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**FACULTY OF ECONOMICS AND BUSINESS ADMINISTRATION**

**GLOBAL BUSINESS AND ECONOMICS**

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**MASTER THESIS**

<b>ISO 14001 STANDARTŲ IR ŽIEDINĖS EKONOMIKOS PRINCIPŲ INTEGRAVIMAS, SIEKiant ORGANIZACIJOS TVARUMO</b>	<b>INTEGRATING ISO 14001 STANDARDS WITH CIRCULAR ECONOMY PRINCIPLES FOR ACHIEVING ORGANIZATIONAL SUSTAINABILITY</b>
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# INTRODUCTION

## Topic Relevance

Studying the role of intersection of ISO 14001 (EMS) with the circular economy principles in sustainable business practices is extremely relevant in present business landscape. Sustainability has become even more critical in the 21st century as there has been an increase in awareness on the issues like Social Inequality, Climate change and depletion of natural resources. It is argued that unmanaged climate change can be threat to global poverty eradication efforts and 68-135 million people are estimated to be at risk of pushing back into poverty due to climate change (United Nations, n.d.).

Moreover, these vulnerable sections contribute the least to the climate change and are mostly at the receiving end. The poorest 50% contribute to only 12% of the total carbon emissions and on the other hand 10% of the richest are responsible for 47% of total global carbon emissions (Emissions Gap Report 2023: Broken Record, n.d.). Depletion of natural resources has been at peak due to unsustainable practices of extraction and harvesting at an alarming rate. These factors have put immense pressure on businesses to operate in a sustainable fashion.

There has been a growing awareness among consumers as well as investors about sustainability and they are increasingly supporting businesses which are committed to sustainable practices. This also gives such businesses a competitive advantage. Moreover, businesses can also benefit from adoption of sustainable practices as it can result in efficient use of resources which can lead to cost savings and also enhance the brand's reputation. It is worth discussing that ISO 14001 provides business with a standard to minimize the negative impact of business operations on environment and comply with regulations and laws. The clauses of ISO 14001 EMS elaborate on this and includes important factors like understanding the context of the organization, leaderships involvement, planning, support, operation, performance evaluation and continuous improvement (Mapping ISO 14001:2015, n.d.).

On the other hand, circularity focuses on regeneration, waste elimination and circulation of products and services at their highest value. Prioritization of sustainability can position businesses to adapt to changing trends in the market and preferences of the customers. There is a need to design a framework that defines how the clauses outlined by ISO 14001 can be framed in context of circularity that is differentiation between ISO standards from the context of linear economy businesses and circular economy businesses. This can also motivate linear businesses to transition into a circular mode by saving on cost and times as the framework is based on the same clauses. Businesses can have a

competitive advantage over less sustainable businesses as they can meet evolving consumer demands and other regulatory requirements. Integrating sustainable practices into circular businesses is a complicated process and a framework which is an association of ISO 14001 and circularity principles can solve this problem by providing a structured approach.

### **The level of exploration of the topic**

The exploration of the master's thesis topic has been partially comprehensive. There are numerous research papers that have been published on topics related to ISO 14001 and its significance in sustainable business practices. This is evident in the studies that have been conducted by MacDonald (2005) and Petros Sebhatu and Enquist (2007) who have discussed ISO 14001 as a catalyst for value creation, strategic sustainability and subsequently sustainable development. However, while there is an abundance of literature resources on the subject in the context of circular economy, the research into the association between ISO 14001 and sustainability practices is still an emerging area of research and there is an opportunity for original contribution. The knowledge about the adoption of Circular economy principles and its intersection with the clauses of ISO 14001 is still under investigation or have been explored to a very limited level. It is worth noting that research has explored circular economy as a sustainability paradigm and explored its potential implications (Geissdoerfer et al. 2017). Moreover, the research conducted also outlines the approaches to sustainability which elaborates on the broader opportunities in sustainability beyond ISO 14001 (Boyer et al. 2016). Despite the individual contributions, there is still a need for research that can bring together ISO 14001 and circularity principles. The aim is minimising inequality, prevent resource depletion, and addressing the risks associated with climate change and give ideas and recommendations for businesses to implement. Further research should aim at providing insights and recommendations by building a framework for business to achieve sustainability by bringing together Environment management system and circular economy principles.

### **The Novelty of the master's thesis**

The novelty of the master's thesis is that it provides a comprehensive approach integrating the principles of circular economy which is waste minimization and resource efficiency with the structure approach of ISO 14001 standardised environmental management system and help business based on circularity principles by developing a framework to improve environmental performance and organizational sustainability.

### **The problem of the Master thesis**

The thesis focuses on filling the knowledge gap between integration of ISO 14001 standards with businesses which are based on circular economy principles and develop a framework for improving sustainable practices that guide circular business to identifies the sustainability challenges and proposes solution.

### **The aim of the Master thesis**

The aim of this master's thesis is to explore the integration of environmental management systems based on ISO 14001 with circular economy principles proposing a framework within organizations to enhance sustainability outcomes.

The objective of the Master thesis

The master's thesis has several objectives that can be categorized into the following.

1. To understand the concept of circular economy principles and comprehend the functioning of circular business models and how it differs from linear business models.
2. To analyse Environmental management systems and their significance
3. To scrutinize the impact of the using ISO 14001 certified Environmental management system on sustainability and business practices
4. To develop a framework that integrates ISO 14001 in the context of circular economy
5. To Summarize and give recommendations based on the developed framework framed on the clauses of ISO 14001 in the context of circularity principles to guide businesses and stakeholders. This can help businesses to design EMS based on circularity principles and make transition from linear to circular economy.

### **Research Methods**

The research methods that is used in this thesis report includes literature review. The literature review provides a solid foundation for the covering the theoretical aspect of the thesis report. A thorough analysis of extant literature resources is done and analysed.

The research utilises a Qualitative research approach which is combined with literature review with empirical research on the basis of semi-structured interviews. The literature review part does a thorough analysis of ISO 14001 principles, Circular economy principles and sustainability to provide a solid theoretical foundation. The findings of the empirical research are integrated with the literature analysis to derive conclusions and recommendations.

### **Structure of this Thesis Report**



The thesis report has been structure in the following way. Literature: A reviewing of the extant literature on Circular Economy, environmental management systems and Sustainability. A Qualitative methodology is used to carry out empirical research on the ways organizations can drive sustainable business by integrating ISO 14001 in the context of circular economy. The analysis of the empirical data that is collected and the results are reported. Conclusions and recommendations for implementation of Environmental management systems in a Circular economy is done and how it can drive sustainability. A list of the literature and references that have been cited in the thesis report. The annexure consists of the necessary metadata data for the thesis which includes transcripts of the semi-structured interviews with the interview questionnaire.

# **1 THEORETICAL ASPECTS INTEGRATING ISO 14001 STANDARDS WITH CIRCULAR ECONOMY PRINCIPLES FOR ACHIEVING ORGANIZATIONAL SUSTAINABILITY**

## **1.1 Sustainability and its dimensions**

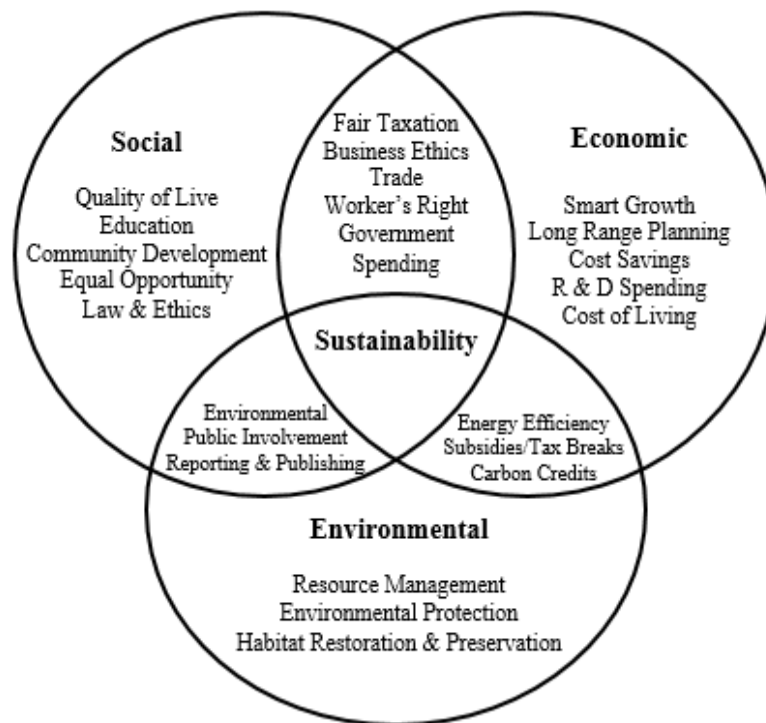
Sustainability can be defined long term societal practice for co-existence on Earth over a long time. The modern concept of sustainability and its definition was vague and disputed. It can be argued that the concept saw its emergence in the 1970s. The definition of the term sustainability is disputed and varies in context and time (Bosselmann, 2010; Ramsey, 2015). Sustainability has been described to have three dimensions or pillars which are environmental, economic, and social. The article by Purvis, Mao, and Robinson (Purvis et al., 2018) challenges the accepted notion of sustainability. The three dimensions paradigm has few theoretical foundations. It emerged without a single point of origin (Purvis et al., 2018). In the context of general use, sustainability concentrates on countering the environmental challenges, these are essentially climate change, biodiversity and ecosystem loss, environmental pollution and degradation. At the global and national level and even at individual levels, Sustainability can guide decisions for future taking into considerations social, economic and environmental factors.

There are frameworks that discuss the hierarchy of the three dimensions of sustainability. One framework can be three nested ellipses which describe the hierarchy of sustainability dimensions where economic and social dimensions are constrained by the environment. If we were to draw a Venn diagram, sustainability would be the area of overlap of the three dimensions and has been depicted below with analysis done further. The environmental dimension is the core of the concept of sustainability. The environmental dimension encompasses various areas which includes prevention and protection of natural resources, mitigating the risks of environmental degradation and minimizing pollution. The awareness about environmental pollution became more prominent in the 1960s and 1970s which resulted in the discussions of sustainability and sustainable development This process began in the 1970s with concern for environmental issues and it was realised that reducing these negative impacts on the environment would improve environmental sustainability (Report of the United Nations Conference on the Human Environment, Stockholm, 5-16 June 1972, 1973). In the late 20<sup>th</sup> Century, the awareness of global

environmental issues became prominent with harmful effects of things like pesticides and chlorofluorocarbons (CFCs) coming under scrutiny. In 1972, the UN held its first conference on environmental issues, emphasizing the need to protect wildlife and natural habitats (Report of the United Nations Conference on the Human Environment, Stockholm, 5-16 June 1972, 1973). The report discusses principles in its declaration and an action plan for human environment with a list of recommendations.

Figure 1

*Sustainability and its dimensions*



Source: Mahmood-Dheyaaldin. (2019). Significant three pillars of sustainability

When it comes to the second pillar which is economic dimension, it can be said that it is quite controversial. (Purvis et al., 2018) This dimension is often associated with concepts such as profitability, economic efficiency, economic development, and growth. However, it must be noted that economic sustainability must not be interpreted as economic growth and development. The primary challenge is to conduct economic activities while reducing their environmental impact. There is a necessity to find ways how societal progress, which would be driven potentially by

economic development, can be reached without excess strain on the environment. A Circular economy which is an innovative model that is distinguished from the traditional linear economy model can improve aspects of economic sustainability. The linear economy model has a the 'take, make, waste' approach. In contrast, the circular economy (CE) model has a regenerative approach and aims to keep products and materials in use for as long as possible.

The definition of the social dimension of sustainability is vague. It can be said that a society is sustainable in social terms if people do not face structural obstacles in key areas which include health, influence and competence. The article 'Five Approaches to Social Sustainability and an Integrated Way Forward' (Boyer et al., 2016) discusses the challenges of incorporating the social aspect into sustainability projects. article contemplates on the challenges of analysis, comprehension, definition and incorporation of the social dimension of sustainability in the sustainability projects. The social pillar is often neglected as the agenda for sustainability is focused more on economic and environmental dimensions. This compartmentalization into three distinct elements overlooks important political implications and neglects the deeply social nature of economies and environments. The article suggests that understanding the different interpretations of social sustainability can help practitioners understand its implications. They argue that sustainability is best understood through socially framed research and efforts, grounded in local experiences and concerns, and integrated across disciplines and professions (Boyer et al., 2016).

The other important aspect is the measurement of sustainability, which is difficult to quantify, and it is even impossible to quantify at times. Sustainability measurement can be defined as a set of frameworks or tools that can measure how sustainable something is and this includes processes, products, services and business. These metrics are still evolving and consider environmental, social and economic domains. The indicators include audits, benchmarks, fairtrade, organics, assessment, appraisal and reporting systems. These metrics are used over a wide range of scales that can measure change in a variable across space or over time (Bell & Morse, 2012).

In conclusion, Sustainability emerged as a key concept in the late 20<sup>th</sup> Century. It has a complex definition and has three key dimensions or pillars which are environmental, economic and social with the environmental aspect at the core of the sustainability discourse which focuses on reduction of environmental impacts. One crucial aspect of sustainability that remains a challenge is the measurement of sustainability. There are various frameworks and tools that attempt to indicate and measure the how sustainable something is. The social dimension has most often been overlooked and has a very vague in definition. It is crucial for addressing the challenges within societies which include health, influence and competence. The economic dimension of

sustainability is often misunderstood as economic development and growth. It emphasizes on economic growth without putting strain on the environment. It has gained importance through the emergence of sustainable business practices and innovative models like the circular economy (CE) which can at least partially replace linear economy.

### **1.1.1 Analysing principles and pathways to sustainable development**

Sustainable development and sustainability are closely linked concepts, but it is worth mentioning that they differ significantly in scope. Sustainable development integrates sustainability principles to achieve social and economic development and has a broader scope. Sustainability is a principle which can also be considered a goal and sustainable development on the other hand is a process to achieve that goal. The Brundtland Report in 1987 defined sustainable development as "development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs" (Our Common Future, Chapter 2: Towards Sustainable Development - a/42/427 Annex, Chapter 2 - UN Documents: Gathering a Body of Global Agreements, n.d.) . In the last two centuries, human societies have accomplished remarkable technical advancements. Nevertheless, our accomplishments have obscured our awareness of our constraints. Despite the substantial financial investment of hundreds of millions of dollars, we have not yet achieved the ability to maintain the survival of an artificial ecosystem, which includes a small human population, in a self-sufficient manner within a hermetically sealed dome on Earth's surface. Despite the substantial financial investment of billions of dollars, we have not yet achieved the capability to support the life of a single astronaut in a spacecraft circling the Earth. Despite our modern infrastructure, including skyscrapers, aircraft, cars, agro-food businesses, and computers, our survival as humans is entirely reliant on the ongoing operation of natural systems. Regrettably, a significant number of individuals, particularly those residing in urban areas, are under the false belief that they are detached from nature in some way. Often, we overlook the invaluable yet complimentary services that nature bestows upon us. Plant life, for example, supplies the oxygen necessary for our respiration and, both directly and indirectly, the nourishment we consume. The natural, bio-geochemical cycles guarantee the continuous movement and exchange of water, carbon, oxygen, and other vital components. (UNGA). There are 17 SDGs, and these goals address the global challenges which include poverty, inequality, climate change, environmental degradation, peace, and justice (Purvis et al., 2018).

It is worth mentioning that Sustainable is a concept that is distinct from the concept of Sustainability which is normative concept. Sustainability can be considered a long term which would lead to a sustainable world. On the other hand, sustainable development refers to the many processes and pathways to achieve Sustainability. There have been various criticisms on the concept of sustainable development. First, development itself is regarded as unsustainable and second there are inconsistencies with definition of development.

Like sustainability, Sustainable development is also regarded to have three dimensions: the environment, economy and society. The idea is that a good balance between the three dimensions should be achieved. For the successful pursuit of sustainable development, six interdependent capacities are necessary.

Studies have identified six essential capacities that are required to effectively facilitate interventions that steer development trajectories towards sustainability. These capacities include the ability to (a) assess sustainable development, (b) advance fairness, (c) adjust to unexpected events, (d) transition the system towards more sustainable development paths, (e) connect knowledge with action, and (f) establish governance structures that enable collaboration in utilising the other capacities (Clark & Harley, 2020)

### **1.1.2 Sustainability in Business – benefits and practices**

Business as usual is not an answer to achieve a sustainable future. With the rising global population, resource crunch and peak levels of environmental degradation. However, it is not yet common practice in business to value the – so called 'freely available' - natural resources. Business should be operating in ways which are 'Sustainable'. A sustainable business enterprise that has a minimal negative impact on the environment, society and economy socially or globally and can be expected to the potential to have a positive effect in the long run. A sustainable business strives to meet the triple bottom line. The idea can of sustainable business can be considered a subset of green capitalism which has a broader scope. Businesses practices for achieving sustainability encompasses a wide range of strategies and practices. These include practices like adoption of renewable energy adoption, energy efficiency, waste reduction and recycling, water conservation, achieving carbon neutrality and strategies like sustainable supply chain management, sustainable product design, lifecycle assessment, and most importantly implementing an environment management system with sustainable innovations or eco-innovations (Carrillo-Hermosilla, del Río, & Könnölä, 2010).

The sustainable practices of renewable energy adoption, energy efficiency, waste reduction, sustainable product design and eco-innovation is core to circular economy principles. In the book *Eco-innovation when sustainability and competitiveness shake hands*. The idea of eco design and eco-innovation has also been discussed in research. ‘Eco-innovation is the development of goods, processes, systems and services which are competitively priced and designed to satisfy human needs supporting a better quality of life. In the life cycle of the products there is a minimal use of natural resources and a minimal negative impact on the environment (Carrillo-Hermosilla, Del Río González, Könnölä, & Del Río González, 2009).

The integration of environmentally and socially responsible practices in the supply chain is crucial. This can be defined as Sustainable supply chain management. This should be considered in all stages of supply chain from sourcing of raw materials to production and final delivery of the finished products to the consumers. This can be achieved by focusing on strategy. Risk management, transparency and supply chain integrity. Supply chain integrity explores the intersection of ethical decisions with businesses (Castillo, Mollenkopf, Bell, & Bozdogan, 2018)

In the book *Cannabis with Forks*, author (Elkington, 1998) discusses the concept of triple bottom line. The triple bottom line is a sustainability framework that helps us examine the social, environmental, and economic impact of an enterprise. Sustainable business practices become more relevant as a business’s success or failure can’t only be justified by its traditional bottom line which is profit or loss. It is also worth considering the sustainability aspect of the business. The business should consider the three bottom lines which includes profit, people and planet. The people account considers the social responsibility of the organization through its operations. The planet account takes into account the environmental responsibility of the business. It aims to measure the financial, social and environmental performance of the businesses over a period of time. Only those businesses that produces a TBL is taking account of the full cost involved in doing business. Businesses should realise that sustainability is no longer a choice, but it is a necessity. Businesses are operating in an unpredictable world with climate change, dwindling natural resources, and ever-increasing demands on our energy and food supply (Elkington, 1998).

These factors are disrupting business operations and supply chains in unexpected ways. It’s high time for private and public organizations to fundamentally rethink and evaluate the way they function. Sustainable business is resilient and agile and are rooted in responsible practices that preserve our planet. Organizations can leverage sustainable practices into their operations can expect valuable business benefits. IBM outlines a list of benefits that can be a result of implementation of sustainable practices. These include competitive advantage. As per IBM’s data,

55% of consumers say environmental responsibility is very or extremely important when choosing a brand (“What Is Sustainability in Business? | IBM,” n.d.). Companies can leverage their active engagement in implementing their sustainable business operations to attract customers and promote brand awareness. It is also worth noting that sustainable businesses have a higher investor compared to the unsustainable ones as 4 out of 5 investors plan to act on social responsibility factors in the coming year. Moreover, sustainable practices lead to reduction in the consumption of resources and optimization of operational efficiencies. Sustainable business also attracts talents who are looking for purpose driven opportunities. Additionally, these businesses comply with regulatory requirements of the governments. Governments will continue to expand regulations and corporate sustainable development goals (SDGs) as a part of their commitment to the global cause. Sustainable businesses are ahead of the curve as they proactively implement sustainable solutions to meet these new regulatory requirements and continually capture, measure, benchmark and report on ESG performance.

Business practices that lead to sustainability can include leveraging artificial intelligence and data to identify opportunities that are sustainable. Another business practice is understanding consumers and investors awareness of the organization’s sustainability initiatives. Broadening the view of value chains and shifting from the traditional way to new ways of value addition.

### **1.1.3 ESGs (Environment, Society and Governance) Metrics for Socially responsible investing**

Socially responsible investment (SRI) understands the impact of companies in specific areas of interest. It involves investing by undertaking exclusionary screening which would ultimately filter out those companies that are engaging in business activities that are undesirable or negatively impacts society or environment or are unethical in any way. This is where ESG metrics helps in achieving ethical investing. ESG metrics is used to analyse an organization’s sustainability practices. There was a demand for information that captures how companies use different forms of capital to provide their products and services how their activities affect society through positive and negative externalities. The forms of capital include natural, social, and intellectual and financial capital. This led to the creation of environmental, social, and governance (ESG) metrics. It has been pointed out in paper that the concept of ESG has an impact on financial markets and investment activity. Companies that have higher ESG ratings are expected to have better financial performance and are perceived to have better financial performance. Consequently, these organization are more attractive to investors (Egorova, Grishunin, & Karminsky, 2022).



