwashing")	1,000	0,836
Q37 The organization converts data and information about Circular Economy into knowledge and uses the outcomes to create higher value and to improve the overall customer experience	1,000	0,807
Q39 The organization reduces its tangible assets and required resources by promoting a sharing culture for the use of its products, services and solutions in line with Circular Economy principles	1,000	0,793
Q40 The organization designs and selects materials for its products, services and solutions based on Circular Economy principles to extend the life cycle of the materials used	1,000	0,888
Q41 The organization periodically determines which assets and resources it no longer needs and based on Circular Economy principles, disposes of them responsibly	1,000	0,852
Q14 Selection of suppliers (based on quality)	1,000	0,854
Q15 Selection of suppliers (based on lead time)	1,000	0,848

Communalities		
	Initial	Extraction
Q42 Organization's customers perceive the organization's approach to Circular Economy as being environmentally responsible, ethically sound and financially fair	1,000	0,798
Q43 People (employees) perceive the organization's approach to Circular Economy as being environmentally responsible, ethically sound and financially fair	1,000	0,861
Q44 The members of the partner network perceive the organization's approach to Circular Economy as being environmentally responsible, ethically sound and financially fair	1,000	0,797
Extraction Method: Principal Component Analysis.		

Table 83 Hypothesis 1.2: Principal Component Analysis – Communalities. Source: own research

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	12,033	66,850	66,850	12,033	66,850	66,850	7,882	43,790	43,790
2	1,729	9,604	76,455	1,729	9,604	76,455	4,838	26,879	70,669
3	1,127	6,261	82,715	1,127	6,261	82,715	2,168	12,046	82,715
4	0,580	3,222	85,938						
5	0,366	2,034	87,972						
6	0,354	1,966	89,938						
7	0,320	1,776	91,714						
8	0,282	1,569	93,283						
9	0,235	1,307	94,590						
10	0,216	1,201	95,791						
11	0,209	1,159	96,950						
12	0,131	0,730	97,680						
13	0,099	0,551	98,230						
14	0,096	0,533	98,763						
15	0,083	0,464	99,227						
16	0,062	0,345	99,571						
17	0,052	0,290	99,862						
18	0,025	0,138	100,000						
Extraction Method: Principal Component Analysis.									

Table 84 Hypothesis 1.2: Principal Component Analysis – Total Variance Explained. Source: own research

Rotated Component Matrix[a]			
	Component		
	1	2	3
Q24 The organization identifies and monitors those drivers of change that are critical to its Circular Economy Operating Model (Key Stakeholders' needs, markets, public opinion, legislation, material technology, best practices	0,318	0,819	0,368
Q25 The organization consistently includes Circular Economy principles as one of the relevant criteria it applies when making strategic and operational decisions	0,284	0,871	0,223
Q26 The organization has measurement processes in place to monitor the successful implementation of Circular Economy principles into its strategic and operational ways of working, as well as the outcomes achieved	0,282	0,878	0,196
Q27 The end-to-end supply chain is structured and managed with full consideration of Circular Economy principles where applicable	0,595	0,626	0,233
Q28 Based on a culture of co-creation and co-design, the organization actively promotes innovative thinking to identify and deliver new Circular Economy opportunities within its ecosystem	0,534	0,683	0,158
Q32 The organization contributes to the development, well-being and prosperity of the Society by offering sustainable solutions that address environmental problems such as climate change, material scarcity or threats to biodiversity	0,687	0,302	0,257
Q34 To support organization Circular Economy ambitions, the organization continuously gathers and evaluates creative ideas from within its ecosystem	0,837	0,441	0,040
Q35 The organization continues to create value with its products, services and solutions as it makes a clear transition from using linear to circular approaches	0,821	0,307	0,023
Q36 To help embed Circular Economy principles, the organization periodically communicates this commitment to its People, at the same time ensuring that the messages remain ethical and avoid misdirection ("greenwashing")	0,844	0,318	0,150
Q37 The organization converts data and information about Circular Economy into knowledge and uses the outcomes to create higher value and to improve the overall customer experience	0,823	0,305	0,192
Q39 The organization reduces its tangible assets and required resources by promoting a sharing culture for the use of its products, services and solutions in line with Circular Economy principles	0,846	0,258	0,101
Q40 The organization designs and selects materials for its products, services and solutions based on Circular Economy principles to extend the life cycle of the materials used	0,880	0,134	0,308
Q41 The organization periodically determines which assets and resources it no longer needs and based on Circular Economy principles, disposes of them responsibly	0,847	0,272	0,246
Q14 Selection of suppliers (based on quality)	0,185	0,286	0,859

Rotated Component Matrix[a]			
	Component		
	1	2	3
Q15 Selection of suppliers (based on lead time)	0,156	0,200	0,885
Q42 Organization's customers perceive the organization's approach to Circular Economy as being environmentally responsible, ethically sound and financially fair	0,721	0,524	0,057
Q43 People (employees) perceive the organization's approach to Circular Economy as being environmentally responsible, ethically sound and financially fair	0,631	0,660	0,162
Q44 The members of the partner network perceive the organization's approach to Circular Economy as being environmentally responsible, ethically sound and financially fair	0,747	0,466	0,147
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.[a]			
a. Rotation converged in 5 iterations.			

Table 85 Hypothesis 1.1: Principal Component Analysis – Rotated Component Matrix. Source: own research

Communalities		
	Initial	Extraction
Q1 Availability of performance management system	1,000	0,813
Q2 Use of KPIs on strategic level	1,000	0,864
Q3 Use of KPIs on departmental level	1,000	0,894
Q4 Use of KPIs on employee level	1,000	0,838
Q5 Use of KPIs on projects level	1,000	0,788
Q6 Use of KPIs on processes level	1,000	0,843
Q7 Documented processes	1,000	0,803
Q8 Sustainability focus	1,000	0,768
Q9 Sustainability KPIs and targets	1,000	0,848
Q10 CSR focus	1,000	0,817
Q11 CSR KPIs and targets	1,000	0,872
Q12 Availability of innovation framework	1,000	0,789
Q13 Selection of suppliers (based on cost)	1,000	0,750
Q14 Selection of suppliers (based on quality)	1,000	0,717
Q15 Selection of suppliers (based on lead time)	1,000	0,772
Q16 Selection of suppliers (based on care for the environment)	1,000	0,820
Q17 Selection of suppliers (based on sustainability aspects focus)	1,000	0,791
Q18 Relationship with suppliers (short term)	1,000	0,742
Q19 Relationship with suppliers (long term)	1,000	0,828
Q20 Relationship with suppliers (partnership)	1,000	0,784
Q21 Relationship with society (as customers)	1,000	0,652
Q22 Relationship with society (as partners)	1,000	0,599
Q23 There is clear alignment evident between the organization's Purpose, Values, Vision, Operating Model and the adoption of Circular Economy principles	1,000	0,736
Q24 The organization identifies and monitors those drivers of change that are critical to its Circular Economy Operating Model (Key Stakeholders' needs, markets, public opinion, legislation, material technology, best practices	1,000	0,872
Q25 The organization consistently includes Circular Economy principles as one of the relevant criteria it applies when making strategic and operational decisions	1,000	0,841
Q26 The organization has measurement processes in place to monitor the successful implementation of Circular Economy principles into its strategic and operational ways of working, as well as the outcomes achieved	1,000	0,868
Q27 The end-to-end supply chain is structured and managed with full consideration of Circular Economy principles where applicable	1,000	0,845
Q28 Based on a culture of co-creation and co-design, the organization actively promotes innovative thinking to identify and deliver new Circular Economy opportunities within its ecosystem	1,000	0,768
Q29 The organization communicates its commitment to Circular Economy principles to its Key Stakeholders and others within its ecosystem	1,000	0,801

Communalities		
	Initial	Extraction
Q30 The organization actively educates its Customers on the importance of adopting Circular Economy principles into their own way of working, and rewards and recognizes them for any successful collaborations	1,000	0,643
Q31 The organization ensures its People are proactively guided, rewarded and recognized for their efforts and ideas to help move the organization towards a way of working based entirely on Circular Economy principles	1,000	0,835
Q32 The organization contributes to the development, well-being and prosperity of the Society by offering sustainable solutions that address environmental problems such as climate change, material scarcity or threats to biodiversity	1,000	0,721
Q33 The organization rewards and recognizes those Partners that adopt and embed Circular Economy principles into their own approach(es), and actively encourages the sharing of good practices	1,000	0,905
Q34 To support organization Circular Economy ambitions, the organization continuously gathers and evaluates creative ideas from within its ecosystem	1,000	0,924
Q35 The organization continues to create value with its products, services and solutions as it makes a clear transition from using linear to circular approaches	1,000	0,780
Q36 To help embed Circular Economy principles, the organization periodically communicates this commitment to its People, at the same time ensuring that the messages remain ethical and avoid misdirection ("greenwashing")	1,000	0,801
Q37 The organization converts data and information about Circular Economy into knowledge and uses the outcomes to create higher value and to improve the overall customer experience	1,000	0,832
Q38 The organization's approach to managing risk includes an assessment of the potential impact on the future ambitions of its Circular Economy Operating Model	1,000	0,880
Q39 The organization reduces its tangible assets and required resources by promoting a sharing culture for the use of its products, services and solutions in line with Circular Economy principles	1,000	0,782
Q40 The organization designs and selects materials for its products, services and solutions based on Circular Economy principles to extend the life cycle of the materials used	1,000	0,894
Q41 The organization periodically determines which assets and resources it no longer needs and based on Circular Economy principles, disposes of them responsibly	1,000	0,829
Extraction Method: Principal Component Analysis.		

