Master of Information Systems (Digital Business Systems)

Exploring the sustainability phenomenon in the Norwegian ERP market

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Abstract

This study investigates first how sustainability is perceived by the ERP market, defined through the Triple Bottom Line, which relates to economic (profit), environmental (planet) and social (people) sustainability. Second, this study investigates whom the drivers of sustainability are and third, which sustainability-capabilities are available in current ERP systems. The focus is on how these three objectives are perceived by nine Norwegian ERP consultants and one ERP end-user. To answer the research question, the adopted theoretical framework is that of *A dynamic and Sustainable View of the Firm*. This exploratory multiple case study shows that customer requests mainly focus on environmental sustainability and that ERP consultants acknowledge that incorporating sustainability into their services could lead to gaining a competitive advantage. Sustainability is intended to become even more critical in the future and has relevance for policymakers, practitioners, and researchers. Both research and practice of ERP and sustainability are still in its infancy phase and opinions on whether ERP systems currently hold capabilities to support sustainability initiatives differ. Yet, the overall perception on incorporating sustainability initiatives within ERP systems is positive.

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I certify that the work presented in the thesis is my own unless referenced

Signature:

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1. Introduction

One of the most admired definitions of sustainability was created by the Brundtland commission in 1987, led by the former Prime Minister of Norway, Gro Harlem Brundtland. The commission defined sustainable development as: *"Development that meets the needs of the present without compromising the ability of future generations to meet their own needs"* (Brundtland 1987).

Reported by the Statistik Sentralbyraa, the Gross Domestic Product of mainland Norway was estimated to have dropped around 14 percent compared to the beginning of March in 2020 (Bougroug and Sletten 2020). The registered unemployment has increased from around 65 000 to around 290 000 people, and forecasted is that businesses need to prepare for weaker consumption rates throughout 2020 (SSB 2020). In the spring of 2020, Corona/Covid-19 has caused a change from 'business as usual' into a situation where businesses are recommended to create business continuity plans to respond to the disruptions in their current operations (Rice 2020). In times like these, companies have to take a critical view of the way they work. Even before the current pandemic, the economic and social framework in which companies need to operate in had started to shift. Global megatrends such as resource scarcity, environmental pollution, and technological innovation (Retief et al. 2016) have changed the expectations of investors, regulators, societies, and employees toward the roles and responsibilities of organizations (Rezaee 2019).

However, what does it involve being sustainable? Sustainability is often associated with recycling, using renewable energy, reducing the carbon footprint, or managing waste (Ursacescu et al. 2019). While Brundtland's (1987) definition might be comprehensive, Elkington stated in 1994 that this definition was rather general and drilled it down to three paradigms which represent profit, people, and planet (Elkington 1998). Elkington (1998) proposed that organizations are responsible for more than just creating economic value and that they should look into their social (people) engagement and involvement in environmental (planet) initiatives. This paradigm is referred to as the Triple Bottom Line (TBL), which is a tool for measuring organizational performance (Hubbard 2009). The TBL framework is an accounting framework that goes beyond conventional measurements of revenue, return on investment (ROI), and shareholder value to involve environmental and social measures (Elkington 1994).

It has been argued that the currently available literature on information systems (IS) and information technology (IT) shows a knowledge gap within greening and sustainability, which has recently been met with an increase in research on Green IS and Green IT (Jenkin, Webster and McShane 2011). While Green IT and IS refer to initiatives and programs that address environmental sustainability in businesses directly or indirectly (Jenkin, Webster and McShane 2011). Sustainable IS does not only cover the aspect of Green IT (Schmidt et al. 2009). Instead, it discusses the design, implementation, and maintenance of IS that results in sustainable business processes (Boudreau, Chen and Huber 2008), capturing the three-dimensions of profit, people and planet for the benefit of future generations to come (Schmidt et al. 2009). Previous research has already recognized the value of IS research in reaching sustainability goals (Butler 2011; Loock, Staake and Thiesse 2013) which is supported by an increase of sustainability-related publications (Tushi, Sedera and Recker 2014; Esfahani, Rahman and Zakaria 2014). Based on a structured review of eight highly ranked IS journals, Chasin (2014, 347) proposes the following definition of sustainability for IS research: *"Sustainability is a characteristic of a stakeholder activity (organizational process or individual behavior) which impacts on natural and social environments and meets the (economic) needs of the present, without compromising the ability of future stakeholders to meet their needs"*. IS research suggests that in order to promote sustainability initiatives within operations, three critical actions are needed (Bengtsson and Ågerfalk 2016);

- A holistic view of sustainability needs to be actively supported by management.
- Required data collection should be reflected based on management support.
- Systems that are ensuring the opportunity on the reporting of sustainability should be adopted.

Furthermore, research on whether Enterprise Resource Planning (ERP) systems can provide sustainable solutions has mostly been conceptual (Chofreh et al. 2014; Frost, Jones and Lee 2013). Therefore, through empirical research, this master thesis aims to answer the following research question:

Are current ERP systems ready for supporting sustainability initiatives?

The objective of this master thesis is first to explore how the phenomenon of sustainability is perceived by the ERP market. This master thesis focuses on the Norwegian ERP marked and explores the consultant's perspective in the current sustainability initiatives that their clients request. The ERP consultant has long been acknowledged in the process of ERP implementation (Baker and Haddara 2019), as these projects are known for being costly, time-consuming, and somehow problematic when finding the right company fit (Jing and Xun 2007). This master thesis focuses on the Norwegian ERP marked and explores the consultant's perspective in the current sustainability initiatives that their clients request.

Second, to explore who are the drivers of sustainability within the ERP market. A challenge within ERP adoption is that vendors try to structure the systems to reflect best practices, but it is the vendor, not the customer, defining what "best" means (Davenport 1998). This might cause them to neglect customer needs, especially when it comes to industries that require customized features and solutions. As for companies that have the opportunity to perform better with a customized ERP system, they need to have a clear understanding of the business implications (Davenport 1998).

Third, to explore the current state of ERP systems and their possibilities to support businesses in implementing sustainability initiatives. The global business environment is characterized by competitive force and high customer demand on product specifications. Understanding and optimizing business processes is a keystone of success in this fast-changing environment (Mabert, Ashok and Venkataramanan 2003). The majority of ERP systems related studies have focused on capabilities that get a functional ERP system up and running, instead of on capabilities that help create ERP value (Jain 2008).

The thesis is structured as follows: first, the literature review presented in chapter two defines 1) How sustainability is viewed by businesses 2) How sustainability can be presented through four frequently adopted sustainability frameworks, resulting in 3) an overview of sustainability initiatives through the TBL (Elkington 1998), and finally, 4) What an ERP system is. Following the literature review is the methodology presented in chapter three. The method is performed based on the research process recommended by Oates (2006). This study adopted an exploratory, short-term, contemporary multiple case study (Oates 2006) with an underlying interpretivism philosophy (Walshman 1995; Munkvold and Bygstad 2016). Data has been collected through semi-structured interviews (Oates 2006) following the interview

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guide development framework by Kallio et al. (2016). The textual data has been analyzed through inductive (Thomas 2006) color-coding (Knafl et al. 1988). This chapter includes the ethical considerations when conducting research and presents the theoretical framework of '*A dynamic and Sustainable View of the Firm*' (Rodriguez, Ricart and Sanchez 2002) adopted in this study. Third, chapter four presents the findings coming from the conducted semi-structured interviews. Fourth, the chapter following presents the discussion structured through the conceptual framework. The final chapters represent the implications for research and practice (chapter six), limitations (chapter seven), and suggestions for future research (chapter eight) and lastly, the thesis gets concluded in chapter nine.

2. Literature Review

Companies' activities can affect the outside world in ways that do not reflect in their market value. Consequently, how companies manage their natural and human resources' use can affect their ability to create value. Many companies are on their way to sustainability, more as a business strategy that drives economic value, than an environmental initiative (Laszlo 2008, 15). Sustainability may be defined generally or narrowly, but a useful definition must identify the context as well as the temporal and three-dimensional measures being considered (Brown et al. 1987). Ihlen and Roper (2014) analyzed how 30 fortune-500 organizations communicated in their non-financial reports on sustainability and sustainable development. Their analysis of 57 reports from 2006 and 2008 came to the following five conclusions. First, the concepts of sustainability and sustainable development can be classified as common business language and, as such, confirms the high-level priority it has on the corporate agenda. Second, both concepts are perceived as corporate-centric, meaning that overall business survival is seen as a priority over other aspects of sustainability. Third, while the concepts of sustainability and sustainable development are categorized as common business language, the majority of the organizations fail to clarify what is meant by these concepts and treat it as "given". The "balance" metaphor is often applied to describe the relationship between the socio-economic system and environmental issues, and as the term is vague, it allows the organizations to describe most business activities. Fourth, most organizations fail to engage with dilemmas and other problems, which would entail a form of sustainability strategy (Ihlen and Roper 2014). Especially the oil industry is mentioned as a sector that fails to lean into demands with which they confronted, such as the industry's emissions that exceed nature's capacity and its consumption behaviors, which exceeds natural reproduction (Dyllick

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and Hockerts 2002). Fifth, also highlighted as the most important finding, Ihlen and Roper (2014) argued that most of the organizations no longer see sustainability as a 'journey' they are on. Instead, they claim to have already arrived and have been conducting sustainable manners for many years (Ihlen and Roper 2014).

Although societies vary in their conceptualizations of sustainability, indefinite individual survival on a global range requires specific support systems, which can be maintained only with a healthy environment and a stable human population (Brown et al. 1987). Larson, Teisberg and Johnson (2000) investigated how sustainable businesses are creating value for multiple stakeholders and improving—even redefining—excellence in business operations and found that sustainable businesses are not only aligned with innovation but that sustainable companies are profitable and possible. One of the insights on sustainable implementation issues was the poorly implemented programs for measuring sustainability, which made incremental differences in operations (Larson, Teisberg and Johnson 2000). Ihlen and Roper (2014) additionally argue that pressure is needed coming from both government and civil society to stop the concept of "greenwashing". They argue that, as organizations claim to have reached sustainability, and have done so for many years, that sustainability falls into the disaster of "stalling", while change is continuously needed. A call for action is claimed, especially for public policies, to enhance the needs for [sustainability] change (Ihlen and Roper 2014). Sustainability as part of an evolution of ideas that enable operational excellence implies that all outputs, products, and non-products are assets waiting to be recovered, thus eliminating the *concept* of waste (Larson, Teisberg and Johnson 2000). Kleindorfer, Singhal and van Wassenhove (2005) stated that companies would be expected to expand their perspective in managing business operations, including people and the planet, and investing in sustainable technologies, operations, and supply chains. Among many reasons for this were (Kleindorfer, Singhal and van Wassenhove 2005):

1. The increasing cost of materials and energy.
2. Public pressure for environmental, health, and safety performance.
3. Increasing awareness of the TBL.

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2.1 Sustainability frameworks

"Our view is that sustainable development is a combination of how you achieve economic value, along with how you integrate the environmental and social impact into strategy and operations".

- David Kepler (2011), executive vice president of business services, chief sustainability officer, and chief information officer at The Dow Chemical Company (Baya and Gruman 2011, 6).

The following sections outline four common sustainability frameworks that are applied individually to help how organizations communicate sustainability. However, these frameworks have various advantages and disadvantages, according to various literature. This thesis is applying the TBL framework mentioned in the paragraph below (2.1.4), as it comprehensively considers all aspects of sustainability.

2.1.1 Corporate Social Responsibility

The first person to start the trend of social responsibility of businesses was done by Bowen in 1953 through the book 'Social Responsibilities of the Businessman' (Bowen 1953). Since then, the term has been evolved in how it is known nowadays: Corporate Social Responsibility (CSR) (Garriga and Melé 2004). CSR can be defined as "*situations where the firm goes beyond compliance and engages in 'actions that appear to further some social good, beyond the interests of the firm and which is required by law*" (McWilliams, Siegel and Wright 2006, 1). Garriga and Melé (2004, 66) argue that most theories related to CSR focus on the following four aspects: 1) Companies meet their objectives which produce long-term profits, 2) business power is used in a responsible manner, 3) social demands are being integrated and 4) through ethically correct working the organization contributes to a good society. According to Barnea and Rubin (2010), CSR is a 'well-developed industry,' which includes hundreds of websites, newsletters, professions, university degrees, reports, and other documentations (Barnea and Rubin 2010, 71). However, research on CSR is still undeveloped and lacks alignment in theoretical frameworks, empirical methods, and measurements (McWilliams, Siegel and Wright 2006).

2.1.2 Sustainable Development Goals

The Sustainable Development Goals (SDGs) address the global sustainability challenges of assuring human well-being, economic prosperity, and environmental protection (Pradhan et al. 2017), and has been a concept applied by businesses who are setting their course toward sustainability. Businesses are the driving force for economic growth, employment, technology development, and innovation, and play an essential role in solving the global sustainability challenges (Hajer et al. 2015; Stafford-Smith et al. 2017). However, as much as the SDGs are dependent on the business, long-term business success hinges on the goals being realized. This has resulted in calls for integrated initiatives around trade, food, business, and other areas of policy alignment to support poverty reduction, human rights, and the environment (Stafford-Smith et al. 2017).

2.1.3 Sustainability Accounting

Sustainability accounting as a concept has emerged from developments in accounting over the years (Schaltegger and Burritt 2010) and was recognized as a subsection of financial accounting that focuses on information regarding non-financial reporting on business performance to external stakeholders such as investors, creditors and the government (Tilt 2009). Another aspect is the managers' reporting to deliver relevant data for decision-making, planning, and control (Burritt 2002; Horngren et al. 2010). Both these aspects reflect the behaviors that specifically affect an organization's success in society, environment, and economy (Lamberton 2005). Sustainability accounting is often related to the TBL, where Elkington (1998) also refers to sustainability accounting, which aims to report on an organization's economic, social, and environmental issues. This recognizes the role of financial reporting and shows how traditional accounting is extensive by improving transparency and accountability through reporting on the three aspects (Gray 1992). According to Schaltegger and Burritt (2010), there are six specific explanations on why executives should be motivated to set up an accounting program that offers detail on sustainability issues for evaluating company actions: (1) Greenwashing, (2) mimicry and industry pressure, (3) Legislative pressure, stakeholder pressure and ensuring the "license to operate", (4) self-regulation, (5) corporate responsibility and ethical reasons and (6) managing the business case for sustainability.

2.1.4 Elkington's Triple Bottom Line

The paradigm referred to as the TBL outlines sustainability as the economic (Profit) bottom line, the environmental (Planet) bottom line, and the social (People) bottom line. Each bottom line represents a wide variety of data and analysis (Elkington 1998).

Profit: This aspect includes economic capital that refers to how a sustainable corporation assesses its business operations and the economic capital that consists of the total value of the business assets minus business liabilities. Businesses are required to report the profit that they achieve over a given period, which is published in the income statement. This part of the TBL includes human capital, which measures the experience and skills of individuals who make an organization (Elkington 1998).

People: The people or the social aspect is probably the most challenging TBL element to measure. It assesses the extent to which a business is socially responsible. This also comprises human capital, in the form of public health, business, and education, yet it embraces a broader assessment of the opportunity for good welfare and wealth formation (Elkington 1998).

Planet: This aspect views how business activities impact the environment. This can be challenging because some measures of impact on the environment, such as the implications for energy prices, measuring carbon emissions. The inputs into the production process are difficult to measure without the right data (Elkington 1998).

2.2 Defining sustainability through the Triple Bottom Line

Research suggests that it is expected from organizations to incorporate sustainability in all three bottom lines; environmental, social, and economical (Elkington 1998; Melville 2010; Porter and Kramer 2006). The interrelationship between these three dimensions is, therefore, important to achieve sustainability (Malik 2019). Hence this thesis is applying the TBL approach as it comprehensively recognizes all aspects of sustainability.

2.2.1 Profit

The traditional belief that businesses' only real moral obligation is to the shareholder (Smith 2003) meaning: to reward its shareholders, make profit, get dividends and returns as long as the business is operating within the parameters of the law. The stakeholder theory requests

businesses to have a moral obligation to more than just their shareholders (Smith 2003). That means not accounting for the needs of the businesses' shareholders, but considering other stakeholders. At the business level, sustainability is mainly equated with economic or financial sustainability (Dyllick and Hockerts 2002). Therefore, profit and loss accounts and balance sheets are expected to be seen in the company's reports. However, when it comes to economic sustainability, there is a lack of generally accepted indicators that include long-term economic sustainability (Elkington 1998). Businesses wanting to embrace sustainable business practices will need to integrate their economic objectives with environmental and social objectives (Cramer 2002). The availability of data could eventually guide the TBL estimates (Slaper and Hall 2011). Organizations have access to an increasing pool of information on the buying preferences of individual customers, allowing them to match their output more tightly with customer needs (Cramer 2002).

In the extent research, economic sustainability indicators are described as variables that deal with the economic bottom line and the flow of money (Slaper and Hall 2011). Business efficiency, productivity, rate of return and payback periods for capital investments, customer value, waste management, inventory turns, cost of servicing capital, earnings before interest and tax, times interest earned, gross and net profits and liquidity are some of the proposed examples (Raza 2018, 50).

The TBL approach is underpinned by how the three pillars of profit, planet, and people also work together to achieve a sustainable organization, and among the three is the environmental-economic aspect. Environmental-economics is not just about producing and consuming; it can also mean conserving and thinking about the costs and benefits, the advantages and disadvantages of environmental protection (Smith 2011), and the desire for prosperity and growth, with the need to protect our natural resources. Currently, companies continually face the question of how to recover goods or resources from consumers, either for purposes of value recovery or as after-sales products (Oltra-Badenes et al. 2019). This means waste management (Hoornweg and Bhada-tata 2012), remanufactured products (Ardente 2018), recycling, or reverse logistics (Oltra-Badenes et al. 2019). To give an example by viewing accounting history: companies try to manage waste using the 'first in, first out' (FIFO) method to manage inventory flow. The assumption is that the earliest goods purchased are the first to be sold, where the benefits of using FIFO are: higher profit, financial statements are harder to manipulate, and less waste (Kimmel, Weygandt and Kieso 2019). Similar to the environmental- economics aspect, managing resources, particularly natural

resources, results in an increase in revenues and the ability to manage waste. As environmental responsibility and awareness grow, methods such as reverse logistics and waste management become relevant and important. However, it was found that ERP solutions that specifically implement reverse logistics are unavailable in many ERP systems (Oltra-Badenes et al. 2019). The benefits of integrating these initiatives in the ERP system will result in product recovery, calculating forecasts, including product return forecast, and transport management. Combining direct and reverse transport can result in considerable savings, as this allows transport costs to be optimized (Oltra-Badenes et al. 2019).