In the analysis of more than 1,000 research papers conducted which explore the relationship between ESG and financial performance from 2015 to 2020. It is pointed to a growing consensus that there is a correlation between good management of ESG issues and improvement in operational metrics like Return on Equity, Return on assets and stock prices (Whelan, Atz, Van Holt, & Clark, 2021). It is worth noting that there are very few studies which found out that there is a negative association between ESG and financial performance. In context of ISO 14001, economic performance can be measured by return on assets (ROA). Return on Assets is defined as the ratio of net profit to total assets. ROA reflects the efficiency of a firm's use of its assets to generate profits (Minutolo et al.,2019).

**Figure 2**

*ESG metrics*

Environmental - How a company interacts with the natural world	Social - How a company considers people and their relationships	Governance - The standards and strategy for running a company
<ul style="list-style-type: none"> <li>• Climate change and emissions</li> <li>• Air and water pollution</li> <li>• Deforestation</li> <li>• Waste management</li> <li>• Water use</li> <li>• Energy efficiency</li> <li>• Biodiversity protection</li> </ul>	<ul style="list-style-type: none"> <li>• Gender and diversity</li> <li>• Data protection</li> <li>• Human rights</li> <li>• Labor standards</li> <li>• Community relations</li> <li>• Customer satisfaction</li> <li>• Employee engagement</li> </ul>	<ul style="list-style-type: none"> <li>• Board composition</li> <li>• Bribery and corruption</li> <li>• Reporting transparency and accountability</li> <li>• Executive compensation</li> <li>• Auditing committee structure</li> <li>• Tax strategies</li> </ul>

Source: (What Is Environmental, Social, and Governance (ESG)? - Persefoni, n.d.-a)

The primary goal of ESG metrics is to capture as accurately as possible an organization's performance on a given ESG issue. When this goal is achieved it can help different stakeholders which include investors, customers, employees, NGOs and the company itself. Investors can use the data to hold companies accountable for their ESG performance as part of their engagement efforts. They can also use the data by integrating it into their business analysis and valuation tools. From a corporate perspective, companies can predict the effectiveness of their efforts in producing

the intended outcomes. It also helps in systematically integrating these efforts into their operating processes, corporate strategy, and executive compensation plans. For the customers, the data can guide their purchasing decisions, for employees when choosing where to work and for NGOs when designing their efforts to drive social progress. (Kotsantonis & Serafeim, 2019).

The Principles for Responsible Investment (PRI) initiative is an initiative launched by the United Nations Global Compact (UNGC) and the United Nations Environment Programme Finance Initiative (UNEP FI). The initiative promotes the consideration of environmental, social, and governance (ESG) issues by investors for capital allocation. The initiative discusses six principles for responsible investing. Since the launch of the Principles by Kofi Annan (ex-UN Secretary-General) in 2006, PRI has been able to sign-up close to 4,000 signatories who represent over \$120 trillion in assets under management (Hill, 2020).

The studies discussed above indicate a trend towards investments and fund allocation to sustainable business. Businesses need investment to operate and investors are increasingly demanding non-financial information from organizations. ESG metrics and frameworks are helping investors to make choices for capital allocation by analysis consistent and interpretable data (Bose, 2020). In conclusion, the literature analysis suggests that scale of ethical investment is high, and businesses must consider sustainability as a key indicator for attracting investment. Circular businesses would be a preference for ethical investors.

#### **1.1.4 Challenges with sustainability in business**

Entrepreneurs in the space of sustainable businesses face numerous challenges which include institutional barriers and fears of failure. This is because there is a dual creation of private and social value. There is always a lack of support when it comes to finance, administration and information (Peng & Walid, 2022). The institutional barriers can be formal, informal, environmental or skill related. Informal barriers may include corruption on the other hand formal barriers include government regulations. (Aidis, 2005). Customer readiness is a challenge. There is a shift in the mindset around sustainability. However, business can't afford to be left behind. Affordability is also a concern. A deep understanding of the customers is required for Co-creating a sustainable future. It is essential to have partners with the right relationships and right ecosystems. Cost can be considered one of the primary challenges in the implementation of sustainable business practices. Higher upfront investments are needed to change. Sticking with the status quo is an inexpensive alternative. Organizations need to build an investment case to show how immediate

investment will result in more durable profitability over the long run. Systemic inertia or the tendency of an organization to resist to a change is another barrier.

Another important factor is management of changes, Organizations may face problems to find an approach for balancing changes. It should be noted that instead of focusing only on the technical aspects there is also a need to manage the human aspects (Bovey & Hede, 2001). The technical challenges can include sustainable design, sustainable supply chain management and sustainable innovation. Innovation is the most critical of all the technical challenges. Eco-innovation can be considered a strategic perspective to renew businesses and involves changes in the behaviour at both organizational and individual level. This include various dimensions which are constitutes a framework which comprehensively help in analysing processes in innovation. These include user, design, product and governance perspective (Carrillo-Hermosilla, Del Río González, Könnölä, & Del Río González, 2009). Sustainable product design results in creation of products with high sustainability keeping in mind the social, economic and environmental aspects. Manufacturing should be based on design methodologies that result in social, economic and environmental sustainability.

Sustainability is often not seen as a key priority as it doesn't provide benefits sooner. Though it is an important goal, it often isn't seen as more of a long-term business plan. It must be realised that acting on sustainability now is necessary to achieving future sustainability in business. Risks must be reframed as opportunities. Businesses lack tools, insights and expertise to sustainable practices. They are unprepared to develop a corporate sustainability vision, strategy and framework. This poses a great risk. Many businesses lack the ability to implement sustainable solutions and don't even know where to start. Sustainability in business is evolving concept, and it will have more questions and answers. Businesses need an ecosystem partner to drive innovation to help them reinvent the world and lead to a sustainable future.

In conclusion, sustainability in businesses is critical and cannot be considered only a choice for adoption. There is a need for new and creative business models that address sustainability. One of the most popular concepts that is gaining popularity is the concept of Circular economy which can be put forward as an alternative to traditional economic activities. Various business models have been identified that support circularity these include product-as-a-service, sharing platforms, and product life extension models, among others. This aim is to optimize resource utilization, reduce waste, and create value for businesses and customers alike, while contributing to the overall goals of the circular economy (CE) which is the goal.

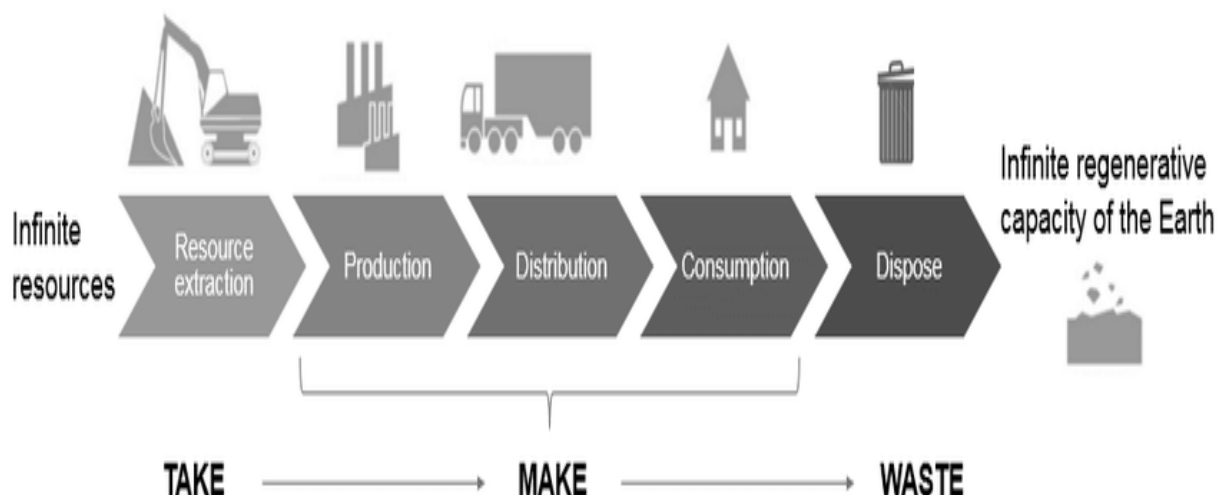
## 1.2 Circular Economy

### 1.2.1 Circular Economy and its distinction from linear Economy

The linear economy which is also referred to as the take-make-waste economy, is an economic system where resources are exploited to produce goods that ultimately end up as waste. The waste is apparent of no further use. The economy always moves in one direction – from raw material to waste. The produced goods are generally not utilised to their full potential in a linear economy. It can be argued that it is an unsustainable and polluting system that degrades natural systems and is one of the key drivers of global challenges, including climate change and biodiversity loss.

**Figure 3**

*The linear economy-The 'take, make and waste' approach of production*



Source: Exploring the role of independent retailers in the circular economy: a case study approach (Wautelet, 2018).

The traditional economic design can trace its roots in the historically uneven distribution of wealth by geographic region. The consumers of resources have been largely concentrated in the western societies and the material inputs have been sourced increasingly from the globally and consequently the industrial nations have experienced an abundance of material resources and energy. In this arrangement, the materials have been cheap compared to the cost of human labour. As a result, the producers have been motivated to adopt business models that relied on extensive use of materials and economized on human work to boost profit which is unsustainable capitalism.

The more energy and materials that have been able to be utilized to supplement human capital, the more competitive edge they could manage to gain. This resulted in neglect of recycling, reusing and putting much emphasis on waste. According to the Ellen MacArthur Foundation, the linear ‘take-make-dispose’ model has its reliance on large quantities of easily accessible resources and energy, and as such is increasingly unfit for the reality in which it operates.

Working towards efficiency alone—a reduction of resources and fossil energy consumed per unit of manufacturing output—will not alter the finite nature of their stocks but can only delay the inevitable and a complete transformation of the entire operating system seems necessary (Ellen MacArthur Foundation, 2013). The foundation of linear economy was laid during the industrial revolution. Though this system offered many benefits, but it did not assume the finiteness of the availability of resources that is raw materials and energy. This economic transformation resulted in rapid industrialisation leading to societies of abundance, increase in the world population, and poverty was reduced. The system did not take into the social and environmental factors into the consideration. In a linear economy, there is a take, make, waste approach. The linear approach exposes businesses to various types of risks most notably supply chain disruptions and volatility of price of resource. There is a need to decouple revenues from material input (Ellen MacArthur Foundation, 2013).

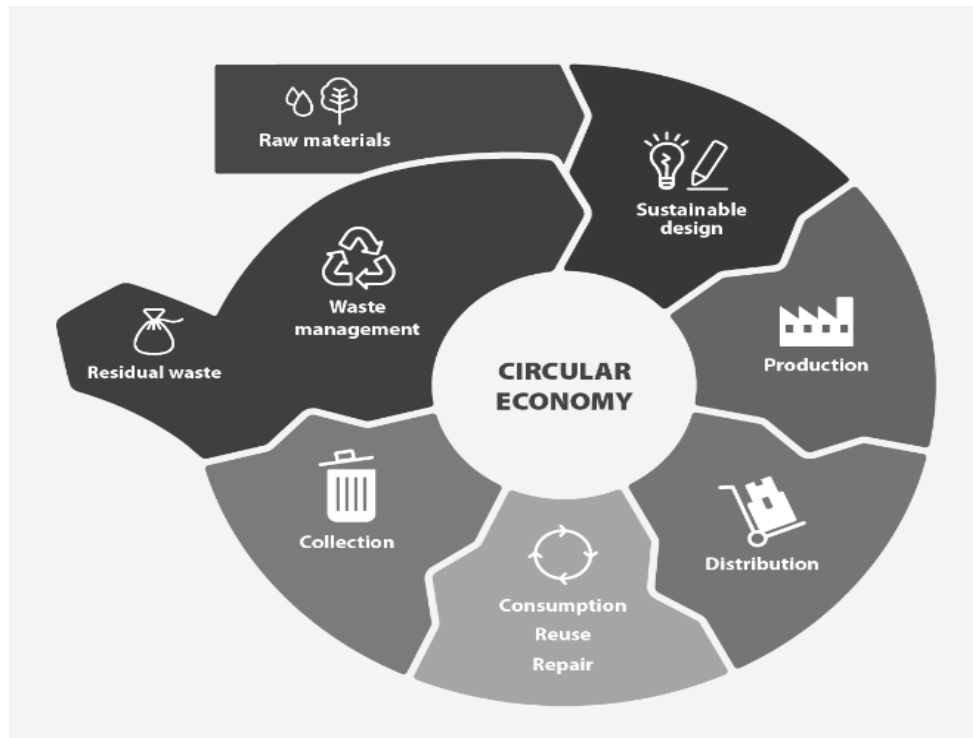
Over the last 150 years, our industrial economy has been dominated by a one-way model of production and consumption. This system involves the production of items using raw materials, the items are sold, used, and ultimately, they are disposed by incineration or as garbage. Given the expanding global population and its corresponding rise in resource consumption and detrimental environmental effects, it is becoming increasingly evident that continuing with the current approach is not viable for achieving a sustainable future. The concept of a circular economy (CE) has been discussed since the 1970s. However, switching from the current linear model of economy to a circular one has recently attracted increased attention from major global companies and policymakers.

According to a published report by the Ellen MacArthur Foundation (EMF) and McKinsey Company at World Economic Forum at Davos in 2012, the transition to a circular economy (CE) could create an opportunity worth US\$630 billion annually for only a subset of the EU manufacturing sectors (Ellen MacArthur Foundation , 2012). In addition to the substantial economic advantages, the EMF also mentions the notable environmental and social benefits that arise from a circular economy. This has led to increased awareness on the concept, encouraging

numerous businesses to eagerly capitalise on the possible financial benefits and opportunities (Wautelet, 2018).

**Figure 4**

*The circular economy model*



Source: European Parliament Research Service

A circular economy (CE) is a concept and describes an economic system. This economic system is based on business models which replace the ‘end-of-life’ concept which aims at reducing, alternatively reusing, recycling and recovering materials in production, distribution and consumption processes. The economy functions at three distinct levels: the micro level, which encompasses products, companies, and consumers; the meso level, which includes eco-industrial parks; and the macro level, which encompasses cities, regions, nations, and beyond. The aim to accomplish sustainable development, which implies creating environmental quality, economic prosperity and social equity, doesn’t compromise on the current needs and on the needs of the future generations (Kirchherr et al., 2017).

The most accepted definition of circular economy (CE) comes from the Ellen McArthur Foundation which reads “A circular economy (CE) is an industrial system that is designed with an intention to be restorative or regenerative. It replaces the ‘end-of-life’ concept with restoration, shifts towards the use of renewable energy, eliminates the use of toxic chemicals, which impair reuse, and aims for the elimination of waste through the superior design of materials, products, systems, and, within this, business models” (Ellen MacArthur Foundation, 2013)

There are potential economic benefits of implementation of sustainable practices which include cost savings, revenue generation and operational efficiency. Various cost saving initiatives can be implemented using sustainable practices which include Save energy like usage of renewable resources and technology can lead to operational efficiency and cost saving in the long term. It is predicted that in the Nigerian telecommunications industry use of sustainable practices like energy saving measures can lead to a potential saving of 16.4 billion euros over the course of 15 years (Olumide, Ojo, Shah, & Coutroubis, 2017). In addition, use of lean construction practices which is apparently a sustainable practice in residential projects can result in the reduction in construction waste production and can help in cost savings of up to 0.19% (Angela et al., 2015)

### **1.2.2 Principles of Circular Economy**

A circular economy (CE) strives to create a system that aims waste elimination and promote the continual use of resources. Circular economy is based on simple principles which include ‘Design out’ waste, distinction between Consumables and durables and use of renewable energy sources (Ellen MacArthur Foundation, 2013)

'Design out' waste: The idea of waste doesn't exist in the paradigm of circular economy. It is crucial that products design involves creative approach to prevent it from being discarded rather it can disassemble and reused. This differentiates it from recycling, as product is not going through the process of break down and remake. This prevents loss of valuable materials and energy. There is a strict distinction between consumable and durable components of a product. This is important as it distinguishes between components which can or can't be returned to the environment. Consumable parts are non-toxic and come from biological sources and can be safely returned to the environment after use. On the other hand, Durable parts are more likely made of materials like metals and plastics that can't be returned to the environment, but these can be designed in ways which facilitates reuse. Another key aspect is the use of energy from renewable sources to power the circular economy. It aims to reduces dependence on non-renewable resources and makes the system more resistant to shocks, like sudden increases in the price of oil. A circular economy (CE)

is about creating a system where there is minimal waste resources by designing products using circular economy (CE) principles to use and reuse them and then return them to the system in a sustainable way that's safe for the environment.

In contrast to linear product design and material utilisation, the principles guide four distinct sources of value creation which include power of the inner circle, power of circling longer, power of cascaded use and power of pure circles. Reducing the relative material consumption in comparison to the linear production system is known as the "power of the inner circle." The greater the potential savings on the shares of material, labour, energy, and capital incorporated in the product, the tighter the circle—that is, the less a product must be altered throughout reuse, refurbishment, and remanufacturing, and the quicker it returns to use. Power of circling longer refers to maximising the number of consecutive cycles (reuse, remanufacturing, or recycling) and/or the duration of each cycle. The power of cascaded use is defined as the diversification of reuse across the value chain. For instance, cotton clothing that is first used as second-hand clothing, then used as fibrefill in upholstery for furniture, and then used as stone wool insulation for construction—all of which serve to offset the entry of virgin materials into the economy until the safe return of cotton fibres to the biosphere. The "power of pure circles" ultimately resides in the fact that clean material streams improve the effectiveness of material redistribution and collection while preserving quality, especially for technical materials. This, in turn, prolongs product life and raises material production (Ellen MacArthur Foundation, 2013). In conclusion, analysis has shown that circular economy (CE) as a concept works and has economic viability and scalability for diverse products irrespective of length of service life. The economy is stuck in a system that supports the linear model of production and consumption. However, a few potent disruptive tendencies are exerting pressure on this lock-in, making it weaker: First, there is no going back to scarce resources and stricter environmental regulations. This will favour circular firms to take over "take-make-dispose" enterprises.

### 1.2.3 Circular Economy and Sustainability

Based on the literature analysis, the Circular Economy as a regenerative system in which resource input and waste, emission, and energy leakage are minimised by slowing, closing, and narrowing material and energy loops. This can be achieved through long-lasting design, maintenance, repair, reuse, remanufacturing, refurbishing, and recycling. On the other hand, sustainability is defined as the balanced integration of economic performance, social inclusiveness, and environmental resilience, keeping in mind the needs of current and future generations.



Circular Economy is viewed as a condition for sustainability, a beneficial relation, or a trade-off (Geissdoerfer et al., 2017). The analysis also gave two distinct tables of similarity and differences between circular economy (CE) and sustainability. It can be concluded that there is a association between the two concepts. However, it is worth mentioning that concepts have different origins, goals, motivations, system prioritisations, institutionalisations, beneficiaries, timeframes, and perceptions of responsibilities.

**Table 1**

*Similarities and differences between sustainability and the circular economy*

	Sustainability	Circular Economy	Similarity
Origins of the term	Environmental movements, NGOs, non-profit and intergovernmental agencies, principles in silviculture and cooperative systems	Different schools of thought like cradle-to-cradle, regulatory implementation by governments, lobbying by NGOs like the EMF, inclusion in political agendas, e.g. European Horizon 2020	
Goals	Open-ended, multitude of goals depending on the considered agent and her interests	Closed loop, ideally eliminating all resource input into and leakage out of the system	Central role of private business, due to resources and capabilities  More agency for the multiple and coexisting pathways of development

Continuation of Table 1

Motivation	Diffused and diverse à reflexivity and adaptive --> past trajectories	Better use of resources, waste, leakage (from linear to circular)	System change/design and innovation at the core
To whose benefit?	The environment, the economy, and society at large.	Economic actors are at the core, benefitting the economy and the environment. Society benefits from environmental improvements and certain add-ons and assumptions, like more manual labour or fairer taxation	<ul style="list-style-type: none"> <li>• Multi-/interdisciplinary research field</li> <li>• Potential cost, risk, diversification, value co-creation opportunities</li> </ul>
How did they institutionalise (wide diffusion)?	Providing vague framing that can be adapted to different contexts and aspirations.	Emphasising economic and environmental benefits	Business model innovation as a key for industry transformation Regulation and incentives as core implementation tools

Source: Developed by the author according to Geissdoerfer et al., 2017

The modern understanding of the term Circular Economy seems to have emerged more recently than that of sustainability. While the Circular Economy is traced back by EMF (2013b) to different schools of thought like cradle-to-cradle and industrial ecology while the concept of sustainability is more older. Sustainability was institutionalised by environmental movements especially after the publication of the Brundtland report in 1987. Circular Economy is aiming at a closed loop, eliminating

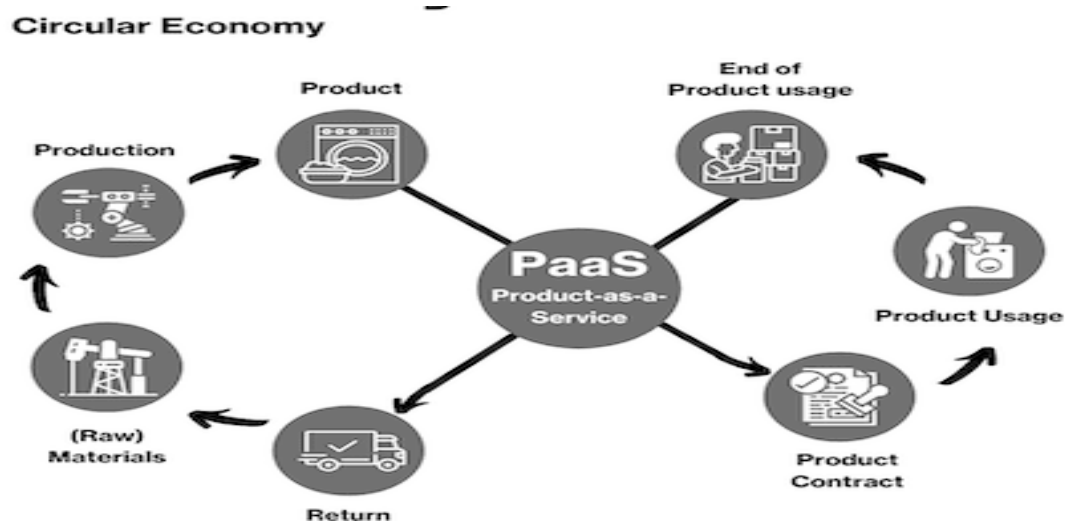
all resource inputs and waste and emission leakages of the system, the goals of sustainability are open-ended.