Table 86 Hypothesis 2.0: Principal Component Analysis – Communalities. Source: own research

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	23,605	57,573	57,573	23,605	57,573	57,573	10,774	26,278	26,278
2	4,121	10,052	67,625	4,121	10,052	67,625	10,314	25,156	51,434
3	2,425	5,914	73,540	2,425	5,914	73,540	5,304	12,936	64,370
4	1,610	3,926	77,466	1,610	3,926	77,466	3,402	8,297	72,667
5	1,188	2,897	80,363	1,188	2,897	80,363	3,155	7,696	80,363
6	0,991	2,418	82,781						
7	0,815	1,988	84,769						
8	0,675	1,648	86,416						
9	0,603	1,472	87,888						
10	0,572	1,395	89,283						
11	0,507	1,236	90,519						
12	0,469	1,143	91,662						
13	0,424	1,035	92,697						
14	0,394	0,960	93,657						
15	0,319	0,778	94,434						
16	0,290	0,708	95,143						
17	0,260	0,633	95,776						
18	0,213	0,521	96,297						
19	0,200	0,487	96,784						
20	0,182	0,443	97,227						
21	0,157	0,384	97,610						
22	0,135	0,330	97,940						
23	0,123	0,299	98,239						
24	0,110	0,268	98,507						
25	0,090	0,219	98,726						
26	0,080	0,195	98,921						
27	0,071	0,174	99,095						
28	0,067	0,164	99,259						
29	0,058	0,141	99,400						
30	0,053	0,128	99,528						
31	0,042	0,102	99,630						
32	0,035	0,086	99,716						

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 %
33	0,033	0,081	99,797						
34	0,023	0,056	99,854						
35	0,021	0,051	99,904						
36	0,012	0,030	99,934						
37	0,010	0,024	99,958						
38	0,008	0,019	99,978						
39	0,004	0,010	99,987						
40	0,003	0,007	99,994						
41	0,002	0,006	100,000						
Extraction Method: Principal Component Analysis.									

Table 87 Hypothesis 2.0: Principal Component Analysis – Total Variance Explained. Source: own research

Rotated Component Matrix[a]					
	Component				
	1	2	3	4	5
Q1 Availability of performance management system	0,081	0,842	0,226	0,072	0,203
Q2 Use of KPIs on strategic level	0,230	0,861	0,250	0,031	0,082
Q3 Use of KPIs on departmental level	0,202	0,893	0,222	0,064	0,048
Q4 Use of KPIs on employee level	0,227	0,832	0,266	0,155	-0,010
Q5 Use of KPIs on projects level	0,229	0,702	0,371	0,313	-0,087
Q6 Use of KPIs on processes level	0,302	0,802	0,277	0,179	0,007
Q7 Documented processes	0,209	0,782	0,285	0,257	-0,016
Q8 Sustainability focus	0,308	0,735	0,161	0,220	0,241
Q9 Sustainability KPIs and targets	0,320	0,797	0,240	0,146	0,179
Q10 CSR focus	0,327	0,696	-0,008	0,095	0,466
Q11 CSR KPIs and targets	0,325	0,632	0,070	0,097	0,594
Q12 Availability of innovation framework	0,485	0,469	0,446	-0,069	0,361
Q13 Selection of suppliers (based on cost)	0,322	0,340	0,659	-0,033	0,309
Q14 Selection of suppliers (based on quality)	0,096	0,421	0,710	0,099	0,129
Q15 Selection of suppliers (based on lead time)	0,075	0,408	0,762	0,076	0,118
Q16 Selection of suppliers (based on care for the environment)	0,443	0,199	0,274	0,297	0,649
Q17 Selection of suppliers (based on sustainability aspects focus)	0,388	0,125	0,467	0,131	0,625
Q18 Relationship with suppliers (short term)	0,181	0,042	0,394	0,383	0,637
Q19 Relationship with suppliers (long term)	0,319	0,265	0,779	0,217	0,048
Q20 Relationship with suppliers (partnership)	0,280	0,142	0,750	0,320	0,142
Q21 Relationship with society (as customers)	0,383	0,293	0,624	-0,058	0,162
Q22 Relationship with society (as partners)	0,434	0,245	0,341	0,409	0,259
Q23 There is clear alignment evident between the organization's Purpose, Values, Vision, Operating Model and the	0,188	0,578	0,295	0,476	0,230

Rotated Component Matrix[a]					
	Component				
	1	2	3	4	5
adoption of Circular Economy principles					
Q24 The organization identifies and monitors those drivers of change that are critical to its Circular Economy Operating Model (Key Stakeholders' needs, markets, public opinion, legislation, material technology, best practices	0,309	0,640	0,244	0,490	0,258
Q25 The organization consistently includes Circular Economy principles as one of the relevant criteria it applies when making strategic and operational decisions	0,302	0,582	0,085	0,557	0,305
Q26 The organization has measurement processes in place to monitor the successful implementation of Circular Economy principles into its strategic and operational ways of working, as well as the outcomes achieved	0,312	0,599	0,086	0,603	0,203
Q27 The end-to-end supply chain is structured and managed with full consideration of Circular Economy principles where applicable	0,596	0,311	0,298	0,540	0,108
Q28 Based on a culture of co-creation and co-design, the organization actively promotes innovative thinking to identify and deliver new Circular Economy opportunities within its ecosystem	0,523	0,431	0,184	0,451	0,266
Q29 The organization communicates its commitment to Circular Economy principles to its Key Stakeholders and others within its ecosystem	0,519	0,415	0,175	0,565	0,096
Q30 The organization actively educates its Customers on the importance of adopting Circular Economy principles into their own way of working, and rewards and	0,530	0,248	0,027	0,474	0,274

Rotated Component Matrix[a]					
	Component				
	1	2	3	4	5
recognizes them for any successful collaborations					
Q31 The organization ensures its People are proactively guided, rewarded and recognized for their efforts and ideas to help move the organization towards a way of working based entirely on Circular Economy principles	0,776	0,412	0,029	0,249	0,038
Q32 The organization contributes to the development, well-being and prosperity of the Society by offering sustainable solutions that address environmental problems such as climate change, material scarcity or threats to biodiversity	0,645	0,229	0,234	0,095	0,434
Q33 The organization rewards and recognizes those Partners that adopt and embed Circular Economy principles into their own approach(es), and actively encourages the sharing of good practices	0,868	0,286	0,156	0,185	0,104
Q34 To support organization Circular Economy ambitions, the organization continuously gathers and evaluates creative ideas from within its ecosystem	0,847	0,229	0,083	0,288	0,255
Q35 The organization continues to create value with its products, services and solutions as it makes a clear transition from using linear to circular approaches	0,833	0,226	0,064	0,164	0,064
Q36 To help embed Circular Economy principles, the organization periodically communicates this commitment to its People, at the same time ensuring that the messages remain ethical and avoid misdirection (“greenwashing”)	0,810	0,188	0,228	0,199	0,133
Q37 The organization converts data and information about Circular Economy into knowledge and uses the outcomes to create	0,838	0,280	0,186	0,093	0,087

Rotated Component Matrix[a]					
	Component				
	1	2	3	4	5
higher value and to improve the overall customer experience					
Q38 The organization's approach to managing risk includes an assessment of the potential impact on the future ambitions of its Circular Economy Operating Model	0,838	0,178	0,333	0,047	0,183
Q39 The organization reduces its tangible assets and required resources by promoting a sharing culture for the use of its products, services and solutions in line with Circular Economy principles	0,828	0,221	0,152	0,134	0,080
Q40 The organization designs and selects materials for its products, services and solutions based on Circular Economy principles to extend the life cycle of the materials used	0,844	0,118	0,335	-0,020	0,234
Q41 The organization periodically determines which assets and resources it no longer needs and based on Circular Economy principles, disposes of them responsibly	0,797	0,146	0,325	0,164	0,198
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.[a]					
a. Rotation converged in 8 iterations.					

Table 88 Hypothesis 2.0: Principal Component Analysis – Rotated Component Matrix. Source: own research

Communalities		
	Initial	Extraction
Q1 Availability of performance management system	1,000	0,826
Q2 Use of KPIs on strategic level	1,000	0,895
Q3 Use of KPIs on departmental level	1,000	0,915
Q4 Use of KPIs on employee level	1,000	0,856
Q5 Use of KPIs on projects level	1,000	0,783
Q6 Use of KPIs on processes level	1,000	0,843
Q9 Sustainability KPIs and targets	1,000	0,839
Q10 CSR focus	1,000	0,792
Q11 CSR KPIs and targets	1,000	0,860
Q12 Availability of innovation framework	1,000	0,783
Q13 Selection of suppliers (based on cost)	1,000	0,749
Q14 Selection of suppliers (based on quality)	1,000	0,730
Q15 Selection of suppliers (based on lead time)	1,000	0,767
Q16 Selection of suppliers (based on care for the environment)	1,000	0,812
Q17 Selection of suppliers (based on sustainability aspects focus)	1,000	0,791
Q18 Relationship with suppliers (short term)	1,000	0,748
Q19 Relationship with suppliers (long term)	1,000	0,830
Q20 Relationship with suppliers (partnership)	1,000	0,791
Q21 Relationship with society (as customers)	1,000	0,651
Q22 Relationship with society (as partners)	1,000	0,592

Communalities		
	Initial	Extraction
Q23 There is clear alignment evident between the organization's Purpose, Values, Vision, Operating Model and the adoption of Circular Economy principles	1,000	0,742
Q24 The organization identifies and monitors those drivers of change that are critical to its Circular Economy Operating Model (Key Stakeholders' needs, markets, public opinion, legislation, material technology, best practices	1,000	0,861
Q25 The organization consistently includes Circular Economy principles as one of the relevant criteria it applies when making strategic and operational decisions	1,000	0,842
Q26 The organization has measurement processes in place to monitor the successful implementation of Circular Economy principles into its strategic and operational ways of working, as well as the outcomes achieved	1,000	0,873
Q27 The end-to-end supply chain is structured and managed with full consideration of Circular Economy principles where applicable	1,000	0,846
Q28 Based on a culture of co-creation and co-design, the organization actively promotes innovative thinking to identify and deliver new Circular Economy opportunities within its ecosystem	1,000	0,766
Q29 The organization communicates its commitment to Circular Economy principles to its Key Stakeholders and others within its ecosystem	1,000	0,812
Q30 The organization actively educates its Customers on the importance of adopting Circular Economy principles into their own way of working, and rewards and recognizes them for any successful collaborations	1,000	0,643
Q31 The organization ensures its People are proactively guided, rewarded and recognized for their efforts and ideas to help move the organization towards a way of working based entirely on Circular Economy principles	1,000	0,832
Q32 The organization contributes to the development, well-being and prosperity of the Society by offering sustainable solutions that address environmental problems such as climate change, material scarcity or threats to biodiversity	1,000	0,723
Q33 The organization rewards and recognizes those Partners that adopt and embed Circular Economy principles into their own approach(es), and actively encourages the sharing of good practices	1,000	0,906
Q34 To support organization Circular Economy ambitions, the organization continuously gathers and evaluates creative ideas from within its ecosystem	1,000	0,925
Q35 The organization continues to create value with its products, services and solutions as it makes a clear transition from using linear to circular approaches	1,000	0,780
Q36 To help embed Circular Economy principles, the organization periodically communicates this commitment to its People, at the same time ensuring that the messages remain ethical and avoid misdirection ("greenwashing")	1,000	0,802
Q37 The organization converts data and information about Circular Economy into knowledge and uses the outcomes to create higher value and to improve the overall customer experience	1,000	0,832
Q38 The organization's approach to managing risk includes an assessment of the potential impact on the future ambitions of its Circular Economy Operating Model	1,000	0,883