2.2.2 Planet

The lack of sustainability practices will cause scarcity of essential raw materials (through pollution, depletion, and waste), from foodstuffs to fuels, from wood to water (Baya and Gruman 2011). From 1970 to 2017, the global extraction of biotic and abiotic materials expanded by more than 240%, reaching a volume of 92 billion tonnes in 2017 (Lutter, Giljum and Gözet 2018). The value of natural materials and materiality is being redefined, where the concept of materiality, meaning, how companies report on their natural capital, is important for decision-making related management areas, in particular for accounting (Juma'h 2009). Elkington's (1998, 20) environmental bottom line requests companies to raise questions on *"what forms of natural capital are affected by our current operations? - and will they be affected by our planned activities? Are these forms of natural capital sustainable given these, and other, likely pressures?"*. Gajic et al. (2012) conducted two case studies on oil and gas companies and found that one of the reasons for ERP implementation was the need for material resource planning. A study was done by Gulla and Brasethvik (2002) on ERP systems in terms of material management illustrates the material flow of how the material data enters the warehouse, goes through accounting and purchasing. The concept of materiality is being expanded to include not only assessing the impact of the company on society and the environment, but also financial performance (Juma'h 2009). The 'UN guidelines on reporting climate-related information' report (2019), under materiality, 'the impact of the company's activities' presents a new element to be taken into account when assessing the materiality of non-financial information. It states that climate-related information should be reported if necessary to understand the company's external impacts (European Union 2019).

According to Elkington (1998) the growing need to measure environmental impact in terms of using new metrics measuring the life-cycle impact of materials, water, energy usage, polluting emissions, waste generation, consumption of critical natural capital and performance against best-practice standards, which is set by leading customers and green and ethical investment funds. In terms of investment, there is an increasing focus from investors on environmental, social, and governance (ESG) issues and how climate can be a financial risk or opportunity to companies (Fink 2019). When investors consider the opportunities and risks of investing in companies, the environmental aspect should be a part of the investment analysis. Furthermore, how companies respond to these risks and opportunities may have significant financial implications and can, therefore, affect the performance of the investors' portfolios. This could also have a considerable influence on non-financial reporting requirements and standards, particularly relevant for large companies and stock-listed companies (Pfeifer and Sullivan 2008). Investors tend to give more attention to the non-mandatory information in a report (Watts and Zimmerman 1987).

2.2.3 People

The attribute of 'People' refers to the social sustainability of an organization. Social sustainability indicators look at the organization's social environment but also include how the community views the organization by defining its reputation. Aspects that could be included are safety and environmental accidents, the rate of complaints, human rights and child labor complaints, customer satisfaction, community engagement initiatives, and contribution to charities or contributed employee days (Raza 2018, 50). The social aspect of sustainability in research can be explained as neglected (Vallance, Perkins and Dixon 2011), and when it is used, it mainly focuses on legislation issues, and health and safety (Hutchins and Sutherland 2008). Due to the vagueness of what social sustainability entails and the differences in priorities coming from multiple stakeholders, organizations are facing difficulties implementing improvements in their business operations (Jones, Michelfelder and Nair 2015). The people pillar can be classified as the most difficult to incorporate (Malik 2019). To look at social sustainability, theories coming from sustainable Human Resource Management (HRM) can be addressed to explore the effect on society when adopting social sustainability initiatives in businesses'. Roca-Ruig (2019, 918) describes the concept as following: *Sustainable HRM implies social norms that contemplate the ethical principles of loyalty, trust, mutual commitment and equity in labor relations and, therefore, stimulate sustainable individual and organizational behavior*". The same research discusses the

importance of the HRM strategy and states that this type of strategy correlates with the sustainable development of society, as both poverty and inequality in society can be reduced through the HR investment strategy. The latter entails competitive employee benefits, stable employment through permanent contracts, and additional training (Roca-Puig 2019). Moreover, social sustainability focuses on globalization, communities and cultures, and businesses that are concerned with this pillar are expected to result in an organization being reputable, respectable, and less vulnerable to risk (Ajmal et al. 2018). Leseure (2018) found that research within operations and supply chain focusing on social sustainability shows that concepts such as sustainability, TBL, and CSR are based on the same specifications. Not everybody agreed on the need for businesses to adopt social sustainability or CSR. Argumentations against CSR imply that the only responsibility an organization has, is to make profit and that social responsibility only falls on the shoulders of government and legislation (Friedman 1962), including the supposed lack of expertise and social skills in management to make decisions that are socially oriented (Davis 1973). However, times have changed, and businesses now realize that current actions must ensure long-term viability, also taking into consideration the social pillar of sustainability (Carroll and Shabana 2010). A definition from Dyllick and Hockerts (2002, 134) is adopted to explain what it entails to be classified as a socially sustainable organization: "*add value to the communities within which they operate by increasing human capital of individual partners as well as furthering the societal capital of these communities. They manage social capital in such a way that stakeholders can understand its motivations and can broadly agree with the company's value systems.*"

2.3 Literature related to ERP systems

In recent years, ERP systems have helped organizations achieve objectives such as; decrease total costs, improving productivity, and increasing ROI. ERP systems are modular and bundled IS that integrates enterprise-wide business processes and functions (Bjelland and Haddara 2018). It promises one database, one application, and a unified interface across the entire enterprise (Bingi, Sharma and Godla 1999). ERP systems intend to serve business processes housed within functional areas that include information and data on vendors, customers, employees and products integrated through standard business (Mishra 2011; Haddara, Fagerstrøm and Mæland 2015) and hold standardized modules such as logistics, finance and accounting, human resources, payroll, sales/marketing and manufacturing

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planning and control (Aladwani 2001). One of the most widely adopted IT solutions in an organization is ERP systems (Al-Mashari, Mudimigh and Zairi 2003). Both research and practices have recognized ERP systems as beneficial for organizations and believed to improve the speed with which information streams through an organization (Davenport 1998; Mishra 2011). While ERP systems can be costly to implement, various researchers' emphasize the importance of the selection in the early phase in the ERP adoption process and implementation of an ERP system (Haddara 2018; Zimmerman and Smedley 2006; Bingi, Sharma and Godla 1999). One of the main drivers for ERP adoption would be the technical and operational integration of business functions to harmonize the information stream with the material flow of goods or services (Beheshti 2006). ERP systems integrate both processes and functions of an organization, creating a seamless, efficient, and more transparent way of executing business operations (Gupta et al. 2018). They have been invented to strengthen all aspects of key operations within organizations by integrating and coordinating processes and functions formerly divided and supported through multiple standalone business systems (Bradford 2015). Business operations are operational activities related to short-term, everyday decisions and actions (Waldron, Vsanthakumar and Arulraj 1997). Examples of operations include accounting, purchasing, sales, manufacturing, and logistics (Bradford 2015). Considering the logistics operation, for example, this represents all the activities that are required to move products through an organization's supply chain (Bin and Chaoyuan 2005). In order to serve both operations and decision-making needs of an organization, the ERP systems' foundation is a well-structured database. Data integration leads to better visibility in the business operations for stakeholders, as all information is gathered and serves as the single version of the truth within an organization. ERP systems, in that sense, show current, complete, and accurate information, which is a benefit for all its users (Bradford 2015). When adopting an ERP system, there are several challenges that an organization has to be aware of, such as the degree of business process re-engineering, customization, and change management required to best fit with the organizations' adopted ERP system (Elragal and Haddara 2012). A vanilla implementation is described as one of the least risky implementations as it keeps the business process re-engineering to the minimum and keeps the core ERP functionalities and process models (Al-Mashari, Mudimigh and Zairi 2003). Haddara and Zach (2011) explain that adopting ERP standard best practices is the aim of many small and medium-sized enterprises as they see it is an opportunity for standardization and a link to more significant markets. However, these standardizations could come with difficulties as they are monolithic software packages that may not sufficiently accommodate

complex organizations (Wagner and Newell 2004). Factors like top management support (Costa et al. 2016, 7), experienced consultants (Baker and Haddara 2019), the involvement of the user in defining ERP system expectations (Wu and Wang 2006), and organizational readiness (Chircu and Kauffman 2000) are considered when implementing ERP systems.

2.4 Cloud-based ERP systems

Though traditional ERP systems have various advantages and abilities of broader flexibility and integration capabilities, other software applications have moved to cloud computing (Duan et al. 2013). The emergence of cloud computing technologies started in late 2000 (Peng and Gala 2015), where eventually cloud-based ERP systems transformed the way systems are offered, acquired, implemented, used, maintained, evolved, and even retired (Bjelland and Haddara 2018). On-premise ERP solutions responsibility' is to maintain its own IT infrastructure, meaning the hardware, which includes the servers, storage, power, network, etcetera. Cloud ERP is nothing more than hosted ERP on a Cloud provider (Kiadehi and Mohammadi 2012). Meaning that an organization can access its ERP system via the internet, which is hosted at a vendor's site. The vendor, therefore, holds the responsibilities on updates, server management, maintenance, and the creation of back-ups (Haddara, Fagerstrøm and Mæland 2015; Bjelland and Haddara 2018, 2). A cloud delivery model consists of three layers, namely Software-as-a-Service (SaaS), Platform-as-a-Service (PaaS), and Infrastructure-as-a-Service (IaaS) (Kavis 2014). Johansson and Ruivo (2013, 98) argue that *"costs, security, availability, usability, implementation, ubiquity, flexibility, compatibility, and analytics"* are factors influencing the adoption of the cloud- ERP system. Concerning the environmental aspect within sustainability, cloud computing could lead to a potential reduction in worldwide data centers, dispersed IT usage, and energy expenditures (Sarkis, Koo and Watson 2013). Other advantages of Cloud ERP may be: optimizing the efficiency of electricity usage, increasing recycling activities, lowering oil and gas pollution, and mitigating energy consumption in cooling the existing centers (Sarkis, Koo and Watson 2013).

2.5 Sustainable ERP

Academics have started conceptualizing a possible 'Sustainable ERP system' (S-ERP) that can address sustainability initiatives and needs in organizations. Chofreh et al. (2014, 142) applies the TBL as a framework and defines S-ERP system as *"an information system that is*

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driven by sustainability consideration that covers all aspects of the value chain. S-ERP systems can be viewed as a holistic, integrative, and complete solution for sustainability business issues". Chofreh et al. (2014) also combined Porter and Kramer´s (2006) research on the value chain creation and Mentzer et al. (2001) internal and external relationships such as customers, suppliers, stakeholders, and third-party suppliers. This was done to address the importance of sustainability-related data on all three sustainability dimensions for the internal and external stakeholders. By integrating business processes from the end consumer to original suppliers in terms of products, services, and information; the organization can provide additional value for the consumer or supplier and thereby increase the value of the entire value chain (Chofreh et al. 2014). According to Chofreh et al. (2014), achieving sustainability in organizations requires a holistic, integrative, and complete view spanning the entire supply chain, including the product manufacturing process, its fabrication, and the manufacturing systems across several products life-cycles, as can be seen in figure 1.
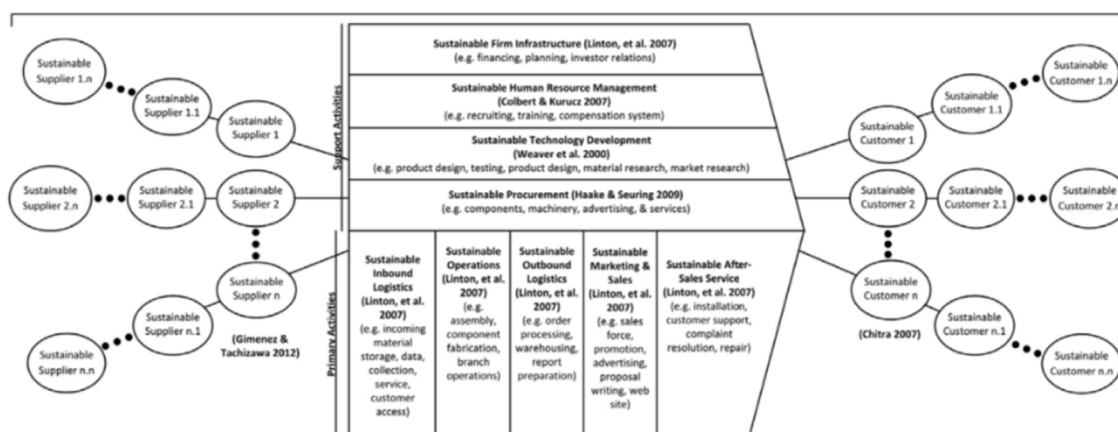
Figure 1: Sustainability research in value chain adapted from Porter and Kramer (2006) and internal and external relationships adapted from Mentzer et al. (2001). Adopted by Chofreh et al. (2014).

However, since research on the S-ERP system is still in the infancy phase, Hasan et al. (2017) developed sustainability performance indicators that can be adopted as a part of the integration of sustainability elements into the ERP system. These performance indicators are divided into the three pillars of economic, social, and environmental dimensions and were presented as the sustainability elements required in S-ERP (Hasan et al. 2017). With their research, they discovered 63 sustainability indicators whereas 21 of them represented the economical aspect, 26 represented environmental indicators aspect, and the remaining 16

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represented social indicators that can be implemented as a part of the integration of sustainability elements into an ERP system (Hasan et al. 2017).

3. Method

In order to achieve the objective clarified in the introduction, the following research question has been answered: *Are current ERP systems ready for supporting sustainability initiatives?*

3.1 Research design

The following paragraphs present greater clarification on the research design, including how data will be collected and analyzed to answer the research question. The decision was made to take on a qualitative research approach. Focusing on qualitative research is particularly appropriate within IS study emphasizing on ´managerial and organizational issues associated with innovation in information and communications technology' (Myers 1997; Munkvold and Bygstad 2016, 2). Figure 2 summarizes the research design adopted for this master thesis, following the research process based on Oates (2006, 33).

Figure 2: The research process based on Oates (2006, 33).

3.2 Research strategy

3.2.1 Multiple case study
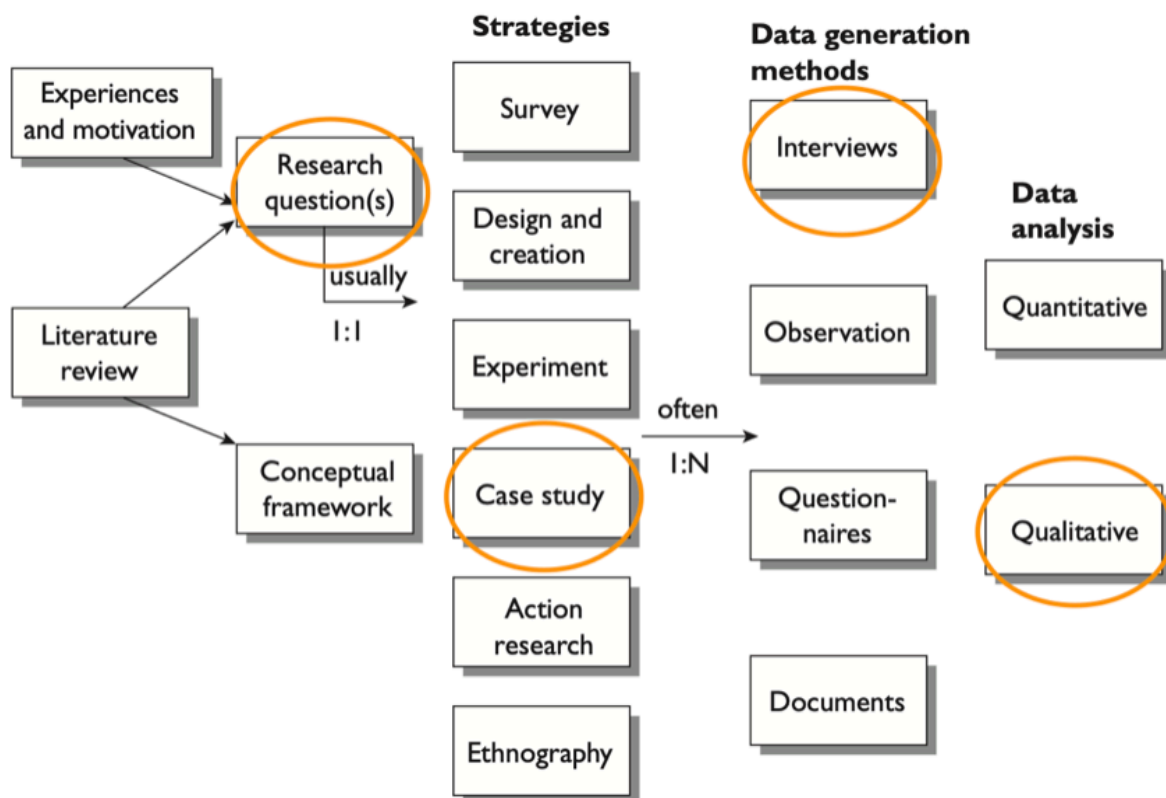
A qualitative case study is an empirical inquiry that investigates a contemporary phenomenon in depth and within its real-life context, especially when the boundaries between the phenomenon and the context are not clearly evident (Merriam 1998). To adequately understand the developing parameters of a business and its responsibilities, exploring what the researchers call 'the sustainability phenomenon' is essential to ensure that business operations do not have a detrimental effect on the environment or human habitation (Campbell and Mollica, 2009). As the study focuses on the current situation, this research is classified as a short-term, contemporary study (Oates 2006). In order to understand the sustainability phenomenon, an exploratory multiple case study was conducted. Exploratory research is adopted to investigate and explain the reason a certain phenomenon occurs (Yin 2009). This type of research is frequently used when there is limited literature available on the chosen topic, which could help to identify topics for future research (Oates 2006).

A multiple case study will enable in-depth analysis, taking into consideration a holistic study where the focus is on all the different stakeholders that are usually connected with ERP systems, such as the ERP consultant and the ERP end-user. What characterizes a case study is that it has an in-depth focus on one instance of the phenomenon that is being investigated. Furthermore, the study takes place in a natural setting and concentrates on the complexity of relationships and processes (Oates 2006, 141-142). The researchers' approach is not to influence the phenomenon, but rather study the phenomenon with other cases under the same context.

3.2.2 Interpretivism

The case study strategy has three underlying philosophies that can be adopted when doing research: positivism, interpretivism, or critical thinking (Oates 2006). As the research involves the social issues related to IS, and the human interpretations and meanings will be a central theme throughout the product (Walsham 1995), the chosen paradigm is that of interpretivism. Moreover, the researchers are interested in understanding the individual's experiences and interpretations of the researched phenomenon (Munkvold and Bygstad 2016). Munkvold and Bygstad argue (2016, 5-6) that the "distinguishing characteristics for

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interpretive research" are "multiple subjective realities and multiple interpretations".
Interpretivism is a research philosophy that acknowledges that the social world cannot be
detached from objective truth and that all observation is value and theory-laden (Leitch, Hill
and Harrison 2010).