#### 1.2.4 Business Models in Circular Economy

A business model is a model that describes the process of creating and capturing value. Business model has been defined as depicting ‘the content, structure, and governance of transactions designed to create value through the exploitation of business opportunities (Zott & Amit, 2010). They conceptualize a business model as a system of interdependent activities that transcends the focal firm and spans its boundaries. The business model enables the firm, together with its partners, to create value and appropriate a share of that value. The term business model refers to a company's plan for making a profit. It identifies the products or services the business plans to sell, its identified target market, and any anticipated expenses. Business models are important for both new and established businesses. They help new, developing companies attract investment, recruit talent, and motivate management and staff. (Kopp, 2023). Possible business models include retailers, manufacturers, subscription, Fee-for-service, product-as-a-service, freemium, marketplace, affiliate, razor pay and pay-as-you-go and franchise. Business models relevant to circular economy (CE) may include product-as-a-services (PAAS), sharing platform and collaborative consumption, product life extension and waste-to-value.

**Figure 5**

*Product-as-a-Service (PaaS) and the circular economy*



Source: What Is Product-as-a-Service (PaaS)? | (Firmhouse, n.d)

Product as a service (PaaS) is a business model for traditional product companies to make their offerings more attractive, move up the value chain and find more customers (Kesavapanikkar et al., 2022). In the PAAS model, the businesses provide access to products or services but retains the ownership of the products. (Bahraini, 2022) However, the customer acceptance of PaaS depends on the market in which it operates. This is beneficial in many ways as it results in longevity of product lifecycle, reduction of waste and efficiency of resources.

In conclusion, business models like Product-as-a-Service (PaaS) enable businesses to be more sustainable. The sharing economy encourages sharing of resources among communities and further assists in reducing negative environmental and societal impacts while lowering costs. This has encouraged companies which also includes big brands like Rolls Royce and Philips to rethink their business models (Govindan et al., 2020). The customers subscribe to the product instead of buying it. The manufacturers still own the product and when the customers don't need the product, the manufacturers can disassemble the product and can be reused which is more likely to contribute to the Circular Economy. Keeping it in the highest value order for the longest period and increasing profitability in the long run. Industries that are taking benefit of this models include consumer goods, consumer electronics, Home and furniture, medical, mobility, lighting and original equipment manufacturers.

Moreover, customers are increasingly becoming inclined towards businesses running on PaaS model. It offers them the flexibility to pay or upgrade their payment options every month. There is more support and loyalty. Upfront costs of buying a product is considerably lower. Furthermore, there is a possibility of getting renewed products once the subscription expires. Customers are now adopting a more circular way of acquiring products, and this can help sustainable business to continue growing over time. Companies like Philips, Xerox etc. are examples who have already started taking proactive measures to transition into Product-as-a-Service models.

### **1.3 ISO 14001 and its integration with circular economic practices**

ISO 14001 Environmental Management Systems (EMS) is a management tool that addresses environmental degradation at the organizational level. It is being adopted by organizations worldwide and it is evident as the global registrations to the Standard has gone up exponentially. There is a plethora of reasons to register for the standard which include compliance to government standards, pressure from consumers, healthy environment and financial cost savings (MacDonald, 2005).

ISO 14001 as a standard has its point of convergence on integration environmental issues and concerns into the activities and operations of the organization to control the impact of the organizational activities of the organization (Jatayan & Sharma, 2022). The ISO 14001 is a globally recognized standard and the ISO 14001 certification certifies organizations after a formal assessment from an independent body on their environmental performance and helps organizations improve their Organizational performance by providing them with a framework and enable them to showcase their commitment to environmental management. It is a set of guidelines and rules that organizations can take into consideration to improve environmental performance and integrates the environment factors with the operations and activities of the organization (Zambrano-Carranza et al., 2021). In the European Union, ISO 14001 is a voluntary system of environmental management for organizations where they can register in an eco-management and audit scheme which aims to improve environmental quality and performance (Zębek, 2021). There has been a systematic analysis of the evolution of ISO 14001 and its implementation globally. This highlights the positive transformation it has on various sectors of the economy and emphasizes the possible opportunities in circular business models. In conclusion, ISO 14001 can be useful designing strategies for organizations to efficiently manage their environmental performance to achieve sustainability and reduce ecological footprint. It is also helping organizations to comply with various environmental regulations which contribute to implementation of business practices which are sustainable and encourage environmental protection (Zębek, 2021). It has also been observed through research that ISO 14001 standard that plays a crucial role in enhancing export performance (Blyde, 2022).

The key aspects of ISO 14001 environmental management system (EMS) include an environmental policy which outlines the organizations compliance with regulations and commitment to protection of environment, planning and implementation, internal review of EMS to ensure effectiveness and suitability, employees and management involvement, and development of technical skills (Chiarini, 2019). Moreover, strong measurement practices, employee involvement, commitment of management leadership, goals visibility, stakeholder engagement and documentation are important in achieving environmental targets within an EMS (Elafi, 2019). The success of EMS implementation also depends on various factors that can be both within the organization that the organization can control and factors outside the organization. The factors can be analysed in a structured manner to understand to design EMS (Bridgen & Helm, 2017). Top management commitment, formal identification of aspects and impacts, monitoring progress towards goals, and documentation are emphasized as critical aspects for improving environmental performance through an ISO 14001-based EMS (Chiarini, 2019).

It is worth noting the efficacy of ISO 14001 in the promotion of sustainability and reduction of environmental impact which include source pollution reduction, recycling and modification of products within organizations. Scholarly research has investigated the positive impact of ISO 14001 certification on the financial costs manufacturing and raw materials, value-addition in market, and growth of revenue and sales (Jatayan & Sharma, 2022). Furthermore, the implementing ISO 14001 can act as a catalyst for green initiatives which include actions, policies, and strategies aimed at promoting environmental sustainability in manufacturing firms (Anna, Kania. Et al., 2022) It has also been investigated that there is a positive and significant correlation between ISO 14001, green servitization which is adoption of service-oriented business models which take into account sustainability principles and sustainable performance (Oyelakin & Johl, 2022). In Indonesia and Kuwait, research of the impact of under ISO 14001 (EMS) on efforts of waste reduction and greenhouse gas emissions in organizations is positive which further emphasizes the significant positive correlation of environmental management systems on organizational commitments to solve environmental concerns (Budi et al., 2020 ; Al-Kahlout et al., 2019). In conclusion, ISO 14001 plays a significant role in achieving sustainability and reducing environmental impact which is in essence the goal of circular economy.

Implementing ISO 14001 within organizations comes with loads of challenges which include high cost of implementation and certifications (Alnavis et al., 2021), these bottlenecks are associated with approaches of the management, cultural features, technical aspects, and constraints on financial resources (Ahmed et al., 2020). It is also worth noting that ISO 14001 went through considerable modifications in the year 2015 from its previous version ISO 14001:2004 which include risk-based thinking, documentation, performance evaluation and adapting to the changes in the 2015 version can be challenging (Rodrigues et al., 2020). Moreover, a significant limitation and concern to all this is implementation cost in addition to knowledge gap and organization issues (Alsulamy et al., 2022). Organizations can overcome these challenges by focusing on optimization of resource allocation on the basis benefits adoption of ISO 14001 (Ociepa-Kubicka et al., 2021), strengthening economic incentives like loans and green financial programs, government support for cheaper certifications (Alnavis et al., 2021) and addressing knowledge gaps and organizational problems alongside focusing on financial problems. By addressing these concerns, organizations can enhance their environmental management systems and integrate ISO 14001 certification. In essence, circularity enables sustainability and an organization with ISO 14001 certified environmental management system are capable of achieving benefits which include enhancement of environmental performance, organizations compliance with regulation, risk-based thinking and management, financial cost savings, operational excellence and trustworthiness from stakeholders and customers.

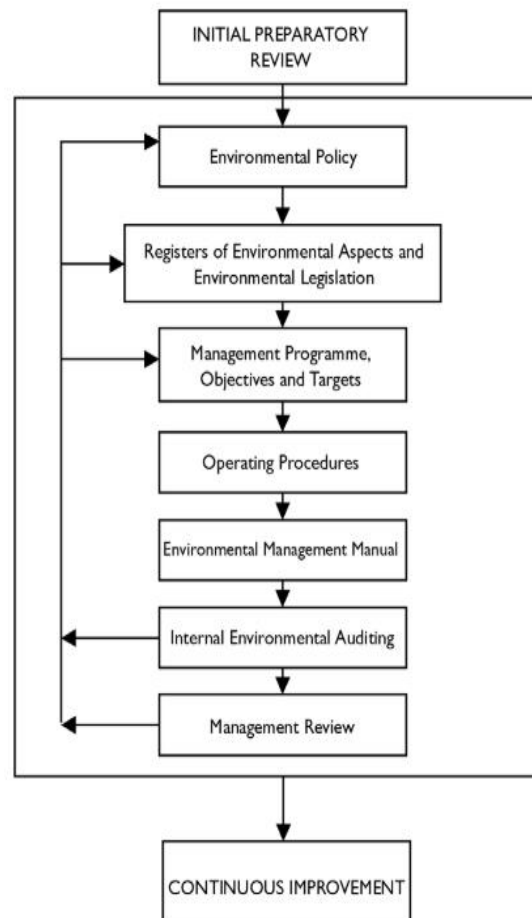
Circular economy is the future, and its principles encompass various aspects of practices that are indispensable for sustainability. The principles of circular economic practices include waste management, resource management, minimizing emissions, recycling and reusing of food waste, stakeholder engagement in order to achieve these principles and focusing on sustainable practices to achieve economic benefits (“Principles of a Circular Economy,” 2022). ISO 14001 can help integrating these principles by offering a standard to follow and achieve sustainability. ISO 14001:2015 DIS (Draft International Standard) emphasizes the significance of achieving a balance between environmental, social and economic subsystems within the global system (Ciravegna Martins da Fonseca, 2015). This is essentially the conclusion that we draw from literature review on sustainability and circular economy and is considered essential in order to meet the needs of the present without compromising the ability of future generations to meet their needs. Systematic identification and management of environmental aspects are crucial to drive sustainability. According to Sebhathu and Enquist, ISO 14001 Environment Management Systems can also be used as a driving force to achieve Sustainable Development and value creation in a radical transformation aimed at quality improvement and not just environmental performance (Petros Sebhathu & Enquist, 2007). An important aspect for circular businesses to implement is to become familiar with the concepts of Risk based thinking, relevant interested parties and lifecycle assessment of ISO 14001 (Ciravegna Martins da Fonseca, 2015). Businesses can assess various potential challenges, disruptions and uncertainties like scarcity of resources, disruption in supply chain and regulatory guidelines. Understanding stakeholders and engagement with them can help understanding the expectations of the stakeholders to align the business practices with the stakeholder’s priorities and circularity principles. Life-cycle assessment helps understanding the environmental impact of products and services. The basic idea of LCA is that all environmental burdens connected with a product or service must be assessed, back to the raw materials and down to waste removal. The SETAC (Society of Environmental Toxicology and Chemistry) triangle is an illustration that summarize the results of workshop is now underlying the standardizing activities of ISO which include definition and scoping of Goal, Inventory analysis, Impact assessment and Improvement assessment. This only differs from SETAC is its interpretation (Klöpffer, 1997). The implementation of EMS goes through various stages and the initial stage involves review of all environmental aspects, relevant laws and regulations and existing environmental procedures (Zobel & Burman, 2004).

ISO 14001 puts special emphasis on leadership involvements in EMS and leadership factors like vision, collaboration, risk-based thinking approach, accountability and action being important in achieving sustainability and this holds for circular businesses. (Nastja, Tomšič., Mirko et. al., 2016) Organization’s leadership’s support for circularity is crucial as they can influence decision making and

drive innovation within organization by supporting initiatives like designing for longevity, more reusing and recycling and minimizing overall emissions and energy consumption.

**Figure 6**

*The logic of ISO 14001*



Source: (ISO 14001 Environmental Certification Step-by-Step, Edwards, 2001)

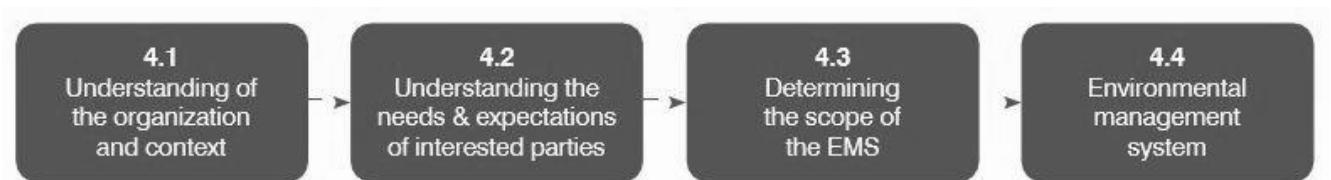
There are 17 clauses of ISO 14001 which are included as sections and sub-sections in environmental policy, planning, implementation and operation, checking and corrective action and management review (MacDonald, 2005). According to ISO 14001:2015 Annex A, context can be explained as environmental conditions which include resource availability, air and water quality and biodiversity, social, political, technological, economic and legal circumstances and internal characteristics of an organization (Guide to Implementing the ISO 14001 Standard, n.d.).



In circular economy, operation of organization is within a complex ecosystem. In circular economy understanding the context can involve assessing resource availability, understanding regulatory frameworks, anticipation of market trends and demand for sustainable products and services, understanding supply chain dynamics, understanding stakeholder priorities, considering innovation and technology. A thorough understanding of the context can enable organisations identify opportunities and challenges related to circularity.

**Figure 7**

*Context of the organization*



Source: (Guide to Implementing the ISO 14001 Standard, n.d.)

Planning defines a framework in which organizations do structural analysis which might include understanding resource flow and determines the aspects, impacts, risks and opportunities of its activities, products and services and then how to manage the result of this analysis (Guide to Implementing the ISO 14001 Standard, n.d.). The next clause is the implementation and operation phase which is the longest phase which includes 7 subclauses. These sub-clauses include resources, responsibility and authorities which ensure that personnels are assigned specific responsibilities, the next subclause is competence, training and awareness, followed by communication, documentation, control of documents, operational control and emergency preparedness and response (Whitelaw, 2012). The next clause is checking and corrective action which includes 4 subclauses. The subclauses are monitoring and measurement, Nonconformance and corrective and preventive action, management of records and auditing the EMS system. The last and final clause is periodic management review of the environmental policy and its objectives and relevance of the EMS in the changing circumstances (Edwards, 2001).

## **2 METHODOLOGY FOR INTEGRATING CIRCULAR ECONOMY PRINCIPLES WITH ISO 14001 ENVIRONMENT MANAGEMENT SYSTEM FOR ORGANIZATIONAL SUSTAINABILITY**

### **2.1 Research Question and Research Model**

#### **Research aim**

The aim of the research is to understand how implementing an Environmental management system that complies with ISO 14001 standards can be integrated with the circular economy principles in achieving or improving sustainability in organizations or making transition from linear to circular economy .

#### **Research Model**

After conducting a thorough literature analysis, it can be inferred that there is a paucity of research on the integration of Circular economy principles and ISO 14001 standards for environmental management systems. The following questions were formulated on the basis of the literature review.

RQ1: What is the relationship between circular economy principles and economic performance of the organization?

RQ2: How does ISO 14001 and Circular economy principles are integrated to achieve economic performance to attain sustainability?

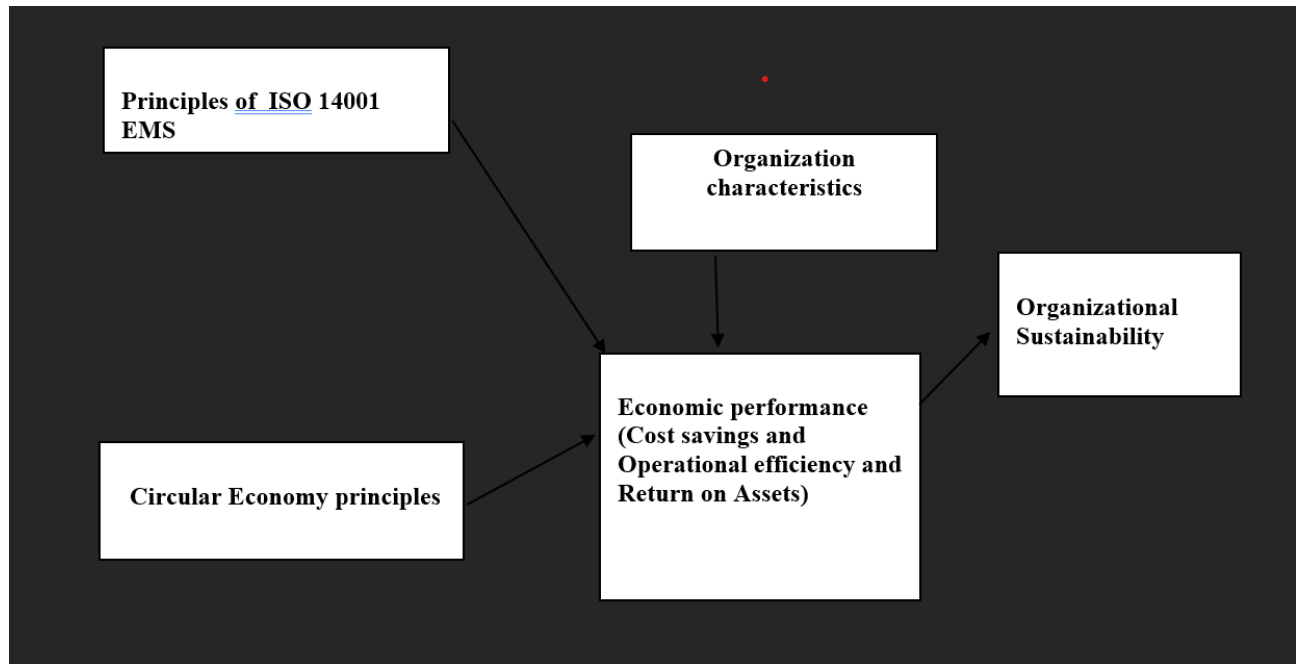
RQ3: How does organizational characteristics effect the implementation of environmental management system?

Initial research model is created based on the analysis of the literature and existing understanding. The research model considers the idea of implementing an environmental management system which is aligned with principles of circularity and standardising the EMS on the clauses of ISO 14001. The independent variables in the research model are adoption of circular economy principles and ISO 14001 Environment management system. The dependent variable is organizational sustainability while economic performance are mediator variables. Organizational characteristics is the moderator variable.

Based on the literature review and the conceived research model, a visual representation of the research model is developed.

Figure 8

*Research model*



Source: Developed by the author

The research model was developed based on comprehensive review of literature about ISO 14001 standards and circular economy principles. The model posits that adopting ISO 14001 standards and circular economy practices (independent variables) result in improvements in the sustainability of organizations (dependent variable) with organizational characteristics as moderating variable and economic performance as mediating variable. The credibility and relevance of the findings were ensured by validating the research model through empirical collection of data and thematic analysis. This ensured that the relationship between variables is correctly captured for the completeness of the study.

## 2.2 Methods deployed in the research

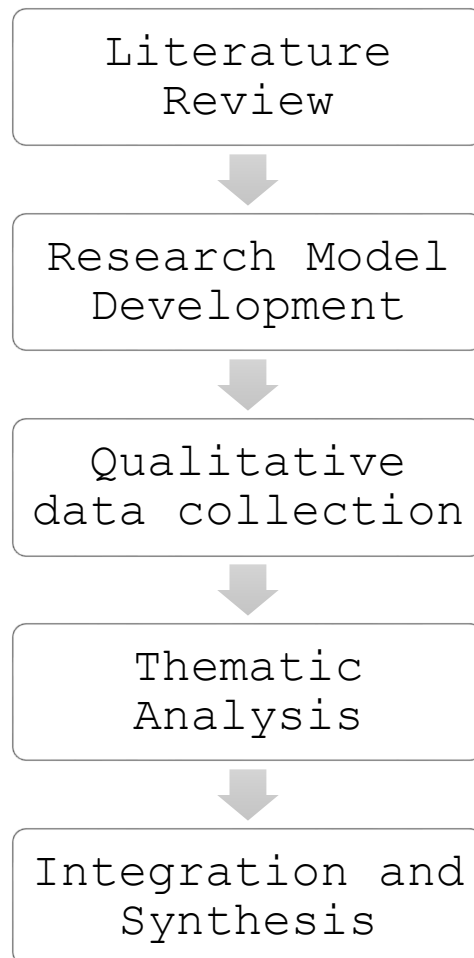
### Research Design

The research design for the thesis is rooted in a qualitative methodology. The rationale behind choosing this methodology is to get a deep understanding of how ISO 14001 standards are integrated with circular economy principles to drive organizational sustainability. After an intensive review of extant literature sources which revealed a gap in empirical research that explore the integration of these

two frameworks. The qualitative design helps in exploring complex processes, influences of contexts and experiences of stakeholders which cannot be completely captured through qualitative analysis or methods based on survey (Braun & Clarke, 2006; Creswell & Poth, 2018).

