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MSc IN SHIPPING MANAGEMENT

**QUALITY MANAGEMENT SYSTEMS AND
THEIR EFFECT ON ESG PRINCIPLES AT THE
SHIPPING SECTOR**

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Abstract

The shipping industry, which plays an important role in global trade and the growth of the economy, is under growing scrutiny to tackle environmental and social issues in addition to Quality Management Systems. This study strives to comprehend the value of ESG factors and the effect of QMS on them, as well as their impact on the performance and long-term resilience of shipping companies, through an extensive literature review.

The findings of this study highlight the importance of efficiently maintaining Quality Management Systems as well as implementing the ESG Principles and their regulations. The outcomes benefit shipping companies by increasing the value of the services provided and improving the company's sustainability levels. Furthermore, social criteria and labour rights are met, personnel welfare is taken care of, and governance is transparent, with equal gender representation on governing bodies and ethical leadership. By implementing ESG criteria, shipping companies can improve their decision-making, attract sustainable investments, and contribute to a more environmentally and socially responsible world.

Περίληψη

Η ναυτιλιακή βιομηχανία, η οποία συνεισφέρει στον παγκόσμιο εμπορικό τομέα και την οικονομική ανάπτυξη, αντιμετωπίζει αυξανόμενη πίεση για την αντιμετώπιση περιβαλλοντικών και κοινωνικών ζητημάτων, παράλληλα με τα Συστήματα Διασφάλισης Ποιότητας (QMS). Αυτή η έρευνα στοχεύει στο να κατανοήσει τη σημασία των παραγόντων ESG και τον αντίκτυπο των QMS σε αυτούς, καθώς και τον αντίκτυπο τους στην απόδοση και τη μακροπρόθεσμη ανθεκτικότητα των ναυτιλιακών εταιρειών, μέσω μιας εκτενούς ανασκόπησης της βιβλιογραφίας.

Τα αποτελέσματα αυτής της μελέτης αναδεικνύουν την ανάγκη για αποτελεσματική εφαρμογή των Συστημάτων Διασφάλισης Ποιότητας και την υλοποίηση των αρχών ESG και των κανονισμών τους. Τα αποτελέσματα είναι θετικά για τις ναυτιλιακές εταιρείες, καθώς δημιουργούν περισσότερη αξία για τις υπηρεσίες που παρέχουν και βελτιώνουν τα επίπεδα βιωσιμότητας της εταιρείας. Επιπλέον, πληρούνται κοινωνικά κριτήρια και τηρούνται τα δικαιώματα των εργαζομένων, καθώς η φροντίδα της ευημερίας του προσωπικού διαδραματίζει σημαντικό ρόλο και όσον αφορά τη διακυβέρνηση υπάρχει διαφάνεια, ισότητα φύλου στη σύσταση των οργάνων διοίκησης και ηθική ηγεσία. Συμπερασματικά, οι ναυτιλιακές εταιρείες μπορούν να βελτιώσουν τη διαδικασία λήψης αποφάσεων, να προσελκύσουν βιώσιμες επενδύσεις και να συμβάλλουν σε έναν πιο περιβαλλοντικά και κοινωνικά υπεύθυνο κόσμο με εφαρμογή των αρχών ESG.

Keywords: QMS, ESG Principles, Sustainability, Maritime sector, CSR, ISO, ISM, TMSA

Abbreviations

BC – Black Carbon
BoD – Board of Directors
DEI – Diversity, Equity, Inclusion
EMS – Energy Management System
ESG – Environment, Social, Governance
GHG – Greenhouse Gas Emissions
GVC – Global Value Chains
IEMS – Integrated Environmental Management System
IMO – International Maritime Organization
IPCC – Intergovernmental Panel on Climate Change
ISM – International Safety Management
ISO – International Standard for Organization
OCIMF – Oil Companies International Marine Forum
QMS – Quality Management Systems
SFRD – Sustainable Finance Disclosure Regulation
SOLAS – Safety of Life at Sea
TC – Technical Committee
TCFD – Task Force on Climate Related Financial Disclosures
TMSA – Tanker Management Self-Assessment
UNCTAD – United Nations Conference on Trade and Development