Table 1 showcases the decisions made throughout this research to ensure that the
interpretivism philosophy was conducted in the correct manner, based on the guidelines
suggested by Munkvold and Bygstad (2016, 8).

Table 1: Guiding questions for distinguishing interpretive research (Munkvold and Bygstad 2016, 8).

Guiding questions	Answers (Yes/No)
Data collection	
Does the interview sample target all available stakeholder groups?	Yes, the research emphasizes the stakeholder group of the ERP consultant but has also included ERP researchers and one ERP end-user. Some of the ERP consultants also have previous experiences as an ERP-end user.
Do you use multiple methods for data triangulation?	No, this research has only used one data generation method which is that of semi-structured interviews.
Do you intend to avoid research bias in the data collection?	No, interpretivism researchers acknowledge that researcher bias is unavoidable, yet have been avoided as much as possible throughout the study.
If your research includes multiple cases do you apply a replication strategy for your selection of cases?	No, the decision to go for multiple cases was to strengthen insights coming from different settings and to see if the results would vary based on the participant's experiences and contextual influences.
Data analysis	

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Do you use researcher triangulation in your coding and analysis?	Yes, with this answer the researchers are not following the criteria of Munkvold and Bygstad (2016). However, as the research is done by two people that both participated in the coding and analysis, a consensus in the results has been made. This might have reduced the effect of researcher bias.
For cross-case analysis, do you focus on both similar and contrasting findings between cases?	Yes, while the findings have also been structured to find similarities in findings that are supported by several of the cases, contrasting details have been given extra attention. This was important for the researchers, as there are many ways to embrace the phenomenon of sustainability.
Validation	
Do you apply 'traditional' criteria (reliability, validity) for judging the quality of your research?	No, as can be seen in paragraph 3.2.3, this research adopted interpretive criteria such as trustworthiness, confirmability, dependability, credibility, and transferability.
Do you take into consideration feedback from the informants that questions your interpretation of the findings?	No, while initially planned to send the findings to the participants after completion. Due to time limitations and changes in the current situation, this was postponed and has not been completed.
Reporting your findings	
Do you discuss multiple possible interpretations of your findings?	Yes, the research has focused itself on multiple interpretations and acknowledges that there is no single, 'true' explanation.
Do you present your conclusions as predictive for similar settings?	No, the researchers acknowledge that generalization can be problematic, however, the conclusions can help future research to see existing problems in their contexts and find opportunities for further research.

3.2.3 Research quality

To judge the quality of the research, the researchers looked at the trustworthiness of the research through four criteria: confirmability, dependability, credibility, and transferability (Oates 2006; Shenton 2004). The clarification on and the implementation of the different criteria based on provision provided by Shenton (2004; Lincoln and Guba 1986) can be found in table 2.

Table 2: The trustworthiness of the research provided by Shenton (2004; Lincoln and Guba 1986).

Quality criteria	Adoption in research
Trustworthiness *Rigor*	The trustworthiness of the interpretive research is often questioned by positivist research; hence, this research adopts four criteria which correspond with the criteria adopted by positivist research (Guba 1981; Shenton 2004): - **Confirmability**, instead of objectivity - **Dependability**, instead of reliability - **Credibility**, instead of internal validity - **Transferability**, instead of external validity
Conformability *Objectivity*	Conformability assures that the findings of the research are coming from participants, without the characteristics and preferences of the researcher. It also considers how researcher beliefs have been involved in decision making and the methods applied. The following providers have been adopted to ensure conformability (Shenton 2004, 72): 1. *Reflective commentary:* within the methodology, the researchers have addressed personal decision-making; including reasons for favoring specific approaches over others as well as admitting weaknesses in the employed research techniques, which can be found in chapter 8 limitations.

Dependability *Reliability*	Relates to the necessity to describe in detail the process of the research in order for future researchers to repeat the study when needed or interested. The following provisions have been adopted to ensure reliability (Shenton 2004, 71-72): 1. *The research design and its implementation;* the methodology provides an inclusive research plan and review on execution 2. *The operational detail of data gathering;* all steps in data collection and analysis have been included.
Credibility *Internal validity*	Answers the question: How congruent are the findings with reality? (Merriam 2009, 242). Various provisions have been adopted to ensure credibility (Shenton 2004, 64-69): 1. *Random sampling:* the selection of the cases presented was based on an ERP marked report received from Devoteam; the participants connected to these cases (organizations) have been sampled randomly. Meaning that from every organization, the first three people with an ERP consultant position based on LinkedIn searches received a request to participate in the research. 2. *Tactics to help ensure honesty among participants:* all participants signed a consent form which allowed them to withdraw from the research at any point of time. The form also included that participation would remain anonymous, which allowed the participant to freely bring in suggestions and experiences without having to fear losing credibility, both internal and external of their employer. 3. *Adoption of well-established research methods;* all attributes of the research design have been decided before execution based on related research within IS. 4. *Frequent debriefing sessions with supervisor:* through bi-weekly collaborative meetings, the researchers ensured that any flaws within proposed actions were removed and that vision of the researchers

	continued to be challenged as the supervisor brought in his experiences and perception. 5. *Qualifications of the researcher:* both researchers have previously published papers on similar subjects. 6. *Member checks:* considered as the most important provision by Guba and Lincoln (1985). The researchers have provided the interviewees with the opportunity to evaluate the description of the findings for confirmation on whether the 'write-up' has been done in a correct manner (Oates 2006). 7. *Examination of previous research findings;* findings in this research has been compared with previous research to judge whether they are consistent.
Transferability *External* *validity*	Answers the question; To which extent can the findings of one study be applied to other situations? (Merriam 2009, 39). The following provisions have been adopted to ensure transferability (Shenton 2004, 69-71): 1. *Thick description;* the context through the background of the data has been documented and described in detail. This is done to support the following research in relating the findings of this research to their chosen domain (Guba and Lincoln 1985).

3.3 Data Collection Method

The data collection phase lasted from mid-February until the end of April in the year 2020. Respondents were asked to participate in a one-hour interview and were given a choice between a face-to-face or Skype interview. Due to limitations in the current Covid-19 pandemic, all interviews in later stages of the research have been conducted online. All interviews have been conducted in English.

3.3.1 Interviews

During the process of deciding the research design, interest has been shown to adopt surveys to generate data instead of interviews. However, this research has a high focus on how the participants define sustainability, as there is a high level of inconsistency on the subject.

Therefore, a decision was made to obtain interviews, as this is a way to access the informants' interpretations in the field. Interviews are suitable for research designs that focus on obtaining detailed information, including questions that are complex and/or open-ended, and explore experiences that are not easily observed (Oates 2006, 187). When conducting interviews, a choice can be made between structured, semi-structured, and unstructured interviews. This research has conducted semi-structured interviews since the interviewees are encouraged to talk more openly about the topic as it creates space for themes and issues that the interviewers have not prepared. This type of interview allows for a more natural 'conversation' in which the order of questions can be adjusted, and the interviewers can build on the opportunity to ask follow-up questions (Oates 2006). As current information on the connection of the different themes, as far as the researchers know, is limited (Chofreh 2014), the interviews have been an important guiding point and have been used as a base for future decisions on the adopted theoretical frameworks and the creation of the conceptual model.

3.3.2 Interview guide

As shown in figure 3, for the development of the two interview guides, a framework provided by Kallio et al. (2016) has been adopted to follow a concise development process. These five interrelated phases support the trustworthiness of qualitative research;

- Correct execution of phase one and two support the credibility of the research through choosing the right type of data collection (Jensen 2008). The choice of data collection method is defended in paragraph 3.3.1.
- The correct execution of phase three supports the confirmability of the research. This enabled the researchers to create an interview guide based on the themes discovered through previous research, which reduced subjectivity coming from the researchers (Guba and Lincoln 1985).
- Phase four and five support the dependability of the research. As can be seen in the figure, expert assessment and field-testing were adopted to ensure the quality of the data collection (Chenail 2011) as well as the creation of a data collection tool to be utilized for future research (Shenton 2004). Expert assessment was utilized by receiving feedback from the supervisor, which removed ambiguities and suggestive questions (Barriball and While 1994) and included questions that were not considered before. Moreover, field-testing was only adopted for the interview guide for the ERP consultants. This enabled the researchers to change the flow of certain questions to allow a more natural conversation.

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Phase 1: Identifying the prerequisites to use semi-structured interviews

Is this method of data collection appropriate for the chosen research question?	Interview are conducted to be able to interpret the perspective of the participants on the phenomenon

Phase 2: Retrieving and utilizing the previous knowledge

Which actions did the researchers take to adopt a coprehensive and adequate understanding of the chosen research topic?	1) A literature review has been conducted to form the basis of the first version of the interview guide 2) Both researchers participated in an alumni-event called 'Framing sustainability' hosted by Norwegian Busines Institution (BI)

Phase 3: Formulating the preliminary interview guide

What questions and follow-up questions are needed to create the interview guide?	1) The main themes were identified based on the literature review 2) The interview guide followed a logical order including follow-up questions 3) The interview guide was formulated in such a manner that allowed for fluency in conversation style

Phase 4: Pilot testing

What are the improvement points in the first versions of the interview guide?	Phase 4.1: Expert Assessment Phase 4.2: Field-testing

Phase 5: Presenting the complete interview guide

Figure 3: Phases adopted for the creation of the semi-structured interview guides (based on Kallio et al. 2016, 2962).

3.3.3 Case selection

A dilemma when conducting research is deciding on how many interviews are enough to answer the research question, taking into consideration data saturation (Guest, Bunce and Johnson 2006). Marshall et al. (2013) have examined 83 IS qualitative studies coming from leading IS journals to investigate how researchers estimate and justify their sample sizes of qualitative interviews. However, their main conclusion in justifying sample sizes showed little

rigor in IS research to justify those numbers. Marshall et al. (2013) recommend three types of best practices to support IS researchers in justifying their sample size. These best practices include 1) citing recommendations from qualitative methodologists, 2) adopting similar sample sizes based on studies with a similar design or research problem, and 3) data saturation (Marshall et al. 2013, 19). Considering data saturation in this research, a distinction has been made between the data needed from consultants (Appendix C) and data needed from end-users (Appendix D). For the consultants' interview guide, the right depth of data was found after completing the 7th interview, as no new themes got introduced in the following interviews. However, a critical reflection on the number of participants conducting interview guide D is needed. As has been clarified before, the ERP system is used for many operations, in many sectors, by many professions. Data saturation is, therefore, less applicable, including the consideration of the researchers' time limitations in the available period when conducting the interviews.

3.3.4 Participant group: ERP consultants

Wang and Chen (2006) conducted a survey demonstrating that the consultant can facilitate communication and conflict analysis in the ERP consulting process and support the improvement of ERP system quality. Consultants from different companies that work with different ERP systems have been interviewed to dive deeper into the concept of sustainability as one single case study will not be representative enough to study the phenomenon, and the findings might not be relatable to the other companies in the ERP market.

The initial selection of participants for the ERP consultants was based on the report 'ERP system in Norway' provided by Devoteam, which showcases an overview of the ERP market in Norway. According to the evaluation in their report, the Norwegian market consists of eighteen relevant ERP systems. These systems focus on the mid and enterprise market, are actively marketed, and have the vendor located in Norway. The systems have to be available for the upcoming years, may not focus on one specific industry, and have to cover several ERP process areas, including finance (Devoteam 2020, 6). Potential participants were contacted through a LinkedIn message, an email, or a phone call. In total, 66 potential participants have been approached to participate in the research. After the first iteration of interviews, the snowball sampling method (Yin 2009) was adopted to recruit participants coming from their personal ERP network.

Furthermore, two researchers focusing on ERP literature have been interviewed to provide additional knowledge on themes that have received limited previous attention in ERP research, such as sustainable ERP. While not active in the Norwegian market, the researchers made a judgment-call that their technical knowledge of ERP systems was valuable information for the performed research. Fortunately, both participants are also active as ERP consultants and were therefore informed on sustainability demands from a consultant perspective. A total of ten participants in the ERP consultant group have been interviewed. One participant's data has been completely removed from the data file, as it lacked the necessary information for this study. Table 3 shows the information on the nine participants from which the data has been used. Participant C and G are the only participants who work for the same organization.

Table 3: The nine participants from which the data has been used.

Part. code	Stakeholder group	Position	Industry / market	ERP system	Type of interview	Length of interview	Interview guide
A	ERP Academic & ERP distributor	Researcher & Consultant	Information Technology & Services / Local	Microsoft Dynamics NAV	Skype	50:45	App. C
B	ERP distributor	Consultant	Information Technology & Services / Local	Xledger	Face-to-Face	1:15:14	App. C
C	ERP distributor	Consultant	Information Technology & Services / Global	D365 Finance and Operations	Face-to-Face	40:16	App. C
D	ERP distributor	Consultant	Accounting / Global	24Seven Office	Face-to-Face	47:03	App. C
E	ERP distributor	Consultant	Computer Software / Local	D365 Business Central	Skype	1:04:52	App. C
F	ERP Academic &	Researcher & Consultant	Information Technology & Services /	SAP	Skype	56:09	App. C

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	ERP distributor		Global				
G	ERP distributor	Consultant	Information Technology & Services / Global	SAP S/4Hana Cloud	Face-to-Face	1:07:50	App. C
H	ERP distributor	Consultant	Information Technology & Services / Global	Infor Cloudsuite	Microsoft Teams	57:45	App. C
I	ERP distributor	Consultant	Computer Software / Local	Visma.net ERP	Microsoft Teams	28:11	App. C

3.3.5 Participant group: ERP end-user

A total of 23 people within the ERP end-user group have been approached to participate in this research. Unfortunately, only one positive response was received. Due to time-limitation, the researchers were unable to perform a second iteration on finding more participants. The data from one end-users was collected to understand how he views the concept of sustainability and present insights into the types of business operations that could be affected by sustainability. Fortunately, this participant is responsible for the yearly reporting section on Corporate Social Responsibility for the procurement department. The participant has worked with ERP within this company since 2012; more information can be found in table 4.

Table 4: One participant from which the data has been used.

Participant code	Stakeholder group	Position	Industry	ERP system	Type of interview	Length of interview	Interview guide
1	ERP end-user	Procurement lead	Oil & Gas	SAP	Microsoft Teams	55:17	Appendix D

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3.4 Data analysis

3.4.1 Data preparation

The interviews have all been digitally recorded after obtaining consent. The consent form that has been used can be found in Appendix B. The need for recording was identified to remove bias and error, as without recording, the researchers would have had to rely on their memory or notes (Oates 2006). A disadvantage to the tape recording of interviews is that it is a time-consuming process to transcribe the interviews for data analysis (Walsham 1995). However, the researchers followed the advice of previous research as this type of data collection is a frequently used method in the IS field (Oates 2006). All interviews have been transcribed in detail, meaning word by word can be found in the first document that contains the data collected.

3.4.2 Qualitative data analysis

In qualitative studies, the researcher engages in the situation and makes sense of the multiple interpretations, as multiple realities exist in any provided context since both the researcher and the participants construct their realities (Thomas 2010). The purpose of data analysis is to develop an understanding or interpretation that answers the fundamental question of 'what is going on here?' (Kaplan and Maxwell 2005). The decision to go for a qualitative method is to focus on rich and detailed information where the possibility of alternative explanations can be explored (Oates 2006). Therefore, the researchers contemplated four basic techniques of qualitative data analysis as suggested by Kaplan and Maxwell (2005), which entail coding, analytical memos, displays, and contextual and narrative analysis. The researchers found the coding technique best suited for the project, which helped to select particular segments of data and sort these into categories that facilitate insight, comparison, and the development of theory (Corbin and Strauss 1998). The researchers used both of these techniques to form an analysis and concluded first to determine the coding method, and then use thematic coding and categorizing. The adopted coding method is inductive, which refers to approaches that primarily use detailed readings of raw data to derive concepts, themes, or a model through interpretations made from the raw data by an evaluator or researcher (Thomas 2006).

The researchers focused on being detailed to ensure the data to be more profound and manageable to categorize. The categorization of the data begun by first selecting the data connected to the research objectives and themes. The categorization of the codes reflected the

themes to get an even more precise understanding of the analysis. Examples of themes that were selected during the coding were: "Sustainability definition", "ERP-systems", "Economic initiatives", "social initiatives", "environmental initiatives", " SDGs" and "drivers of sustainability". The coding occurred through a color-coding system where the different themes received their own color. This was done to make the 70 pages of textual data more manageable as the colors visualized the different themes in the data and enabled a faster data extraction into different matrix tables (Knafl et al. 1988).

= People/Social sustainability

Part	Keywords	Quotes
A	Work conditions	Socially also, more the work problems and working conditions. deployment of seasonal workers, especially in horticulture. Yes thinking out loud those are the things that come to my mind.
F	SCR awareness	Businesses are understanding that this is happening for them and they are making problems for people so they try to make this sustainable.
F	HR	On the other side human resource is also different approach they have to check the labour about the social responsibilities and other things so everything becomes scattered and becomes segregated, so for a top manager is very difficult to make decisions that are the point of sustainable ERP.

Figure 4: Color-coding table.

3.4.3 Theoretical framework

By structuring the data collected from the interviews, this thesis draws upon the framework of the *dynamic and sustainable view of the firm* (Rodriguez, Ricart and Sanchez 2002) as shown in figure 5. According to Rodriguez, Ricart and Sanchez (2002), this framework was created based on the need for businesses to fully undertake the fact that an organization is part of an environmental (Shrivastava 1994) and social (Eells and Walton 1961; Davis and Blomstrom 1968) system. Furthermore, it takes on the principles of sustainable development and the persistence of competitive advantage (Rodriguez, Ricart and Sanchez 2002).