**Figure 9**

*Method design: qualitative approach*



Source: Developed by the author

The diagram above describes a multi-phased structured approach that has been adopted in the thesis for exploring the integration of ISO 14001 standards with circular economy principles for achieving organizational sustainability. At the centre of the design is qualitative methodology and it begins with literature review which helps in the development of the research model and designing the

protocol for interviews. The data-collection involves conducting semi-structured interviews with a group of professionals who have been selected purposefully from diverse backgrounds. This ensures a rich variety of perspectives which are relevant to the research questions. After the data collection is done through the semi-structured interviews, all the interviews are transcribed and then made to go through thematic analysis. The thematic analysis follows Braun and Clarke's six phase process. The six-phase process includes familiarization, coding which is both theoretical and data-driven, searching for themes, reviewing themes, definition of themes and analysis. The thesis leverages Python-based coding and frequency analysis which supplements manual coding. This helps in keeping the process transparent and reproducible. The analysis phase results in key themes which can be mapped to research questions and the conceptual model. This gives us evidence that the findings of the empirical research do align with the research questions and the conceptual model. The final phase of the research design includes the integration of the empirical findings with the research model which helps in triangulation and results in the generation of recommendations for organizations and policymakers. The design ensures that the study can deliver valuable insights and is methodologically robust.

Data collection for the study is done through six semi-structured interviews who come from various backgrounds including sustainability, environmental management and compliance roles. The interview questionnaire was developed with attention to detail to align with the aims and objectives of the thesis. The interview questionnaire can be referenced in Annex 2. The interviews were transcribed, and participants have been labelled as Participant 1 to Participant 6. The selection of participants was strategically done with purposeful sampling with an aim to ensure that participants come from various backgrounds and levels of expertise and skills.

The literature review and the research questions guided in the development of the protocol of the interview. The questions for the interview elicit responses in detail on different aspects of the research which include understanding of ISO 14001 standards and EMS, circularity principles, characteristics of organizations and views on sustainability and economic outcomes.

Each participant chosen for the interview had relevant experience and expertise holding senior or specialized roles in environment management, compliance and sustainability. It must be noted that the selection was done based on their ability to provide in-depth and valuable insights into the various aspects of the thesis (Table 4). The diversity of the participants ensured detailed understanding of how these frameworks are operationalised across different industry sectors and organizational contexts. Table below illustrates the participant demographics with their current role and the reason for including them as participants for the interview.

**Table 2***Participant demographics*

Participant	Current Role	Reason for Inclusion
Participant 1	Global ESG and Sustainability Manager	Provides insights on building sustainability programs and implementing circular economy models.
Participant 2	Environmental Product Compliance Manager	Shares perspectives on product compliance, sustainability regulations, and circular economy practices.
Participant 3	Senior Manager of Global Sustainability	Sustainability strategy, EMS, and ISO 14001 integration.
Participant 4	Regional Leader for Environment, Health, Safety and Sustainability	Provides insights on environmental management processes, ISO 14001 alignment, and commercial benefits.

Continuation of Table 2

Participant 5	Manager in Cargo Team	Shares sustainability practices in operation, waste management, and circular economy initiatives.
Participant 6	Director of Global Occupational Health and Safety	Discusses standard setting, internal audits, and consistency in sustainability management.

Source: Developed by the author

Thematic analysis was done based on Braun and Clarke's six phase framework for analysis of qualitative data (Braun & Clarke, 2006). This is widely recognised and uses a methodological approach that is rigorous and systematic. The selection of this framework was done to leverage its flexibility in structure as this helps in identifying, organizing and interpreting patterns which are essentially themes and gives meaningful insight for guidance on the theory and inductive discovery. The six phases process included familiarization, code generation, theme identification, review, definition and reporting. The first phase was familiarization with data which is essentially began with immersion in the data where the transcripts were read repeatedly and based on the reading initial notetaking was done. The meaningful parts of the transcript text are highlighted, and all the data that is relevant to the study is assigned a code. A code is a word or a short phrase that captures the essence of what is being said, and this is repeated for the whole dataset. The codes are then reviewed to find patterns that are then grouped together based on similarities in key ideas which can be potential themes.

Thematic analysis was conducted following Braun and Clarke's (2006) six-phase process: familiarization, code generation, theme identification, review, definition, and reporting (Braun & Clarke, 2006). The process began with immersion in the data through repeated readings of the transcripts and

initial notetaking. The data is cleaned after the transcription is done by correcting errors and formatting it. Relevant segments of the captured data were labelled with codes which are short phrases capturing significant aspects of the text. Codes were then grouped into broader themes that represented key ideas and patterns across the dataset. A hybrid approach was utilized for coding with both theory-driven codes which emerged from the literature and data-driven codes which emerged from the interviews.

**Table 3**

*Research methodology*

Phase	Data collection methodology	Method of analysis
Literature Analysis	Review of academic, industry, and policy literature on ISO 14001, circular economy, and sustainability	Content analysis and synthesis to inform research model and interview design
Qualitative Empirical Study	Semi-structured interviews with sustainability, EHS, and compliance professionals (6 participants, purposive sampling)	Thematic analysis (Braun & Clarke, 2006), hybrid coding (manual and Python-assisted), code and theme frequency analysis

Source: Developed by the author

Table 2 illustrates the phases of the research with the methodology for the collecting the data and method used for the analysis of data. For the literature review phase, academic, policy related literature and industry related literature was reviewed which helped in analysis and synthesis to inform the research model and interview design. In the qualitative study, semi structured interviews were followed by thematic interviews analysis.

Python assisted coding was done to enhance rigour and transparency. Python assisted coding helped in achieving systematic extraction of keywords from the transcripts which was followed by grouping of codes and frequency analysis. Each transcript was saved as a string type data in a text document for



processing and kept ready for analysis. Based on literature review, the research questions and manual coding a dictionary or list of themes is created where a dictionary is a data structure in Python. The NLTK which stands for natural language toolkit is a python library used for processing natural language data. NLTK was used for processing the text.

The code below was used for processing the transcripts. The code tokenizes the transcripts into sentences and check if any of the keywords from the dictionary appears in them.

The nltk library and collections module is imported here:

```
import nltk
from nltk.tokenize import sent_tokenize
from collections import Counter
```

Each theme is mapped to relevant to different relevant keywords and a dictionary is initialised using them:

```
themes = {
    'ISO_Implementation': ['ISO 14001', 'certification', 'standard', 'compliance'],
    'CE_Principles': ['circular economy', 'recycling', 'reuse', 'lifecycle'],
    'Integration_Strategies': ['integration', 'align', 'framework', 'process'],
    'Economic_Performance': ['cost', 'savings', 'economic', 'benefit'],
    'Organizational_Factors': ['size', 'industry', 'culture', 'leadership']
}
```

Theme\_counts variable keeps a track of keyword frequencies across all the transcripts:

```
theme_counts = Counter()
```

The code below iterates through all the transcripts:

```
for transcript in transcripts:
    sentences = sent_tokenize(transcript)
    for sentence in sentences:
        for kw in sum(themes.values(), []):
            if kw.lower() in sentence.lower():
```

```
theme_counts[kw] += 1
```

The code receives the transcript files as input and process them. The theme\_count variable saves the frequency for each keyword. The output data of the code is then used to populate the code frequency table below.

**Table 4**

*Code frequency table*

Code	Frequency	Research Question Alignment
ISO 14001	42	RQ2, RQ3
Certification	28	RQ2, RQ3
Compliance	16	RQ2, RQ3
Circular Economy	38	RQ1, RQ2
Recycling	31	RQ1
Lifecycle/Lifecycle thinking	19	RQ1, RQ2
Integration	14	RQ2
Process/Processes	23	RQ2, RQ3
Cost	27	RQ1
Savings	25	RQ1
Economic/Economic performance	17	RQ1, RQ2
Resource Efficiency	18	RQ1
Waste/Waste management	22	RQ1
Leadership	18	RQ3
Size	13	RQ3
Industry	14	RQ3
Culture	15	RQ3

Source: Developed by the author

The automated process achieved through Python assisted coding helps in identifying and quantifying key themes like as “ISO 14001” (42 mentions), “circular economy” (38), “recycling” (31), and “certification” (28). This highlight that the codes are at the core and align with the analysis. Manual review also

complemented the automated coding through Python which helped ensuring the richness of the qualitative data analysis. The hybrid approach allowed to understand what is happening with the patterns and detailed interpretations of the meaning resulting in detailed thematic analysis.

### **2.3 Assumptions and limitations of the research**

There are various assumptions made in the three phases of the research, and it is worth discussing those assumptions for critical reflection on the work, providing context of the research and transparency. The general assumption in the research maintains objectivity by minimizing personal biases and preconceptions, adhering to ethical standards which ensures confidentiality and consent from the participants and assumption of availability of resources which is necessary for completing the research.

In the Qualitative interview phase, the assumptions that are considered are assumption of honesty of the participants which assumes that the participant provides accurate and truthful responses to the interview questions based on their experiences, assumption of representativeness which is assuming that the participants represent a diverse range of opinions, experiences and roles.

The qualitative analysis phase assumes that the collection of data through the semi-structured interviews is done using appropriate methodologies which include coding and thematic analysis, and the data is reliable and accurate which would ensure the validity of the qualitative analysis. It also assumes that all the themes that are extracted from the analysis are consistent enough across different sources to do meaningful comparisons. This allows more comprehensive understanding of the subject by combining data from different sources. Another assumption that is crucial is the assumption of sample representativeness that assumes that the sample that are in the secondary data sets adequately represents the population of interest.

The assumptions made in the final phase includes assumption of compatibility which assumes that the literature analysis and the qualitative analysis can be interpreted in a meaningful way even when there are potential differences in the sources of data, analysis techniques and methods, the assumption of triangulation which assumes that triangulation of the findings of the data from qualitative and literature review phase will lead to enhancement of the validity and reliability of the overall findings of the research.

There are various potential limitations of the research which include limitations of sampling, constraints on time, constraints on resources, researchers bias, limitations on data and causality. In the research, the sampling may not be large enough to represent the broader population and lead to biases and limits the generalizability of the findings. It is also worth noting that there are chances the data

collected from secondary sources can be incomplete or missing. The research may also lack objectivity and there could be limitations in measurement of variables.

Despite making sufficient efforts for maintaining objectivity, preconceived notions and biases are bound to influence the research process. This holds true when interview questions are prepared, data is being interpreted, and findings are presented. The constraint on time can also be a crucial factor that can limit the scope or depth of the findings of the research and hence effect the quality of the research. The research also considers the ethical aspects of confidentiality and consent of the interview participants. For instance, the type of questions asked in the interviews can be limited because of ethical constraints and therefore these constraints can limit the quality of the research.

### 3 EMPIRICAL STUDY AND RESEARCH RESULTS FOR QUALITATIVE ANALYSIS OF ISO 14001 AND CIRCULAR ECONOMY INTEGRATION FOR ORGANIZATIONAL SUSTAINABILITY

#### 3.1 Introduction

The chapter describes the findings of the empirical research and give a comprehensive understanding of how organizations integrate ISO 14001 Environmental Management Systems with circular economy principles to achieve organizational sustainability. The qualitative analysis is based on semi-structured interviews that were conducted with six industry professionals from diverse domains ranging from sustainability, environmental management and compliance roles. The analysis explores the practical challenges, and benefits of integrating these two frameworks. The thematic analysis is based on Braun and Clarke's (2006) methodology which has been enhanced by computational programming using Python. This ensures transparency and rigor of the analysis. The findings of the research have been organized thematically. Each theme is supported by the narratives of the participants and illustrated using tables and contextualized within the academic literature.

#### 3.2 Thematic Analysis and Findings

The Thematic Analysis has been accomplished using a six-phase process. The reason for choosing Thematic Analysis lies in its flexibility in the analysis of qualitative data which results in both theory-driven and data-driven development of themes. Thematic analysis also provides accessibility as it doesn't need the technical knowledge of any complex qualitative methodology. It helps in capturing and exploring the participants experiences and perceptions. The data-driven approach ensures that any unexpected and context-specific details are captured and on the other hand theory-driven approach takes care of alignment with research objectives.

After the thematic analysis, six themes emerged which include ISO 14001 implementation status and approach , perceived benefits of the implementation of ISO 14001 EMS which are essentially positive outcomes organizations associate with them implementation of an environmental management system, awareness of circular economy practices which include designing out waste, keeping products and materials in use and regeneration of natural systems, integration of ISO 14001 and circular economy principles, economic performance which includes outcomes from sustainability initiatives in terms costs

and the influence of organisational characteristics which include size of the organization, domain or type of the industry and culture of the organization on sustainability efforts.

**Table 5**

*Theme table with expert comments*

<i>Theme</i>	<i>Description</i>	<i>Expert Comments</i>
ISO 14001 Implementation	Status, approach, and rationale for EMS adoption	P1: “We’re working on it...” (Annex 1, P1) P2: “Our internal EMS is written in language ISO 14001...” (Annex 1, P2) P6: “We have achieved ISO 14001 certification...” (Annex 1, P2)
Perceived Benefits	Operational, commercial, and reputational gains	P3: “Consistency in practices across our sites...” (Annex 1, P3) P1: “It brings credibility...” (Annex 1, P1) P4: “Enhancement of competitiveness, especially in tenders...” (Annex 1, P4)
Circular Economy Practices	Awareness of Circular Economy principles and specific practices adopted	P5: “Design for environment standards...” (Annex 1, P5) P6: “Converted 3,500 kg of waste into 500kg of organic manure...” (Annex 1, P6) P2: “Responsibility for end-of-life phase of products...” (Annex 1, P2)

Continuation of Table 4

Integration Strategies	The processes followed for integration of ISO 14001 and CE principles	P1: “ISO 14001 will help us... expand that mentality...” (Annex 1, P1) P6: “Lifecycle thinking is a bridge to circularity...” (Annex 1, P6) P3: “Continual improvement drives adoption of circular solutions...” (Annex 1, P3)
Economic Performance	Economic impact of EMS and CE	P4: “Designing smaller packaging equals less shipping fees...” (Annex 1, P4) P6: “Saved 15,000 tonnes of jet fuel...” (Annex 1, P6) P5: “Overall more expensive than savings found...” (Annex 1, P5)
Organizational Factors	Size of the Organization, type of industry, and culture	P5: “Larger organizations have more flexibility...” (Annex 1, P5) P6: “In aviation, focus is on carbon emissions...” (Annex 1, P6) P2: “Medical devices driven by demand for safety and sustainability...” (Annex 1, P2)

Source: Developed by the author

Table 4 gives an overview of these themes with some description and example comments from various participants.

### 3.2 Overview of Themes

After a thorough and rigorous analysis following the six-phase process of Braun and Clarke, 2006, six main themes emerged, each of these themes are supported by direct quotes and code frequency analysis. These themes explicitly provide foundational context for answering the research questions RQ1, RQ2 and RQ3.

The findings of the analysis reflects that the themes are aligned and answers the research questions. The table below where each row is a theme and each column shows whether the theme addresses a particular research question where ‘✓’ means Yes and ‘Blank’ means No.

**Table 6**

*Theme alignment with research question*

THEME	RQ1	RQ2	RQ3
ISO 14001 Implementation		✓	✓
Perceived Benefits		✓	
CE Practices	✓		
Integration Strategies		✓	
Economic Performance	✓	Informs RQ2	Informs RQ3
Organizational Factors			✓

Source: Developed by the author

#### Theme 1: ISO 14001 implementation status and approach

This theme was described under this theme is “What is your organization’s current status regarding ISO 14001 implementation, and how do you approach EMS adoption?” (Annex 2). This theme explicitly addresses RQ3 which is “How does organizational characteristics effect the implementation of environmental management system?” by demonstrating that implementation of ISO 14001 is dependent on the organizational characteristics such as size, context, leadership and resources. Organizations have described ISO 14001 implementation as a phased and strategic journey. Most of the



respondents emphasised the alignment of internal standards and processes with ISO 14001, which can be used as a foundation for eventual certification. For example, Participant 1 noted, “We’re working on it... It’s now our final record for our team,” highlighting the ongoing nature of the effort (Annex 1; Participant 1). Participant 2 explained that although their company did not yet have ISO 14001 accreditation, their internal EMS was “written in language ISO 14001 for the environment,” which reflects a deliberate strategy to implement best practices before certification (Annex 1, Participant 2). Participant 3 noted “We have started with internal audits and benchmarking against ISO 14001 requirements”, Participant 4 noted “Our approach is to gradually align all processes with ISO 14001 before applying for formal certification” (Annex 1, Participant 4). Participant 6’s organization had achieved the certification and was recognized for its environmental management and is outlined in the comment “We have achieved ISO 14001 certification and are recognized for our environmental management” (Annex 1, Participant 6). This aligns with existing literature where it is discussed that ISO 14001 adoption is a gradual and context-sensitive process. The findings extend and validate the phased approach of implementing ISO 14001. The diversity of responses suggests both priorities of organizations and resource availability (MacDonald, 2005). Theme 1 answers RQ3 by demonstrating how an organization implements ISO 14001 is directly shaped by its size, resources, sector, leadership, and culture. The diversity of participants confirm that organizational characteristics is an important and decisive factor in EMS implementation

## Theme 2: Perceived benefits of ISO 14001

In response to the interview question, “What benefits has your organization experienced as a result of implementing ISO 14001?” (Annex 2) and “What do you think are the benefits that ISO 14001 has on the environmental performance of your organization?” (Annex 2), participants discussed various internal and external advantages that reflect the value of the standard. In terms of operations, ISO 14001 brought consistency and structure to environmental practices. Participant 3 described, “the number one benefit is consistency in practices across our sites... leveraging what each site is doing to make the other sites better” (Annex 1, Participant 3). ISO 14001 was also seen as a tool for building credibility of an organization towards its customers and build trust with stakeholders. Participant 1 emphasized, “it brings credibility... our customers are asking for it, so it would just be basically credibility that what we are doing... has been certified by a third party, which is well known” (Annex 1, Participant 1). Commercially, ISO 14001 certification leads to enhancement of competitiveness, especially in tenders and contracts (Annex 1, Participant 4; MacDonald, 2005; Jatayan & Sharma, 2022). This observation resonates with the literature and experience of the respondents. Theme 2 discusses how integration of

ISO 14001 and circular economy principles is not merely theoretical concept. The integration can be achieved through improvements in operations, cost savings, enhance access to the market, and build trust among stakeholders. These benefits clearly show how a well-integrated EMS can serve as a bridge between environmental performance and economic value. Theme 2 aptly answers RQ2 in both empirical and conceptual terms.

### Theme 3: Circular economy practices

Theme 3 has been built on the responses from participants to “What is the familiarity of your organization with the principles of Circular Economy?” and “What are some specific circular economy practices that have been adopted in your organization?” (Annex 2). Participants demonstrated strong awareness of Circular Economy principles during the environment, with varying levels of practical implementation in their experience. Some organizations implement CE thinking into designing products, selection of materials, and end-of-life management of products. Participant 5 described “design for environment standards... all of the sustainability and environmental regulations that go into designing a product” (Annex 1, Participant 5). Participant 6 provided an example of converting of garden and kitchen waste into organic manure (Annex 1, Participant 6). Extended producer responsibility was also highlighted, where organizations take care of the end-of-life phase of their products (Annex 1, Participant 5). These practices shared by the respondents are aligned with the Ellen MacArthur Foundation’s (2013) principles of designing out waste and keeping materials in use. Theme 3 demonstrates alignment of sustainability goals with the adoption of CE principles. It also discusses the direct and indirect effects on economic performance of organizations due to the adoption of CE practices. Organizations have reported cost savings through waste reduction and resource efficiency. They have also reported new streams from recycling and waste reduction. There is clear, empirical evidence from the findings that there is clear link between CE practices (the independent variable) and economic performance (the mediating variable) in the research model. Theme 3 aptly addresses the RQ1 by discussing the economic implications of implementing CE practices.

### Theme 4: Integration of ISO 14001 and circular economy practices

Theme 4 is built from participant responses to questions Q7: “In your experience, how well do you think principles of ISO 14001 align with circular economy practices?” and Q8: “Can you discuss some examples of how ISO 14001 has been integrated with circular economy principles in your organization?” (Annex 2). Participants described a natural collaboration between ISO 14001 and Circular economy. The structured and process-oriented approach of ISO 14001 provides a foundation

for embedding circularity in organizations. Participant 1 stated, “ISO 14001 will help us to... reinforce the need to have a process right... expand that mentality that we already have, you know, process oriented, then start incorporating those circular economy principles” (Annex 1, Participant 1). Lifecycle thinking, a core requirement of ISO 14001:2015, was cited as a bridge to circularity (Annex 1, Participant 6). The standard’s emphasis on continual improvement was seen as driving the adoption of more sophisticated circular solutions over time (Annex 1, Participant 3; Ciravegna Martins da Fonseca, 2015). Theme 4 captures how organizations use the structured and process-oriented approach of ISO 14001 as a foundation for embedding circularity. The findings of the theme are also supported by the evidence from the literature and answers RQ2 by showing how ISO 14001 and CE principles are integrated to deliver economic and sustainability benefits.

#### Theme 5: Economic performance and cost benefits

Theme 5 is built on the question 9 from the questionnaire “How has implementing ISO 14001 and circular economy practices impacted the economic performance of the organization?” (Annex 2). Theme 5 explores both negative and positive economic impacts of implementing ISO 14001 and circular economy practices.