Communalities		
	Initial	Extraction
Q39 The organization reduces its tangible assets and required resources by promoting a sharing culture for the use of its products, services and solutions in line with Circular Economy principles	1,000	0,782
Q40 The organization designs and selects materials for its products, services and solutions based on Circular Economy principles to extend the life cycle of the materials used	1,000	0,894
Q41 The organization periodically determines which assets and resources it no longer needs and based on Circular Economy principles, disposes of them responsibly	1,000	0,827
Extraction Method: Principal Component Analysis.		

Table 89 Hypothesis 2.1: Principal Component Analysis – Communalities. Source: own research

Total Variance Explained									
	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	22,419	57,484	57,484	22,419	57,484	57,484	10,540	27,026	27,026
2	3,852	9,877	67,361	3,852	9,877	67,361	8,565	21,962	48,988
3	2,390	6,127	73,488	2,390	6,127	73,488	5,259	13,484	62,472
4	1,596	4,091	77,579	1,596	4,091	77,579	3,778	9,688	72,159
5	1,170	3,000	80,579	1,170	3,000	80,579	3,284	8,420	80,579
6	0,963	2,470	83,049						
7	0,778	1,995	85,045						
8	0,641	1,642	86,687						
9	0,583	1,494	88,181						
10	0,527	1,351	89,532						
11	0,495	1,270	90,802						
12	0,442	1,132	91,934						
13	0,375	0,963	92,897						
14	0,343	0,880	93,776						
15	0,291	0,746	94,522						
16	0,281	0,721	95,243						
17	0,252	0,646	95,889						
18	0,206	0,529	96,419						
19	0,181	0,464	96,883						
20	0,177	0,454	97,337						
21	0,153	0,392	97,728						
22	0,128	0,329	98,057						
23	0,114	0,293	98,350						
24	0,109	0,279	98,629						
25	0,084	0,214	98,843						
26	0,074	0,190	99,033						
27	0,070	0,179	99,212						
28	0,058	0,148	99,360						
29	0,049	0,126	99,486						
30	0,041	0,106	99,592						
31	0,038	0,097	99,689						
32	0,034	0,087	99,776						

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 %
33	0,023	0,059	99,836						
34	0,020	0,051	99,887						
35	0,017	0,044	99,931						
36	0,010	0,027	99,957						
37	0,009	0,024	99,982						
38	0,004	0,010	99,992						
39	0,003	0,008	100,000						
Extraction Method: Principal Component Analysis.									

Table 90 Hypothesis 2.1: Principal Component Analysis – Total Variance Explained. Source: own research

Rotated Component Matrix[a]					
	Component				
	1	2	3	4	5
Q1 Availability of performance management system	0,080	0,843	0,232	0,126	0,197
Q2 Use of KPIs on strategic level	0,229	0,874	0,254	0,090	0,076
Q3 Use of KPIs on departmental level	0,202	0,896	0,231	0,127	0,041
Q4 Use of KPIs on employee level	0,226	0,827	0,275	0,212	-0,007
Q5 Use of KPIs on projects level	0,229	0,676	0,381	0,353	-0,065
Q6 Use of KPIs on processes level	0,304	0,779	0,295	0,239	0,004
Q9 Sustainability KPIs and targets	0,322	0,774	0,251	0,201	0,181
Q10 CSR focus	0,326	0,680	0,002	0,148	0,449
Q11 CSR KPIs and targets	0,322	0,623	0,070	0,138	0,586
Q12 Availability of innovation framework	0,485	0,471	0,447	-0,037	0,355
Q13 Selection of suppliers (based on cost)	0,321	0,343	0,654	-0,020	0,317
Q14 Selection of suppliers (based on quality)	0,097	0,395	0,730	0,137	0,111
Q15 Selection of suppliers (based on lead time)	0,079	0,375	0,769	0,091	0,139
Q16 Selection of suppliers (based on care for the environment)	0,434	0,188	0,265	0,303	0,653
Q17 Selection of suppliers (based on sustainability aspects focus)	0,381	0,123	0,450	0,122	0,643
Q18 Relationship with suppliers (short term)	0,170	0,032	0,371	0,350	0,676
Q19 Relationship with suppliers (long term)	0,318	0,242	0,785	0,224	0,068
Q20 Relationship with suppliers (partnership)	0,280	0,099	0,759	0,316	0,166
Q21 Relationship with society (as customers)	0,386	0,293	0,606	-0,070	0,213
Q22 Relationship with society (as partners)	0,428	0,224	0,330	0,398	0,302

Rotated Component Matrix[a]					
	Component				
	1	2	3	4	5
Q23 There is clear alignment evident between the organization's Purpose, Values, Vision, Operating Model and the adoption of Circular Economy principles	0,182	0,541	0,308	0,516	0,234
Q24 The organization identifies and monitors those drivers of change that are critical to its Circular Economy Operating Model (Key Stakeholders' needs, markets, public opinion, legislation, material technology, best practices	0,306	0,583	0,264	0,537	0,263
Q25 The organization consistently includes Circular Economy principles as one of the relevant criteria it applies when making strategic and operational decisions	0,295	0,537	0,103	0,605	0,298
Q26 The organization has measurement processes in place to monitor the successful implementation of Circular Economy principles into its strategic and operational ways of working, as well as the outcomes achieved	0,305	0,552	0,104	0,650	0,203
Q27 The end-to-end supply chain is structured and managed with full consideration of Circular Economy principles where applicable	0,592	0,260	0,311	0,562	0,127
Q28 Based on a culture of co-creation and co-design, the organization actively promotes innovative thinking to identify and deliver new Circular Economy opportunities within its ecosystem	0,519	0,393	0,185	0,472	0,294
Q29 The organization communicates its commitment to Circular Economy principles to its Key Stakeholders and others within its ecosystem	0,513	0,371	0,194	0,604	0,095
Q30 The organization actively educates its Customers on the importance of adopting Circular Economy principles into their own way of working, and rewards and recognizes them for any successful collaborations	0,522	0,227	0,020	0,477	0,302
Q31 The organization ensures its People are proactively guided, rewarded and recognized for their efforts and ideas to help move the organization towards a way of working based entirely on Circular Economy principles	0,774	0,390	0,026	0,275	0,069
Q32 The organization contributes to the development, well-being and prosperity of the Society by offering sustainable solutions that address environmental problems such as climate change, material scarcity or threats to biodiversity	0,640	0,233	0,220	0,101	0,447
Q33 The organization rewards and recognizes those Partners that adopt and embed Circular Economy principles into their own approach(es), and actively encourages the sharing of good practices	0,866	0,268	0,162	0,214	0,107
Q34 To support organization Circular Economy ambitions, the organization continuously gathers and evaluates creative ideas from within its ecosystem	0,842	0,207	0,082	0,305	0,270

Rotated Component Matrix[a]					
	Component				
	1	2	3	4	5
Q35 The organization continues to create value with its products, services and solutions as it makes a clear transition from using linear to circular approaches	0,831	0,212	0,067	0,189	0,070
Q36 To help embed Circular Economy principles, the organization periodically communicates this commitment to its People, at the same time ensuring that the messages remain ethical and avoid misdirection ("greenwashing")	0,808	0,164	0,234	0,220	0,140
Q37 The organization converts data and information about Circular Economy into knowledge and uses the outcomes to create higher value and to improve the overall customer experience	0,839	0,259	0,195	0,125	0,088
Q38 The organization's approach to managing risk includes an assessment of the potential impact on the future ambitions of its Circular Economy Operating Model	0,839	0,157	0,332	0,059	0,202
Q39 The organization reduces its tangible assets and required resources by promoting a sharing culture for the use of its products, services and solutions in line with Circular Economy principles	0,826	0,209	0,152	0,154	0,092
Q40 The organization designs and selects materials for its products, services and solutions based on Circular Economy principles to extend the life cycle of the materials used	0,844	0,113	0,327	-0,012	0,250
Q41 The organization periodically determines which assets and resources it no longer needs and based on Circular Economy principles, disposes of them responsibly	0,793	0,138	0,327	0,182	0,198
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.[a]					
a. Rotation converged in 8 iterations.					