This model was adopted due to its comprehensive nature, which related to the three created objectives set at the start of the research.
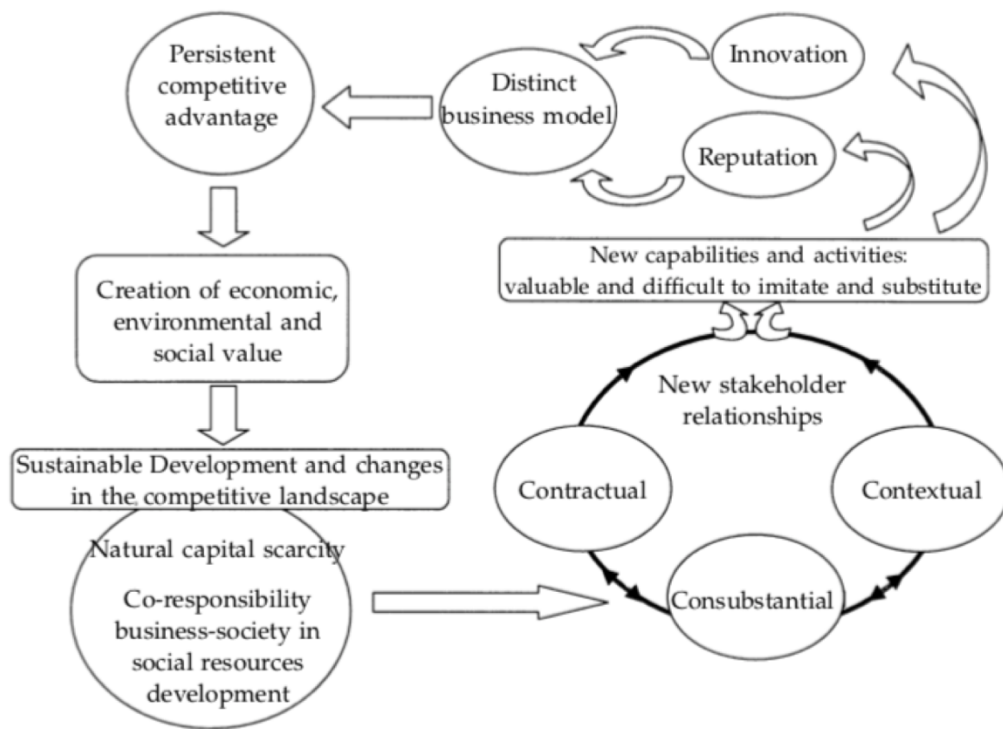
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Figure 5: Dynamic and sustainable view of the firm (Rodriguez, Ricart and Sanchez. 2002, 139).

Rodriguez, Ricart and Sanchez (2002) did their study to investigate if sustainable development and the sustainability of competitive advantage affect how businesses manage their resources, capabilities, and activities, fostering the persistence of competitive advantages based on knowledge on sustainability and innovative philosophies. A strong business position will, moreover, depend on the persistence of its supporting competitive advantages. Competitiveness, according to Porter (2011) occurs when businesses can meet the test of international competition, but at the same time meet the living standards of the average citizen, meaning that companies have to be able to do well, but workers and citizens and employees have to do well.

The framework of Rodriguez, Ricart and Sanchez (2002) applies the economic, environmental, and social for value creation as the sustainable view of firms' theory, based on the three pillars of people, planet and profit visualized in figure 6.
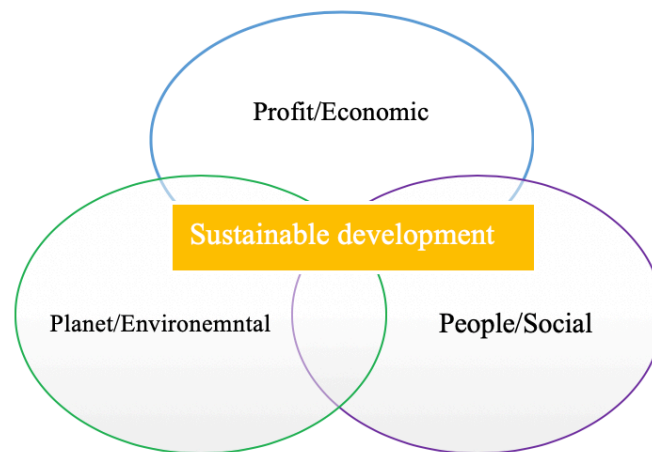
Figure 6: Triple Bottom Line (Elkington 1998; Shahriari, Pilevari and Gholami 2016).

Sustainable development includes the concept of the scarcity of natural resources and the co-responsibility of firms and the societies in which they operate for the development and use of social and natural resources (Rodriguez, Ricart and Sanchez 2002). The three levels support the development of new resources and activities (Rodriguez, Ricart and Sanchez 2002):

- Consubstantial, which are the stakeholders essential for the business to exist, includes employees, strategic partners and shareholders, and investors;
- Contractual stakeholders, which provides for the financial institutions, customers, suppliers, and subcontractors;
- Contextual stakeholders represent knowledge and opinion makers, local communities, and government.

The assessment of the different stakeholders is based on an open, transparent, and honest dialogue between the stakeholders and the company to obtain an increase in revenue in a persistent manner (Rodriguez, Ricart and Sanchez 2002).

To have a persistent competitive advantage, the company's resources, capabilities, and activities need to have strategic value. Rodriguez, Ricart and Sanchez (2002) state that new capabilities and activities have to be difficult to imitate, challenging to substitute, and need to be valuable if the company is wishing to develop a competitive advantage. Innovation and reputation are two clear sources that support a persistent competitive advantage. However, this can only transpire by the acceptance of the changes in the competitive landscape derived from sustainable development and the improvement of the resources, capabilities, and activities (Rodriguez, Ricart and Sanchez 2002). Both innovation and reputation help

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establish a business model that is different from the competitors (Rodriguez, Ricart and Sanchez 2002).

3.5 Ethical considerations

To ensure considerations with respect to maintaining privacy and confidentiality, the researchers turned to the guidelines of NSD (Norsk senter for forskningsdata). Following these guidelines protects both research ethics and researchers to ensure that participants are treated ethically. To ensure that personal –and sensitive data was managed ethically and safely, the researchers reported the project to NSD for approval before conducting the interviews. Appendix A also shows the approval received from the university's research ethics committee. For recording purposes, an old mobile phone has been used, which remained in flight mode. The participants also got requested beforehand if they approve of being recorded during the interviews through a consent form, which can be found in appendix B. This consent form confirms information privacy. Information privacy is a subset of privacy (Laudon and Traver 2007), meaning that a person upholds the possibility to protect information about him-/herself (Presthus 2012). The participant can, at any time, send the researchers an Email and ask for their information to be deleted. Moreover, once the project was completed, the participants received the final results of the thesis to observe if there is any information that could be traced back to them. The researchers performed the transcriptions of the recorded data, and any information that could be traced back to the participant was marked with an X to protect the participants' privacy. The data was stored on a password-protected Google Drive. Furthermore, all participants received a personal code to ensure they remained anonymous and were not traceable during the research process.

4. Findings

The following section presents the findings through the adopted theoretical framework of *The Dynamic and sustainable view of the firm*. In their study, Rodriguez, Ricart and Sanchez (2002) identified three aspects that fit into what they labeled as the *dynamic and sustainable view* of the firm. Connections in the findings are drawn upon the main aspects of the model. The model emphasizes on *sustainable development* (Paragraph 4.1)*, stakeholder relationship* (Paragraph 4.2)*, and distinct business model* (Paragraph 4.3). These three aspects of the model are utilized to reflect on the objectives and findings of this thesis.

4.1 Sustainable development

In the findings, sustainable development is connected to how the sustainability phenomenon is perceived by the ERP marked from the consultants' perspective. Based on figure 7 below, this is arranged by looking at how sustainability is defined and then applying the TBL framework to understand how consultants in the ERP world are viewing the involvement of the economic (profit), environmental (planet), and social (people) aspects. This involves looking at how their companies are taking account of their use of natural resources, taking responsibility in business-society and social resources development.
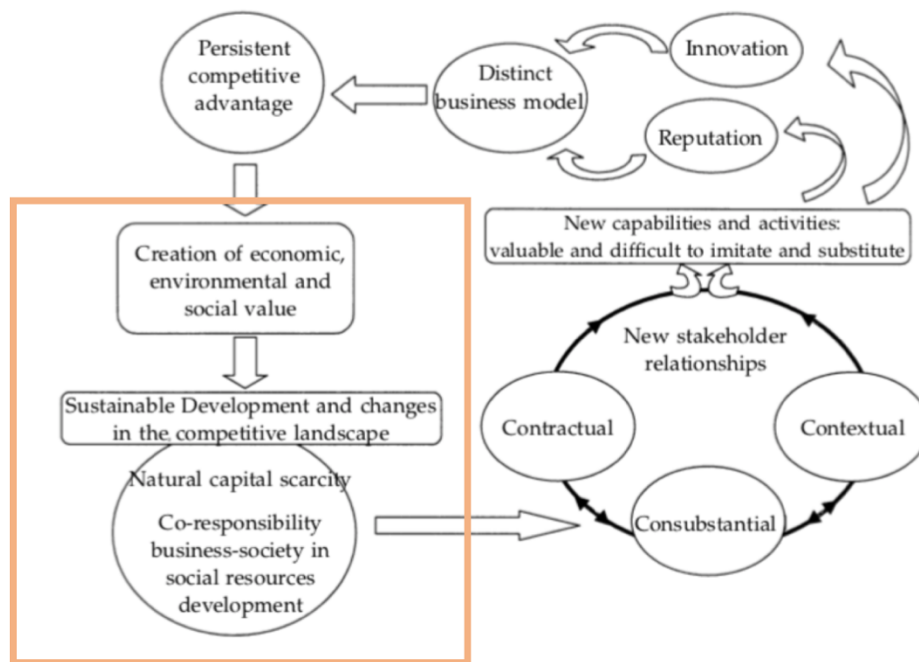

Figure 7: Dynamic and sustainable view of the firm; sustainable development (Rodriguez, Ricart and Sanchez 2002, 139).

"I've read that companies do these initiatives, without calling it sustainability. They do a bit of environmental and social initiatives and profitable is always on the table."
- *Participant D*

One participant knows the definition of sustainability from Brundtland by heart, and follows with an explanation on the TBL, adding to the latter that *"many standards are based on this philosophy, many are developing and standardizing based on that philosophy. They try to infuse sustainability concept into their business function"* (Participant F). Organizations often start with the economic part of sustainability; *"the most important and easiest part to introduce sustainability is the profitable or economic part, driven by results"* (Participant C). Sustainability, however, is not just a golden ticket for organizations *"when they see what they*

should do and try to put sustainability into their business function they reach to this problem, that now everything is sustainable, but it is still difficult for us to make decisions" (Participant F). When participant 1 got asked on their definition of sustainability, *"for me it is something about a system that can exist constantly and that you have some balance of what you can harvest and what you use, you can say this is the key in sustainability, and the definition is always difficult to nail"*.

The following section clarifies the findings on sustainable development based on the TBL framework by Elkington (2018) through the aspects of profit, planet, and people. A summary of these findings can be found in table 5.

Table 5: Highlights from the findings on TBL.

Profit *Economic value*	People *Social value*	Planet *Environmental value*
People and planet initiatives will only get adopted if there is a positive economic benefit for organizations. Such as; cost reduction and increased income streams	Social awareness pushed by society is forcing organizations to adopt ecological initiatives. Social resources development through positive employer brand, enhancing diversity, considering the work-life balance, and the human capital of an organization.	Seeing new streams of revenue by managing and reusing waste to avoid creating natural resource scarcity of resources for future generations. Cloud-ERP can be seen as a solution for energy saving.

4.1.1 Profit

"Good environmental ideas always have a good financial model" (participant B). The idea that financial incentives drive the organization's strategy is heavily represented in the findings. Seven of ten participants, including the user perspective, showed a similar view on how the financial aspect of sustainability is viewed in their work environment.

"Unfortunately, I think companies only think about the profit side of sustainability, and if they do not earn anything from being sustainable, they will not do it either" (participant I). From the user perspective, *"I see it [sustainability] more on the agenda, but again, the motivation behind it is of course driven by the economic aspect and how in the long run our company*

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can have several income streams" (Participant 1). Similar statements were shared by six of the other participants as well. An example of environmental initiatives that can help increase profit by participant H was *"if they can lower the temperature with one degree, they save maybe millions a year; it is as simple as that. They can change energy usage and save more money"* Frameworks such as FIFO according to participant I are unfortunately used from a financial point of view and not as a sustainable approach. With ERP systems, some of the cost-effective ideas that could turn to a sustainable initiative is keeping track of fuel prices, *"all the cruise lines and airlines, they have functionalities in the ERP system for fuel-hedging where they are speculating in fuel prices"* (Participant H). Continuing on the opportunities in adopting sustainable initiatives, another example is gaining a competitive advantage. *"It is a competitive advantage, if you go to Norwegian's page and read about how they represent themselves and one of the things they say is that all planes pollute a certain % less than average and for them that is extremely important because fuel is a huge expense"* (Participant H). This is a way of gaining trust and showing that they are taking environmental and social responsibility. Sustainable initiatives are important *"Because if they do not go toward sustainability, they will lose their competitive advantage"* (Participant F).

4.1.2 Planet

This aspect investigates how the participants viewed the environmental issues in their organization and the risks and opportunities that result from this. Environmental issues are what most participants related to when the discussion on sustainability got presented during the interview. Participants had several examples of how environmental initiatives could help the organization operate sustainably, taking into consideration the current trends on the **scarcity of natural resources**. Participant G emphasized on the importance of resource productivity describing that *"the consequence of wasting our planets limited materials and minerals is important because we are stealing from our children and if we don't use these materials in a more circular system, and in a more productive way, then we are stupid".* The participant was then referring to the concept of a circular economy on the consumption of raw materials. This was also stated by participant F saying, *"In a circular economy, there is reduce, recycle, remanufacture, reuse, and recover, so you use the raw materials, make the product and at the products end-life you turn it back to raw materials or reuse the waste"* and further explained that *"The way ERP will handle this product is important, it is our product until it reaches to that customer or until it is returned to the supplier"* (Participant F). The opportunity from sustainable initiatives in ERP can be used to measure the usage of materials,

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ways to decrease or reuse the consumed materials, which provides control over the production environment (Participant D). An example of that is a company that used the leftover materials from a sawmill to produce panelboards. *"You chop down wood in the forest, bring it to the sewing mill and use the wood to produce the main product, but the waste, which is the tiles, that are used for the production of the panelboard, and this is one part of the production, the waste can also be used for energy consumption, you can also burn it for instance."* (Participant D). Waste management and value of waste is also a theme among participants *"BOM or Bill of Materials measures the consumption of the materials and the minus sign is waste, this waste output from the production, is performed in the ERP system, sometimes you can sell the waste, buy it. It is about managing the audit train for the waste."* (Participant B). In relation to ERP systems, data collection was considered as ERP systems are information management systems. *"With ERP, you can plan your business processes, and you can plan your material much better, but you also have direct information about the use of the materials, including the inputs such as energy"* (Participant A). Companies use data to report on their financial performance, but there is also an opportunity to use this data and report on environmental performance, for instance, on raw materials and energy consumption.

Another environmental aspect that six of the participants mentioned was **cloud-ERP** in relation to the environmental aspect, *"if you create Cloud-based software as a service and the cloud data center is running on renewable energy; it is very energy effective you can use the spillover heat to heat the nearby houses and so on"* (Participant G). Another point is the data function in Cloud-ERP. *"I do not implement ERP anymore; I use cloud ERP. Companies are sending data and business functions to the cloud. If a company needs ordering raw materials they do it through the cloud and the ordering happens from one supplier to another, until a product is made, from there the product comes out and goes to the customer, the customer put the data into the cloud"* (Participant F). Additional view with cloud ERP was the ability to add on applications and functions *"The ERP core is now becoming more narrow, like a core engine so to say, and then you will build a universe of cloud-based applications around it, and be able to connect and interact through ERP core"* (Participant B).

4.1.3 People

Four participants state that companies are increasingly gaining awareness of the problems they create for society and how they are trying to enhance their operations towards sustainability. Participant I also reflects this on the current corona crisis and how this will

probably result in a decrease of traveling, including the shown results on climate change as people are no longer leaving their house this frequently. Participant I urges that companies are going to demand more reports and certain frameworks such as sustainable accounting from their ERP systems, but acknowledges that the government's incentives will influence this as well. Participant D questions: "*When you talk about sustainability it's hard to know what is sustainable, is it sustainable to use this raw material as an energy product or is it sustainable to have labor and make other products?*". Participant B states that **social awareness** is not a contradiction, and that listed or 'important' companies in Norway care about how they appear in the media as well, which is *"something you have to take into consideration when you are designing your business case."* Social awareness is also related to the employer branding of organizations: "*your employer branding is extremely important. I mean, what kind of people do you want? How do you attract the best talents for your company if you don't have a very good reputation?"* (Participant B). The ERP system could be an opportunity here according to participant G "*if a company says, were going to attract talents of tomorrow, we are going to keep them healthy and satisfied, ERP could help achieve this KPI"*.

Enhancing diversity is a social sustainability initiative that, according to one participant, could be supported through ERP systems. Participant F states "*you can put how many ethnicities and cultural background you have in the company, you can put male and female employees percentage, there are different criteria that you can put in*". However, "*from my perspective, some of these criteria are based on western culture mindset*" elaborating on how the ERP system is not focused on the differences in social aspects in other societies. Participant G states that **work-life balance** is a social issues companies are currently facing, but sees great opportunities in enabling ERP systems to track productivity and relates this with sick leave and vacation planning, also considering aspects such as tracking screen time and taking recommended breaks during the workday. "*If you can use the ERP system to maintain the best possible balance because today when everything is a thump away, it's difficult to find the right balance*" (Participant G). Participant B states that ERP systems allow employees not to be in the office every day by working remotely, whether that is from home or elsewhere. Adding to this, participant D questions whether the opportunity to work from home is necessarily good for society "*people can basically work from your couch back home in the evenings, and what actually happens to the society when we do this? What happens to your friends, family, and social life? It is hard to be present in the moment*". Including that working remotely can also be seen as a limitation in business operations, as from a leadership

perspective, it makes it more difficult to understand how your employees are using the technology and whether your employees are efficient.

Taking care of human capital is an activity that is mentioned by participant A. He gives an example coming from horticulture and the work problems and working conditions in this sector, including the deployment of seasonal workers. Participant B shares this view and includes that changing business operations through ERP systems could reduce manpower and adds that even robots are being 'fired' now "*They are firing their robots because they make the software more sophisticated.*" This can be seen as a consequence of utilizing new technology, stating that "*we can be better on making it possible to have a sustainable approach on the way we work, the way we do things.*" Technology is seen as an impact on the HR aspect of how we work, as the human capital is the real transformation part when it comes to digital transformation (Participant B). Participant I works directly with the salary-related parts of the ERP system and relates sustainability initiatives to both saving time as well as using the time in a better way.