There were mixed responses when it comes to Economic impacts of integrating ISO 14001 and CE practices. Several participants pointed that this integration can result in cost savings and efficiency gains. Participant 4 described how “designing smaller packaging equals more products being able to fit on a pallet equals less shipping fees... being able to design a product for recyclability and having more efficient manufacturing processes so that there’s less waste” (Annex 1, Participant 4). Participant 6 shared that “in over three years we have saved approximately 15,000 tonnes of jet fuel... a significant cost saving while also reducing our carbon footprints” (Annex 1, Participant 6). However, some of the participants differed on the aspect of any economic benefits. They highlighted the upfront and ongoing costs of circular economy initiatives, specifically pointing out regulatory compliance and EPR. Participant 5 noted, “Economic performance, I would say overall they’re more expensive than there are savings from what we found... something like extended producer responsibility, that’s a cost” (Annex 1, Participant 5). These observations from the respondents reflect the literature’s meticulous and nuanced findings on EMS and CE economics (Minutolo et al., 2019; Oyelakin & Johl, 2022).

Theme 5 shows that the relationship between circular economy principles and economic performance is mostly positive. This relationship is very nuanced though, CE practices can result cost savings, efficiency in operations, and even create new streams of revenue. It must also be taken into consideration that these financial benefits might be visible over time and can vary by context. Theme 5

directly and explicitly answers RQ1 as it gives evidence for both opportunities and challenges organizations can face in linking circular economy adoption to economic performance.

#### Theme 6: Organizational Characteristics – Size, Domain, and Culture

Theme 6 is built on Q10 of the questionnaire: “How have your organization's size, industry, and culture influenced the implementation of environmental management practices?” (Annex 2). This question was specifically designed to elicit detailed responses about the moderating effects of organizational characteristics on adoption of EMS. Participants responses suggest that the success of integration of ISO 14001 and CE is shaped by the characteristics of the organization like size, industry, and culture.

Larger organizations, according to Participant 5, “have more flexibility to be able to implement these things as opposed to a small company” (Annex 1, Participant 5). Industry context also shapes priorities and challenges, with aviation focusing on carbon emissions and fuel efficiency (Annex 1, Participant 6) and medical devices driven by consumer demand for safety and sustainability (Annex 1, Participant 5). Organizational culture and leadership were repeatedly cited as critical factors, with employee engagement and cross-departmental collaboration essential for success (Annex 2, Participant 6; Chiarini, 2019; Martin, 2020). Theme 6 is crucial as it answers RQ3 and provides empirical evidence that organizational characteristics such as size, industry, and culture are active and decisive moderators that help in shaping and decide the success of EMS (ISO 14001) implementation.

The contribution of each participant to each major theme that has been identified during the qualitative analysis has been visually summarized in the theme Frequency table (Table 6). The rows represent themes, and the columns represent participants represented by (P1-P6). X in each cell represents the contribution of relevant insights of each participant to the theme.

**Table 7**

*Theme frequency by participant*

THEME	P1	P2	P3	P4	P5	P6
ISO 14001 Implementation	X	X	X	X	X	X
Perceived Benefits	X	X	X	X	X	X
CE Practices	X	X	X	X	X	X

Continuation of Table 7

Integration Strategies	X	X	X			X
Economic Performance	X	X		X	X	X
Organizational Factors	X	X	X	X	X	X

Source: Developed by the author

The table above is a methodological and analytical tool that can be used for validating the breadth and depth of the findings. It also supports robustness of the findings and provides evidence that the analysis is biased on single perspective but are supported by multiple participants. This table also ensure transparency and facilitation of thematic comparisons. The theme frequency table serves as critical piece of evidence that suggests that the analysis is grounded and supported by data and ensures credibility.

### 3.3 Integration with Literature and Research Model

The findings of the thesis are aligned and extend the existing literature on sustainability, circular economy practices and environmental management systems like ISO 14001. The literature review established that ISO 14001 provides a structured framework for environmental management (MacDonald, 2005; Petros Sebhatu & Enquist, 2007), but integration of ISO 14001 with circular economy is still emerging as an area of research (Geissdoerfer et al., 2017; Ellen MacArthur Foundation, 2013).

Empirical results from the study reiterates the assertion of the literature by emphasizing the implementation of ISO 14001 implementation as a phased and context-sensitive process which is highly dependent on organizational characteristics such as size, industry, and culture (Chiarini, 2019; Martin, 2020). The findings of both the interviews and the literature indicate that larger organizations which have better resources and infrastructure are more equipped to pursue certification and integrate sustainability practices. The literature also discusses the economic dimension of sustainability as not merely economic growth but achieving profitability and efficiency without compromising on environment (Purvis et al., 2018; Minutolo et al., 2019).

The findings of the empirical research support this as organizations adopting circular economy principles realise efficiency in operations and cost savings but there is notable upfront investment and

challenges. The literature also identifies the integration of Iso 14001 and CE as promising path for achieving sustainability at an organizational level.

It is worth noting that there is a lack of frameworks and studies that show how integration works in a real-world setting (Ciravegna Martins da Fonseca, 2015; Wautelet, 2018). The findings of the thesis address this gap by providing recommendations of how organizations can leverage ISO 14001 standard's process-oriented approach with lifecycle thinking and continuous improvement as a foundation for embedding CE practices. This will drive both economic and sustainability initiatives.

There is ample of evidence for supporting the role of characteristics of an organization like size, type and culture having a moderating effect and can be validated by the empirical data (Chiarini, 2019; Martin, 2020). The empirical findings confirm that ISO 14001 provides a structure environmental management and a platform for circularity. It also demonstrates the enhancement of economic performance, but these benefits are context-dependent and needs strategic planning and investment.

The research model for the thesis posits that adoption of ISO 14001 and circular economy principles which are independent variables results in improved organizational sustainability (dependent variable), with economic performance as a mediator variable and characteristics of the organization as a moderating variable. There is sufficient evidence for the empirical validation of the research model. The thematic analysis showed that different organizations follow different pathways and are at various stages of the implementation of ISO 14001. Organizations with mature environmental management system and who are committed to circularity principles are at a better position to achieve sustainability which confirms that the independent variable has a central role. The findings of the research also support the research model's assertion that economic performance mediates the relationship between implementation of EMS/ CE and sustainability outcomes.

The moderating effect of the characteristics of an organisation is also strongly supported. Larger organisations in highly regulated sectors with committed leadership can implement EMS and CE practices more effectively with better benefits than smaller organisations. Organisations culture is also an equally important factor. The goal of integrating ISO 14001 with CE principles is to achieve organizational sustainability. The findings of the empirical research show that organizations with aligned EMS and CE strategies are more adaptable and show resilience. They are also capable of meeting expectations of the stakeholders for environmental and economic performance.

Thematic analysis also supports the research model. Themes such as "ISO 14001 and "Organizational characteristics" addresses the how various factors which can be internal or external influence EMS adoption. Themes "Perceived Benefits," "Circular Economy Practices," and "Economic

Performance” supports the mediating role of economic performance and answers the research questions RQ1 and RQ2.

The integration of the literature and the research model with empirical findings validates the conceptual model by showing that organizational characteristics and economic performance are real determinants of sustainability outcomes. It also extends the literature and gives instances of how EMS and CE can be operationalized and creates a framework for organizations to follow.

### **3.4 Limitations and Reflections**

There are several limitations in this research that should be acknowledged. The sample size is still small, while this is appropriate for qualitative research, but it still limits generalizability of the findings. The sample was skewed toward large organizations, which may not completely capture the experiences and challenges of smaller organizations or other industries. Despite putting efforts to maintain objectivity throughout the whole analysis, the process of theme interpretation and selection of quotes might have involved some degree of subjectivity. There is also a bias of perspectives and assumptions which can influence the understanding and presentation of the data. Python-based coding on the other hand has ensured increased transparency and efficiency in handling the data and thematic organization, it cannot fully replace human interpretation and is limited in its ability for detailed or context-dependent meanings.

## CONCLUSIONS

The thesis explores the integration of ISO 14001 EMS with circular economy principles and understands how this integration can be applied by organizations to achieve sustainability. Through a comprehensive review of existing literature and a detailed qualitative empirical study, the core research questions are addressed by the research findings, each of which is reflected in the following conclusions.

The literature consistently highlighted that CE practices like recycling, eco-design and resource efficiency etc. are recognized as significant drivers of environmental performance and economic value (Ellen MacArthur Foundation, 2013; Geissdoerfer et al., 2017). This is related to RQ1 – “What is the relationship between circular economy principles and economic performance of the organization?” which is reinforced by the findings of the empirical research. The findings suggest that organizations implementing CE practices realise efficiencies in operations, new avenues for growth and cost savings. The empirical findings with the literature also caution that these benefits are not uniform and might not be visible right away but in a longer run. The results are dependent on the context of the organization, its scale and maturity of implementation. Short-term gains are offset by upfront investments and cost incurred for regulatory compliance. It can be concluded that CE principles embedded in ISO 14001 standards have great potential to improve economic performance but at the same time it requires strategic planning and long-term commitment.

The empirical findings and the literature ISO 14001 as a framework for environment management. It provides a structure which ensures consistency and provides a platform for continuous improvement (MacDonald, 2005; Ciravegna Martins da Fonseca, 2015). Organizations are using ISO 14001 as a platform for embedding circularity practices into the operations. This is evident from the empirical research and helps answering RQ2 – “How does ISO 14001 and circular economy principles are integrated to achieve economic performance to attain sustainability?”. It was described in the interviews that process-oriented nature of ISO 14001 has natural alignment with CE strategies supporting innovation, operational efficiency, enhancement of credibility. This integration supports compliance and reduction of risk. The successful cases of the integration were found that approach ISO as a system which drives circularity resulting in sustainability and not just as a compliance tool. The literature and the finding of the qualitative research suggest that integration CE practices with ISO



14001 can be achieved when it is process-driven, context-sensitive and is driven by commitment of leadership with cross-functional collaboration between various teams.

The literature and findings of the empirical research supports the moderating effect of organizational characteristics of the organization such as size, domain and culture as critical (Chiarini, 2019; Martin, 2020). The findings also suggest that larger organizations which have well established infrastructure and higher availability of resources can implement and scale CE and EMS initiatives better than smaller organizations lacking them. This aptly answers the research question RQ3 - “How does organizational characteristics effect the implementation of environmental management system?”. The context of the industry shapes priorities and challenges faced by the organizations. Organizational characteristics like culture, leadership and employee engagement are decisive factors and important enablers for successful integration of EMS and CE practices. On the other hand, organizations which lack these characteristics face greater barriers, observe slower progress with limited outcomes.

After integrating the findings of the empirical research and literature review with the objectives of the thesis, it is concluded that the integration of ISO 14001 and circular economy practices provides an empirically supported roadmap for improving organizational sustainability. The foundation of this integration is established by a thorough literature review which is supported by the findings of the empirical research providing evidence for the mechanism, challenges and the benefits of the integration. The research shows that the integration is not a process that fits everywhere rather it should be customized to the unique context, resources and culture of each organization to achieve the best results.

The key contribution of the thesis is the development of a framework for guiding organizations which empirically well informed. This will help organizations especially the ones which want to make a transition from linear to circular models in operationalizing the standards of ISO 14001 to support circularity and achieving sustainability.

## RECOMMENDATIONS

1. Adopting a phased and strategic approach before seeking ISO 14001 certification -  
Even before seeking any formal certification for ISO 14001, the first step is organizations should start by aligning the internal processes and standards with the requirements of ISO 14001. This should be phase and strategic process which helps in gradually adapting and building capacity which ensures that certification is meaningful for the organization rather than a box-checking exercise. A phased approach also enables organizations by identification of gaps and systematically addressing these gaps in implementation. This reduces the risk of non-compliance during formal audits (Annex 1, Participant 1; Braun & Clarke, 2006).
2. Embedding Circularity by utilization of ISO 14001's process orientated approach:  
ISO 14001's structured framework with lifecycle thinking, and continuous improvement clauses can be utilised as a foundation for integrating circular economy practices. This includes implementing minimising waste, and integration of supply chains which are closed loop and concepts like eco-design into the standard operating processes of organizations. Regular lifecycle assessments should also be conducted by organizations and risk-based thinking should be implemented to find opportunities for circularity (Annex 1, Participant 6; Ciravegna Martins da Fonseca, 2015).
3. Building teams which are Cross-Functional and Engaging Leadership:  
There is a need to develop cross functional teams and engagement of leadership to integrate CE principles with ISO 14001. To successfully integrate EMS with CE requires collaboration between sustainability, product design, operations, and compliance teams. Leadership should also actively play its part in developing a culture to champion both ISO 14001 and circular economy initiatives. Leadership engagement ensures consistency in commitment, optimal resource allocation, and clear communication of sustainability goals across various levels of the organization (Annex 1 Participant 3; Chiarini, 2019).
4. Defining metrics with dual purposes for measurement and transparency:  
A crucial aspect that can be recommended is development of metrics that measure both environmental compliance and circular economy progress. Regular reporting on these metrics to internal and external stakeholders results in building trust, demonstration of progress, and

identification of areas for improvement. Transparency in reporting also supports regulatory compliance and enhances reputation of the organization (Annex 1, Participant 4; Ellen MacArthur Foundation, 2013).

5. **Monitoring and Balancing Economic Impacts of CE practices with ISO 14001:**  
Organizations must track both the costs and savings linked with the implementation EMS and CE practices closely. It should be anticipated that there will be high short-term costs which must be efficiently, but it is highly likely the implementation will yield long-term benefits. Business cases for circular initiatives should include both direct and indirect economic benefits, such as resource savings, risk reduction, and enhanced market access (Annex 1, Participant 5; Minutolo et al., 2019).
6. **Customize Integration to Industry and Scale:** Industry context and size of the organization must be taken into consideration to tailor the EMS and CE strategies. For instance, the focus of a medical device manufacturer can be on product safety and regulatory compliance. On the other hand, airlines might give priority to fuel efficiency and carbon reduction. It is highly unlikely that one-size-fits-all approach will be successful and this leads customization which ensures relevance and effectiveness (Annex 1, Participant 5; Chiarini, 2019).
7. **An organizational culture which is proactive and promotes inclusiveness should be fostered:**  
Two critical components for success in the integration and implementation is commitment of leadership and employee engagement. There must be sufficient investment in training, communication, and recognition programs. This is important to build a culture in the organization that values sustainability and innovation. This type of culture can be created by encouraging participation of employees in environmental initiatives and recognizing their contributions is crucial at all the levels within the organization (Annex 1, Participant 6; Martin, 2020).
8. **Utilize Digital Tools for Transparency and Continuous Improvement:**  
Leveraging digital tools and technology for tracking, reporting, and continuous improvement of sustainability initiatives. Technology usage can enhance transparency, help in reproduction, and efficiency. This gives organizations the ability to scale their efforts and respond promptly to new challenges (Annex 1, Braun & Clarke, 2006).
9. **Engaging Stakeholders and Building Partnerships:**  
Involving important stakeholders which include suppliers, customers, and regulators in the journey towards achieving circularity and ISO 14001 certification is crucial. It should be noted that encouraging initiatives which involve collaboration can increase the impact and foster shared responsibility. Collaboration initiatives can include supplier training or joint recycling program.

Transparency in communication is important to build trust, support compliance and give access to the market (Annex 1, Participant 6; Ellen MacArthur Foundation, 2013)

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# **ISO 14001 STANDARTŲ IR ŽIEDINĖS EKONOMIKOS PRINCIPŲ INTEGRAVIMAS, SIEKiant ORGANIZACIJOS TVARUMO**

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Magistro baigiamasis darbas Pasaulinis verslas ir ekonomika

Vilniaus Universiteto Ekonomikos ir verslo administravimo fakultetas

Darbo Vadovas: Assoc. Prof. Dr. Roma Adomaitiene, Vilnius, 2025

## **SANTRAUKA**

64 puslapiai, 9 paveikslai, 7 lentelės, 2 priedai ir 56 nuorodos

Darbo tikslas – ištirti, kaip ISO 14001 integravimas su žiedinės ekonomikos principais lemia organizacijos tvarumą. Tyrimo tikslas – pateikti praktines rekomendacijas, kaip pereiti nuo tradicinių verslo modelių prie tvaresnių organizacijų, taikant integruotą AVS su žiedinės ekonomikos principais. Darbe aptariamos tokios sąvokos kaip tvarumas, darnus vystymasis, žiedinė ekonomika ir ISO 14001. Darbe nagrinėjama ISO 14001 sistema kaip struktūrizuota sistema, skirta valdyti poveikį aplinkai. Tai padeda suprasti organizacijos, kuriai taikomas hibridinis požiūris, apimantis tiek teoriją, tiek realaus pasaulio taikymą integruojant ISO 14001 su tęstinio mokymo praktika, patirtį. Tyrime naudojamas mišrus metodas, apimantis literatūros apžvalgą, pusiau struktūrizuotus interviu su pramonės specialistais ir antrinių duomenų analizę naudojant kodavimą ir teminę analizę.

Disertacijos išvados buvo išsamios ir aktualios, atitinkančios disertacijos tikslus ir uždavinius. Organizacijos yra skirtinguose ISO 14001 diegimo lygiuose / etapuose ir prieš sertifikavimą patiria vidinius pokyčius, kurie atitinka ISO 14001 standartų nuostatas. ISO sertifikuotos organizacijos demonstruoja veiklos nuoseklumą, didesnę patikimumą ir yra labai konkurencingos. ISO 14001 pobūdis yra orientuotas į procesą ir atitinka tęstinio mokymo principus, kurie orientuoti į produktų gyvavimo ciklą, nuolatinį tobulinimą ir rizikos valdymą. Rekomendacijos apima organizacijų vidinį suderinimą pagal ISO 14001 nuostatas, skatinant tarpfunkcinę komandų bendradarbiavimą, vadovybės įsipareigojimą ir rodikliais pagrįstą požiūrį į atitikties ir cikliško stebėjimą.

Apibendrinant galima teigti, kad ISO 14001 integravimas su CE gali būti pasiektas planuojant, įsipareigojant vadovybei ir kuriant pokyčiams atvirą kultūrą. Darbe siūloma sistema su veiksmų planais ir rekomendacijomis, kaip pasiekti tvarumą ir pasirengimą ateičiai.

# **INTEGRATING ISO 14001 STANDARDS WITH CIRCULAR ECONOMY PRINCIPLES FOR ACHIEVING ORGANIZATIONAL SUSTAINABILITY**

Chiranjib Bhattacharjee

Master Thesis Global Business and Economics

Master Programme, Faculty of Economics and Business Administration, Vilnius University

Supervisor Assoc. Prof. Dr. Roma Adomaitiene, Vilnius, 2025

## **SUMMARY**

64 pages, 9 figures, 7 tables, 2 annexes, and 56 references

The aim of the thesis is to explore how integrating ISO 14001 with CE principles lead to organizational sustainability. The research aims to provide practical recommendations for moving from traditional business models to make organizations more sustainable with integrated EMS with CE principles. The thesis discusses concepts like sustainability, sustainable development, circular economy and ISO 14001. The thesis explores ISO 14001 framework as a structured system for managing environmental impacts. This helps understand the challenges and experiences of organization with a hybrid approach which includes both the theory and real-world application of integrating ISO 14001 with CE practices. The study uses a mixed approach is used which includes literature review, semi-structured interviews with industry professionals, and secondary data analysis using coding and thematic analysis.

The findings of the thesis were elaborate and relevant and addresses the aims and objectives of the thesis. Organizations are at different levels/stages of ISO 14001 adoption and go through internal changes which align with the clause of ISO 14001 standards before being certified. ISO certified organizations show operational consistency, greater credibility and are highly competitive. The nature of ISO 14001 is process oriented and aligns with CE principles which focuses on life cycle of products, continuous improvement and risk management. The recommendations include internal alignment of organizations according to the ISO 14001 clauses, encouraging cross-functional collaboration among teams, commitment of leadership and metrics driven approach to track compliance and circularity.

In conclusion, integration ISO 14001 with CE can be achieved through planning, commitment of leadership and a culture which is open for change. The thesis offers a framework with actionable steps and recommendation to achieve sustainability and readiness for the future.

## ANNEXURES

### Annexure 1

#### Interview Transcripts

Note: All transcripts in this paper have been included with the consent from the participant. As per the request from participant 6, the transcript has been anonymously named in the transcript. In accordance with ethical guidelines, the sensitive or identifying information has been redacted.

#### Transcript (Participant 1)

11 April 2025, 05:03pm

Participant 1 0:04

Yes, I can.

Chiranjib Bhattacharjee 0:17

If you allow it, yeah. So.

Participant 1 0:19

You have my consent, yeah.

Chiranjib Bhattacharjee 0:21

Yeah. So I'll start with the the first question.

What is your current role and how long you have been in this position?

Participant 1 0:34

I'm the senior manager of global sustainability at Deskcom and I've been in this position for one month. Sorry one year and two months.

Chiranjib Bhattacharjee 0:46

OK. Going to the next question, can you briefly describe your organisation approach to sustainability and environmental management?

Participant 1 0:59

We, our organisation approach is to be proactive as much as we can.

We are using processes. We follow a structure because we do manage regulations. So we have an environmental management system that help us to structure and and follow procedures and processes to achieve what we what we need to do in terms of the overall vision and strategy for our team is to.

Help desk come to be to to step up on sustainability efforts.

By doing not only the mandatory requirements in terms of regulations, but also doing voluntary either disclosures or efforts that will help us to be able to compete in the market.

Chiranjib Bhattacharjee 1:55

Thanks, that's that was very elaborate going to the next question.

Has your organisation implemented ISO 14,001?

Participant 1 2:08

Not yet.