Table 91 Hypothesis 2.1: Principal Component Analysis – Rotated Component Matrix. Source: own research

Communalities		
	Initial	Extraction
Q13 Selection of suppliers (based on cost)	1,000	0,737
Q14 Selection of suppliers (based on quality)	1,000	0,778
Q15 Selection of suppliers (based on lead time)	1,000	0,804
Q16 Selection of suppliers (based on care for the environment)	1,000	0,759
Q17 Selection of suppliers (based on sustainability aspects focus)	1,000	0,723
Q18 Relationship with suppliers (short term)	1,000	0,813
Q19 Relationship with suppliers (long term)	1,000	0,789
Q20 Relationship with suppliers (partnership)	1,000	0,711
Q21 Relationship with society (as customers)	1,000	0,634
Q22 Relationship with society (as partners)	1,000	0,662
Q23 There is clear alignment evident between the organization's Purpose, Values, Vision, Operating Model and the adoption of Circular Economy principles	1,000	0,777
Q24 The organization identifies and monitors those drivers of change that are critical to its Circular Economy Operating Model (Key Stakeholders' needs, markets, public opinion, legislation, material technology, best practices	1,000	0,891
Q25 The organization consistently includes Circular Economy principles as one of the relevant criteria it applies when making strategic and operational decisions	1,000	0,864
Q26 The organization has measurement processes in place to monitor the successful implementation of Circular Economy principles into its strategic and operational ways of working, as well as the outcomes achieved	1,000	0,883
Q27 The end-to-end supply chain is structured and managed with full consideration of Circular Economy principles where applicable	1,000	0,791
Q28 Based on a culture of co-creation and co-design, the organization actively promotes innovative thinking to identify and deliver new Circular Economy opportunities within its ecosystem	1,000	0,779
Q29 The organization communicates its commitment to Circular Economy principles to its Key Stakeholders and others within its ecosystem	1,000	0,807
Q30 The organization actively educates its Customers on the importance of adopting Circular Economy principles into their own way of working, and rewards and recognizes them for any successful collaborations	1,000	0,668
Q31 The organization ensures its People are proactively guided, rewarded and recognized for their efforts and ideas to help move the organization towards a way of working based entirely on Circular Economy principles	1,000	0,805
Q32 The organization contributes to the development, well-being and prosperity of the Society by offering sustainable solutions that address environmental problems such as climate change, material scarcity or threats to biodiversity	1,000	0,730

Communalities		
	Initial	Extraction
Q33 The organization rewards and recognizes those Partners that adopt and embed Circular Economy principles into their own approach(es), and actively encourages the sharing of good practices	1,000	0,905
Q34 To support organization Circular Economy ambitions, the organization continuously gathers and evaluates creative ideas from within its ecosystem	1,000	0,917
Q35 The organization continues to create value with its products, services and solutions as it makes a clear transition from using linear to circular approaches	1,000	0,781
Q36 To help embed Circular Economy principles, the organization periodically communicates this commitment to its People, at the same time ensuring that the messages remain ethical and avoid misdirection ("greenwashing")	1,000	0,802
Q37 The organization converts data and information about Circular Economy into knowledge and uses the outcomes to create higher value and to improve the overall customer experience	1,000	0,839
Q38 The organization's approach to managing risk includes an assessment of the potential impact on the future ambitions of its Circular Economy Operating Model	1,000	0,887
Q39 The organization reduces its tangible assets and required resources by promoting a sharing culture for the use of its products, services and solutions in line with Circular Economy principles	1,000	0,786
Q40 The organization designs and selects materials for its products, services and solutions based on Circular Economy principles to extend the life cycle of the materials used	1,000	0,883
Q41 The organization periodically determines which assets and resources it no longer needs and based on Circular Economy principles, disposes of them responsibly	1,000	0,816
Extraction Method: Principal Component Analysis.		

Table 92 Hypothesis 2.2: Principal Component Analysis – Communalities. Source: own research

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	17,238	59,442	59,442	17,238	59,442	59,442	9,181	31,659	31,659
2	2,685	9,259	68,701	2,685	9,259	68,701	5,526	19,054	50,714
3	1,936	6,677	75,378	1,936	6,677	75,378	4,995	17,226	67,939
4	1,161	4,004	79,382	1,161	4,004	79,382	3,318	11,442	79,382
5	0,925	3,189	82,571						
6	0,662	2,284	84,854						
7	0,568	1,959	86,814						
8	0,527	1,818	88,632						
9	0,467	1,612	90,243						
10	0,382	1,316	91,559						
11	0,372	1,281	92,841						
12	0,290	0,999	93,839						
13	0,270	0,932	94,772						
14	0,260	0,898	95,670						
15	0,183	0,630	96,300						
16	0,155	0,536	96,836						
17	0,150	0,516	97,351						
18	0,131	0,453	97,804						
19	0,117	0,403	98,208						
20	0,108	0,372	98,579						
21	0,099	0,341	98,921						
22	0,073	0,253	99,173						
23	0,069	0,238	99,411						
24	0,041	0,141	99,553						
25	0,038	0,130	99,683						
26	0,035	0,119	99,803						
27	0,028	0,096	99,898						
28	0,019	0,065	99,963						
29	0,011	0,037	100,000						
Extraction Method: Principal Component Analysis.									

Table 93 Hypothesis 2.2: Principal Component Analysis – Total Variance Explained. Source: own research

Rotated Component Matrix[a]				
	Component			
	1	2	3	4
Q13 Selection of suppliers (based on cost)	0,313	0,154	0,737	0,268
Q14 Selection of suppliers (based on quality)	0,100	0,332	0,810	0,042
Q15 Selection of suppliers (based on lead time)	0,088	0,237	0,854	0,100
Q16 Selection of suppliers (based on care for the environment)	0,390	0,383	0,276	0,620
Q17 Selection of suppliers (based on sustainability aspects focus)	0,337	0,203	0,455	0,601
Q18 Relationship with suppliers (short term)	0,114	0,235	0,289	0,814
Q19 Relationship with suppliers (long term)	0,306	0,240	0,779	0,175
Q20 Relationship with suppliers (partnership)	0,255	0,206	0,703	0,330
Q21 Relationship with society (as customers)	0,367	0,033	0,595	0,380
Q22 Relationship with society (as partners)	0,385	0,345	0,246	0,579
Q23 There is clear alignment evident between the organization's Purpose, Values, Vision, Operating Model and the adoption of Circular Economy principles	0,168	0,747	0,398	0,178
Q24 The organization identifies and monitors those drivers of change that are critical to its Circular Economy Operating Model (Key Stakeholders' needs, markets, public opinion, legislation, material technology, best practices	0,294	0,792	0,382	0,178
Q25 The organization consistently includes Circular Economy principles as one of the relevant criteria it applies when making strategic and operational decisions	0,275	0,835	0,209	0,216
Q26 The organization has measurement processes in place to monitor the successful implementation of Circular Economy principles into its strategic and operational ways of working, as well as the outcomes achieved	0,285	0,857	0,180	0,189
Q27 The end-to-end supply chain is structured and managed with full consideration of Circular Economy principles where applicable	0,566	0,571	0,299	0,235
Q28 Based on a culture of co-creation and co-design, the organization actively promotes innovative thinking to identify and deliver new Circular Economy opportunities within its ecosystem	0,487	0,615	0,209	0,347
Q29 The organization communicates its commitment to Circular Economy principles to its Key Stakeholders and others within its ecosystem	0,491	0,704	0,224	0,145
Q30 The organization actively educates its Customers on the importance of adopting Circular Economy principles into their own way of working, and rewards and recognizes them for any successful collaborations	0,484	0,485	-0,016	0,445
Q31 The organization ensures its People are proactively guided, rewarded and recognized for their efforts and ideas to help move the organization towards a way of working based entirely on Circular Economy principles	0,768	0,432	0,075	0,150
Q32 The organization contributes to the development, well-being and prosperity of the Society by offering sustainable solutions that address environmental problems such as climate change, material scarcity or threats to biodiversity	0,607	0,211	0,228	0,516

Rotated Component Matrix[a]				
	Component			
	1	2	3	4
Q33 The organization rewards and recognizes those Partners that adopt and embed Circular Economy principles into their own approach(es), and actively encourages the sharing of good practices	0,858	0,322	0,188	0,171
Q34 To support organization Circular Economy ambitions, the organization continuously gathers and evaluates creative ideas from within its ecosystem	0,818	0,373	0,097	0,314
Q35 The organization continues to create value with its products, services and solutions as it makes a clear transition from using linear to circular approaches	0,824	0,283	0,096	0,111
Q36 To help embed Circular Economy principles, the organization periodically communicates this commitment to its People, at the same time ensuring that the messages remain ethical and avoid misdirection ("greenwashing")	0,797	0,269	0,244	0,187
Q37 The organization converts data and information about Circular Economy into knowledge and uses the outcomes to create higher value and to improve the overall customer experience	0,837	0,264	0,238	0,107
Q38 The organization's approach to managing risk includes an assessment of the potential impact on the future ambitions of its Circular Economy Operating Model	0,830	0,138	0,358	0,225
Q39 The organization reduces its tangible assets and required resources by promoting a sharing culture for the use of its products, services and solutions in line with Circular Economy principles	0,825	0,223	0,177	0,154
Q40 The organization designs and selects materials for its products, services and solutions based on Circular Economy principles to extend the life cycle of the materials used	0,831	0,074	0,351	0,251
Q41 The organization periodically determines which assets and resources it no longer needs and based on Circular Economy principles, disposes of them responsibly	0,775	0,223	0,330	0,237
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.[a]				
a. Rotation converged in 7 iterations.				