1. Introduction

The shipping industry is vital for global commerce and economic growth, transporting more than 80% of the world's goods by sea (UNCTAD, 2020). As the industry expands, its environmental, social, and governance (ESG) performance comes under severe scrutiny. With climate change, labor rights, and business ethics arising as critical concerns for investors, the implementation of ESG principles for shipping companies has come to be as a focal point for long-term value creation and sustainable development (Eccles & Serafeim, 2013). Simultaneously, the growing importance of the maritime sector in the worldwide economy highlights the need to utilise the science of quality management systems (QMS) to investigate the interdisciplinary nature of the products and services offered by this sector (Glykas & George, 2017). The opportunity for QMS to assist with initiatives aimed at sustainability through integrated management systems or by improving environmental management systems based on QMS lessons learned has increased interest (Siva et al., 2016). The purpose of this diploma thesis, titled "Quality Management Systems and their Effect on ESG Principles in the Shipping Sector," is to investigate the significance and implications of QMS on the newly introduced ESG Principles in the maritime sector. The study seeks to provide a comprehensive understanding of how QMS factors influence the adoption of ESG concepts in the shipping industry by examining the theoretical foundations of QMS and ESG as well as its regulatory trends. How can both performance and quality components influence the ESG Principles and, as thus, be of significant value to the shipping sector without resulting in serious issues in shipping entities' functions?

2. Literature Review

2.1. Definition of Quality Management Systems (QMS)

The creation and preservation of high-quality entities necessitates a solid foundation. Quality management, which began nearly four decades ago with the ideas of Deming, Shewart, Juran, and Ishikawa, has evolved into an established management philosophy and area of research (Hackman and Wageman, 1995). An understanding of best practises, a solid, process-oriented quality assurance system, and a process of continuous evolution towards high-performance management practises are all required for designing an effective organisational structure (Evans & Lindsay, 1999). As a result, a quality management system contains the necessary ingredients to 'enable organisational employees to identify, design, develop, produce, deliver, and support products or services that the customer wants' (Summers, 2003). According to the systems approach, customer satisfaction can only be achieved if all areas of the organisation cooperate (Maguad, 2006).

Furthermore, achieving customer satisfaction is dependent not only on how well and thoroughly quality actions in various areas of the organisation work independently, but also on how well and thoroughly they work together (Foster, 2001). The choice of a quality model or a quality system is determined by the organisation and its goals. There is no model that can offer a perfect, one-size-fits-all solution to all organisational needs. Instead, the model is tailored to the organization's specific needs using the contingency view. Quality models function as a foundation of conveying how organisations should operate and clarifying the roles, responsibilities, and actions of all organisational participants (Maguad, 2006).

Furthermore, the organisation must be properly motivated to implement a QMS. In depth, organisations that implement and seek certification of their QMS for external motives such as

image or customer requirements benefit more from QMS implementation in areas such as quality and operational improvement (Boiral and Amara, 2009; del Castillo-Peces et al., 2018; Poksinska et al., 2002; Sampaio et al., 2009).

2.2. *Quality Management Systems in the Shipping Sector*

Academics and practitioners have paid close attention to safety and quality management theories in the maritime sector over the last few decades. Furthermore, they continue to be important topics of interest in the maritime community and the primary concerns of all shipping companies related shareholders (Karahalios et al., 2015, Schröder-Hinrichs et al., 2013). As previously stated, focusing solely on competitive rates and cost-cutting strategies is insufficient when considering customer satisfaction and committed clientele with strong relationships in the shipping industry. Shipping companies should now pursue quality-improving management initiatives in order to provide their customers with dependable, safe, and high-quality services and ensure their satisfaction (Huang et al., 2015).

Shipping is a service industry and the significance of its quality has increased considerably in recent years. To gain the higher loyalty from customer, business reputation, and market share it is important for a shipping company to enhance and deliver a high-quality service (Bolton and James, 1991; Lun and Pang, 2010; Lun and Marlow, 2011). Harmon (1997) states the nature of shipping service is basically different from physical product or manufacturing as it copes with intangible services, depends on human performance and decisions, producing value by location change, to some extent, and the condition of the cargo transported. In order to manage the maritime business despite the turbulences caused by their operating market, a robust QMS is highly desirable. This can support the firms in planning and executing their operations in a global market, meanwhile managing the uncertainties associated with the operations while consistently satisfying the customers (Glykas et al., 2017).

Evidently so, the already available and growing literature, paths the way to establishing the importance of quality philosophies and the implementations of well-rounded systems and processes that stimulate the presence of quality management systems in the maritime sector. These systems are crucial for enhancing safety, efficiency, and reliability in the maritime industry. Nevertheless, added value is a great advantage that studies have shown could potentially derive from a QMS (Rönnbäck et al., 2009), if there is contribution from higher levels of management and enthusiasm for future implementation of quality systems that could be beneficial for the shipping company.