Chiranjib Bhattacharjee 2:08

If yes or no, not yet.

Participant 1 2:10

K log it. We're working on it. It's now our final record for our team.

Chiranjib Bhattacharjee 2:12

Yeah.

Sure. What do you think ISO 14,001 can bring to your organisation? Environmental proper performance?

Participant 1 2:27

Bring credibility. Right. Because is a well-known certification.

Where even our customers are asking for it, so it would just be basically.

Credibility that what we are doing, you know, it has been certified by a third party, which is well known. So our customer has can have that confidence that we're doing the right thing.

Chiranjib Bhattacharjee 2:54

Thank you. That makes sense.

Moving to the next question, how familiar is your organisation with circular economy principles?

Participant 1 3:06

By organisation I will refer at this point to the global sustainability team and we are very familiar with the concept.

On my organisation, in terms of EHS, they are, I think we all have aware of awareness and that probably won't be the same case for deskom as a as an organisation.

Excuse me.

Chiranjib Bhattacharjee 3:29

Yep.

I'm moving to the next question on Circular Economy practises.

What specific circular economy practises has your organisation adopted?

Participant 1 3:44

If I am right now picturing that, you know Butterfly Dragon, you know for physicality. Think we have implemented those small circles where folks to give you an example, all the ways that are on manufacturing are generating especially plastic is being recycled and converted into another product, right. So we're giving another where we're proposing that plastic into another product.

But if I want to see that beautify diagram when I apply circularity to every single part of the process.

We are not there yet.

Chiranjib Bhattacharjee 4:21

OK.

To the next question.

How do you think that how ISO 14,000 principles can align with circular economic practises from your experience?

Participant 1 4:37

It will help us to.

Reinforce the need.

To have a process right and in the way that I'm, let me rephrase it right. So we are a medical device company, highly regulated where our overarching you know basically regulation is the medical device regulation. So that we basically follow certain process. So having the ISO 14 or you know 100 environmental regulation will help us to basically.

Expand that mentality that we already have, you know, process oriented than start incorporating those sequel economy principles, so ensuring that we are following step by step, which we already are, but incorporating those principles, I think that will give that will help us basically to reinforce that because they are part of the process and it's audible right.

Chiranjib Bhattacharjee 5:36

I think you basically answered the next question as well, which is.

If you can provide any example where ISO 14,001 can be integrated with circular economic principles in your organisation, but I think you have already kind of answered it, so I'll move to the next question. How do you think that implementing ISO 14,001 and circular economy practises can affect the?

Participant 1 5:58

B.

Chiranjib Bhattacharjee 6:08

Organisation economic performance.

Participant 1 6:11

Could have a a bigger impact.

In the sense that we will be able to.

Reduce. Hopefully the use of raw materials, you know, distraction and all that. So by bringing back all our products or even services, so it might have a meaningful impact if it is done right, right. So we have to create a business case and identify what are the business models that we want to change or the raw materials that we want to bring back. So then we can build that. But we will have economical benefits for us.

Most likely also economic benefits for our customers as well because they might see the reflection of that by either a higher cost or receiving more services for it and they're on the same for our partners as well.

Chiranjib Bhattacharjee 7:01

Makes sense?

Moving to.

The last question.

How? How have you how do you think that your organisation, size industry and culture influence the implementation of environmental management practises and it should not be specific to Organization or your current organisation in general like in your whole experience in the past?

Participant 1 7:31

Yeah, I think my experience is right now, uh or I I I think it's been building up for a couple of years is all large organisation like deskcom.

Are has been.

Already committed in many cases on everything that is environmental, social and government practises, right and right now we're talking about environmental practises, so it is the culture, is there, the commitment is there. So large you're gonna say has that responsibility to commit to environment. In the past has been most likely voluntary, but I think right now the trends you know from from either political or economic needs, they are telling us that are not voluntary anymore. So we're seeing trends, especially in the European market where large companies and even some small and medium businesses have a social environmental responsibility for.

In order for them to start selling products so.

So definitely, you know, having environmental management practises for those, for example like us that we already have in those, we are being proactive and when those regulations comes, we're gonna be in better shape than probably others, right? But but yeah, it's been influencing the way we do things.

Chiranjib Bhattacharjee 8:54

That makes sense. That was very elaborate and insightful adira, and that brings us to the end of this interview.

I think I will definitely share what I what results I get after this after I do the coding and analysis of the. The you know the data that I get from the interviews and yeah, thank you so much for making time and jumping in and making it to this interview and.

I really appreciate and I'm grateful. Thank you so much.



Participant 1 9:35

I don't think you should immediately. Yeah. Keep me posted. It's interesting what you're doing. OK.

Transcript (Participant 2)

11 April 2025, 11:04am

Chiranjib Bhattacharjee 0:03

For making it to this interview, and I'll be asking you for your permission and consent for like, recording this interview, transcribing this interview for my thesis and.

The thesis actually revolves around the the topic of the synthesis is how we integrate ISO 14,001 with circular economy principles in order to attain.

Organise organisational sustainability and.

The goal is to.

Find ways and give recommendations to organisations who want to make a switch into this domain. So

I'll be starting the the interview now and I'll be asking you questions sequentially and.

I it it will be you'll be giving me valuable insights for my like for data collection. So let's start with.

The questionna what is your current role and how long have you been in this position?

Participant 2 1:20

OK, so I have so I yeah, I head up EHS, which is stands for environment, health, safety and sustainability. So I'm the regional leader here in Europe for Organization.

I have been in the role almost 2 1/2 years.

And part of my role, one the main part of the role is really supporting the region with all aspects of environment, health, safety and sustainability management. So I support all of our commercial offices, of which there's eleven now across Europe. I also support all of the remote based employees, the field sales.

Based employees and then I am heavily involved in the manufacture build the construction of our first European manufacturing plant which is in Galway, Ireland so.

Chiranjib Bhattacharjee 2:21

Thanks, Josh. Yeah.

Participant 2 2:22

That's my role.

Chiranjib Bhattacharjee 2:25

Moving forward, can you briefly describe your organisation approach to sustainability and environmental management?

Participant 2 2:34

So I, you know, Organization is still relatively early on the journey, so.

At the in 2022, the.

Sustainability Steering Group was established.

And the sustainability team was also established alongside several sustainability working groups. So there's a working group on, you know, manufacturing operations and making them more energy efficient.

And reducing the.

Environmental impact of our manufacturing operations, there's a group that focuses on R&D product development. You know this month for logistics for example.

Those were established in in 2022. In 2023, you know a lot of work was done on trying to capture, you know, our baseline in terms of our, you know, environmental perform footprint globally. And you know there's a, there's still a lot of work going on into, in, in, you know, measuring our, you know, greenhouse of gas emission gas emissions.

Been in position to measure it and then you know, look to to manage and reduce our footprint going forward. That's the the current plan. So yeah, we were still relatively early on on the journey, but you know we've we've actually achieved quite a lot in a relatively small period of time in terms of getting the foundations in terms of you know the correct teams in place.

The process is in place, you know, software platforms to help us, you know, measure our.

Environmental performance.

And then yeah, like, you know, current focus is turning now to you know what we what can we do to further reduce our global environmental footprint so.

Chiranjib Bhattacharjee 4:32

Makes sense?

Moving forward, this this revolves around I I I so 14,001 implementation has your organisation implemented ISO 14,001? If yes or no.

Can you can you brief give a brief about it? Yeah.

Participant 2 4:52

So currently, no, we don't have ISO 14,000 and one accreditation. What I will say though is that the global standards that are being written and implemented are in line with ISO 14,000 and one. So our environmental health and safety, you know, management.

System which we refer to as the performance framework for, you know, all of our health and safety management process, environmental management processes.

Are all written in language ISO 14,000 and one for the environment, and then. Similarly for safety, is 45,000 and one.

So we currently don't have the accreditation, although our internal processes and procedures are aligned.

In terms of a plan to to.

Get that there is plans. You know, I can't speak for the manufacturing operations in the US and Malaysia, but I can speak to the long term plan for the manufacturing plant in Galway and Ireland, so. The construction will be finishing at the end of this year and you know the current plan is to be producing commercial product around quarter three in 2026.

The European market and at the moment we're establishing a lot of our health and safety management processes, environmental management processes for the island site and the plan will be for us to, you know.

Work.

To achieve the our internal certification against our performance framework, of which there's there's 4 levels. So we'll be working on that throughout the course of this year, next year and my.

And the long term objective is to be looking at going for 14,001 accreditation and also 45,000 accreditation.

Sort of quarter 3/20/27 for the plant in Ireland so that that's our plan here in in Europe. You know the the reason why is you know there's it makes sense to design your management processes you know in line with the international standard because it's generally regarded as best practise.

But you know, there's also, you know, commercial benefit in terms of helping us to, you know, win new tender and new business when we're looking to, you know, step into new markets from a commercial perspective. You know that by having those accreditations really does help you know with

with the winning of those tenders and new new business so.

That's what. That's why it's it's important and it's it's on the strategy for the site here in in Ireland.

Chiranjib Bhattacharjee 7:50

That's that's very elaborate, Josh. So moving forward like since we we don't have 40,001 accreditation still, but what do you think can be benefits of having it?

Participant 2 8:01

Yeah.

Chiranjib Bhattacharjee 8:07

For the organisational organisations environmental performance.

Participant 2 8:12

Yeah. So firstly, like from a manufacturing operations perspective, you know being you know having our environment management processes in line with the international standard helps because it is like I said earlier, it's regarded as as best practise and.

You know, part of the the process with 14,001 DS, you know it it there's a.

A commitment to continuous improvement, so you know we will be establishing processes that firstly are going to make us compliant, you know, from a reput perspective, but then also you know it by going through the ISO accreditation and you know that that recertification process drives the need for continual improvement which you know we will only benefit.

The manufacturing operations.

Then, like I said earlier, from a commercial perspective, there is a a benefit of having the accreditation when it comes to new tenders. So over the last 5-6 years, there's been this a greater focus placed on businesses in terms of how you know what they're doing from environmental perspective, what they're doing to measure their global footprint.

And reduce it so.

The a lot of the focus now in new tenders.

There's more and more questions being asked on our environmental performance, what the sustainability strategy is of the organisation that we're having to provide a lot more data now in terms of you know what, how we're what our global footprint looks like.

And.

You know, by having the you know by having 14,000 and one, it does actually benefit in that you know it it shows that we're committed, it shows that we're we're we've got the necessary.

Processes and procedures in place to be managing our environmental impact, reducing it where we can and and maintaining compliance. So you know from from a tender perspective, it really does help with you know winning those new new contracts.

Chiranjib Bhattacharjee 10:38

It's Josh.

Going forward to the next block of you know, question is like the organisational characteristics. How do you think that the organisation, size, industry and culture influence implementation of environment environmental management practises?

Participant 2 11:01

Specific to Organization.

Chiranjib Bhattacharjee 11:03

Yeah. Like in general, as far as your experience is concerned, like not just text com like from all the experiences that you have had in the past like the.

Participant 2 11:21

Yeah. I mean, I think.

Yeah, there's a greater expectation now.

And so, you know, we, you know, we're we're a global organisation with a footprint, you know, with manufacturing operations in the US.

In in Europe and you know, we also have the the manufacturing operations in.

In Malaysia, you know and then we have all of the commercial operations as well across those, those three, you know Asia Pacific here in in Europe and then also in the US so there's a there's a greater expectation on organisations of our size to be driving.

Their their you know.

The sustainability strategy, you know that like I said, you know, there's there's over the last 5-6 years, there's been a huge increase in the amount of focus.

In the tender related questions and ultimately you know like you know I think where the regulations here, particularly in Europe are are pushing the organisations, is that you know.

You, you, you carefully select your partners.

To you know, to help with your overall your.

Environmental performance. So you know a lot of our customers, you know we, you know we we send a greater chance of getting their business by showing that we are you know we have these.

Specifications use accreditations and you know it's, you know.

It did. The expectation now globally is is far greater than it was sort of 10 or 15 years ago.

In terms of Organization?

And you know it it's it's challenging because yeah, it's quite you know it's quite complex organisation.

You know the the focus really from a night to 14,000 and one perspective will be mainly centred around our manufacturing sites. You know that some, some organisations do go like go after like a global certification for 14,000 or more or you know other similar ISO standards. But you know we we will initially be focused on the manufacturing.

Site so that that's that's the current plan with with Organization.

Chiranjib Bhattacharjee 13:51

I'm moving to circular economy. I just switched some questions just for making it very random, but so moving to the circular economy.

Participant 2 13:56

Mm hmm.

Chiranjib Bhattacharjee 14:03

How familiar is your organisation with circular economy principles?

Participant 2 14:09

The organisation is is familiar. Yeah, I think that, you know, there is a there is a good understanding. You know the, you know we have we have the global sustainability team who are you know driving the overall sustainability strategy globally within Organization. You know over the last few years you know they've done a lot of education.

You know, by by setting up the the working groups and you know, educating them in terms of what the you know, what the expectations are now you know there's new new regulations constantly coming out. You know, particularly here in Europe that.

A place you know additional obligations on on all the organisation. So you know there there's there's. Yeah, the sustainability team have been educating the rest of the business on on the circular economy practises and I think generally you know like the those principles are becoming you know more common now I think you know like across the board you know I think you know even people within. You know, most people within their general households are quite familiar with that. Those practises now and you see various different industries are implementing those very similar in principles in, in, in industry. So yeah, we we have a very good understanding of it. Index com I would say.

Chiranjib Bhattacharjee 15:36

Moving to the next question, it's related to this, but.

What do you think?

Is specific circular economic practises that Organization has adopted till now. If they they have done so.

Participant 2 15:55

So I think I think 1 area is the you know selection of the materials. I think you know that that's really where it starts you know trying to.

You know select materials that you know come from sustainable sources. So you know for for example.

You know the the materials that go into our packaging, you know trying to use.

As much recycled.

Packaging plastic packaging like that goes into, you know, making a part of our products packaging, you know that's that's something that that there's been, there's been work done on that in terms of.

You're selecting the right, you know type of sustainable materials that going into it, trying to utilise as much recycled material as well rather than you know opting to use raw material straight away from the from a packaging perspective.

You know, there's also been a drive to reduce the amount of packaging as well.

And so you know that this there was significant steps made from G6 to the G7 product, for example in terms of minimising the amount of packaging used.

Similarly with the product, you know the plastics that going into the product, you know the there's been work done on trying to make the product smaller as well in terms of size. So using less plastic.

You know, in in the product itself, so.

And the sense of, you know, continue to get smaller, the applicator continues to get smaller and you know that those principles have been adopted now for some time in organization and they continue to be and you know I think as we release new product, we will continue to see improvements in that space.

There's also a drive to extend the life of the you know, the the sensors, so.

You know, moving from a 10 day sensor to a 15 day sensor. So you know our users rather than using 3 sensors a month, they're going to be going to using.

And two senses a month, which automatically you know, there's like a 30% saving there in terms of the amount of, you know plastic and you know packaging that's used plastic for the product. So you know that that that's those principles have already been adopted in organization and will continue to be and I think there's there's further scope to do more in in in that space.

As we continue to release new products.

So yeah.

Chiranjib Bhattacharjee 18:44

Thanks, Josh. So as you said like, so you come from the circular like use Organization has been adopting these practises, do you think from your experience that?

ISO 14,001 principles. The clauses in ISO 14,001 can be integrated with circular economy practises.

From your experience, even if.

Organization has not adopted.

ISO 14,001 certification till now. But what do you think about it?

Participant 2 19:22

I I think yes. You know, I think I think the you know the.

I can't provide you any examples, but yeah, I think I think there are. You know there's definitely.

Opportunity for there to be.

Integration within you know 14,000 and one and and those those principles of you know secular economy.

You know, ultimately it's it's about.

Yeah, you know, encouraging businesses to think about the, the you know the selection of the materials.

That go into their product, think about the size of their product, the amount of you know, materials that you are used in it. I think you know where, where, where we as Organization can be doing more and



other you know I think that whether there's a greater challenge probably for most organisations is. The kind of back end which is.

You know how the you know how the products are disposed or recycled. I think that's where there's a greater opportunity for for organisations, but it's it's very challenging and you know, I think some of the principles in in central economy and and I said you know, they're aligned and you know it's about continuing getting better continually make an improvement.

To reduce your, you know in this in certainly in this sense in this instance reduce the environmental impact of products that are placed on on the market.

I definitely think that there's opportunity there.

Chiranjib Bhattacharjee 21:06

Yeah.

Yeah, yeah. So one of like, there are like 13 clauses in ISO 14,001. Some of them are like understanding the context of the organisation in in which in this case Organization is actually.

Participant 2 21:16

Yeah.

Yeah.

Chiranjib Bhattacharjee 21:26

The context of Organization is pretty much.

Related to circular economy practises, because in Organization we would want to reuse the you know the product or the materials to minimise waste. So yeah as you said it has like from an experience it has some but like there are multiple aspects to ISO 14,001 there is leadership planning.

Participant 2 21:55

Yep, Yep.

Chiranjib Bhattacharjee 21:57

Things like support continuous improvement, which obviously can be like you know from your experience you know there.

Participant 2 22:01

Yeah.

Yeah. So from a leader, you know, a leadership perspective, you know that that really ties into this the strategy so that we have a global sustainability strategy. You know, like you know from a leadership perspective, you know it has to be, you know it has to be seen to be important to the leadership. You know that they need to be, you know encouraging the business to to go for the these types of organisation.

Chiranjib Bhattacharjee 22:14

Yeah.

Yeah.

Participant 2 22:32

These accreditation so.

Yeah, you know that I think you know the the the clauses in 14,000 and one really do you know set set up you know the the framework for you know how you apply those principles and secular economy and just yeah continue to make improvements and reduction on on the you know global footprint that we that we have so.

Yeah.

Chiranjib Bhattacharjee 23:04

And I think what you have been explaining in the whole interview is that I think tech com is already.

Aligned with the clauses and principle of ISO 14,001 with what you explained till now, even if you have not got certified but it is already aligned with all the aspects. So I think we are in a good shape for the future moving forward to one last question and it is again related to 14,001 and.

Participant 2 23:15

Mm hmm.

Yeah.

Hmm.

Chiranjib Bhattacharjee 23:38

Is and circular economy and how has implemented? How has implementing ISO 14,001 and circular

economy practises affected your organisation economic performance? I would say I would rephrase it like how? How do you think it can affect the organisation economic performance?

Participant 2 24:00

So by by obtaining the accreditation.

Chiranjib Bhattacharjee 24:03

Like if you integrate the you know circular economy practises and the clauses of ISO 14,001, how do you think it can affect the organisation economic performance?

Participant 2 24:17

So yeah, by by doing I I you know, I think I think ultimately.

The you know, it drives having a strategy coming back to, you know that that leadership, you know, like the we have a strategy in place.

And.

There's.

An objective to firstly, you know better, measure and monitor our environmental footprint and our environmental impact if you like.

And you know then through through the using the principles we will.

Continue to look to make improvements and reductions. So from a manufacturing perspective, you know the strategy will is you know continue to look like how do we use less.

You know electric, you know, utility services, for example, within the manufacturing, how do we become more energy efficient?

You know, think from a logistics perspective, you know, the strategy really is like, you know how you know, how do we, you know, minimise the amount of you know long distance shipping or moving moving away from air freight into.

Ocean freight and even down to like you know, here in Europe, we're going to have our manufacturing plant.

Which will provide the products to you know, your the European market. So you're not shipping it then from Malaysia or shipping it all the way over from from the US to provide the you know the market here in, in Europe and you know then from a commercial perspective I think it comes back to you know helping us you know win, win new business you know like if if we're if we're seen to be a responsible organisation who you know are taken.

Our environmental performance. Seriously.

And looking to reduce it and you know, do right by the environment and I think we put ourselves in a great position to win new business and so.

You know, I think that yeah, that's where we will. That's where the benefit is really.

Transcript (Participant 3)

17 April 2025, 04:04pm

Chiranjib Bhattacharjee 0:09

Yeah. Hi, Catherine. Thank you for accepting the interview invite and making it to the interview today. Your your inputs will be very helpful for me in in building and completing my thesis and doing the empirical research.

Going forward, I will ask I'll ask you for your consent and permission to record our conversation and if you want, I can.

Skip or put your name in the in the in the in the interview transcript in my thesis as well. So.

You do have. Are you OK with it?

Participant 3 0:58

Yes, that's fine.

Chiranjib Bhattacharjee 1:00

Yeah. So I'll, I'll start from.

The basic questions.

Regarding your background and the first question is, what is your current role and how long have you been in this position?

Participant 3 1:18

My current role is global, ESG and sustainability manager for Organization. I've been in this role for about 3 1/2 years now and have been with the company for five years overall.

This role was brand new 3 1/2 years ago. We didn't have a global sustainability manager, so when I started we we built the programme from.

From the grassroots up, so I've been here since the our the our for the from the start of our

sustainability journey.

The company.

Chiranjib Bhattacharjee 1:54

Yeah. Going to the next question, can you briefly describe your organisation approach to sustainability and environment management?

Participant 3 2:06

Yes, we consider our sustainability one of the pillars of our organisation and we publish an annual Sustainability report detailing our progress towards different targets and our overall our overall stance on sustainability, on climate change and where we're at as a company. We tried to disclose as as much information.

As possible to be transparent about where we are in our sustainability journey, where we're not a net zero company, we're we're at the bigot. Like I said, we're at.

About the early stages, we've just recently started calculating our scope 3 greenhouse gas emissions. But overall as a company, our our approach to sustainability is to to do well, to do good for, for the earth and for the company. And we follow a circular economy model.