4.2 Stakeholder Relationships

Based on figure 8, the stakeholder relationship is adopted to define who are the drivers of implementing sustainability within the ERP market.
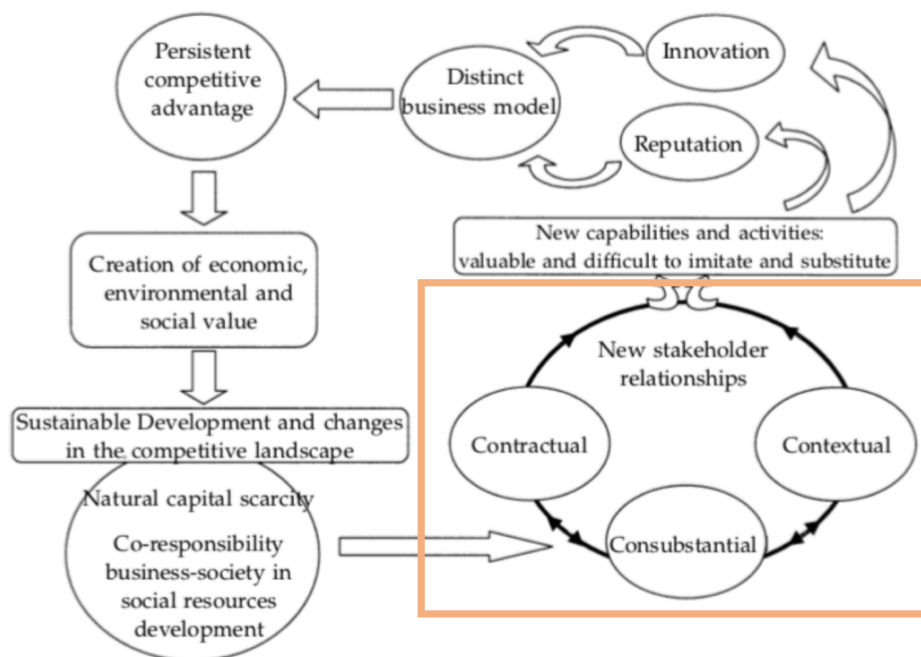

Figure 8: Dynamic and sustainable view of the firm; stakeholder relationship (Rodriguez, Ricart and Sanchez 2002, 139).

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Response varied in the discussion on whom of the different stakeholders are the drivers of sustainability changes. Another issue was how the participants viewed changes toward sustainability as three out of ten participants saw it as a form of competitive advantage, while four out of ten participants considered it is a significant risk to take on. A summary of the findings of paragraph 4.2 can be found in table 6.

Table 6: Highlights from the findings on the stakeholders.

Contractual	Consubstantial	Contextual
ERP vendors Leaders in their field Customers	Employees Investors	Public administration Society SDGs

4.2.1 Contractual

Two ERP vendors have been mentioned as the drivers on implementing sustainability within the ERP system. "*you might say that Microsoft is a driving force, but they are a driving force because they have bought a lot, and SAP has also done that. Microsoft is, right now, they are leading ahea*d (Participant B). Microsoft is mentioned by three of the participants on their sustainability initiatives, referencing to the Microsoft sustainability initiative that got discontinued in 2009, participant H elaborated on the fact and added: "*However, two years ago I guess, I had a big client who asked for this specific sustainability functionality*" (Participant H). However, the participant justified further that it is difficult to make this change. "*From a practitioner's side, only companies like SAP can do that and get money off their customers, and suppliers do not know about sustainable ERP. So as leaders of ERP, they are pioneers also in this case*" (Participant F). Similar to Microsoft, the participants mentioned SAP as **leaders in their field** and could drive change towards sustainability. "*SAP is the largest ERP provider, and did you know that 77% of all the financial transactions globally go through an SAP system? They have a hand on the steering wheel of our economy. Through a more considerable extent, then we are aware of*" (Participant B).

Participant F suggests that the supplier has an opportunity to drive change as they are the one making the system "*some of the suppliers and stakeholders are already on their way to*

change. A faster change leads them [the vendors] to be pioneers in this and have an advantage".

However, suppliers are not the only ones viewed as change leaders, participant D and E looked at the **customers** as the drivers of change; *"The customers are the kings; they decide how things should be; it does not matter what the consultant think*s, *the consumer is the driver for change"* (Participant D). Similarly stated by participant E, adding why the customer should change; *"The driver is very often the customer themselves because they got special requirements; it could be legislation"* (Participant E). Fortunately, the researchers managed to interview one ERP end-user and gathered insights on the ERP customer perspective. The participant view on the consultant was dominated by the skills of the consultant. Participant 1 stressed that an organization needs not only reliable data but also discipline in the data, and consultants should be able to make something out of this data *"the consultants can be as good as the data more or less"* (Participant 1). The participant added why this data is important to handle in the right way in connection to reporting *"we have to report to the government and our clients how our footprint is, so it is coming more and more within the function"* (Participant 1).

During the discussion on the three aspects of sustainability and how they are viewed in the organization, participant 1 mentioned that the profitable aspect often drives the initiatives. In terms of the environmental aspect participant 1 mentioned that in 2020 they made a goal of using at least 50% locally sourced suppliers and following the Health, Safety, Security and Environment (HSSE) guidelines *"environment has been on our radar for quite some years, but in the recent years, it is in the evaluation criteria, but not on top of the agenda"* (Participant 1). Viewing the social aspect, participant 1 mentioned availability in the ERP system, as you have the opportunity to work from home or on vacation, for instance. Another social aspect is society *"to build the local society when we move into a different market. Follow the local content requirements, but also to follow our flavor around it"* (Participant 1). In terms of the whole sustainability aspect and ERP, the participant mentioned that many functionalities are missing stating for instance *"It is easy to relate it to carbon footprint, but that is not something can pull out from the system as it is now. Yes, you can potentially state that you can do it, but we are not using it now* (Participant 1).

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4.2.2 Consubstantial

Two participants reflect on the **current knowledge and competencies of consultants** on sustainability. One participant states that training and bringing up the topic more often could be done within their organization (Participant B). Participant F says that *"if you are an ERP consultant you also need sustainability competence to deliver the best customer value"* and includes that *"it is hard to find people with enough sustainability background as well as the tech background, so it is our job as well to educate our employees and bring in new people that have new insights."* Despite the understanding on how planet-profit or people-profit can work well together, especially in respect of all three dimensions, there is a lack of competence on sustainability in consultancy organizations; *"I believe that hopefully, also we see that we have to build sustainability competence and merge it with other consultancy disciplines to maintain a competitive advantage"* (Participant G). Two participants explain that building competences in their organizations are currently done through voluntary learning communities (C and G). Participant C states that the community is quite active, but he has not been part of it till this date. Participant G states that *"I was not aware that there were many opportunities for the Enterprise and especially for tech enterprises to improve their operations so that they reduce their footprint, but also develop new innovative services to help our customers become more sustainable. I believe it is a huge and profitable market"*.

The culture of a company influences the way employees work on establishing a sustainability-focused company culture (participant F and G), including on how this is supported by management support (participant G). Participant G states that he is actively training himself on sustainability, causing him to realize the opportunities to develop new innovative services on helping them with their operations in becoming sustainable. However, he states, *"I work on a voluntary basis with sustainability. I have my manager, and he is ok with me spending some time on other things then what he actually pays me for"*.

Two participants relate that the interest in sustainability within their organizations is coming from **the younger generation**. Participant D states that *"I would say that at the company is recruiting a lot of younger people and they are bringing their perspective, and I think the perspective has changed just over the last ten years"* which is followed up by participant C *"We have many young students coming, this is not the first sign that it is important."*. When asked why they think the younger generation cares about this, participant D stated that *"I*

think that is an easy question to answer because this [sustainability] is an essential part of the youngsters' future so this is a serious question."

Other consubstantial stakeholders are the investors "*One of the key drivers today are the investors because, for them, climate issues are a risk, they want to invest the money where the risk is lowest or reduced*" (Participant G). The participant exemplified this statement by explaining the annual letter by the CEO of BlackRock, the world's largest investment fund, Larry Fink. In his letter, he claimed that *"BlackRock will put climate change at the center of investment strategy"*, the participant then quotes Fink "*If you are not performing your business in a sustainable way, you are not going to get our money"*. Investors are willing to invest their money in companies that are able to identify their opportunities and mitigates risk associated with environmental, social, and economic issues; this is shown through the quality of the company's non-financial reporting. Participant G also mentioned companies that are on their way toward sustainability, saying, "*Tech companies they are making a huge effort they are not doing this to be nice they are doing this because it is the smart thing to do. Hopefully, more and more businesses will contribute also. It gives them a competitive advantage; they are like the first movers, but not all sustainability efforts are going to succeed"*. Investors are willing to invest their money in companies that can identify their opportunities and mitigate risk associated with environmental, social, and economic issues; this is shown through the company's non-financial reporting quality. *"To be able to do reporting, you will, of course, you need the right data and correct data, and this is where are ERP systems or any other systems need to have in place and to have more control over their processes"* (Participant D). However, the participant said he doubted that this functionality already existed in the ERP system, referring to how the shipping industry is not the best at their quality in reporting.

4.2.3 Contextual

Considering the contextual stakeholder, four participants reflected on the support needed from **public administration through legislation**. Participant G states: *"it's irritating that the government, not just in Norway, almost everywhere are not doing their job to incorporate sustainability. They are handling this very poorly." A*dding to this*, "The government needs to put in place some regulations and have a policy that makes everybody compete on the same terms, reduce the risk and have supportive tools in place for the enterprises"* (Participant G). This is also argued to be the reason why ERP systems get implemented in the first place: *"A large corporation buys an ERP system to deliver the documentation that the government*

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requires. So, it has to start with the government setting regulations" (Participant H). Participant I agrees and argues how the government is the first in line to promote sustainability. "*It has to start with the government and then the customers*, *if the customer requires something that the vendor cannot deliver, then they would not have a competitive advantage anymore, so maybe it has to start with the government and then when it is going to be a natural thing for the vendors to incorporate or develop"* (Participant I). Participant H supports that argument by saying, **"***ERP systems are known as costly, for a vendor to recommend that to the customer, it just seems as if we want to make more money. Since that law is not in place, then the functionality is not in the system"* Another participant had a more holistic view on the subject, "*the rules of society will force the companies to change*" (Participant F) hinting on the awareness of society on things like the Paris agreement.

A worldwide framework that affects society and, therefore, businesses are the SDGs. Seeing the opportunity of integrating sustainability in ERP consultancy services is mentioned by participant D through the SDG's "*I mentioned the United Nations 17 goals, the company wants to operate in a sustainable manner and also would like a sustainability strategy. That is part of what the company has been working with for the past couple of months, and we are looking at this from a strategic point of view because we want to position ourselves*". Two participants stated that while their organizations are working with the SDGs, that knowledge is not being used as a service for consultancy (Participant I and G). "*We get "A" listed, but we are not using it, we are not communicating it, we are not saying that we have a good story on the sustainability environment area. A story that says you can trust us as a provider of sustainable solutions because we are doing this ourselves*" (participant G).

4.3 Distinct Business Model

The final section looks at whether ERP systems have the opportunities to support businesses in implementing sustainability initiatives that could force new business models, sustainable operations, and process innovation. This section is visualized in figure 9. As well, a summary of the findings of paragraph 4.3 can be found in table 7.
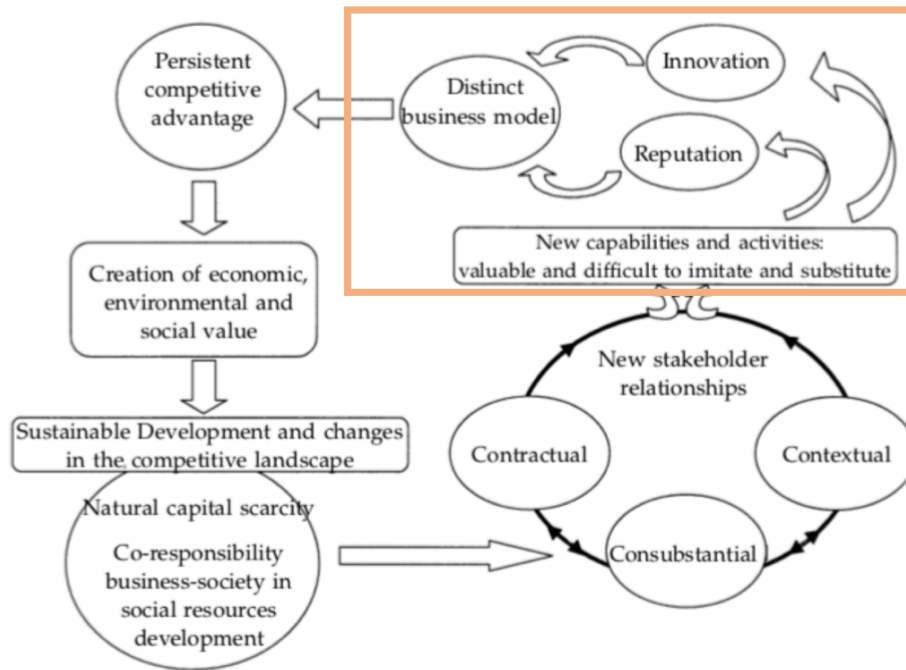
Figure 9: Dynamic and sustainable view of the firm; distinct business model (Rodriguez, Ricart and Sanchez 2002, 139).

Table 7: Highlights from the findings.

New capabilities	Innovation	Reputation	New business models
Sustainability-related requests from customers mainly focus on environmental (planet) initiatives.	There are conflicting opinions on the current existence of sustainability functionalities within ERP systems.	ERP systems are there for processes, transactions, and data. Hence, there are positive views on adding sustainability functionalities in ERP systems.	Adopting environmental initiatives could lead to new business models. Such as moving from selling a product to providing a service through rental.

4.3.1 New capabilities

The consultant is working on behalf of the client and incorporates those functionalities that are needed for the client (participant H). Participant A and C state that they notice that their clients are becoming increasingly interested in sustainability. Participant A works primarily with clients in the agricultural sector and states, "*The market is increasingly demanding this, and it sets quite strict requirements. Also, from the government. But it is just that, a lot of*

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them have intrinsic motivation to do something with sustainability, which is great, but if you don't, you will miss out on your license to produce." He adds that there is a difference between forerunners and followers and that those with more experience handling data are starting to request more *"they generate data and want to be able to do more and combine it with other data sources."* Table 8 contains an overview of types of requests that the participants have received on incorporating new capabilities related to sustainability initiatives in ERP systems.

Table 8: Requested functions from clients.

Examples of sustainability initiatives	
Transportation	*"Yes, especially on things like transportation"* (Participant E)
Waste management	*"The customer is focused on reducing waste, not overproducing, stuff they don't sell, want to balance the supply, and they know that in order to that you need some good analytical tools, and I start designing, this is planning to optimize, so ERP is not handling everything. but the ERP is connecting data."* (Participant B)
Environment	*"There is not much talking to the customers or request from the customers about sustainability as if now that is my experience because when we are meeting the customer we're talking about the technology and the cloud solution, but of course when you come to the public customers: hospitals and different departments they are required to have like and their request for a crime and Environment issues. They are asking us how can we deliver this"* (Participant G)
Energy tracking	*"The only request I got is "veidekke" which are the biggest building company in Norway, they build universities, schools, road, tunnels, and they had a requirement that they wanted to track how much Co2 they generate"* (Participant H)
Reporting	*"I think we had one client maybe 6 months ago but I don't think that the agreement went through [...]. They wanted a system that they could make sustainability accounting, that is the only company that has demanded some of these types of reports actually."* (Participant I)

Dashboards	*"Well, what some people would like is to have a sort of sustainability dashboard to see how sustainable am I actually. The problem is when you ask them what would you like to see. And then they say yeah well don't you have something that I can start having a look at. So it is a sort of, it is chicken and egg discussion [...] What somebody needs to understand what should be in there, when is it good from an environmental point of view and when is it not "* (Participant E)

4.3.2 Innovation

With the current ERP solutions available on the market, five participants state that the solutions **lack functionalities** to be considered equal in the three aspects of the TBL. Participant G states, *"Today, as far as I know, ERP only has the financial objectives, and they probably lack the planet and people dimension."*. One participant (I) considers the system they are working with as a basic system, as it only allows for vanilla implementation: *"Everyone can use it and maybe we can make some corrections and some small functions to the customer, but it is not very sustainability-focused"*. Participant F states that there is confusion in the market on whether an ERP system can already be considered as a sustainability-enhancing tool; *"The ERP before had the company to integrate data for supporting the top management to make decisions (...)* *"Some people do not understand the point with this, so they say the ERP is already sustainable*" relating to the changing mindset from only looking at profit towards also including *"other aspects of the calculation"*. Participant C adds to this that the ERP is looking over all of the processes in every business, but that sustainability is currently not dependent on the ERP strategy and that there are other ways to support the business processes. He adds to this that *"what is important in my opinion is that the processes are well optimized"*. A solution suggested by participant C to make ERP sustainable is to add the concept of sustainable accounting within the system. Participant D relates the optimization of sustainability reporting through ERP systems but acknowledges that the systems currently do not have the full functionality to do this, causing people to search for other platforms to get the accurate data for calculations and estimates.

Participant B and participant F are the participants that clearly states that the current ERP solutions available **already have the capabilities** for handling sustainability: *"I think sustainability should be a driver and initiative for keeping your ERP solutions up to date. Because the capabilities of ERP solutions are there."* Building on this, he also states that *"if we are going to modify the way we live and produce consumables to make a more sustainable*

growth but to become more sustainable, we need technology to support, to monitor, and to improve the way that we produce things continuously."

The participants have provided various examples of how the environmental approach has increased revenue, yet another important aspect is how the environmental approach has resulted in a **change in the business model**. Participant B elaborated on the fact that *"companies that used to sell equipment, no longer sell it, they rent it. Alternatively, they may behave, other business models that do not mean that you sell something, you just rent a capability. You take back the equipment, then recycle it."* in summary*, "It is important to gain competence and new insights on how you can implement sustainability into your business model and strategy and increase competitive advantage"* (Participant G)*.* The one participant 1, which is a user of ERP system, stated that the government is, of course, responsible, but *"also those who define the business model and find a way to make it productive, those are the ones who are going to win this the race"* adding "*We can always sit and wait for the government to do something, but we can also lead the way to sustainability, then it is likely to be successful"*.