Table 94 Hypothesis 2.2: Principal Component Analysis – Rotated Component Matrix. Source: own research

Communalities		
	Initial	Extraction
Q13 Selection of suppliers (based on cost)	1,000	0,744
Q14 Selection of suppliers (based on quality)	1,000	0,788
Q15 Selection of suppliers (based on lead time)	1,000	0,788
Q16 Selection of suppliers (based on care for the environment)	1,000	0,756
Q17 Selection of suppliers (based on sustainability aspects focus)	1,000	0,721
Q18 Relationship with suppliers (short term)	1,000	0,817
Q19 Relationship with suppliers (long term)	1,000	0,783
Q20 Relationship with suppliers (partnership)	1,000	0,693
Q21 Relationship with society (as customers)	1,000	0,641
Q22 Relationship with society (as partners)	1,000	0,666
Q23 There is clear alignment evident between the organization's Purpose, Values, Vision, Operating Model and the adoption of Circular Economy principles	1,000	0,777
Q24 The organization identifies and monitors those drivers of change that are critical to its Circular Economy Operating Model (Key Stakeholders' needs, markets, public opinion, legislation, material technology, best practices	1,000	0,891
Q25 The organization consistently includes Circular Economy principles as one of the relevant criteria it applies when making strategic and operational decisions	1,000	0,864
Q26 The organization has measurement processes in place to monitor the successful implementation of Circular Economy principles into its strategic and operational ways of working, as well as the outcomes achieved	1,000	0,882
Q27 The end-to-end supply chain is structured and managed with full consideration of Circular Economy principles where applicable	1,000	0,789
Q28 Based on a culture of co-creation and co-design, the organization actively promotes innovative thinking to identify and deliver new Circular Economy opportunities within its ecosystem	1,000	0,779
Q29 The organization communicates its commitment to Circular Economy principles to its Key Stakeholders and others within its ecosystem	1,000	0,807
Q30 The organization actively educates its Customers on the importance of adopting Circular Economy principles into their own way of working, and rewards and recognizes them for any successful collaborations	1,000	0,668
Q31 The organization ensures its People are proactively guided, rewarded and recognized for their efforts and ideas to help move the organization towards a way of working based entirely on Circular Economy principles	1,000	0,804
Q32 The organization contributes to the development, well-being and prosperity of the Society by offering sustainable solutions that address environmental problems such as climate change, material scarcity or threats to biodiversity	1,000	0,730
Q33 The organization rewards and recognizes those Partners that adopt and embed Circular Economy principles into their own approach(es), and actively encourages the sharing of good practices	1,000	0,905
Q34 To support organization Circular Economy ambitions, the organization continuously gathers and evaluates creative ideas from within its ecosystem	1,000	0,917
Q35 The organization continues to create value with its products, services and solutions as it makes a clear transition from using linear to circular approaches	1,000	0,781
Q36 To help embed Circular Economy principles, the organization periodically communicates this commitment to its People, at the same time ensuring that the messages remain ethical and avoid misdirection ("greenwashing")	1,000	0,799

Communalities		
	Initial	Extraction
Q37 The organization converts data and information about Circular Economy into knowledge and uses the outcomes to create higher value and to improve the overall customer experience	1,000	0,839
Q38 The organization's approach to managing risk includes an assessment of the potential impact on the future ambitions of its Circular Economy Operating Model	1,000	0,884
Q39 The organization reduces its tangible assets and required resources by promoting a sharing culture for the use of its products, services and solutions in line with Circular Economy principles	1,000	0,784
Q40 The organization designs and selects materials for its products, services and solutions based on Circular Economy principles to extend the life cycle of the materials used	1,000	0,882
Q41 The organization periodically determines which assets and resources it no longer needs and based on Circular Economy principles, disposes of them responsibly	1,000	0,817
Q12 Availability of innovation framework	1,000	0,704
Extraction Method: Principal Component Analysis.		

Table 95 Hypothesis 3.0: Principal Component Analysis – Communalities. Source: own research

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	17,851	59,502	59,502	17,851	59,502	59,502	9,363	31,211	31,211
2	2,716	9,054	68,557	2,716	9,054	68,557	5,552	18,505	49,716
3	1,969	6,562	75,119	1,969	6,562	75,119	5,489	18,297	68,013
4	1,165	3,883	79,002	1,165	3,883	79,002	3,297	10,989	79,002
5	0,933	3,110	82,112						
6	0,669	2,232	84,343						
7	0,589	1,964	86,308						
8	0,527	1,758	88,066						
9	0,476	1,585	89,651						
10	0,412	1,373	91,024						
11	0,381	1,271	92,295						
12	0,321	1,071	93,366						
13	0,286	0,955	94,321						
14	0,267	0,891	95,212						
15	0,230	0,768	95,980						
16	0,175	0,585	96,565						
17	0,155	0,517	97,082						
18	0,148	0,493	97,575						
19	0,131	0,438	98,013						
20	0,113	0,376	98,389						
21	0,101	0,338	98,727						
22	0,096	0,319	99,046						
23	0,072	0,239	99,285						
24	0,056	0,186	99,471						
25	0,040	0,134	99,604						
26	0,038	0,126	99,730						
27	0,034	0,112	99,843						
28	0,024	0,080	99,923						
29	0,013	0,043	99,965						
30	0,010	0,035	100,000						
Extraction Method: Principal Component Analysis.									

Table 96 Hypothesis 3.0: Principal Component Analysis – Total Variance Explained. Source: own research

Rotated Component Matrix[a]				
	Component			
	1	2	3	4
Q13 Selection of suppliers (based on cost)	0,307	0,150	0,750	0,256
Q14 Selection of suppliers (based on quality)	0,093	0,329	0,819	0,027
Q15 Selection of suppliers (based on lead time)	0,077	0,240	0,847	0,091
Q16 Selection of suppliers (based on care for the environment)	0,391	0,379	0,294	0,611
Q17 Selection of suppliers (based on sustainability aspects focus)	0,337	0,198	0,474	0,586
Q18 Relationship with suppliers (short term)	0,112	0,235	0,292	0,815
Q19 Relationship with suppliers (long term)	0,297	0,240	0,780	0,168
Q20 Relationship with suppliers (partnership)	0,245	0,210	0,693	0,330
Q21 Relationship with society (as customers)	0,363	0,029	0,611	0,367
Q22 Relationship with society (as partners)	0,383	0,343	0,253	0,581
Q23 There is clear alignment evident between the organization's Purpose, Values, Vision, Operating Model and the adoption of Circular Economy principles	0,167	0,745	0,406	0,171
Q24 The organization identifies and monitors those drivers of change that are critical to its Circular Economy Operating Model (Key Stakeholders' needs, markets, public opinion, legislation, material technology, best practices	0,292	0,791	0,389	0,173
Q25 The organization consistently includes Circular Economy principles as one of the relevant criteria it applies when making strategic and operational decisions	0,275	0,835	0,213	0,215
Q26 The organization has measurement processes in place to monitor the successful implementation of Circular Economy principles into its strategic and operational ways of working, as well as the outcomes achieved	0,286	0,854	0,191	0,187
Q27 The end-to-end supply chain is structured and managed with full consideration of Circular Economy principles where applicable	0,562	0,572	0,300	0,236
Q28 Based on a culture of co-creation and co-design, the organization actively promotes innovative thinking to identify and deliver new Circular Economy opportunities within its ecosystem	0,488	0,610	0,226	0,342
Q29 The organization communicates its commitment to Circular Economy principles to its Key Stakeholders and others within its ecosystem	0,489	0,704	0,226	0,145
Q30 The organization actively educates its Customers on the importance of adopting Circular Economy principles into their own way of working, and rewards and recognizes them for any successful collaborations	0,487	0,481	-0,003	0,446
Q31 The organization ensures its People are proactively guided, rewarded and recognized for their efforts and ideas to help move the organization towards a way of working based entirely on Circular Economy principles	0,768	0,431	0,084	0,149

Rotated Component Matrix[a]				
	Component			
	1	2	3	4
Q32 The organization contributes to the development, well-being and prosperity of the Society by offering sustainable solutions that address environmental problems such as climate change, material scarcity or threats to biodiversity	0,608	0,206	0,248	0,506
Q33 The organization rewards and recognizes those Partners that adopt and embed Circular Economy principles into their own approach(es), and actively encourages the sharing of good practices	0,857	0,320	0,200	0,167
Q34 To support organization Circular Economy ambitions, the organization continuously gathers and evaluates creative ideas from within its ecosystem	0,819	0,370	0,111	0,311
Q35 The organization continues to create value with its products, services and solutions as it makes a clear transition from using linear to circular approaches	0,824	0,280	0,107	0,108
Q36 To help embed Circular Economy principles, the organization periodically communicates this commitment to its People, at the same time ensuring that the messages remain ethical and avoid misdirection ("greenwashing")	0,794	0,269	0,249	0,182
Q37 The organization converts data and information about Circular Economy into knowledge and uses the outcomes to create higher value and to improve the overall customer experience	0,836	0,262	0,249	0,100
Q38 The organization's approach to managing risk includes an assessment of the potential impact on the future ambitions of its Circular Economy Operating Model	0,826	0,137	0,368	0,217
Q39 The organization reduces its tangible assets and required resources by promoting a sharing culture for the use of its products, services and solutions in line with Circular Economy principles	0,823	0,222	0,184	0,152
Q40 The organization designs and selects materials for its products, services and solutions based on Circular Economy principles to extend the life cycle of the materials used	0,829	0,072	0,363	0,241
Q41 The organization periodically determines which assets and resources it no longer needs and based on Circular Economy principles, disposes of them responsibly	0,773	0,221	0,344	0,229
Q12 Availability of innovation framework	0,478	0,249	0,594	0,247
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.[a]				
a. Rotation converged in 7 iterations.				

Table 97 Hypothesis 3.0: Principal Component Analysis – Rotated Component Matrix. Source: own research

Communalities		
	Initial	Extraction
Q23 There is clear alignment evident between the organization's Purpose, Values, Vision, Operating Model and the adoption of Circular Economy principles	1,000	0,743
Q24 The organization identifies and monitors those drivers of change that are critical to its Circular Economy Operating Model (Key Stakeholders' needs, markets, public opinion, legislation, material technology, best practices	1,000	0,890
Q25 The organization consistently includes Circular Economy principles as one of the relevant criteria it applies when making strategic and operational decisions	1,000	0,867
Q26 The organization has measurement processes in place to monitor the successful implementation of Circular Economy principles into its strategic and operational ways of working, as well as the outcomes achieved	1,000	0,868
Q27 The end-to-end supply chain is structured and managed with full consideration of Circular Economy principles where applicable	1,000	0,785
Q28 Based on a culture of co-creation and co-design, the organization actively promotes innovative thinking to identify and deliver new Circular Economy opportunities within its ecosystem	1,000	0,772
Q29 The organization communicates its commitment to Circular Economy principles to its Key Stakeholders and others within its ecosystem	1,000	0,791
Q30 The organization actively educates its Customers on the importance of adopting Circular Economy principles into their own way of working, and rewards and recognizes them for any successful collaborations	1,000	0,524
Q31 The organization ensures its People are proactively guided, rewarded and recognized for their efforts and ideas to help move the organization towards a way of working based entirely on Circular Economy principles	1,000	0,755
Q32 The organization contributes to the development, well-being and prosperity of the Society by offering sustainable solutions that address environmental problems such as climate change, material scarcity or threats to biodiversity	1,000	0,613
Q33 The organization rewards and recognizes those Partners that adopt and embed Circular Economy principles into their own approach(es), and actively encourages the sharing of good practices	1,000	0,881
Q34 To support organization Circular Economy ambitions, the organization continuously gathers and evaluates creative ideas from within its ecosystem	1,000	0,871
Q35 The organization continues to create value with its products, services and solutions as it makes a clear transition from using linear to circular approaches	1,000	0,738
Q36 To help embed Circular Economy principles, the organization periodically communicates this commitment to its People, at the same time ensuring that the messages remain ethical and avoid misdirection ("greenwashing")	1,000	0,794
Q37 The organization converts data and information about Circular Economy into knowledge and uses the outcomes to create higher value and to improve the overall customer experience	1,000	0,827
Q38 The organization's approach to managing risk includes an assessment of the potential impact on the future ambitions of its Circular Economy Operating Model	1,000	0,843
Q39 The organization reduces its tangible assets and required resources by promoting a sharing culture for the use of its products, services and solutions in line with Circular Economy principles	1,000	0,788
Q40 The organization designs and selects materials for its products, services and solutions based on Circular Economy principles to extend the life cycle of the materials used	1,000	0,851