Chiranjib Bhattacharjee 3:07

Thanks, I got it and that's that makes sense going to to ISO 14,000 implementation questions. I know Organization is not ISO 1414 thousand one certified, but still if you can give your inputs on. Since desk Organization is not, but then I'll ask you if Organization is not ISO 14,001 certified, when do you think you will be and?

Why it has not been done yet like?

Participant 3 3:47

So we are as a company our our environmental health, safety and Sustainability department. We developed an EHS performance framework with different levels of internal certification for the organisation to ISO to standards that align to internal standards that align to ISO 14,001 and to the health and safety standard. So currently we're at the foundational level of certifying our.

Our sites individually.

To the foundational level, but we are we are growing as a company and we want to make sure that we do everything right and we we don't want to just write documents for the purpose of writing documents

to get a green check mark, we want to make sure that all of our internal processes and standards are actually followed correctly and accurately and that's why.

Chiranjib Bhattacharjee 4:41

It's.

Participant 3 4:43

Our our journey to get ISO certified is a bit longer than other companies because we want to make sure that we're doing it right and for the right reasons and that we as a company are confident. That we're following all of the internal processes and standards that are required by ISO.

Chiranjib Bhattacharjee 5:01

OK, what benefits has ISO do you think can ISO 14,001 bring to the organisation environmental performance?

Participant 3 5:14

I think it it gives.

I think for environmental performance it is one thing, but I think really the purpose of ISO is to give confidence to.

To suppliers purchasers, peers in the industry that you are compliant and.

And have standards and processes in place to meet environmental performance requirements. So a lot of tender requests or ESG questionnaires ask about ISO 14,001.

Because it sets an even playing field across the whole world globally. So it's kind of like an SAT score for college admissions, right? It puts all companies on an even playing field. And if you are 14,001 certified, others have more confidence in your actions towards.

Your environmental performance, I don't think. I think several companies have.

Environmental performance and have high sustainability targets without being ISO certified, but I think ISO certification is a great foundational certification to provide transparency and to give confidence in the organisation.

Chiranjib Bhattacharjee 6:43

How familiar is your organisation with?

Participant 3 6:49

We we we have that as a core principle and we've been publishing our circular economy model in our annual sustainability report for the past three years.

Chiranjib Bhattacharjee 7:01

OK.

What?

Specific circular economy practises has your organisation adopted?

Participant 3 7:12

I think one of the main things is just looking at the organisation holistically from the design, through manufacturing distribution.

One example of of of this is is looking at how the design of packaging at the very start of the process can impact.

How many boxes can stack on a pallet and how efficient they can be distributed?

Via aeroplane or ocean freight. And so we had that learning as a company of, oh, we have to.

Design with circularity in mind so that everyone across the organisation is is communicating together with the with the end goal to be more efficient and be more sustainable with a lower environmental footprint. But also if you follow these circular economy strategies, it will often lead to cost savings as well because you're implementing efficiencies.

Chiranjib Bhattacharjee 8:16

Thanks, Catherine. Last question and then then we'll finish this interview. How well do you do ISO 14,001 principle align with circular economy practises in your experience?

Participant 3 8:34

As we noted, Organization is not ISO 14,001 certified right now and I and I am not familiar with in depth with the circular economy practises outlined in ISO 14,001.

Chiranjib Bhattacharjee 8:51

One one question that would be helpful to understand like how economic experience, I'm sorry,

economic performance is affected by these certifications. So how do you think that circular economy practises affect an organisation economic performance?

Participant 3 9:14

An economic performance? What do you mean by that?

Chiranjib Bhattacharjee 9:18

Economic performance, as in like savings, and if you for example, if you're recycling the products, you're saving money there financially helping the organisation save a lot of resources as well, yeah.

Participant 3 9:31

Oh yeah. I mean, as a yeah, as I noted in my previous response, I think the circuit circular economy model ties directly with cost savings for the organisation.

Designing smaller packaging equals more product. Being able to fit on a pallet equals less shipping fees. Being able to design a product for recyclability and having more efficient manufacturing processes so that there's less waste. So I I think the circular economy model is great for the environment.

But it also has a huge business case for implementation for the efficiencies that result from circular economy practises.

Transcript (Participant 4)

24 April 2025, 04:05pm

Chiranjib Bhattacharjee 0:08

Hi, Lee. Thank you for making to this interview. I'll be going through a list of questions and she will be answering them based on your experiences and before we start the interview, I'll ask you for your permission and consent to record this interview. The transcript, transcribe this interview and.

If you allow, if you want, I will be putting your name in the appendix of my thesis when I'm attaching this transcript there.

Participant 4 0:46

Yeah, you have my permission to transcribe and put my name in your thesis.



Chiranjib Bhattacharjee 0:52

Thank you so much. So I'll be. I'll be starting with the.

Questions now and we start with your background. The first question is like what is your current role and how long you have been in this position?

Participant 4 1:09

The Environmental Product Compliance manager, it's part of the Ehss department and I've been in the role for two years.

Chiranjib Bhattacharjee 1:21

Thank you.

Moving forward to the next question, can you briefly describe your organisation approach to sustainability and environmental management?

Participant 4 1:34

We put a high priority on sustainability and environmental management. We have several programmes in place.

As well as a commitment to sustainability.

And you can find those on the different websites that we have. I can send you some links if that would be helpful.

Chiranjib Bhattacharjee 1:57

That that will be able to do.

Moving forward to the implementation of ISO 14,001 practises so.

Has your organisation implemented as of 14,001? If yes, when and if not, are you planning to do it and?

What are the like? You know, the timelines and experience of implementation of this in your current role or in your previous roles if you have done that?

Participant 4 2:34

So in my previous roles we've not been certified to ISO 14001 and we're not currently certified at Organization to that. But they are working on it and the timeline is within the next few years.

Chiranjib Bhattacharjee 2:40

Yeah.

That makes sense.

In case.

In case you have some inputs on this question like what are the benefits that ISO 14,001 can bring to the organisation environmental performance?

Participant 4 3:14

Sure. I I think you know as we kind of go through the process, it definitely brings some standardisation. And provides guidelines for us to.

Help increase the environmental performance of our organisation. I think sustainability is a very broad term and even with storage economy, so I think the benefit is really the guidelines and kind of allowing.

The development of that kind of system or process to remain streamlined.

Chiranjib Bhattacharjee 3:50

Makes sense. Moving to circular economy practises?

How familiar is your organisation with Circular economy principle?

Principles.

Participant 4 4:02

Very familiar with it. We actually have a closed loop circular economy.

As part of what we share out to the company and something we actively promote.

And train on.

Yeah. And so we look as so I'm part of Yadira's team, the Yadira kind of covers sustainability altogether. So I focus on product compliance and sustainability.

So if you think of the product being sold globally, there are a lot of different regulations we need to comply with standards and materials.

And then the other side of it is Catherine Sharp and she focuses more on facility sustainability.

So does that make sense?

Chiranjib Bhattacharjee 4:57

That makes sense.

Participant 4 4:59

OK, so with what I do.

Chiranjib Bhattacharjee 4:59

Yeah, I can. I can see that.

Yeah. Sorry. Yeah. Yeah, I can see that there is some, you know.

Participant 4 5:05

Sorry, go ahead.

Chiranjib Bhattacharjee 5:11

There is a team of the in the answers that have been getting from different individuals regarding the experiences, and there are certain aspects that everyone mentions. For example, one of them is the product part product aspect of circular economy that you also mentioned on my previous interviews. Interview is also mentioned.

So one of them like this is a crucial thing that I've noticed.

And one of the teams for my research would be the product and yeah, so.

Moving to the next question.

What specific circular economy practises has your organisation adopted?

Participant 4 6:03

So we have quite a few. So when you look at concept, we've implemented design for environment standards.

And that really encompasses all of the sustainability and environmental regulations that go into designing a product. And there are a lot coming out from the European Union right now.

So that will kind of go into concept also into sourcing when you get into different regulations like the European Union, deforestation regulation.

Operations.

And distribution are more handled by Catherine, who does facilities. So you know don't want to speak

to that too much.

And then we go through use an end of life and for that we have we comply with the extended producer responsibility regulations that are most heavily present in Europe and Canada and then also coming in, in the US.

And basically that means.

The producer, which is us, is ultimately responsible for end of life of the product. So we hire what's called producer responsibility organisations or PR OS to collect the end of life products and ensure that they're recycled properly.

Chiranjib Bhattacharjee 7:33

It's very elaborate.

So moving to the next section, which talks about the integration of ISO 14,001 with circular economy. So as far as your experience is concerned, how well do you think that ISO 14,000 principles align with circular economy practises?

Participant 4 8:00

I don't know that I have enough experience to say with the alignment of the 1401 principles.

Chiranjib Bhattacharjee 8:09

I can give you some, you know, points actually regarding ISO 14,001 here. So it can be things like leadership or.

This is one of the clauses of ISO 14,001 that one of the most crucial pillars of ISO 14,001 is the leadership, and maybe how the leadership is involved in this.

Circular economy thing in your organisation.

How much they, you know, care about it.

You can feel free to skip this, but I just give you one point probably.

Participant 4 8:57

I mean, as far as leadership goes, I know.

The leadership of our department.

Is very much focused on getting 1401 certified.

Chiranjib Bhattacharjee 9:05

Yeah.

OK.

Participant 4 9:10

And also promoting the circular economy.

I just I'm not sure specifically.

How the integration of those two work?

Chiranjib Bhattacharjee 9:21

Yeah, that is, that is what?

We will be like trying to achieve here, so that's completely fine.

So moving to the next question.

Because as you answered that you don't have much to, you know, answer on the integration aspect, I'll move to the economic aspect of an organisation and how implementing ISO 14,001 and circular economic practises can affect the organisation economic performance with economic performance I mean like.

You know, minimising expenses, maybe recycling and all those things like you know making it more optimal economically the the whole process operations and other things.

Participant 4 10:26

Economic performance, I would say overall.

They're more expensive.

Than there are savings from what we found, but that's hard for me to say, so I know we do like solar panels and things like that that are probably saving a lot of energy or we're doing recycling projects, right that.

Are saving money because we can take metals and send them back to recycler.

Chiranjib Bhattacharjee 10:59

OK.

Participant 4 10:59

And reuse a lot of those materials for something like extended producer responsibility. That's a cost.

And you know, I don't know that.

We've done an analysis at this point to see.

What that looks like overall.

So I think there's some give and there's some take.

It. Yeah. And I'm not sure how it ends up.

Chiranjib Bhattacharjee 11:25

Get.

Makes sense. Yeah. Essentially what I have analysed with my literature analysis and other things in the long run, it is actually economically viable to have these certifications and it makes the organisation more, you know.

Participant 4 11:30

Yeah. For the bottom line.

Chiranjib Bhattacharjee 11:49

Less dependent.

Dependent on things that are, you know, circular of economy makes you more sustainable in the long run and that is what is, you know, the goal of this entire thesis like how?

Like recommending organisations who are not ISO 14,001 certified but are implementing circular economy practises and like bringing them together and recommend how to you know achieve this. So one of like few of the clauses of the 14,001 is one is like context of the organisation planning.

Performance evaluation improvement. So it is more similar to quality assurance in some aspects.

But one thing is.

The most important thing that you know resonates with Organization is context of the organisation and. Since Techscom is producing products which should actually go through the recycling and then there there can be a lot of savings and that that the product that we are selling so.

Yeah, that is my, you know.

Observation from what I have.

Right till now. So and last question.

Participant 4 13:14

I think from the facilities perspective, it's definitely more beneficial. Absolutely. I think with what I do with the product.

Chiranjib Bhattacharjee 13:17

Yeah.

Participant 4 13:23

You know, ultimately.

Someone's paying for the disposal in the end use and so whether in certain countries it really depends globally, but a lot of times that will be taxpayers. And so by putting that responsibility.

Onto the producer. Overall it's probably.

More beneficial.

Instead of having kind of somebody else paying for that and use and disposal.

And it's better for the environment.

So it is focused more on recycling as opposed to just putting things into the trash can. And I'm speaking kind of as extended producer responsibility as a whole, but it's really forcing.

Producers to.

Market the recycling of their products.

And telling people how to properly dispose of them. So I think right now we're seeing that as a big cost.

But ultimately, somebody's going to be paying for that. And now that responsibility is just on a producer.

Chiranjib Bhattacharjee 14:35

Yeah. So.

That's actually something which is a new input, like in general people would. People would say that yes, there are economic benefits, but.

According like from your point of view, it's the other way around, so that's that's very reasonable as well. The points that you have put, I'll have the last question now and then we are done with the interview. So the last question is a general organisational characteristic question.

So how have your organisations or how an organisation, size industry and culture influence the implementation of environmental management practises?

Participant 4 15:30

I I think the big there's a few different aspects to it, so the organisation size, we are a large company. I

think that gives us more flexibility to be able to implement these things as opposed to a small company.  
So implementing circular economy.

I don't know that it's necessarily easier, but I think due to marketing.

How do I say this?

It's.

I think more beneficial kind of from the marketing standpoint, if somebody looks at a large company like Organization, you know they could more easily think well, why aren't they doing more for the environment. So I think there's some influence there.

Chiranjib Bhattacharjee 16:24

Yeah.

Yeah.

Participant 4 16:28

The industry being the medical device industry.

You know, these are people that are working towards health and so it's very important for us to.

Number one, just have a safe product.

Chiranjib Bhattacharjee 16:43

Yeah.

Participant 4 16:46

And to have it easy to use but then also.

Know these are being used every 10 days or something like that. You know, 10 to 15 days. So being in the medical device industry, I think.

Chiranjib Bhattacharjee 16:56

Yeah.

Participant 4 17:03

Consumers more want some kind of sustainability aspects to the product.



Chiranjib Bhattacharjee 17:10

Makes sense?

Participant 4 17:10

So it's something that, yeah, is driven because we're in that industry, it'll, you know, really be driven by consumer demand.

And then the culture here at Organization, I've really found is how do we do things better.

Right. And how do we service the needs of customers or patients?

While making a minimal impact on the environment.

Chiranjib Bhattacharjee 17:44

Let's that that makes sense. And I think the answers were very elaborate. If you went through each question in depth. So thank you so much for that leak and thank you for making it to the interview and helping me.

I'll be sharing the insights and you know results of the thesis once I'm done with it, with you and the other interviews.

Transcript (Participant 3)

28 April 2025, 03:38pm

Chiranjib Bhattacharjee 0:07

I'll be going through a list of questions which are very important for answering.

And doing the qualitative analysis for my thesis and before I start the interview, I would like to ask you for your consent to transcribe this interview and.

Keep if you want. I can keep it anonymous. Or if you want me to keep your name in this transcription, in my appendix of my thesis.

I can do that as well.

Participant 5 0:44

So yes, you can transcribe it. You have my consent and you're welcome to use my name in your thesis.

Chiranjib Bhattacharjee 0:50

Thank you so much. So I'll be going through the.

Participant 5 0:51

Mm hmm.

Chiranjib Bhattacharjee 0:54

The questions now and to start off I I'll be starting with some background information. So the first question is, what is your current role and how long you have been in this position?

Participant 5 1:08

My current role is director of the Global Occupational Health and Safety team, so we're a global team within the Ehss department and we focus on worker health and safety.

And the other thing that we focus on is the internal audit function and the standard setting to take us to ISO 14,000 and one and 45,000 and one.

And I've been in the role for.

About a year and a half now.

Chiranjib Bhattacharjee 1:43

Thanks. So moving forward to the next question, can you briefly describe your organisation approach to sustainability and environmental management?

Participant 5 1:54

The piece that I'm connected with that I mentioned is.

To prepare for ISO 14,000 and one and doing consistent sustainability management practises across our global sites.

Is to we write standards company standards on topics so that way if there's a regulation in place in one spot but not in another, we put together minimum standards.

That we have to meet as Organization based on a topic and then?

And then the company will then go through and certify.

Each each site to the the topics within a level so.

That that there are probably 35 to 40 different topics.

Health and safety and environmental sustainability topics, and they're broken up into four levels. The first level is foundational. It has about 15 topics and they are mostly things like fire prevention and protection.

Emergency response.

Waste management. That one's environmental as well regulated waste management, things like that.

The next one is called the compliance level. It has 20 different topics and.

They are very health and safety.

Related. And then the next level is prevention level. It has things like job hazard analysis and other environmental analysis.

Greenhouse gas management and then the last level is leadership and it is almost.

Completely sustainability related and environmental compliance related or not compliance, environmental and.

Sustainability topics. So within each one of those levels, we write standards for those and then.

A a a site will then say we're ready to be certified to a level and that group comes out and does the the certification or assessment and says Yep, you passed, you did it and you get a they get an internal certification and so we'll use that. That's our, that's our organisation approach as we write standards and then we and groups say we've met them and we come out and assess.

Chiranjib Bhattacharjee 4:21

That's that's very elaborate. Thanks for this answer. Moving to the next.

Participant 5 4:24

Sorry, that wasn't very brief.

Chiranjib Bhattacharjee 4:28

Yeah, that's that's that's very helpful.

Moving to ISO 14,000 implementation in this section, the first question is Hazard organisation implemented ISO 14,001. If yes well and if not, what what is their approach in case you want to get certified.

Participant 5 4:49

So we that's definitely our target goal. We do not have 14,000 and one implemented or you know certified at at any sites. But that is our goal in, in the timeline we're looking at is to have at least one

manufacturing site certified to 14,000 and one within the next two years, possibly as early as the next as 12 months from now, we may have a site that's going to call for that.

And be ready to do that.

So anyway, that's our timeline. So no, we we don't have it yet, but we're.

Working towards that and hopefully within the next by two years from now, have that in place.

Chiranjib Bhattacharjee 5:29

What benefits do you think I supporting those in one can bring to your organisations environmental performance?

Participant 5 5:37

Hmm, that's great.

Well, I think the number one benefit is.

Is consistency in practises across our sites.

And and to leverage.

Leveraging what each side is doing to make the other sites better. So.

If one site was doing an environmental think, you know if left to their own devices, each site maybe have different levels of performance.

Especially from the the energy usage and also our our product is made of a lot of plastic and and it is single use and so.

Right now, since we don't totally have everything circular, we don't bring all the way back.

Just finding a way to recycle things 'cause we have a lot of scrap and even from the user's end 14,000 and one I think will bring consistency and leverage.

How leverage how each site disposes of or reuses or finds a way to to disposition? I guess that twice.

Our product, where one group might not do it at all or another site might be really great at it. We can we can leverage what each site is doing using 14,000 and one doing that evaluation.

Chiranjib Bhattacharjee 7:13

Going to the next section.

It's about circular economic practises.

The first question is how familiar it is your organisation with circular economic practises.

Participant 5 7:27

I feel like we're pretty familiar, however I don't. I don't manage it, so I I do know that we have a whole department dedicated to managing circular economy and they spend a lot of time with our R&D groups and also with our production groups and L&D groups for.

What we're doing with our scrap, so I we're quite familiar, but we have other experts that works their jobs to manage it.

Chiranjib Bhattacharjee 7:48

OK.

That makes sense. Moving to the next question, what specific circular economic practises has your organisation adopted?

Participant 5 8:03

Great question. I I'm going to say I don't really know.

'Cause, I don't do that. I do. I do know that there's.

Chiranjib Bhattacharjee 8:07

Yeah.

Participant 5 8:11

That we are sending scrap as much as possible to to recyclers, but specifically what scrap and how that, yeah, that would be the jarrah's group that manages that. I'm sure they gave you. I'm sure they gave you good detailed answers. 'cause. I know they know it. Yeah.

Chiranjib Bhattacharjee 8:24

That's that's fine, yeah.

Yeah. Yeah, yeah, yeah. Moving to the next question.

How well do you think ISO 14,000 principles aligned with circular economy practises in your experience?

Participant 5 8:41

Yeah, I I think that ISO 14,000 and one actually really does drive companies to be thinking about.

What kind of?

Waste or impact their their product has and so ISO 14,000 and one has the impacts and aspects analysis

or aspects and impacts and.

That is a really valuable piece that companies can use really kind of think outside the box about what their company does and where their product goes and helps them identify well, all this stuff sort of goes to the trash.

Or to the landfill and uses things up and I. And I think that without using 14,000 and one and I've seen this in in previous roles that I've had that they they really wouldn't have a way to.

Do that analysis, capture it and and present it to top management. So ISO has the piece where you have to do the analysis. Come up with the risk and then make sure top management is aware to then set goals. So I think that all of those elements really bring structure to.

Typically to a way for a company to.

To manage those where if it's just regulations.

In the past, companies often just leave it to the department that manages that regulation, and they say don't don't bother us unless somebody comes in the door and says, oh, you, you're doing something wrong. So it kind of doesn't have a way to get elevated to management level. So I do think 14,000 and one really does help bring that to light through those those elements.

Chiranjib Bhattacharjee 10:37

Yep, that makes sense.

Participant 5 10:40

You.

Chiranjib Bhattacharjee 10:40

Moving to the next question, I think you already kind of answered it, but I'll still ask and you can keep it brief if you want. Can you provide examples of how ISO 14,001 has been integrated with circular or economy principles in your organisation? I think the previous questions basically answer this question, but yeah, yeah.

Participant 5 11:03

That. Yeah, yeah. So maybe I already answered it. But yeah, the the structure of 14,000 and one helps me in circular economy principles.

Based on the risk assessment and and bring it to light with top management.

Our organisation we're we're using this to.

You know, based on our standards and structure, we're already using that.

To.

Put in elements that already talk about.

Product sustainability and reuse and you know we have elements like designing for the environment where we we want to make sure sites are.

When they're designing the product, thinking ahead on how it can be reused, right? So with the conception of the product.

Where we have standards that.

We have standards that sorry, I'm super jet lagged so.