4.3.3 Reputation

Four participants responded positively to the available opportunities for ERPs and sustainability initiatives. Two participants state there is a connection between sustainability and business processes "*to be able to produce sustainably, you must have your production processes or other processes in control, ERP is a very important tool in that*" (participant A) and "*With an ERP system, the goal is to change your processes and make them more effective, if you could do this in a smarter way, this could help from all three perspectives.*" (Participant D). Participant A states that "*an ERP system is about the registration of data and the processing of data, and reasonable basic transactions within the company, which can be purchasing and sales, but also product handling and it is the same with cost price, of course, you can also do that for sustainability.*" While the functionality is currently unavailable, Participant H refers back to a previous job he had, where he was working with MS Dynamics: "*MS dynamics had a sustainability functionality launched in 2009, but this has been discontinued*". The functionality allowed the user to create an environmental sustainability dashboard enabling the user to track their energy consumption and greenhouse gas emissions. He states that it should not be difficult to add this functionality to any ERP system. *"The ERP system is a collection of transactions and some transactions, for example, the operations*

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related to shipping a large item, you know that this item will generate some electricity, some fuel from the trucks, and you can estimate how much fuel systems as that generate.". Concerning the reputation of the ERP system on sustainability, participant 1 said: *"I would never state that ERP can drive sustainability but in the position of stating that we will use the ERP system to harvest data to enable us to make the right decisions regarding sustainability among other things".*

5. Discussion

5.1 How is the phenomenon of sustainability perceived by the ERP market?

In order to drive sustainable value creation, it is necessary to outline how businesses frame sustainable development. Ihlen and Roper (2014) conclusion' of how companies view sustainability is perceived as an indication of what the findings of this study reveal. According to the findings, organizations apply different sustainability frameworks such as SDGs to communicate their sustainability efforts. However, in reality, the concept of sustainability is not often communicated within the organization or adopted in the business operations. Participant D and 1 stated that sustainability is not on top of the agenda in the organization strategy, but that companies do these social initiatives or environment-focused initiatives, without calling it sustainability. Based on the findings, the most recognized part of the three dimensions is the profit part, which indeed showcases that the profit aspect is the main driver in business' environmental and social initiatives. This is not only the case in this research; a study conducted by Høgevold et al. (2015) on the TBL approach in the Norwegian market, shows that the main incentives to adopt sustainable business practices are economical, followed by environmental and social aspects. Profit should include a "social purpose" where businesses aim at creating shared value for both the society and the organization, as this will result in growth in profit and societal development (Porter and Kramer 2011, 75). Researchers have also discovered that customers are key factors in motivating organizations to adopt environmental practices (Bhaskaran et al. 2006). Customers that have started requesting sustainability initiatives, mainly focus on environmental practices, as could be seen under the new capabilities in the findings. Financial frameworks, such as FIFO, are integrated into the ERP system. However, based on the thought that FIFO is a traditional financial framework that has been proven efficient (Participant I), it is not adopted as a framework to support waste reduction or track the scarcity of essential materials.

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Finance and accounting, and HR are already two of the core functions in the ERP system, being able to encompass information on all the financial transactions, payroll, planning, hiring, etcetera. From a social standpoint, HR can help firms capitalize on ERP implementation by creating large and adjustable pools of human talent (Lengnick-Hall and Lengnick-Hall 2006). Social awareness was also a discussed topic among participants, stating that companies who are aware of their social position can not only attract future employees but keep employees in the company. ERP, in that sense, according to participant G, could help achieve these KPI's, intended to gather data on, for example, sick leave and the average turnover in the company. A prime focus of the solution is to unlock the business value of ERP systems by analyzing the valuable data of these transactions; this is confirmed as possible to implement by several consultants.

By identifying the environmental aspect of sustainability, findings show that information on how material resources, energy, and pollution measurement is not a typical function on the ERP systems, although it is possible to execute (Participant B). These functions are requested by clients, as some clients have an obligation to report to the government on their environmental impact. One participant argued that the reason for not naturally including this in the system is that not everyone necessarily needs environmental functions in their company. This indicates that there is an interest in this technology, but currently, it is not viewed as a core ERP function or is encouraged to practice.

5.2 Who are the drivers of sustainability within the ERP market?

Rodriguez, Ricart and Sanchez (2002) consider stakeholder classification to help companies acknowledge the importance of improving how they manage their relationships with stakeholders. Each of these stakeholders has a direct or indirect influence on the company, depending on their category. Some stakeholders are crucial for the business to exist; some are the subject of primarily contractual relationships; others represent the social and natural system in which companies operate (Rodriguez, Ricart and Sanchez 2002). As the question arises on who should be responsible for driving sustainability, respond varied between participants. Rodriguez, Ricart and Sanchez (2002) consider the government as the contextual stakeholders. The research argued that government regulations are one of the ways to set sustainable practices, aligning with previously conducted research (Brown 2011). This is

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shared by four of the participants who claim that the government could drive sustainability through legislation and standard frameworks. As for the customer, participants argued that customers are the ones that should be requesting sustainability-related functions.

On the other hand, the customer may raise the question of whether these functions are necessary to pay for and how to utilize the functionalities to make sustainable decisions based on the measurement coming from the data collected in the ERP system. If vendors would have offered the sustainability solutions, participants argued that this might seem like idea vendors are proposing to sell based on making a profit. While there are several suggestions on who should be the driver of sustainability, three participants argued that big companies such as SAP and Microsoft should be the drivers as they have the biggest influence, and are recognized as pioneers in this field. As mentioned, Microsoft did already come up with an environmental function in 2009, but it got discontinued as the request was low at that time. SAP's new digital learning initiative platform is enrolling courses on sustainability to teach their clients how to integrate sustainability into their strategy (SAP 2020). However, the courses show limited remarks on ERP systems in their attempt to teach sustainability.

Participants say that big companies are the ones with the power to make a change. One participant argued that the one who is sitting with valuable information is the one with the influence. This means that if a company can gather valuable information, be able to mitigate risk, see opportunities and act on the three aspects, those are the ones who are *"getting a seat in the table with the big boys and girls"* (Participant 1). Participant 1, an ERP-user, argued that data is as important as the consultant, meaning that if the consultant is not knowledgeable about what kind of data this business is trying to gather, then the data is worth nothing. This data could also be used to report to investors how the company mitigates risks and perceives opportunities, as Melville and Whisnant (2012, 30) state in their paper on environmental ERP; (institutional) investors are seeking better information on sustainability initiatives, processes, structures, and governance. Requiring organizations to adopt advanced (sustainability) information systems to help them to document, communicate, and, most importantly, validate the information (Melville and Whisnant 2012). Furthermore, Rodriguez, Ricart and Sanchez (2002) claim that building new stakeholder relationships with employees while focussing on sustainable development ultimately involves attaining employee satisfaction.

5.3 What is the current state of ERP systems and their possibilities to support businesses in implementing sustainability initiatives?

ERP systems are one of the most adopted IT solutions in organizations (Al-Mashari, Mudimigh and Zairi 2003) containing several modules (Aladwani 2001) which hold information and data on vendors, customers, employees, and products, intending to serve business processes housed within multiple functional areas (Mishra 2011; Haddara, Fagerstrøm and Mæland 2015). Opting for moving from an on-premise ERP system to a cloud-ERP system can be seen as a possibility for businesses to implement as a sustainability initiative. Cloud-ERP as an environmental solution was mentioned by six of the participants and was seen as one of the main contributors to environmental sustainability. The comments on cloud-ERP relate to other research in supporting the opportunity to be more energy effective. This holds cost benefits for the supplier as well; for example, it allows them to switch to different data centers in different seasons. Such as switching to a data center in the north of Norway for cooling purposes, thereby reducing the energy demand in the summer period (Jørgensen and Sørheller 2018).

Innovation and reputation through the theoretical framework for Rodriquez, Ricart and Sanchez (2002) are seen as two clear sources of persistent competitive advantage deriving from sustainable development and the development of resources, capabilities, and activities. Combining innovation and reputation lead to the creation of new business models (Rodriguez, Ricart and Sanchez 2002). Some of the participants state that they see the opportunities for implementing sustainability functionalities in the future. Relating to innovation, the perceptions on the current availability of supporting sustainability initiatives are opposing, as participants claim that the systems both lack and already include sustainability functionalities. One of the participants states that Microsoft once had a sustainability feature, but that this has been discontinued. This conflicts with recent research by Chofreh et al. (2020), who describe that this functionality does exist through Microsoft Dynamics 365 from Microsoft, which facilitates the evaluation, tracking, and reporting of the sustainability performance of organizations through an environmental sustainability dashboard (Chofreh 2020; Microsoft 2018). Similar to the findings in this research, Chofreh et al. (2020) also mention SAP. They refer to the availability of 'Sustainability Performance Management 4.0' from SAP, which enables the controlling, analyzation, and reporting of organizational performance to achieve sustainability outcomes. This functionality includes corporate environmental, social, and

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economic performance (Chofreh 2020; SAP 2018). Most sustainability initiatives introduced in the findings are related to the environmental aspect, as this is what the customers inquire that they are missing. However, regarding the social aspect, request on social initiatives was low from the client's side according to the consultants. One cause could be that companies are relating the social aspect of sustainability to the HR module as it is one of the core ERP functionalities, thinking that they have arrived the social aspect of sustainability. Another argument could be that they do not request social initiatives because they often relate environmental initiatives solely to sustainability, and not necessarily all three dimensions applied together and used intertwined.

5.4 Are current ERP systems ready for supporting sustainability initiatives?

Two important purposes of the ERP system is to facilitate essential business operations and routine transactions by integrating all data and cross-functional systems into the program (Bjelland and Haddara 2018). By introducing the sustainability phenomenon, the researchers opened a door for another way to view ERP opportunities that could help businesses execute their sustainability initiatives. Currently, the sustainability phenomenon is still in the infancy phase in the ERP domain (Chofreh et al. 2014), and large companies such as SAP and Microsoft are yet attempting to frame the concept of sustainability (Chofreh et al. 2020). However, as one of the participants mentioned, these two ERP vendors are also pioneers in this area, exploring various approaches to incorporate sustainability. The question of whether ERP systems can support sustainability initiatives or not can be answered based on the findings; the system is able to accumulate information that could be used to help organizations measure their sustainable performance. According to participants, the capability does not exist yet. However, the ability is there to incorporate sustainability via, for instance, a module in the ERP system, dashboard reporting or the integration of sustainability initiatives in the different modules in the ERP system such as supply chain, procurement, finance and other required modules which means integrating sustainability into the business strategy.

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6. Implications

6.1 Implications for research

This thesis contributes new insights on sustainable IS, with a particular focus on ERP systems, from the consultant perspective. While the importance of the consultant within ERP research has been acknowledged, the consultant perspective is often overlooked (Baker and Haddara 2019). Insights on the concept of sustainability within ERP systems are presented through the perceptions of ten participants coming from eight consultancy firms and one client organization. By adopting the chosen research design, future researchers interested in researching the topic under discussion are supported in finding new research directions. IS research so far provides a limited focus on sustainability (Dao, Langella and Carbo 2011) and often primarily considers environmental sustainability (e.g., Melville 2010; Watson, Boudreau and Chen 2010). This research acknowledges the development of sustainability capabilities on all three bottom lines. Moreover, this research adopts the theoretical framework of *A dynamic and Sustainable View of the Firm* (Rodriguez, Ricart and Sanchez 2002). This framework has previously, as far as the researchers know, not received attention within IS research yet provides perspective on the connection between sustainable development, stakeholder relationships, and new business models. The framework allows for a clarification on how these three aspects work together in adopting a new phenomenon within an existing system from a business perspective. Furthermore, this research highlights the importance of understanding what sustainability means for ERP systems by adopting the TBL model of Elkington (1998) within sustainable development. Which confirmed the main focus on the planet bottom line over the profit and people bottom line. Finally, this research contributes to the body of knowledge on capabilities that help create ERP value instead of focussing on the capabilities that get a functional ERP system up and running, as requested by previous research (Jain 2008).

6.2 Implications for practice

This thesis confirms findings relating to previous research on sustainability in IS organizations. Schmidt (2009) argued that IS organizations must be aware of the sustainability initiatives required to remain competitive in the future. Sustainability in IS management can promote corporate reputation, the attractiveness to investors and customers, competitive advantage, and enhance efficiency through operations via product or service innovations. Given growing energy- and other resource prices', the relevance of sustainability

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is intended to become even more critical in the future. Therefore, the notion of sustainability has relevance for policymakers, practitioners, and researchers (Schmidt 2009). As a result, this study presumes that sustainability is applicable in ERP consultancy services and can have a positive influence on the IS business performance.

However, this research shows potential problems for clients that are thinking about adopting sustainability initiatives through their ERP system as there seems to be a lack of capabilities in supporting them. Views on sustainability-capabilities within the currently available ERP systems are both positive and negative. More attention needs to be provided by ERP vendors on the sustainability-capabilities of their ERP systems to make ERP consultants aware of the existing capabilities. However, the overall reputation of ERP in incorporating sustainability is positive and is considered as a strategy to gain a competitive advantage over other ERP consultancies. Moreover, ERP consultants are recommended to gain competences on sustainability and whether their companies consider using sustainability as a competitive advantage. Consequently, it may be their competitors, the government, or their customers pushing the adoption of sustainability in ERP systems and ERP consultancy services. This is co-occurring while having the understanding that adopting sustainability leads to gaining a competitive advantage over other ERP vendors. However, the relationship between the vendors and the implementation partners have not been acknowledged throughout this research.

7. Limitations

The conducted study holds an important limitation on the area of available literature, as only a few scholars have contributed to the body of knowledge on ERP systems and sustainability. As the opinions of other researchers on the chosen concepts have been limited, both the literature review as well as the discussion can be considered to bring a less objective perspective. Therefore, a call for an increase in research is suggested based on the findings of this research. There is especially a need for more empirical focused research to strengthen the currently available conceptual papers. The limited availability of knowledge in combining ERP and sustainability was also found in the obtained participant pool. Only ten interviews have been carried out, as the researchers failed to find more participants prepared to speak about sustainability and ERP systems. The initial data collection strategy held stronger participation of end-user participants to get a holistic understanding of the sustainability

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phenomenon in practice. However, finding multiple ERP-end users working with sustainable business operations failed and has, therefore, resulted in limited contributions. Moreover, stated in the findings, it is challenging to identify ERP consultants that have both a sustainability and a technical background, which might have compromised the results of the research. Fortunately, two of the ERP consultants had actively educated themselves on the subject. Hence, bringing invaluable information that strengthened this research. However, most of the participants represented different organizations, which leads to the question if the participants have a complete picture while representing their employer. Finally, a limitation from a positivist perspective on interpretivism research is the limitations on generalization (Oates 2006). Due to the interpretive approach of this research, generalisability could be considered as limited. Instead, this research can inform other research settings (Munkvold and Bygstad 2016) that are interested in researching the connection between sustainability and ERP systems. Suggestions for researches have been highlighted in the following chapter 8 on 'Future research'.

8. Future research

Through the conducted research, multiple interesting opportunities for future research could be realized. 1) Country-specific research: it might be interesting to see if the findings of this study are similar amongst different countries. This study focused on Norway, a country awarded by the UN Human Development Index with the first place as 'best country to live in (UNDP 2019). The country is known for its high quality of life, low corruption, and positive gender equality (Hellevik 2008) and holds a society with a high awareness of environmental issues (Witoszek 2018). It could, for example, be interesting to look at a country that is ranked in the medium or low categories and opt for a cross-case analysis to find differences and/or similarities. 2) Sector-specific research: the conducted study does not take into consideration any differences in needs for the different sector groups that benefit from ERP usage. Future researchers are encouraged to consider specific sector needs, such as the oil industry and their environmental requirements (Dyllick and Hockerts 2002) or the agricultural sector and their governmental influence (Participant A). 3) Age as a moderator: Employees are seen as a stakeholder group who are beginning to demand that organizations meet specific social and environmental standards, especially those of the younger generation (Cramer 2002). As shown in findings, two participants relate to this and state that the growing interest in sustainability within their organizations is coming from the younger generation. For future

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research, it might be interesting to see if results are similar or different amongst consultants from different age groups. 4) End-user perspective: further research on the end-user perspective is suggested to determine the interest or need of the ERP system as a sustainability tool. Previous research on the end-user perspective suggests that ERP systems are not viewed as a solution to support organizations in becoming more sustainable (Slaman and Haddara 2019). However, this research focused on the adoption phase of the ERP-life cycle model, meaning that the case-organization had not yet implemented an ERP system and therefore lacked critical information to assess the phenomenon from an end-user perspective.

9. Conclusion

Through the lens of Dynamic and Sustainable view of the firm framework, this research looked into how sustainable development is perceived, who the drivers of sustainability are, and if current ERP systems are ready to support sustainability initiatives in businesses. Combined, this research was driven by the following research question: Are current ERP systems ready for supporting sustainability initiatives?

This study established that from a consultant perspective, there are opposing responses to the research question. Hence, sustainability functionalities are both included and excluded in the currently available ERP systems. First, results show that adopting sustainability does get acknowledged as a competitive advantage for ERP consultancy. Yet, sustainability is not on top of the agenda, according to the participants. Leaders in the ERP market, such as Microsoft and SAP, have taken the first steps into creating what is called 'Sustainable ERP'. This is not highly promoted or articulated as not all the interviewed consultants were aware of these capabilities. However, consultants that were aware of the concept of sustainability mentioned it, and one consultant showed the environmental functionality that Microsoft had discontinued, which he perceived as a sustainability functionality. The consultants have also seen sustainability-related requests coming in from their customers. However, these initiatives mainly focus on the planet bottom line. Moreover, sustainability initiatives will only be considered if they provide a positive result to the profit bottom line. In that sense, the researchers conclude that consultants who expand their competence and gain knowledge on sustainability are likely to, not only satisfy their clients' needs but also to be more capable of assessing what the concept of sustainability is and how can it be incorporated and adopted so that ERP consultancy can gain a competitive advantage. The end-user acknowledges that the

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data is as good as the consultant, indicating that the consultant has to be knowledgeable of what kind of sustainability data is important for the client, which confirms that the consultant competence is crucial for the client to have a successful sustainability adoption.

In conclusion, there is yet a lot to learn about sustainability and what all three bottom lines entail for ERP vendors, ERP consultants, and ERP end-users. Future research is encouraged to expend the body of knowledge on sustainability and ERP to really discover the benefits it could bring to future generations to come.

References

Ajmal, Mian M., Mehmood Khan, Matloub Hussain and Petri Helo. 2018. "Conceptualizing and incorporating social sustainability in the business world", *International Journal of Sustainable Development & World Ecology* 25(4): 327-339.

Al-Mashari, Majed, Abdullah Al-Mudimigh, and Mohamed Zairi. 2003. "Enterprise Resource Planning: A Taxonomy Of Critical Factors". *European Journal Of Operational Research* 146 (2): 352-364. doi:10.1016/s0377-2217(02)00554-4.

Aladwani, Adel M. 2001. "Change Management Strategies For Successful ERP Implementation". *Business Process Management Journal* 7 (3): 266-275. doi:10.1108/14637150110392764.