Communalities		
	Initial	Extraction
Q41 The organization periodically determines which assets and resources it no longer needs and based on Circular Economy principles, disposes of them responsibly	1,000	0,790
Q42 Organization's customers perceive the organization's approach to Circular Economy as being environmentally responsible, ethically sound and financially fair	1,000	0,751
Q43 People (employees) perceive the organization's approach to Circular Economy as being environmentally responsible, ethically sound and financially fair	1,000	0,843
Q44 The members of the partner network perceive the organization's approach to Circular Economy as being environmentally responsible, ethically sound and financially fair	1,000	0,803
Q45 The organization has a set of performance results that clearly indicate the degree of success it has had in delivering on its Circular Economy objectives	1,000	0,747
Q46 When compared with other organizations, either in its own ecosystem or outside, it can demonstrate that it succeeds equally or better than others in delivering its Circular Economy ambitions	1,000	0,738
Q47 The organization's internal and external audit results and risk assessments indicate outstanding performance in relation to targets set for embedding Circular Economy principles	1,000	0,742
Q48 Based on its achievements, the organization has received external recognition for acting as a role model in the application of Circular Economy principles and associated	1,000	0,472
Extraction Method: Principal Component Analysis.		

Table 98 Hypothesis 3.1a: Principal Component Analysis – Communalities. Source: own research

Total Variance Explained									
	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	18,048	69,415	69,415	18,048	69,415	69,415	11,955	45,982	45,982
2	2,039	7,843	77,258	2,039	7,843	77,258	8,132	31,277	77,258
3	0,944	3,632	80,890						
4	0,830	3,193	84,083						
5	0,667	2,566	86,649						
6	0,459	1,765	88,414						
7	0,402	1,547	89,961						
8	0,377	1,448	91,410						
9	0,329	1,264	92,674						
10	0,320	1,230	93,904						
11	0,256	0,983	94,887						
12	0,229	0,882	95,769						
13	0,191	0,734	96,503						
14	0,184	0,709	97,213						
15	0,143	0,549	97,761						
16	0,113	0,434	98,195						
17	0,100	0,383	98,578						
18	0,078	0,299	98,877						
19	0,074	0,286	99,163						
20	0,059	0,228	99,391						
21	0,043	0,166	99,557						
22	0,035	0,136	99,693						
23	0,028	0,108	99,802						
24	0,022	0,083	99,885						
25	0,016	0,062	99,947						
26	0,014	0,053	100,000						
Extraction Method: Principal Component Analysis.									

Table 99 Hypothesis 3.1a: Principal Component Analysis – Total Variance Explained. Source: own research

Rotated Component Matrix[a]		
	Component	
	1	2
Q23 There is clear alignment evident between the organization's Purpose, Values, Vision, Operating Model and the adoption of Circular Economy principles	0,181	0,843
Q24 The organization identifies and monitors those drivers of change that are critical to its Circular Economy Operating Model (Key Stakeholders' needs, markets, public opinion, legislation, material technology, best practices	0,313	0,890
Q25 The organization consistently includes Circular Economy principles as one of the relevant criteria it applies when making strategic and operational decisions	0,279	0,888
Q26 The organization has measurement processes in place to monitor the successful implementation of Circular Economy principles into its strategic and operational ways of working, as well as the outcomes achieved	0,289	0,886
Q27 The end-to-end supply chain is structured and managed with full consideration of Circular Economy principles where applicable	0,600	0,652
Q28 Based on a culture of co-creation and co-design, the organization actively promotes innovative thinking to identify and deliver new Circular Economy opportunities within its ecosystem	0,516	0,711
Q29 The organization communicates its commitment to Circular Economy principles to its Key Stakeholders and others within its ecosystem	0,501	0,735
Q30 The organization actively educates its Customers on the importance of adopting Circular Economy principles into their own way of working, and rewards and recognizes them for any successful collaborations	0,508	0,516
Q31 The organization ensures its People are proactively guided, rewarded and recognized for their efforts and ideas to help move the organization towards a way of working based entirely on Circular Economy principles	0,744	0,449
Q32 The organization contributes to the development, well-being and prosperity of the Society by offering sustainable solutions that address environmental problems such as climate change, material scarcity or threats to biodiversity	0,705	0,340
Q33 The organization rewards and recognizes those Partners that adopt and embed Circular Economy principles into their own approach(es), and actively encourages the sharing of good practices	0,860	0,376
Q34 To support organization Circular Economy ambitions, the organization continuously gathers and evaluates creative ideas from within its ecosystem	0,828	0,431
Q35 The organization continues to create value with its products, services and solutions as it makes a clear transition from using linear to circular approaches	0,802	0,307
Q36 To help embed Circular Economy principles, the organization periodically communicates this commitment to its People, at the same time ensuring that the messages remain ethical and avoid misdirection ("greenwashing")	0,817	0,355
Q37 The organization converts data and information about Circular Economy into knowledge and uses the outcomes to create higher value and to improve the overall customer experience	0,845	0,335
Q38 The organization's approach to managing risk includes an assessment of the potential impact on the future ambitions of its Circular Economy Operating Model	0,880	0,262
Q39 The organization reduces its tangible assets and required resources by promoting a sharing culture for the use of its products, services and solutions in line with Circular Economy principles	0,841	0,283

Rotated Component Matrix[a]		
	Component	
	1	2
Q40 The organization designs and selects materials for its products, services and solutions based on Circular Economy principles to extend the life cycle of the materials used	0,900	0,204
Q41 The organization periodically determines which assets and resources it no longer needs and based on Circular Economy principles, disposes of them responsibly	0,823	0,335
Q42 Organization's customers perceive the organization's approach to Circular Economy as being environmentally responsible, ethically sound and financially fair	0,699	0,512
Q43 People (employees) perceive the organization's approach to Circular Economy as being environmentally responsible, ethically sound and financially fair	0,615	0,682
Q44 The members of the partner network perceive the organization's approach to Circular Economy as being environmentally responsible, ethically sound and financially fair	0,747	0,495
Q45 The organization has a set of performance results that clearly indicate the degree of success it has had in delivering on its Circular Economy objectives	0,697	0,511
Q46 When compared with other organizations, either in its own ecosystem or outside, it can demonstrate that it succeeds equally or better than others in delivering its Circular Economy ambitions	0,631	0,583
Q47 The organization's internal and external audit results and risk assessments indicate outstanding performance in relation to targets set for embedding Circular Economy principles	0,630	0,587
Q48 Based on its achievements, the organization has received external recognition for acting as a role model in the application of Circular Economy principles and associated	0,591	0,350
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.[a]		
a. Rotation converged in 3 iterations.		

Table 100 Hypothesis 3.1a: Principal Component Analysis – Rotated Component Matrix. Source: own research

Communalities		
	Initial	Extraction
Q37 The organization converts data and information about Circular Economy into knowledge and uses the outcomes to create higher value and to improve the overall customer experience	1,000	0,805
ImprovedCircularEconomyPerformance	1,000	0,776
Q21 Relationship with society (as customers)	1,000	0,511
Extraction Method: Principal Component Analysis.		

Table 101 Hypothesis 3.1b: Principal Component Analysis – Communalities. Source: own research

Total Variance Explained						
	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2,093	69,758	69,758	2,093	69,758	69,758
2	0,649	21,620	91,378			
3	0,259	8,622	100,000			
Extraction Method: Principal Component Analysis.						

Table 102 Hypothesis 3.1b: Principal Component Analysis – Total Variance Explained. Source: own research

Rotated Component Matrix[a]	
	a. Only one component was extracted. The solution cannot be rotated.