Chiranjib Bhattacharjee 12:05

Mm hmm, no issues, yeah.

Participant 5 12:06

I just. I just flew back. My brain's, like kind of half off.

Anyway, so we we're using it in that 14,001 already. We're using the standard structure that 14,000 and one has if that helps. It's a great example. And then so we put together different standards and that that then will drive.

Chiranjib Bhattacharjee 12:24

Mm hmm. Mm hmm mm hmm.

Participant 5 12:30

Mindset and a thought process to help with promoting circular economy principles.

So they embedded.

Chiranjib Bhattacharjee 12:36

That's a that's a very, very good answer. I would say based on, yeah.

Participant 5 12:39

Oh, is it?

Chiranjib Bhattacharjee 12:42

Moving to the last sections. So there are two aspects that I'm also. These are my mediation variables and quadratic variables, 1 is.

The economic performance and the other is organisational characteristics. So how do you think is implementing ISO 14,001 with circular economic practises?

Can affect the organisation economic performance like the cost aspect of things.

Participant 5 13:15

You know, honestly I have no, I have no idea. I'm. I'm still sort of waiting to see some numbers for that in a company.

Chiranjib Bhattacharjee 13:22

Yeah.

Participant 5 13:24

My my roles have been definitely and it's still consistent where I part of the upfront and the structure and the management, but I then I sort of leave it and and someone else then owns the piece of what's the data and how does it affect it. So I honestly have never really.

Seen the hard numbers.

Chiranjib Bhattacharjee 13:50

Yeah.

Participant 5 13:50

In my career, because I've always, I've either it takes several years and so I've seen it get implemented. I know that it does make a difference, but.

I I don't know how, I don't know.

I can't. I can explain it. So your dear knows that part.

Chiranjib Bhattacharjee 14:06

Like one of in one of in most of the interviews, they were like it positively effects the economic performance. But one of the interviewees, Lee, she said that I don't think it does. It's more of it increases the cost and economic performance so.

Yeah, that's. But yeah, if you don't have the numbers, you cannot give proper answers, OK.



Moving to the last question has how have your organisation, size industry and culture influence implementation of environmental management practises?

And it should not be specific to your current organisation in general from your experience.

Participant 5 14:55

Yeah. So I'm going to answer it from.

The size, industry and culture.

I think those elements dictate whether you can't even focus on implementing environmental management practises.

For example, I so Organization is.

Pretty large organisation.

Comparatively, and because of its size.

It it can.

Have people who do focus on this right? So there are there are amiodarious group. There are five, maybe six or seven. Now people employed dedicated to thinking basically just about.

This topic.

And I mean only and where if you have a company that is.

500 people or less and where I've worked for them, you know, sort of very much startup size.

That we're making something that was still you threw away.

We threw, we threw away a lot of printed circuit boards that could have been recycled.

There just wasn't the bandwidth or the appetite or the business focus to be able to.

Do make any efforts there so they're really if your business is focused solely on.

Just trying to be profitable and continue to exist longer than a couple of years based on funding and you know?

And how much cash is left versus profitability you you just you can't so I think.

Size of the industry itself also drives.

Attitudes.

And and culture really comes from leadership. So if we also, if leadership's not interested whatsoever, then they wouldn't fund it either.

So all of those are huge.

Huge factors and it can just take one piece to break down where the organisation isn't focused on it at all.

## Transcript (Participant 6)

0:0:3.524 --> 0:0:6.644

Chiranjib Bhattacharjee

With your permission, I'll be transcribing this.

0:0:8.274 --> 0:0:16.834

Chiranjib Bhattacharjee

Entire interview and if you give your consent, I'll put your name in my thesis. Otherwise, I'll keep it anonymous.

0:0:21.184 --> 0:0:26.824

Participant 6

You can have the transcript done, but I would request you to please keep my name anonymous.

0:0:29.284 --> 0:0:33.284

Chiranjib Bhattacharjee

OK, so I'll be starting the interview now with the questions.

0:0:34.834 --> 0:0:43.714

Chiranjib Bhattacharjee

To start off, I'll be asking questions on your background and then we'll move to the other aspects of the thesis.

0:0:45.514 --> 0:0:51.154

Chiranjib Bhattacharjee

About your background information, what is the current role and how long have you been in this position?

0:0:54.874 --> 0:1:12.274

Participant 6

So currently I'm working as a manager in the cargo team with Air India. I will see initiatives in projects are also managing operation at one of our domestic hubs. I have been in the position for about 3 years having training shortly after Air India returned to the Tata Group and then we 2022.

0:1:13.834 --> 0:1:25.394

Participant 6

My responsibilities includes implementing sustainable practises in power operations and ensuring compliance with international standards by improving operational efficiency.

0:1:30.504 --> 0:1:31.344

Chiranjib Bhattacharjee

Makes sense?

0:1:33.74 --> 0:1:34.234

Chiranjib Bhattacharjee

Moving to the next question.

0:1:35.964 --> 0:1:43.804

Chiranjib Bhattacharjee

What can you briefly describe what your organisation approach to sustainability and environmental management?

0:1:48.554 --> 0:1:53.914

Participant 6

Air India has adopted a comprehensive approach to sustainability and environmental management.

0:1:55.474 --> 0:2:14.674

Participant 6

We were the first airline in India to establish an environment policy and implement an environment management system. Our EMS is responsible for maintaining data and information related to fuel consumption, carbon emission and energy demand, which helps us develop future action plans to reduce the carbon footprint footprints.

0:2:18.194 --> 0:2:22.794

Chiranjib Bhattacharjee

Makes sense. Moving to ISO 14,001 implementation section.

0:2:24.354 --> 0:2:30.34

Chiranjib Bhattacharjee

First question is has your organisation implemented ISO 14,001? If yes, when?

0:2:31.954 --> 0:2:37.474

Participant 6

Yes, area yes, yes. Chiranjeevi India had implemented this.

0:2:39.34 --> 0:2:49.834

Participant 6

But they don't have the exact date of our initial ISO 14,001 certification. Our EMS has been in place for several years now and follows ISS standards.

0:2:51.514 --> 0:3:3.914

Participant 6

Our commitment to environmental management system has been recognised with several awards, according accordingly we have been awarded several times also for contributing to reducing carbon emissions.

0:3:8.844 --> 0:3:20.244

Chiranjib Bhattacharjee

Thanks Majid. This is very elaborate. Moving to the next question, what benefits has ISO 14,001 brought to your organisation environmental performance?

0:3:21.884 --> 0:3:26.884

Participant 6

Sure. I will give you 3 examples which.

0:3:28.434 --> 0:3:37.634

Participant 6

Has significantly benefited us. Firstly, it has provided a structured framework for identifying, monitoring and managing our environmental practises.

0:3:39.554 --> 0:3:39.874

Participant 6

OK.

0:3:42.484 --> 0:3:48.524

Participant 6

And secondly, it has enhanced our compliance with legal and other regulatory obligations.

0:3:50.74 --> 0:4:4.74

Participant 6

Which is very vital and highly regulated derivation industry, OK. And thirdly, it has facilitated that option of an integrated approach to carbon emission reduction.

0:4:5.794 --> 0:4:8.634

Participant 6

Along with covering every aspect from ground to error partitions.

0:4:17.984 --> 0:4:18.144

Participant 6

So.

0:4:19.394 --> 0:4:26.714

Chiranjib Bhattacharjee

Makes sense. Moving to circular economy practises? How familiar is your organisation with circular economy principles?

0:4:32.574 --> 0:4:33.414

Participant 6

Talking about.

0:4:34.954 --> 0:4:36.554

Participant 6

Regular economic transfer.

0:4:38.714 --> 0:4:39.194

Participant 6

Our.

0:4:41.854 --> 0:4:44.574

Participant 6

You are kind of very familiar to this.

0:4:46.114 --> 0:4:46.994

Participant 6

If you see.

0:4:49.314 --> 0:4:50.674

Participant 6

This principles.

0:4:53.154 --> 0:5:6.314

Participant 6

Is demonstrated through our waste management initiatives such as the project at our Mumbai facility where we convert garden and kitchen waste into organic manure. So this project.

0:5:8.154 --> 0:5:12.874

Participant 6

Exemplifies the economic concept of transforming waste into valuable resources.

0:5:14.514 --> 0:5:21.474

Participant 6

And additionally, as the part of the data Group Air India than anything with Indian product transition to circle economy.

0:5:22.754 --> 0:5:35.634

Participant 6

Which requires collective action, deliberate and coordinated effort across industries. So our leadership recognises the practise and it approaches offer compelling.

0:5:37.434 --> 0:5:41.154

Participant 6

Compelling solution to the challenges of organisation and industrialization in India.

0:5:49.624 --> 0:5:51.744

Chiranjib Bhattacharjee

All right. Moving to the next question.

0:5:53.314 --> 0:5:59.634

Chiranjib Bhattacharjee

What specific circular economic practises has your organisation adopted?

0:6:2.224 --> 0:6:11.104

Participant 6

So there are two three example I will give you. AI will try to give you 2 examples which I remember. So one is.

0:6:12.674 --> 0:6:14.754

Participant 6

Resource efficient meaning system.

0:6:16.374 --> 0:6:27.334

Participant 6

So our new arrow was automated aircraft cleaning system using the waterless process, saving up to 30,000 litres of clean water per narrow body aircraft.

0:6:29.994 --> 0:6:34.154

Participant 6

Up to 75,000 litres per void for the aircraft annually.

0:6:35.714 --> 0:6:47.794

Participant 6

This technology not only conserves water, but also reduces aerodynamic drag, including fuel efficiency and extending aircraft lifespan. OK, and and and.

0:6:49.514 --> 0:6:50.634

Participant 6

The other bit is.

0:6:53.34 --> 0:7:4.874

Participant 6

This recycling and compositing our recycle green product in Mumbai has converted more than 3500 kg of garden in kitchen waste into 500 kilogrammes of organic manure.

0:7:6.104 --> 0:7:17.744

Participant 6

OK, so this is what I remember changing. So I see this as one of the good practises which we have implemented in the recent past.

0:7:20.644 --> 0:7:24.564

Chiranjib Bhattacharjee

And make sense moving to the next question.

0:7:26.74 --> 0:7:26.394

Chiranjib Bhattacharjee

How well?

0:7:27.994 --> 0:7:35.354

Chiranjib Bhattacharjee

How well do ISO 14,000 principles align with circular economic practises in your experience?

0:7:44.384 --> 0:7:48.344

Participant 6

So I will try you to answer this question through some.

0:7:52.404 --> 0:7:54.644

Participant 6

Examples which we.

0:7:56.124 --> 0:7:59.204

Participant 6

As an organisation specifically talking about.

0:8:1.314 --> 0:8:5.394

Participant 6

That team I am in two. So in cargo operation.

0:8:7.314 --> 0:8:16.794

Participant 6

This has prompted us to consider not just our direct environmental impacts, but also those of our packaging, equipment and transportation system.

0:8:18.594 --> 0:8:19.634

Participant 6

So this this.

0:8:22.274 --> 0:8:22.354

Participant 6

Is.

0:8:24.54 --> 0:8:25.214

Participant 6

The lifecycle thinking.

0:8:26.754 --> 0:8:33.394

Participant 6

Which aligns perfectly with the circle economic focus on the entire life cycle of a product and service.

0:8:38.644 --> 0:8:39.524

Chiranjib Bhattacharjee

Makes sense?

0:8:41.154 --> 0:8:42.994

Chiranjib Bhattacharjee

Moving to the next question.

0:8:49.54 --> 0:9:0.54

Chiranjib Bhattacharjee

How can you provide examples of how ISO 14,001 has been integrated with circular economy principles in your organisation?

0:9:3.134 --> 0:9:4.614

Participant 6

Let me think about it once.

0:9:22.494 --> 0:9:28.774

Participant 6

So if you remember, he was talking about the arrow as automated system.



0:9:30.314 --> 0:9:31.754

Participant 6

So if you see.

0:9:34.574 --> 0:9:37.334

Participant 6

It's a kind of a continual involvement.

0:9:38.874 --> 0:10:3.114

Participant 6

Improvement. OK, so ISO 14,001 impasse is 1. Continually improvement has driven our adoption of increasingly sophisticated circular solution. So for example, our progression from manual aircraft keep cleaning with automated system has heard saving around 75,000 litres of water.

0:10:4.114 --> 0:10:6.754

Participant 6

Provide body aircraft annually.

0:10:10.924 --> 0:10:30.884

Chiranjib Bhattacharjee

Makes sense. Moving to the next question, this is more about the economic performance and you of an organisation. How has implementing ISO 14,001 and circular economy practises affected your organisation economic performance?

0:10:35.64 --> 0:10:39.24

Participant 6

So if you talk about this.

0:10:40.634 --> 0:10:43.754

Participant 6

Let me try to give you some examples.

0:10:46.154 --> 0:10:46.234

Participant 6

So.

0:10:47.864 --> 0:10:50.104

Participant 6

So recently what we have done is that.

0:10:51.834 --> 0:10:59.954

Participant 6

We have added some taxi bot to our operations at Delhi and Bangalore airports. So which has.

0:11:2.554 --> 0:11:26.754

Participant 6

Helped us with cost savings along with fuel efficiency. So what does that help? Is that in in over three years we have saved approximately 15,000 tonnes of jet swear. So given the high cost of aviation fuel, this represent a significant cost saving while also reducing our carbon footprints.

0:11:33.544 --> 0:11:35.24

Chiranjib Bhattacharjee

Moving to the final question.

0:11:36.594 --> 0:11:44.874

Chiranjib Bhattacharjee

How have your organisation, size industry and culture influenced implementation of environmental management practises?

0:11:48.734 --> 0:11:51.174

Participant 6

So I will take a bit of.

0:11:52.874 --> 0:11:53.754

Participant 6

Bit of bit of.

0:11:57.814 --> 0:11:59.934

Participant 6

Time to make you understand this so.

0:12:1.714 --> 0:12:9.74

Participant 6

If I talk about size and scale advantages as one of India's leading airlines with an extensive network.

0:12:10.674 --> 0:12:17.314

Participant 6

Our scale has enabled us to implement environmental initiatives with significant humidity impact.

0:12:18.994 --> 0:12:24.34

Participant 6

For example, our reduction of single use plastic by 80% across our worldwide network.

0:12:25.714 --> 0:12:29.274

Participant 6

As a substantial environmental benefit, due to our extensive operation.

0:12:30.804 --> 0:12:46.44

Participant 6

Our ambitious expansion plans to grow to a 400 aircraft lead by 2027 also allow those to implement new sustainability technology at scale, achieving greater environmental and economic benefits.

0:12:48.714 --> 0:12:52.954

Participant 6

Yeah, talking about industry specific challenges and opportunities.

0:12:54.594 --> 0:13:1.874

Participant 6

So when we talk about aviation industry, aviation industry faces a very unique environmental challenge.

0:13:3.594 --> 0:13:7.874

Participant 6

Particularly Liga regarding carbon, carbon emissions and fuel consumption.

0:13:9.904 --> 0:13:14.904

Participant 6

This has focused our environmental management practises and fuel efficiency.

0:13:16.474 --> 0:13:23.634

Participant 6

And initiatives like Taxi board operation and automatic aircraft cleaning to reduce aerodynamic drag.

0:13:25.634 --> 0:13:36.394

Participant 6

As a cargo operation within an air we had, we have had to adopt environmental practises to address specific impacts of air thread while managing the regulatory requirements of both aviation and fabric sector.

0:13:39.54 --> 0:13:40.174

Participant 6

Since we are in.

0:13:42.34 --> 0:13:44.194

Participant 6

A digital transformation phase right now.

0:13:46.954 --> 0:13:49.34

Participant 6

Our organisation is also.

0:13:50.634 --> 0:13:58.194

Participant 6

Transforming. So since returning to the Tata Group in January 2022, Air India has gone.

0:14:0.154 --> 0:14:6.434

Participant 6

Undergone a cultural transformation that has accelerated our environmental initiatives. OK.

0:14:8.874 --> 0:14:9.234

Participant 6

So.

0:14:11.394 --> 0:14:12.954

Participant 6

What we have done is that.

0:14:14.674 --> 0:14:21.314

Participant 6

With our sustainability programme, we have now integrated into our transformation road map.

0:14:23.194 --> 0:14:24.114

Participant 6

Or Wahhab dot AI.

0:14:26.474 --> 0:14:40.594

Participant 6

OK. And being one of the responsible airline air India's constantly looking for ways to improve sustainability and manageable carbon footprint, yeah.

0:14:42.354 --> 0:14:43.754

Participant 6

And when we talk about?

0:14:45.754 --> 0:15:10.154

Participant 6

Our collaborative approach as an organisation we as an organisation encourages collaboration across departments and with external partner. For instances, our environmental initiatives are involved in how, in how the experts working with catering partners in multiple vendors, our recycle green project in Mumbai was implemented through active cooperation between Team Air India Local.

0:15:11.874 --> 0:15:14.594

Participant 6

Municipal authorities and an engineer called Arieli.

0:15:15.784 --> 0:15:16.104

Participant 6

OK.

0:15:18.434 --> 0:15:23.634

Participant 6

Now when I talk about the how we are trying to engage our employees.

0:15:27.154 --> 0:15:29.874

Participant 6

We we as a organisation.

0:15:31.474 --> 0:15:37.114

Participant 6

Feel that until employees are not actively participating, it is.

0:15:39.194 --> 0:15:57.554

Participant 6

All all our initiatives are kind of going into vain. So what we have done is that we have actively pushed our employees to participate and make this successful environmental changes initiatives, OK.

0:15:59.134 --> 0:16:0.814

Participant 6

So when I talk about this.

0:16:2.354 --> 0:16:17.954

Participant 6

I will waste to manual project in Mumbai involve nearly 200 volunteers from different departments demonstrating how our organisational culture supports in environmental engagement at all the levels.

OK.

0:16:19.514 --> 0:16:19.594

Participant 6

Now.

0:16:21.834 --> 0:16:29.954

Participant 6

These are few of our organisational characteristics which have created both challenges and opportunities in implementing.

0:16:31.754 --> 0:16:37.874

Participant 6

Environmental management practises, but our experience shows that with appropriate strategies and leadership commitment.

0:16:38.654 --> 0:16:45.414

Participant 6

Even a large complex organisation in the carbon intensive industry can make significant progress towards the stability.

0:16:57.874 --> 0:16:58.314

Participant 6

Chiranjeev.

0:17:16.144 --> 0:17:19.504

Participant 6

Hello changing my am I audible?

0:17:20.774 --> 0:17:33.94

Chiranjib Bhattacharjee

Yes, you're audible. Thank you for your time and effort. Amarjit. Your insights are very valuable for my thesis and thank you for making time and I appreciate your efforts.

0:17:34.674 --> 0:17:37.754

Chiranjib Bhattacharjee

Shining this interview in a short notice.

0:17:34.834 --> 0:17:35.594

Participant 6

But thank you.

0:17:39.354 --> 0:17:44.674

Participant 6

Thanks. Thanks for inviting me. Thanks to to be, I hope this would be helpful for you. Thank you.

0:17:41.604 --> 0:17:42.4

Chiranjib Bhattacharjee

Thank you.

0:17:45.114 --> 0:17:45.674

Chiranjib Bhattacharjee

Thank you.

## Annexure 2

### Interview Questionnaire

1. What is your current role? How long have you been working in this position?

The question helps in understanding the experiences and views of the interviewee from their role and background.

2. Can you briefly give details of your organization's approach to sustainability and environmental management?

This question gives a perspective of the sustainability practices of the organization. This has been discussed in the literature analysis phase of the thesis in "Sustainability in Business – Benefits and Practices" (Carrillo-Hermosilla et al., 2010; Elkington, 1998).

3. Has ISO 14001 been implemented in your organization? If yes, when and if not when do you plan to achieve it or why have you not considered it?

This question helps identifying the timeline and experience with the implementation of ISO 14001. This also highlighted in the literature review section of the thesis (MacDonald, 2005; Jatayan & Sharma, 2022).

4. What do you think are the benefits that ISO 14001 has on the environmental performance of your organization?

This has been emphasized in the literature and explores the impact of ISO 14001 on sustainability and environmental performance (Zambrano-Carranza et al., 2021; Smithers, 2024).

5. What is the familiarity of your organization with the principles of Circular Economy?

This question has been addresses the awareness for the principles of circular economy and is outlined in the literature (Geissdoerfer et al. 2017; Ellen MacArthur Foundation,2013)).

6. What are some specific circular economy practices that have been adopted in your organization?

This question helps gathering details about the implementation of circular economy principles which has been discussed in the literature under “Principles of circular economy” (Ellen MacArthur Foundation, 2013; Wautelet, 2018).

7. In your experience, how well do you think principles of ISO 14001 align with circular economy practices?

This explores the synergy or relationship between ISO 14001 and Circular economy practices



and has been outlined in the literature under “ISO 14001 and its integration with circular economic practices” Ciravegna Martins da Fonseca (2015) and Sebhatu & Enquist (2007)

8. Can you discuss some examples of how ISO 14001 has been integrated with circular economy principles in your organization?

This question helps collecting instances of the integration and has been discussed under "ISO 14001 Integration with Circular Economic Practices" (Advisera, 2017; Zambrano-Carranza et al., 2021).

9. How has implementing ISO 14001 and circular economy practices has impacted the economic performance of the organization?

This question assesses the economic performance of the organization when tied to sustainability measures and has been discussed in the literature (Minutolo et al. 2019; Oyelakin & Johl 2022).

10. How has the size, industry, and culture of your organization shaped the implementation of environmental management practices?

This question examines the moderating effects of the characteristics of an organization on adoption of environmental management systems and has been discussed thoroughly in the literature.