Ardente, Fulvio, Laura Talens Peiró, Fabrice Mathieux, and Davide Polverini. 2018. "Accounting For The Environmental Benefits Of Remanufactured Products: Method And Application". *Journal Of Cleaner Production* 198: 1545-1558. doi:10.1016/j.jclepro.2018.07.012.

Baker, Raniin Chantel, and Moutaz Haddara. 2019. "Exploring consultants' role in ERP systems implementations." *IADIS International Conference Information Systems.* 163-170.

Barnea, Amir, and Amir Rubin. 2010. "Corporate social responsibility as a conflict between shareholders." *Journal of business ethics* 97(1): 71-86.

Barriball, K. Louise and Alison While. 1994. "Collecting data using a semi- structured interview: a discussion paper." *Journal of Advanced Nursing* 19 (2): 328–335. doi:10.1111/j.1365-2648.1994.tb010 88.

Baya, Vinod, and Galen Gruman. 2011. "Sustainability: moving from compliance to leadership." *Technology Forecast: A Quarterly Journal* 4: 6-21

Beheshti, Hooshang M. 2006. "What Managers Should Know About ERP/ERP II". *Management Research News* 29 (4): 184-193. doi:10.1108/01409170610665040.

Bengtsson, Frederik and Pär J. Ågerfalk. 2016. "Sustaining sustainability: Investigating the long-term effects of a sustainability initiative." *Scandinavian Conference on Information Systems (SCIS 2016)*. Springer, Cham 259: 86-99.

Bhaskaran, Suku. 2006. "Incremental innovation and business performance: small and medium-size food enterprises in a concentrated industry environment." *Journal of Small Business Management* 44 (1): 64-80.

Bin, Shuai, and Sun Chaoyuan. 2005. "The Correlativity Analysis between Logistics Industry and National Economy Development ." Accessed April 1, 2020. http://www.seidatacollection.com/upload/product/201001/12646716644xym9b6o.pdf.

Bingi, Prasad, Maneesh K. Sharma, and Jayanth K. Godla. 1999. "Critical issues affecting an ERP implementation." *IS Management* 16 (3): 7-14.

Bjelland, Elise, and Moutaz Haddara. 2018. "Evolution of ERP systems in the Cloud: A study on System Updates." *Systems* 6 (2) 22.

Boudreau, Marie-Claude, Adela Chen, and Mark Huber. 2008. "Green IS: Building Sustainable Business Practices." *Information Systems: Global Text Project* 1-17.

Bougroug, Achraf, and Pal Sletten. 2020. "Nå situasjonen i norsk økonomi Anslag for aktivitetsnivået ved utgangen av mars 2020." *Statistics Norway Documents 2020/17*.

Accessed April 24, 2020. https://www.ssb.no/nasjonalregnskap-og-konjunkturer/artikler-og-publikasjoner/_attachment/417638?_ts=17158473978.

Bowen, Howard R. 1953. *Social Responsibilities of the Businessman.* University of Iowa press: Iowa City.

Bradford, Marianne. 2015. *Modern ERP: select, implement, & use today's advanced business systems.* Lulu.com: third edition.

Brown, Becky J., Mark E. Hanson, Diana M. Liverman, and Robert W. Merideth. 1987. "Global Sustainability: Toward Definition". *Environmental Management* 11 (6): 713-719. doi:10.1007/bf01867238.

Brown, Alan S. 2011. "Sustainability." *Mechanical engineering* 133 (11): 36-41.

Brundtland, Gro Harlem. 1987. "Our Common Future—Call For Action". *Environmental Conservation* 14 (4): 291-294. doi:10.1017/s0376892900016805.

Burritt, Roger L. 2002. "Environmental Reporting In Australia: Current Practices And Issues For The Future". *Business Strategy And The Environment* 11 (6): 391-406. doi:10.1002/bse.343.

Butler, Tom. 2011. "Compliance with institutional imperatives on environmental sustainability: Building theory on the role of Green IS." *The Journal of Strategic Information Systems* 20 (1): 6-26.

Campbell, Tom, and David Mollica. 2009. "The 'Sustainability' Phenomenon." *Sustainability* 1-35.

Carroll, Archie B., and Kareem Shabana. 2010. "The business case for Corporate Social Responsibility: A review of concepts, Research and practice". *International Journal of Management Reviews* 12 (1): 85-105.

Chasin, Friedrich. 2014. "Sustainability: Are we all talking about the same thing? State-of-the-art and proposals for an Integrative Definition of Sustainability in Information Systems." *2nd International Conference on ICT for sustainability (ICT4S 2014).* Atlantis press 2014.

Chenail, Ronald J. 2011. "Interviewing the Investigator: strategies for addressing instrumentation and researcher bias concerns in qualitative research." *The Qualitative Report* 16 (1): 255–262.

Chircu, Alina M., and Robert J. Kauffman. 2000. "Limits to Value in Electronic Commerce-Related IT Investments." *Journal of Management Information Systems* 17 (2): 59-80.

Chofreh, Abdoulmohammad G., Feybi Ariani Goni, Jirí Jaromír Klemes, Muhammad Noman Malik and Huma Hayat Khan. 2020. "Development of guidelines for the implementation of sustainable enterprise resource planning systems." *Journal of Cleaner Production* 244: 1-16.

Chofreh, Abdoulmohammad Gholamzadeh, Feybi Ariani Goni, Awaluddin Mohamed Shaharoun, Syuhaida Ismail, and Jiří Jaromír Klemeš. 2014. "Sustainable Enterprise Resource Planning: Imperatives And Research Directions". *Journal Of Cleaner Production* 71: 139-147. doi:10.1016/j.jclepro.2014.01.010.

Corbin, Juliet, and Anselm Strauss. 1998. *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory*. Vol. REDO. Thousand Oaks, CA: Sage Publications.

Costa, Carlos J., Edgar Ferreira, Fernando Bento, and Manuela Aparicio. 2016. "Enterprise resource planning adoption and satisfaction determinants." *Computers in Human Behavior* 63: 659-671.

Cramer, Jacqueline. 2002. "From financial to sustainable profit." *Corporate Social Responsibility and Environmental Management* 9 (2): 99-106.

Dao, Viet, Ian Langella, and Jerry Carbo. 2011. "From green to sustainability: Information Technology and an integrated sustainability framework." *The Journal of Strategic Information Systems* 20 (1): 63-79.

Davenport, Thomas H. 1998. "Putting the enterprise into the enterprise system." *Harvard business review* 76 (4)

Davis, Keith, and Robert L. Blomstrom. 1968. "BUSINESS AND ITS ENVIRONMENT". *Academy Of Management Journal* 11 (2): 237-238. doi:10.5465/amj.1968.4297423.

Davis, Keith. 1973. "The case for and against business assumption of social responsibilities". *Academy of Management Journal* 16 (2): 312–322.

Devoteam Fornebu Consulting. 2020. "ERP systems in Norway - An independent analysis, market overview, and summary of ERP systems and vendors in Norway. Theme- The impact of emerging technologies."

Duan, Jiaqi, Parwiz Faker, Alexander Fesak, and Tim Stuart. 2013. "Benefits and Drawbacks of Cloud-Based versus Traditional ERP systems." *Proceedings of the 2012-13 Course on Advanced Resource Planning.*

Dyllick, Thomas and Kai Hockerts. 2002. "Beyond the business case for corporate sustainability." *Business Strategy and the Environment* 11(2): 130–141.

Eells, Richard, and Clarence Walton. 1961. "Conceptual Foundations of Business (Richard D. Irwin, Homewood, IL)."

Elkington, John. 1994. "Towards The Sustainable Corporation: Win-Win-Win Business Strategies For Sustainable Development". *California Management Review* 36 (2): 90-100. doi:10.2307/41165746.

Elkington, John. 1998. "Accounting for the triple bottom line". *Measuring Business Excellence* 2 (3): 18-22. doi:10.1108/eb025539.

Elragal, Ahmed and Moutaz Haddara. 2012. "The Future of ERP Systems: look backward before moving forward." *Procedia Technology* 5:21-30.

Esfahani, Mohammad Dalvi, Azizah Abdul Rahman and Nor Hidayati Zakaria. 2014. "The status quo and the prospect of green IT and green IS: a systematic literature review." *Journal of Soft Computing and Decision Support Systems* 2 (1): 18–34.

European Union. 2019. *Supplement on reporting climate-related information.* Financial Stability, Financial Services and Capital Markets Union, European Commission, Brussel: European Commission, 35.

Fink, Larry. 2019 "Purpose & Profit." *Larry Fink's annual letter to CEOs, BlackRock.*

Friedman, Milton. 1962. "The social responsibility of business is to increase its profits." *New York Times*, September, 126.

Frost, Geoff, Stewart Jones, and Philip Lee. 2012. "The Collection, Integration and Reporting of Sustainability Information within an Organisation: State of Practice." *The University of Sydney, Sydney, Australia2012.*

Gajic, Gordana, Stevan Stankovski, Gordana Ostojic, Zdravko Tesic, and Ljubomir Miladinovic. 2012. "Method Of Evaluating The Impact Of ERP Implementation Critical Success Factors – A Case Study In Oil And Gas Industries". *Enterprise Information Systems* 8 (1): 84-106. doi:10.1080/17517575.2012.690105.

Garriga, Elisabet, and Domènec Melé. 2014. "Corporate social responsibility theories: Mapping the territory." *Journal of business ethics* 53 (1-2): 51-71.

Gray, Rob. 1992. "Accounting And Environmentalism: An Exploration Of The Challenge Of Gently Accounting For Accountability, Transparency And Sustainability". *Accounting, Organizations And Society* 17 (5): 399-425. doi:10.1016/0361-3682(92)90038-t.

Guba, Egon G. 1981. "Criteria for assessing the trustworthiness of naturalistic inquiries." *Educational Communications and Technology Journal.* 29: 75-92.

Guba, Egon G. and Yvonna S. Lincoln. 1985. *Naturalistic inquiry.* (Vol. 75): Sage Publications, Incorporated.

Guest, Greg, Arwen Bunce, and Laura Johnson. 2006. "How many interviews are enough? An experiment with data saturation and variability." *Field Methods* 18 (1): 59-82.

Gulla, Jon Atle, and Terje Brasethvik. 2002. "A Model-Driven ERP Environment With Search Facilities". Data & Knowledge Engineering 42 (3): 327-341. doi:10.1016/s0169-023x(02)00051-4.

Gupta, Shivam, Sameer Kumar, Sanjay Kumar Singh, Cyril Foropon, and Charu Chandra. 2018. "Role of Cloud ERP on The Performance of an Organization." *The International Journal of Logistics Management* 29 (2): 659-675.

Haddara, Moutaz and Ondrej Zach. 2011. "ERP systems in SMEs: A literature review". *44th Hawaii International Conference on System Sciences.* IEEE: 1-10.

Haddara, Moutaz, Asle Fagerstrøm, and Bjørnar Mæland. 2015. "Cloud ERP Systems: Anatomy of Adoption Factors & Attitudes." *Journal of Enterprise Resource Planning Studies.*

Haddara, Moutaz. 2018. "ERP systems selection in multinational enterprises: a practical guide." *International Journal of Information Systems and Project Management* 6 (1): 43-57.

Hajer, Maarten, Måns Nilsson, Kate Raworth, Peter Bakker, Frans Berkhout, Yvo de Boer, Johan Rockström, Kathrin Ludwig, and Marcel Kok. 2015. "Beyond Cockpit-Ism: Four Insights To Enhance The Transformative Potential Of The Sustainable Development Goals". *Sustainability* 7 (2): 1651-1660. doi:10.3390/su7021651.

Hasan, Muhammad Syahid, Zuhriah Ebrahim, Wan H.W. Mahmood and M.N. Rahman. 2017. "Sustainable-ERP system: a preliminary study on sustainability indicators." *Journal of Advanced Manufacturing Technology (JAMT)* 11(1) 1: 61-74.

Hellevik, Ottar. 2008. *Jakten på den norske lykken: Norsk Monitor 1987 - 2005 (The Pursuit of Norwegian Happiness: Monitoring Norway in 1987-20005)*. Oslo: Universitetsforlaget.

Høgevold, Nils M., Göran Svensson, H.B. Klopper, Beverly Wagner, Juan Carlos Sosa Valera, Carmen Padin, Carlos Ferro, and Daniel Petzer. 2015. "A Triple Bottom Line Construct And Reasons For Implementing Sustainable Business Practices In Companies And

Their Business Networks". *Corporate Governance: The International Journal Of Business In Society* 15 (4): 427-443. doi:10.1108/cg-11-2014-0134.

Hoornweg, Daniel., & Bhada-Tata, Perinaz. 2012. What a waste: a global review of solid waste management. *Urban Development Series Knowledge Papers.*

Horngren, Charles T., George Foster, Srikant M. Datar, Madhav Rajan, Chris Ittner, and Amelia Annette Baldwin. 2010. "Cost Accounting: A Managerial Emphasis,". *Issues In Accounting Education* 25 (4): 789-790. doi:10.2308/iace.2010.25.4.789.

Hubbard, Graham. 2009. "Measuring organizational performance: beyond the triple bottom line." *Business strategy and the environment* 18 (3): 177-191.

Hutchins, Margot J. and John W. Sutherland. 2008. "An exploration of measures of social sustainability and their application to supply chain decisions." *Journal of Cleaner production* 16 (15): 1688-1698.

Ihlen, Øyvind and Juliet Roper. 2014. "Corporate reports on Sustainability and Sustainable Development: 'We have arrived'". *Sustainable Development* 22: 42-51.

Isaksson, Raine, and Ulrich Steimle. 2009. "What Does GRI-Reporting Tell Us About Corporate Sustainability?". The TQM Journal 21 (2): 168-181. doi:10.1108/17542730910938155.

Jain, Vikas. 2008. "A framework for sustainable ERP value." Dissertation., The George Washington University, Washington, D.C.

Jenkin, Tracy A., Jane Webster, and Lindsay McShane. 2011. "An agenda for 'green' information technology and systems research." *Information and Organization* 21 (1): 17-40.

Jensen, Devon. 2008. "Credibility". In *The SAGE Encyclopedia of Qualitative Research Methods* , edited by Lisa M. Given, 139-140. Los Angeles: SAGE.

Jing, Ranzhe, and Qiu Xun. 2007. "A study on critical success factors in ERP systems implementation." *International Conference on Service Systems and Service Management.* IEEE. 1-6.

Johansson, Björn, and Pedro Ruivo. 2013. "Exploring factors for adopting ERP as SaaS." *Procedia Technology* 9: 94-99.

Jones, Sharon A, Diane Michelfelder and Indira Nair. 2015. "Engineering managers and sustainable systems: the need for and challenges of using an ethical framework for transformative leadership". *Journal of Cleaner Production* 140 (1) 1: 205-212.

Jørgensen, Emeli Høvik, and Vegard Uri Sørheller. 2018. "Implementering av skybaserte ERP-systemer: En kvalitativ studie i norske små og mellomstore bedrifter". MS thesis. *Universitetet i Agder; University of Agder.*

Juma'h, Ahmad H., and Metropolitan Campus. 2009. "The implications of materiality concept on accounting practices and decision making." *Revista Empresarial Inter Metro/Inter Metro Business Journal* 5 (1): 22-37.

Kallio, Hanna, Anna-Maija Pietilä, Martin Johnson, and Mari Kangasniemi. 2016. "Systematic methodological review: Developing a framework for a qualitative semi-structured interview guide." *Journal of advanced nursing* 72 (12): 2954-2965.

Kaplan, Bonnie, and Joseph A. Maxwell. 2005. "Qualitative research methods for evaluations computer information systems." In *Evaluation the organizational impact of healthcare information system*s. New York, NY: Springer.

Kavis, Michael. 2014. *Architecting The Cloud.* 1st ed. New Jersey: John Wiley & Sons.

Kiadehi, Elias Fathi, and Shahriar Mohammadi. 2012. "Cloud ERP: Implementation of enterprise resource planning using cloud computing technology." *Journal of Basic and Applied Scientific Research* 2 (11): 11422-11427.

Kimmel, Paul D, Jerry J Weygandt, and Donald E Kieso. 2019. *Accounting.* Hoboken, NJ: John Wiley & Sons.

Kleindorfer, Paul R., Kalyan Singhal, and Luk N. Wassenhove. 2005. "Sustainable Operations Management." *Production and Operations Management* 14 (4): 482-492.

Knafl, Kathleen A., Denise C. Webster, Jeanne Quint Benoliel and Janice M. Morse.1988. "Managing and analyzing qualitative data a description of tasks, techniques, and materials". *Western Journal of Nursing Research.* 10 (2): 195-218.

Lamberton, Geoff. 2005. "Sustainability Accounting—A Brief History And Conceptual Framework". *Accounting Forum* 29 (1): 7-26. doi:10.1016/j.accfor.2004.11.001.

Larson, Andrea L., Elizabeth Olmsted Teisberg, and Richard R. Johnson. 2000. "Sustainable Business: Opportunity And Value Creation". *Interfaces* 30 (3): 1-12. doi:10.1287/inte.30.3.1.11658.

Laszlo, Christopher. 2008. "*Sustainable Value How the World's Leading Companies are Doing Well by Doing good*. 1st ed. California: Greenleaf Publishing Ltd.

Laudon, Kenneth C, and Carol G Traver. 2016. *E-commerce: business, technology, society*. Pearson. Twelfth edition.

Leitch, Claire M., Frances M. Hill, and Richard T. Harrison. 2010. "The philosophy and practice of interpretivist research in entrepreneurship: Quality, validation and trust." *Organizational Research Methods* 13 (1): 67-84.

Lengnick-Hall, Cynthia A., and Mark L. Lengnick-Hall. 2006. "HR, ERP, And Knowledge For Competitive Advantage". *Human Resource Management* 45 (2): 179-194. doi:10.1002/hrm.20103.

Leseure, Michel. 2018. "A critical review of the social dimension of sustainability in operations management research." *Proceedings of the fifth International EUROMA Sustainable Operations and Supply Chain Forum*, Kassel, Germany, March 05-06.

Lincoln, Yvonna S., and Egon G. Guba. 1986. "But is it rigorous? Trustworthiness and authenticity in naturalistic evaluation." In D.D. Williams (Ed.), Naturalistic evaluation (73-84). New Directions for Program Evaluation, No. 30. San Francisco, CA:Jossey-Bass.

Loock, Claire-Michelle, Thorsten Staake, and Frédéric Thiesse. 2013. "Motivating energyefficient behavior with green is: an investigation of goal setting and the role of defaults." *MIS quarterly* 37 (4): 1313-1332.