Table 103 Hypothesis 3.1b: Principal Component Analysis – Rotated Component Matrix. Source: own research

Communalities		
	Initial	Extraction
Q37 The organization converts data and information about Circular Economy into knowledge and uses the outcomes to create higher value and to improve the overall customer experience	1,000	0,820
Q21 Relationship with society (as customers)	1,000	0,359
Q23 There is clear alignment evident between the organization's Purpose, Values, Vision, Operating Model and the adoption of Circular Economy principles	1,000	0,754
Q24 The organization identifies and monitors those drivers of change that are critical to its Circular Economy Operating Model (Key Stakeholders' needs, markets, public opinion, legislation, material technology, best practices	1,000	0,891
Q25 The organization consistently includes Circular Economy principles as one of the relevant criteria it applies when making strategic and operational decisions	1,000	0,868
Q26 The organization has measurement processes in place to monitor the successful implementation of Circular Economy principles into its strategic and operational ways of working, as well as the outcomes achieved	1,000	0,870
Q27 The end-to-end supply chain is structured and managed with full consideration of Circular Economy principles where applicable	1,000	0,798
Q28 Based on a culture of co-creation and co-design, the organization actively promotes innovative thinking to identify and deliver new Circular Economy opportunities within its ecosystem	1,000	0,779
Q29 The organization communicates its commitment to Circular Economy principles to its Key Stakeholders and others within its ecosystem	1,000	0,772
Q30 The organization actively educates its Customers on the importance of adopting Circular Economy principles into their own way of working, and rewards and recognizes them for any successful collaborations	1,000	0,547
Q31 The organization ensures its People are proactively guided, rewarded and recognized for their efforts and ideas to help move the organization towards a way of working based entirely on Circular Economy principles	1,000	0,755
Q32 The organization contributes to the development, well-being and prosperity of the Society by offering sustainable solutions that address environmental problems such as climate change, material scarcity or threats to biodiversity	1,000	0,618
Q33 The organization rewards and recognizes those Partners that adopt and embed Circular Economy principles into their own approach(es), and actively encourages the sharing of good practices	1,000	0,887
Q34 To support organization Circular Economy ambitions, the organization continuously gathers and evaluates creative ideas from within its ecosystem	1,000	0,889
Q35 The organization continues to create value with its products, services and solutions as it makes a clear transition from using linear to circular approaches	1,000	0,744
Q36 To help embed Circular Economy principles, the organization periodically communicates this commitment to its People, at the same time ensuring that the messages remain ethical and avoid misdirection ("greenwashing")	1,000	0,810
Q38 The organization's approach to managing risk includes an assessment of the potential impact on the future ambitions of its Circular Economy Operating Model	1,000	0,866
Q39 The organization reduces its tangible assets and required resources by promoting a sharing culture for the use of its products, services and solutions in line with Circular Economy principles	1,000	0,781

Communalities		
	Initial	Extraction
Q40 The organization designs and selects materials for its products, services and solutions based on Circular Economy principles to extend the life cycle of the materials used	1,000	0,862
Q41 The organization periodically determines which assets and resources it no longer needs and based on Circular Economy principles, disposes of them responsibly	1,000	0,814
Q42 Organization's customers perceive the organization's approach to Circular Economy as being environmentally responsible, ethically sound and financially fair	1,000	0,735
Q43 People (employees) perceive the organization's approach to Circular Economy as being environmentally responsible, ethically sound and financially fair	1,000	0,836
Extraction Method: Principal Component Analysis.		

Table 104 Hypothesis 3.2: Principal Component Analysis – Communalities. Source: own research

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	15,021	68,277	68,277	15,021	68,277	68,277	10,045	45,658	45,658
2	2,033	9,241	77,518	2,033	9,241	77,518	7,009	31,859	77,518
3	0,903	4,104	81,622						
4	0,634	2,881	84,503						
5	0,567	2,578	87,081						
6	0,497	2,258	89,340						
7	0,375	1,704	91,043						
8	0,341	1,548	92,591						
9	0,280	1,271	93,863						
10	0,233	1,059	94,921						
11	0,208	0,947	95,868						
12	0,168	0,764	96,632						
13	0,149	0,676	97,309						
14	0,131	0,595	97,904						
15	0,102	0,465	98,369						
16	0,086	0,389	98,758						
17	0,074	0,335	99,093						
18	0,064	0,289	99,383						
19	0,048	0,218	99,600						
20	0,043	0,195	99,795						
21	0,029	0,132	99,926						
22	0,016	0,074	100,000						
Extraction Method: Principal Component Analysis.									

Table 105 Hypothesis 3.2: Principal Component Analysis – Total Variance Explained. Source: own research

Rotated Component Matrix[a]		
	Component	
	1	2
Q37 The organization converts data and information about Circular Economy into knowledge and uses the outcomes to create higher value and to improve the overall customer experience	0,841	0,336
Q21 Relationship with society (as customers)	0,534	0,271
Q23 There is clear alignment evident between the organization's Purpose, Values, Vision, Operating Model and the adoption of Circular Economy principles	0,202	0,844
Q24 The organization identifies and monitors those drivers of change that are critical to its Circular Economy Operating Model (Key Stakeholders' needs, markets, public opinion, legislation, material technology, best practices	0,319	0,888
Q25 The organization consistently includes Circular Economy principles as one of the relevant criteria it applies when making strategic and operational decisions	0,271	0,891
Q26 The organization has measurement processes in place to monitor the successful implementation of Circular Economy principles into its strategic and operational ways of working, as well as the outcomes achieved	0,271	0,892
Q27 The end-to-end supply chain is structured and managed with full consideration of Circular Economy principles where applicable	0,601	0,661
Q28 Based on a culture of co-creation and co-design, the organization actively promotes innovative thinking to identify and deliver new Circular Economy opportunities within its ecosystem	0,521	0,712
Q29 The organization communicates its commitment to Circular Economy principles to its Key Stakeholders and others within its ecosystem	0,479	0,736
Q30 The organization actively educates its Customers on the importance of adopting Circular Economy principles into their own way of working, and rewards and recognizes them for any successful collaborations	0,507	0,539
Q31 The organization ensures its People are proactively guided, rewarded and recognized for their efforts and ideas to help move the organization towards a way of working based entirely on Circular Economy principles	0,737	0,461
Q32 The organization contributes to the development, well-being and prosperity of the Society by offering sustainable solutions that address environmental problems such as climate change, material scarcity or threats to biodiversity	0,707	0,344
Q33 The organization rewards and recognizes those Partners that adopt and embed Circular Economy principles into their own approach(es), and actively encourages the sharing of good practices	0,860	0,384
Q34 To support organization Circular Economy ambitions, the organization continuously gathers and evaluates creative ideas from within its ecosystem	0,829	0,448
Q35 The organization continues to create value with its products, services and solutions as it makes a clear transition from using linear to circular approaches	0,802	0,316
Q36 To help embed Circular Economy principles, the organization periodically communicates this commitment to its People, at the same time ensuring that the messages remain ethical and avoid misdirection ("greenwashing")	0,824	0,363
Q38 The organization's approach to managing risk includes an assessment of the potential impact on the future ambitions of its Circular Economy Operating Model	0,893	0,262

Rotated Component Matrix[a]		
	Component	
	1	2
Q39 The organization reduces its tangible assets and required resources by promoting a sharing culture for the use of its products, services and solutions in line with Circular Economy principles	0,835	0,288
Q40 The organization designs and selects materials for its products, services and solutions based on Circular Economy principles to extend the life cycle of the materials used	0,906	0,204
Q41 The organization periodically determines which assets and resources it no longer needs and based on Circular Economy principles, disposes of them responsibly	0,833	0,347
Q42 Organization's customers perceive the organization's approach to Circular Economy as being environmentally responsible, ethically sound and financially fair	0,684	0,517
Q43 People (employees) perceive the organization's approach to Circular Economy as being environmentally responsible, ethically sound and financially fair	0,611	0,681
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.[a]		
a. Rotation converged in 3 iterations.		

Table 106 Hypothesis 3.2: Principal Component Analysis – Rotated Component Matrix. Source: own research

Communalities		
	Initial	Extraction
Q37 The organization converts data and information about Circular Economy into knowledge and uses the outcomes to create higher value and to improve the overall customer experience	1,000	0,827
Q23 There is clear alignment evident between the organization's Purpose, Values, Vision, Operating Model and the adoption of Circular Economy principles	1,000	0,743
Q24 The organization identifies and monitors those drivers of change that are critical to its Circular Economy Operating Model (Key Stakeholders' needs, markets, public opinion, legislation, material technology, best practices	1,000	0,890
Q25 The organization consistently includes Circular Economy principles as one of the relevant criteria it applies when making strategic and operational decisions	1,000	0,867
Q26 The organization has measurement processes in place to monitor the successful implementation of Circular Economy principles into its strategic and operational ways of working, as well as the outcomes achieved	1,000	0,868
Q27 The end-to-end supply chain is structured and managed with full consideration of Circular Economy principles where applicable	1,000	0,785
Q28 Based on a culture of co-creation and co-design, the organization actively promotes innovative thinking to identify and deliver new Circular Economy opportunities within its ecosystem	1,000	0,772
Q29 The organization communicates its commitment to Circular Economy principles to its Key Stakeholders and others within its ecosystem	1,000	0,791
Q30 The organization actively educates its Customers on the importance of adopting Circular Economy principles into their own way of working, and rewards and recognizes them for any successful collaborations	1,000	0,524
Q31 The organization ensures its People are proactively guided, rewarded and recognized for their efforts and ideas to help move the organization towards a way of working based entirely on Circular Economy principles	1,000	0,755
Q32 The organization contributes to the development, well-being and prosperity of the Society by offering sustainable solutions that address environmental problems such as climate change, material scarcity or threats to biodiversity	1,000	0,613
Q33 The organization rewards and recognizes those Partners that adopt and embed Circular Economy principles into their own approach(es), and actively encourages the sharing of good practices	1,000	0,881
Q34 To support organization Circular Economy ambitions, the organization continuously gathers and evaluates creative ideas from within its ecosystem	1,000	0,871
Q35 The organization continues to create value with its products, services and solutions as it makes a clear transition from using linear to circular approaches	1,000	0,738
Q36 To help embed Circular Economy principles, the organization periodically communicates this commitment to its People, at the same time ensuring that the messages remain ethical and avoid misdirection ("greenwashing")	1,000	0,794
Q38 The organization's approach to managing risk includes an assessment of the potential impact on the future ambitions of its Circular Economy Operating Model	1,000	0,843
Q39 The organization reduces its tangible assets and required resources by promoting a sharing culture for the use of its products, services and solutions in line with Circular Economy principles	1,000	0,788

Communalities		
	Initial	Extraction
Q40 The organization designs and selects materials for its products, services and solutions based on Circular Economy principles to extend the life cycle of the materials used	1,000	0,851
Q41 The organization periodically determines which assets and resources it no longer needs and based on Circular Economy principles, disposes of them responsibly	1,000	0,790
Q42 Organization's customers perceive the organization's approach to Circular Economy as being environmentally responsible, ethically sound and financially fair	1,000	0,751
Q43 People (employees) perceive the organization's approach to Circular Economy as being environmentally responsible, ethically sound and financially fair	1,000	0,843
Q44 The members of the partner network perceive the organization's approach to Circular Economy as being environmentally responsible, ethically sound and financially fair	1,000	0,803
Q45 The organization has a set of performance results that clearly indicate the degree of success it has had in delivering on its Circular Economy objectives	1,000	0,747
Q46 When compared with other organizations, either in its own ecosystem or outside, it can demonstrate that it succeeds equally or better than others in delivering its Circular Economy ambitions	1,000	0,738
Q47 The organization's internal and external audit results and risk assessments indicate outstanding performance in relation to targets set for embedding Circular Economy principles	1,000	0,742
Q48 Based on its achievements, the organization has received external recognition for acting as a role model in the application of Circular Economy principles and associated	1,000	0,472
Extraction Method: Principal Component Analysis.		

Table 107 Hypothesis 4.1: Principal Component Analysis – Communalities. Source: own research

Total Variance Explained									
	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	18,048	69,415	69,415	18,048	69,415	69,415	11,955	45,982	45,982
2	2,039	7,843	77,258	2,039	7,843	77,258	8,132	31,277	77,258
3	0,944	3,632	80,890						
4	0,830	3,193	84,083						
5	0,667	2,566	86,649						
6	0,459	1,765	88,414						
7	0,402	1,547	89,961						
8	0,377	1,448	91,410						
9	0,329	1,264	92,674						
10	0,320	1,230	93,904						
11	0,256	0,983	94,887						
12	0,229	0,882	95,769						
13	0,191	0,734	96,503						
14	0,184	0,709	97,213						
15	0,143	0,549	97,761						
16	0,113	0,434	98,195						
17	0,100	0,383	98,578						
18	0,078	0,299	98,877						
19	0,074	0,286	99,163						
20	0,059	0,228	99,391						
21	0,043	0,166	99,557						
22	0,035	0,136	99,693						
23	0,028	0,108	99,802						
24	0,022	0,083	99,885						
25	0,016	0,062	99,947						
26	0,014	0,053	100,000						
Extraction Method: Principal Component Analysis.									

Table 108 Hypothesis 4.1: Principal Component Analysis – Total Variance Explained. Source: own research

Rotated Component Matrix[a]		
	Component	
	1	2
Q37 The organization converts data and information about Circular Economy into knowledge and uses the outcomes to create higher value and to improve the overall customer experience	0,845	0,335
Q23 There is clear alignment evident between the organization's Purpose, Values, Vision, Operating Model and the adoption of Circular Economy principles	0,181	0,843
Q24 The organization identifies and monitors those drivers of change that are critical to its Circular Economy Operating Model (Key Stakeholders' needs, markets, public opinion, legislation, material technology, best practices	0,313	0,890
Q25 The organization consistently includes Circular Economy principles as one of the relevant criteria it applies when making strategic and operational decisions	0,279	0,888
Q26 The organization has measurement processes in place to monitor the successful implementation of Circular Economy principles into its strategic and operational ways of working, as well as the outcomes achieved	0,289	0,886
Q27 The end-to-end supply chain is structured and managed with full consideration of Circular Economy principles where applicable	0,600	0,652
Q28 Based on a culture of co-creation and co-design, the organization actively promotes innovative thinking to identify and deliver new Circular Economy opportunities within its ecosystem	0,516	0,711
Q29 The organization communicates its commitment to Circular Economy principles to its Key Stakeholders and others within its ecosystem	0,501	0,735
Q30 The organization actively educates its Customers on the importance of adopting Circular Economy principles into their own way of working, and rewards and recognizes them for any successful collaborations	0,508	0,516
Q31 The organization ensures its People are proactively guided, rewarded and recognized for their efforts and ideas to help move the organization towards a way of working based entirely on Circular Economy principles	0,744	0,449
Q32 The organization contributes to the development, well-being and prosperity of the Society by offering sustainable solutions that address environmental problems such as climate change, material scarcity or threats to biodiversity	0,705	0,340
Q33 The organization rewards and recognizes those Partners that adopt and embed Circular Economy principles into their own approach(es), and actively encourages the sharing of good practices	0,860	0,376
Q34 To support organization Circular Economy ambitions, the organization continuously gathers and evaluates creative ideas from within its ecosystem	0,828	0,431
Q35 The organization continues to create value with its products, services and solutions as it makes a clear transition from using linear to circular approaches	0,802	0,307
Q36 To help embed Circular Economy principles, the organization periodically communicates this commitment to its People, at the same time ensuring that the messages remain ethical and avoid misdirection ("greenwashing")	0,817	0,355
Q38 The organization's approach to managing risk includes an assessment of the potential impact on the future ambitions of its Circular Economy Operating Model	0,880	0,262
Q39 The organization reduces its tangible assets and required resources by promoting a sharing culture for the use of its products, services and solutions in line with Circular Economy principles	0,841	0,283

Q40 The organization designs and selects materials for its products, services and solutions based on Circular Economy principles to extend the life cycle of the materials used	0,900	0,204
Q41 The organization periodically determines which assets and resources it no longer needs and based on Circular Economy principles, disposes of them responsibly	0,823	0,335
Q42 Organization's customers perceive the organization's approach to Circular Economy as being environmentally responsible, ethically sound and financially fair	0,699	0,512
Q43 People (employees) perceive the organization's approach to Circular Economy as being environmentally responsible, ethically sound and financially fair	0,615	0,682
Q44 The members of the partner network perceive the organization's approach to Circular Economy as being environmentally responsible, ethically sound and financially fair	0,747	0,495
Q45 The organization has a set of performance results that clearly indicate the degree of success it has had in delivering on its Circular Economy objectives	0,697	0,511
Q46 When compared with other organizations, either in its own ecosystem or outside, it can demonstrate that it succeeds equally or better than others in delivering its Circular Economy ambitions	0,631	0,583
Q47 The organization's internal and external audit results and risk assessments indicate outstanding performance in relation to targets set for embedding Circular Economy principles	0,630	0,587
Q48 Based on its achievements, the organization has received external recognition for acting as a role model in the application of Circular Economy principles and associated	0,591	0,350
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.[a]		
a. Rotation converged in 3 iterations.		

Table 109 Hypothesis 4.1: Principal Component Analysis – Rotated Component Matrix. Source: own research

Communalities		
	Initial	Extraction
Q37 The organization converts data and information about Circular Economy into knowledge and uses the outcomes to create higher value and to improve the overall customer experience	1,000	0,809
Q30 The organization actively educates its Customers on the importance of adopting Circular Economy principles into their own way of working, and rewards and recognizes them for any successful collaborations	1,000	0,488
Q31 The organization ensures its People are proactively guided, rewarded and recognized for their efforts and ideas to help move the organization towards a way of working based entirely on Circular Economy principles	1,000	0,751
Q32 The organization contributes to the development, well-being and prosperity of the Society by offering sustainable solutions that address environmental problems such as climate change, material scarcity or threats to biodiversity	1,000	0,609
Q33 The organization rewards and recognizes those Partners that adopt and embed Circular Economy principles into their own approach(es), and actively encourages the sharing of good practices	1,000	0,866
Q34 To support organization Circular Economy ambitions, the organization continuously gathers and evaluates creative ideas from within its ecosystem	1,000	0,865
Q35 The organization continues to create value with its products, services and solutions as it makes a clear transition from using linear to circular approaches	1,000	0,718
Q36 To help embed Circular Economy principles, the organization periodically communicates this commitment to its People, at the same time ensuring that the messages remain ethical and avoid misdirection ("greenwashing")	1,000	0,784
Q38 The organization's approach to managing risk includes an assessment of the potential impact on the future ambitions of its Circular Economy Operating Model	1,000	0,795
Q39 The organization reduces its tangible assets and required resources by promoting a sharing culture for the use of its products, services and solutions in line with Circular Economy principles	1,000	0,757
Q40 The organization designs and selects materials for its products, services and solutions based on Circular Economy principles to extend the life cycle of the materials used	1,000	0,777
Q41 The organization periodically determines which assets and resources it no longer needs and based on Circular Economy principles, disposes of them responsibly	1,000	0,773
Q42 Organization's customers perceive the organization's approach to Circular Economy as being environmentally responsible, ethically sound and financially fair	1,000	0,748
Q43 People (employees) perceive the organization's approach to Circular Economy as being environmentally responsible, ethically sound and financially fair	1,000	0,761
Q44 The members of the partner network perceive the organization's approach to Circular Economy as being environmentally responsible, ethically sound and financially fair	1,000	0,813
Q45 The organization has a set of performance results that clearly indicate the degree of success it has had in delivering on its Circular Economy objectives	1,000	0,751
Q46 When compared with other organizations, either in its own ecosystem or outside, it can demonstrate that it succeeds equally or better than others in delivering its Circular Economy ambitions	1,000	0,707

Q47 The organization's internal and external audit results and risk assessments indicate outstanding performance in relation to targets set for embedding Circular Economy principles	1,000	0,706
Q48 Based on its achievements, the organization has received external recognition for acting as a role model in the application of Circular Economy principles and associated	1,000	0,485
Extraction Method: Principal Component Analysis.		

Table 110 Hypothesis 5: Principal Component Analysis – Communalities. Source: own research

Total Variance Explained						
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	13,965	73,500	73,500	13,965	73,500	73,500
2	0,950	5,002	78,502			
3	0,790	4,157	82,659			
4	0,686	3,608	86,267			
5	0,440	2,317	88,584			
6	0,388	2,043	90,626			
7	0,339	1,786	92,412			
8	0,298	1,570	93,983			
9	0,259	1,365	95,348			
10	0,184	0,968	96,316			
11	0,139	0,731	97,047			
12	0,133	0,699	97,746			
13	0,123	0,647	98,393			
14	0,090	0,476	98,870			
15	0,063	0,329	99,199			
16	0,050	0,265	99,463			
17	0,043	0,226	99,689			
18	0,033	0,172	99,861			
19	0,026	0,139	100,000			
Extraction Method: Principal Component Analysis.						

Table 111 Hypothesis 5: Principal Component Analysis – Total Variance Explained. Source: own research

Rotated Component Matrix[a]	
	a. Only one component was extracted. The solution cannot be rotated.

Table 112 Hypothesis 5: Principal Component Analysis – Rotated Component Matrix. Source: own research