Lutter, Stephan, Giljum, Stefan and Göze, Burcu 2018. "Global Trends Of Material Use – Materialflows.Net". *Materialflows.Net.* http://www.materialflows.net/global-trends-of-material-use/.

Mabert, Vincent A., Soni Ashok, and M. A. Venkataramanan. 2003. "The Impact Of Organization Size On Enterprise Resource Planning (ERP) Implementations In The US Manufacturing Sector." *Omega* 31 (3): 235-246.

Malik, Zeeshan. 2019 "Sustainability and Logistics Organizations in Sweden." MS thesis. *Jönköping iinternational business school.*

Marshall, Bryan, Peter Cardon, Amit Poddar, and Renee Fontenot. 2013. "Does sample size matter in qualitative research?: A review of Qualitative Interviews in IS Research." *Journal of Computer Information Systems* 54 (1): 11-22.

McWilliams, Abagail, Donald S. Siegel, and Patrick M. Wright. 2006. "Corporate social responsibility: Strategic implications." *Journal of management studies* 43 (1): 1-18.

Melville, Nigel P. 2010. "Information Systems Innovation for Environmental Sustainability." *Mis Quarterly* 34 (1): 1-21.

Melville, Nigel P., and Ryan Whisnant. 2012. "Environmental Sustainability: Empirical Analysis of Environmental ERP Implementation. University of Michigan." Michigan, USA: Ann Arbor

Mentzer, John. T., DeWitt, William., Keebler, James. S., Min, Soonhong., Nix, Nancy. W., Smith, Carlo. D., & Zacharia, Zach. G. 2001. Defining supply chain management. *Journal of Business logistics*, *22*(2), 1-25.

Merriam, S. B. 2009. Qualitative research: A guide to design and implementation (3rd ed). San Francisco, CA: Jossey-Bass.

Merriam, Sharan B. 1998. *Qualitative Research and Case Study Applications in Education. Revised and Expanded from.* San Francisco: ossey-Bass Publishers.

Microsoft. 2018. www.dynamics.microsoft.com/en-us accessed 02.01.2019. Quoted in Abdoulmohammad Gholamzadeh Chofreh, Feybi Ariani Goni, Jirí Jaromír Klemes, Muhammad Noman Malik and Huma Hayat Khan. 2020. "Development of guidelines for the implementation of sustainable enterprise resource planning systems." *Journal of Cleaner Production* 244: 1-16.

Mishra, Alok. 2011. "Achieving business benefits from erp systems." *Enterprise Information Systems: Concepts, Methodologies, Tools and Applications*. IGI Global. 1279-1294.

Munkvold, Bjørn Erik, and Bendik Bygstad. 2016. "The land of confusion - clearing up some common misunderstandings of interpretive research."

Myers, Michael D. 1997. "Qualitative Research in Information Systems". *MIS Quarterly* 21 (22): 241-242. Archival version, June 1997, http://www.misq.org/supplements/. *Association for Information Systems (AISWorld) Section on Qualitative Research in Information Systems*, updated version, last modified: March 1, 2016, www.qual.auckland.ac.nz.

Oates, Briony J. 2006. *Researching Information Systems and Computing*. California: Sage Publications.

Oltra-Badenes, Raul, Hermenegildo Gil-Gomez, Vicente Guerola-Navarro, and Pau Vicedo. 2019. "Is It Possible To Manage The Product Recovery Processes In An ERP? Analysis Of Functional Needs". *Sustainability* 11 (16): 4380. doi:10.3390/su11164380.

Peng, Guo Chao Alex, and Chirag Gala. 2014. "Cloud ERP: A new dilemma to modern organizations?" *Journal of Computer Information Systems* 54 (4): 22-30.

Pfeifer, Stephanie, and Rory Sullivan. 2008. "Public Policy, Institutional Investors And Climate Change: A UK Case-Study". *Climatic Change* 89 (3-4): 245-262. doi:10.1007/s10584-007-9380-y.

Porter, Michael E. 2011. *Competitive Advantage of Nations: Creating and Sustaining Superior Performance.* New York : Simon and Schuster Inc.

Porter, Michael E. and Mark R. Kramer. 2006. "The link between competitive advantage and corporate social responsibility." *Harvard Business Review.* 84 (12): 78-92.

Pradhan, Prajal, Luis Costa, Diego Rybski, Wolfgang Lucht, and Jurgen P. Kropp. 2017. "A systems study of Sustainable Development Goals (SDG) interactions." *Earth's future* 5 (11): 1169-1179.

Presthus, Wanda. 2012. "Catch Me If You Can! How Technology is Running Away from Ethics in Business Intelligence." *NOKOBIT–Norsk konferanse for organisasjoners bruk av informasjonsteknologi.*

Raza, Mazahir. 2018. "How To Measure The Immeasurable Degree To Which An Organization Is Sustainable?". *Management Of Sustainable Development* 10 (1): 49-52. doi:10.2478/msd-2018-0007.

Retief, Francois, Alan Bond, Jenny Pope, Angus Morrison-Saunders and Nicholas King. 2016. "Global megatrends and their implications for environmental assessment practice. *Environmental Impact Assessment Review* 61: 52-60.

Rezaee, Zabihollah. 2019. *Business Sustainability, Corporate Governance, and Organizational Ethics.* New Jersey: John Wiley & Sons.

Rice, James B. Jr. 2020. "Prepare your Supply chain for Coronavirus." *Coronavirus and Business: The Insights you need from Harvard Business Review* (Harvard Business School Publishing Corporation) 17-20.

Roca-Puig, Vicente. 2019. "The circular path of social sustainability: An empirical analysis." *Journal of Cleaner Production* 212: 916-924

Rodriguez, Miguel A., Joan E. Ricart, and Pablo Sanchez. 2002. "Sustainable development and the sustainability of competitive advantage: A dynamic and sustainable view of the firm." *Creativity and innovation management.* 11 (3): 135-146.

SAP, Open Course. 2020. "Sustainability: Learning From Leading Companies". *Open.Sap.Com*. https://open.sap.com/.

SAP. 2018. www.help.sap.com/viewer/f61cc730a56547d99616ffa2fee7add9/4.0/en-US/7ac3c9507a90e85ee10000000a44538d.html accessed 02.01.2019. Quoted in Abdoulmohammad Gholamzadeh Chofreh, Feybi Ariani Goni, Jirí Jaromír Klemes, Muhammad Noman Malik and Huma Hayat Khan. 2020. "Development of guidelines for the implementation of sustainable enterprise resource planning systems." *Journal of Cleaner Production* 244: 1-16.

Sarkis, Joseph, Chulmo Koo, and Richard T. Watson. 2013. "Green information systems & technologies - this generation and beyond: Introduction to the special issue." *Information Systems Frontiers* 13 (5): 695-704.

Schaltegger, Stefan, and Roger L. Burritt. 2010. "Sustainability Accounting For Companies: Catchphrase Or Decision Support For Business Leaders?". *Journal Of World Business* 45 (4): 375-384. doi:10.1016/j.jwb.2009.08.002.

Schmidt, Nils-Holger, Koray Erek, Lutz M. Kolbe and Rüdiger Zarnekow. 2009. "Towards a Procedural Model for Sustainable Information Systems Management." *42nd Hawaii International Conference on System Sciences*, Big Island, HI, 1-10. doi: 10.1109/HICSS.2009.468.

Shahriari, Mohammadreza, Nazanin Pilevari, and Zahra Gholami. 2016. "The Effect Of Information Systems On The Supply Chain Sustainability Using DEMATEL Method". *Communications On Advanced Computational Science With Applications* 2016 (1): 47-56. doi:10.5899/2016/cacsa-00053.

Shenton, Andrew K,. 2004. "Strategies for ensuring trustworthiness in qualitative research projects." *Education for Information* 22: 63-75.

Shrivastava, Paul. 1994. "Castrated environment: Greening organizational studies." *Organization Studies* 15 (5): 705-726.

Slaman, Milou and Moutaz Haddara. 2019. "How Green Can the Lettuce Be? A Case Study on Greening Initiatives in Supply Chains and Sustainable ERP Systems." *Procedia Computer Science* 164: 79-85.

Slaper, Timothy F., and Tanya J. Hall. 2011. "The triple bottom line: What is it and how does it work." *Indiana business review* 86 (1): 4-8.

Smith, H. Jeff. 2003 "The shareholders vs. stakeholders debate." *MIT Sloan Management Review* 44 (4): 85-90.

SSB. 2020. Abrupt standstill in the Norwegian economy. April 24. Accessed April 24, 2020. https://www.ssb.no/en/nasjonalregnskap-og-konjunkturer/artikler-og-publikasjoner/abrupt-standstill-in-the-norwegian-economy.

Stafford-Smith, Mark, David Griggs, Owen Gaffney, Farooq Ullah, Belinda Reyers, Norichika Kanie, Bjorn Stigson, Paul Shrivastava, Melissa Leach, and Deborah O'Connell. 2017. "Integration: the key to implementing the Sustainable Development Goals." *Sustainability Science* 12 (6): 911-919.

Thomas, David R. 2006. "A general inductive approach for analyzing qualitative evaluation data." *American journal of evaluation* 27 (2): 237-246.

Thomas, Pelleth Y. 2010. "Towards developing a web-based blended learning environment at the University of Botswana." Doctoral Dissertation.

Tilt, Carol. A. 2009. "Corporate Responsibility Accounting and Accountants". *Professionals' Perspectives of Corporate Social Responsibility,* Idowu, Samuel O.; Leal Filho, Walter (Eds.), 11-32. Berlin Heidelberg: Springer-Verlag.

Tushi, Bonny T., Darshana Sedera and Jan Recker. 2014. "Green IT segment analysis: an academic literature review". *Proceedings of the Twentieth Americas Conference on Information Systems (AMCIS 2014)* 1–15.

UNDP. 2019. Human Development Report 2019. Beyond income, beyond averages, beyond today: inequalities in human development in the 21st centure. Published for the United Nations Development Programme. Electronic source, conducted on 18th of may 2020 http://hdr.undp.org/sites/default/files/hdr_2019_overview_-_english.pdf

Ursacescu, Minodora, Dan Popescu, Cristina State, and Ion Smeureanu. 2019. "Assessing The Greenness Of Enterprise Resource Planning Systems Through Green IT Solutions: A Romanian Perspective". *Sustainability* 11 (16): 4472. doi:10.3390/su11164472.

Vallance, Suzanne, Harvey C. Perkins and Jennifer E. Dixan. 2011. "What is social sustainability? A clarification of concepts." *Geoforum* 42: 342-348.

Wagner, Erica L., and Sue Newell. 2004. "'Best'for whom?: the tension between 'best practice'ERP packages and diverse epistemic cultures in a university context." *The Journal of Strategic Information Systems* 13 (4): 305-328.

Waldron, Mark W., Jay Vsanthakumar, and S Arulraj. 1997. "Improving the organization and management of extension." In *Improving agricultural extension. A reference manual*, by Mark W. Waldron. Illinois: International Program for Agricultural Knowledge System.

Walshman, Geoff. 1995. "Interpretive case studies in IS research: nature and method." *European Journal of Information Systems* 4: 72-81.

Wang, Eric T.G., and Jessica H.F. Chen. 2006. "Effects of internal support and consultant quality on the consulting process and ERP system quality." *Decision support system*s 42 (2): 1029-1041.

Watson, Richard T., Marie-Claire Boudreau, and Adela J. Chen. 2010. Information systems and environmentally sustainable development: energy informatics and new directions for the IS community. MIS Quarterly 34 (1), 23–38.

Watts, Ross L., and Jerold L. Zimmerman. 1986. "Positive accounting theory." *Prentice-Hall Inc.*

Witoszek, Nina. 2018. "Teaching sustainability in Norway, China and Ghana: challenges to the UN programme." *Environmental Education Research*. 24 (6): 831-844.

Wu, Jen-Her, and Yu-Min Wang. 2006. "Measuring ERP success: the ultimate users' view." *International Journal of Operation & Production Management* 26 (8): 882-903.

Yin, Robert K. 2009. *Case Study Research: Design and Methods*. Thousand Oaks, CA: SAGE Publications.

Zimmerman, Ewa and Jo Smedley. 2006. "ERP Implementations-a never ending story?". *IRIS 29, Paradigms Politics Paradoxes, 29th Information Systems Research Seminar in Scandinavia, August 12-15 2006, Helsingør, Denmark*. IRIS: 12.

Appendix

Appendix A: Ethical Approval

Kristiania University College

29th of April 2020

STATEMENT OF ETHICS APPROVAL

Proposer: Milou Slaman and Raniin Chantel Backer

The school's research ethics committee has considered your submitted proposal. Acting under delegated authority, the committee is satisfied that there is no objection on ethical grounds to the proposed study.

Approval is given on the understanding that you will adhere to the terms agreed with participants and to inform the committee of any change of plans in relation to the information provided in the application form.

Yours sincerely,

Asle Fagerstrøm
Professor

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Appendix B: Consent form

Information Sheet and Consent Form

The following document gives you as a participant an overview of the research project and what we ask from you as a participant. It also contains the contact information of us and our supervisor in case of questions. Please complete the consent form by signing below.

Background

Our names are Chantel Raniin Backer and Milou Slaman, and we are Master's students at the Kristiania University College. We are currently writing a master thesis about the state of ERP in connection with sustainability. The chosen case sector is that of agriculture.

What this study is about

Our thesis is about how ERP systems can support sustainability initiatives within organizations. Through the principle of the Triple Bottom Line (Social, Economical, Ecological), we are researching the need of the market to meet their current sustainability challenges and how an ERP system could meet these challenges.

What I will ask of you as participant

Our research method is done through semi-structured interviews, and we are asking you to please answer these questions from your point of view. The estimated time frame is one hour per interview, but it is up to you if you want to finish sooner, or take more time. We will be taping the interview using a smartphone, and transcribe afterwards. If you object to this, I will refrain from taping and transcribe directly during the interview. In this case, please allow some extra time for the interview. In any case, your name will not appear in any documentation, nor will imply any attributes that can be related back to you or the organisation you work for. Your name will be replaced with a letter (Participant A; Participant B). You will participate at your own discretion; it is entirely voluntary, and you may withdraw at any time. This will not have any consequences for any of the parties.
Thank you very much in advance for your time.

Contact information

Our supervisor's name and e-mail: Moutaz Haddara, Moutaz.Haddara@kristiania.no
We can be contacted at these emails: raniinc.b@hotmail.no & milouslaman@gmail.com

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Consent Form (the participant fills out)

I want to participate in this study ❒

I am aware of that I can withdraw at any time during the study ❒

Signature: ....

Appendix C: Questionnaire ERP consultant

An ERP system, at its essence, is a tool for managing information. ERP software integrates information on business operations, including product planning, development, manufacturing processes, financials, sales and marketing.

Our objective is to investigate whether an ERP system can provide relevant information to sustainable initiatives within an organization to help them with their sustainability challenges. By sustainability we focus on the (possible) economic, social and ecological aspects of an ERP system from a consultant perspective.

We have a set of questions for you that are here to guide the interview, but we want to mention beforehand that we hope to have more of a conversation and are very open to new - related- topics being suggested by you as the interviewee.

This interview is anonymous. We will not -unless otherwise clarified by you- mention your name or any attributes that might relate your answers back to you.

The basics:
1. Which sector do you work for?
2. What is your position in the company?
3. What is your company size? (small/medium/large)
4. Which ERP system do you use?
5. Do you use one ERP system or more? If yes: are they interlinked?

Sustainability:
1. What is sustainability in your opinion?
2. How can ERP systems be considered green or sustainable in your opinion?
3. Have you noticed a sustainability trend based on your experience in ERP?
4. Have you seen that vendors are focusing on sustainable ERP?
5. Have you seen that customers are requesting sustainable ERP solutions?
   a. If yes, do you have any examples for us?
6. What are the sustainability measures that you already see in the industry within the ERP sector?
7. What are the sustainability measures that are not yet explored within the ERP sector?
8. Who would you say are the drivers of sustainability?

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9. Do you think that ERP systems can provide the information needed to assess the risks and opportunities implied by global changes in the environment?
   a. Why?
10. What is your perspective on the Sustainable Development Goals?
11. Do you think ERP can benefit the organization to keep up with the emerging regulations and standards at both industry and governmental level?
12. How do you see the economical aspect of sustainability is being view in your company?
13. How do you see the environmental aspect of sustainability is being view in your company?
14. How do you see the social aspect of sustainability is being view in your company?
   a. Which of these challenges is receiving the most attention?
   b. Which of these challenges should receive the most attention?
15. Finally, is there anything we haven't asked or discussed that you would consider as critical for this topic?

Appendix D: Questionnaire ERP end-user

An ERP system, at its essence, is a tool for managing information. ERP software integrates information on business operations, including product planning, development, manufacturing processes, financials, sales and marketing.

Our objective is to investigate whether an ERP system can provide relevant information to sustainable initiatives within an organization to help them with their sustainability challenges. By sustainability we focus on the (possible) economic, social and ecological aspects of an ERP system.

We have a set of questions for you that are here to guide the interview, but we want to mention beforehand that we hope to have more of a conversation and are very open to new - related- topics being suggested by you as the interviewee.

This interview is anonymous. We will not -unless otherwise clarified by you- mention your name or any attributes that might relate your answers back to you.

The basics:

1. Which sector do you work for?
2. What is your position in the company?
3. What is your company size? (small/medium/large)
4. Which ERP system do you use?
5. Do you use one ERP system or more?
   a. If yes: are they interlinked?

Sustainability:

1. What is your definition of sustainability?

2. How does sustainability influence your daily operations?

3. What role does sustainability play in your company?

4. Are people within your organizations aware of the concept of sustainability?

5. Can you mention one social way your company is looking at sustainability?

   a. Can you mention one environmental way your company is looking at sustainability?

    b. Can you mention one economical way your company is looking at sustainability?

"Sustainability is a characteristic of a stakeholder activity (organizational process or individual behaviour) which impacts on natural and social environments and meets the (economic) needs of the present, without compromising the ability of future stakeholders to meet their needs" (Chasin 2014, 347)

6. How <u>is</u> the ERP system contributing to sustainability initiatives within your organization?
7. Are there any benefits that you see with the ERP system that can contribute to sustainability?
8. What functionalities are you currently missing to perform your sustainability-related tasks?
9. Overall, would you say you are satisfied with the ERP functionalities related to sustainability?
    a. Why yes/no?
10. In your opinion, who do you think should be the driver of sustainability-focused changes in the ERP system? (The vendor, the company, government etc.)

11. Finally, is there anything we haven't asked or discussed that you would consider as critical for this topic?