Thus, the scope of literature regarding the implementation of various QMS is realizing the importance such philosophies and practices will play out in the long run concerning the levels of safety and quality in the shipping sector. Nowadays, quality and safety are highly appreciated by all members of an organization and more and more sought and anticipated. In this regard, the ISO 9000 Standards (Celik, 2009), the International Safety Management (ISM) Code and the Total Quality Management (TQM) are employed. However, it must be noted that the correlation between the implementation of the aforementioned systems and the desired outcome is not always guaranteed. The variables that affect the intended outcomes can be external elements such as the level of competition in the sector or the market and technological turbulence (Wang et al., 2012), as well as environmental uncertainty (Zhang et al., 2012). On the other hand, internal variables can also alter the path of the shipping organization. Such factors describe the degree of innovativeness (Wiengarten et al., 2013) or the company's organizational structure (Douglas and Judge, 2001).

As a result of its unique and unpredictable nature, the human element tends to be the most vital variable in ensuring the effective implementation of quality systems. Individual commitment, competence, attitudes, and motivation, as well as the interpersonal and

cognitive skills of a shipping organization's human resource pool at all levels, determine the final result, particularly in the shipping sector in terms of safety and quality (IMO, 2010).

2.2.1. ISO 9000 Series Standard

The most essential ideas and tenets for a QMS are revealed when an International Standard is implemented. One of the most significant quality standards is ISO 9000, which, according to ISO (2009), is a family of standards that specify the fundamental conditions that must be met by any certified business or organization in order to assess, create, maintain, and put into practice an efficient and successful quality management system. The International Organisation for Standardization, based in Geneva, first proposed it in 1987 with the intention of creating industrial standards that would ease trade between countries. The standard's foundation and guidelines are geared towards excellent management practices and specifications to guarantee that the corresponding goods or services precisely satisfy the needs of the customers. The pertinent literature has provided ample evidence of the ISO 9000 series standards' efficacy (Psomas et al., 2013). In general, ISO 9000 standards attest to the existence of an established quality management system and the observance of all recommended procedures for process systemization enhancements (ISO, 2009). While the ISM Code is a requirement of all shipping organizations, ISO 9000 certification is a voluntary process. Despite this, there are many conceptual and structural similarities between the two codes (Chen, 2000, Pun et al., 2003).

Since their first publication in 1987, the ISO standards used in quality management have undergone a significant change. At first, the main focus was on making sure that goods and services were under quality control, with a particular emphasis on the need for well-documented processes in order to achieve this goal. The standard changed significantly with the release of the 1994 edition. It moved its emphasis to process management and quality assurance, presuming that well-established businesses had some degree of quality control already in place. These guidelines are not meant to be used as performance measures to assess the caliber of a business's goods or services, or the results it produces for the environment. Rather, they serve as recommendations outlining the necessity of formally and methodically organizing a variety of business processes into a set of procedures and meticulously documenting the ways in which they are implemented. (Delmas, 2001; Braun, 2005).

A further significant shift in ISO standards came about in 2000, this time putting a strong focus on the customer—internal or external. This version mandated that each process be customised to produce particular results that precisely met the customer's defined requirements. 2008 saw an additional improvement in the standard, with an emphasis on the organization's performance. This was to be accomplished by means of iterative feedback cycles and corrective measures designed to promote ongoing progress. Ultimately, the scope of ISO 9000:2015 was expanded to include the company's entire business model as well as its goals of growth and success. A more thorough understanding of quality management was introduced by this revision, which also brought it into line with the organization's expansion and overarching objectives.

By conducting a literature review of the academic papers that are available, it is evidently clear that there is an abundance of research done for the implementation of the ISO 9000 series in the manufacturing sector. Furthermore, the service sector has also an adequate data base. However, the shipping sector is lacking as far as the rest of the two sectors. Subsequently, the review of the ISO 9000 series in the shipping sector will be limited but with this paper, the author will try to shed some more light into the aforementioned topic.

In the shipping sector, it is widely accepted that the price isn't all that matters (Panayides and Cullinane, 2002), and organizations are starting to navigate towards the application and adoption of quality systems, such as ISO 9000 Standard series, will not only increase their profits, but will moreover aid their process design and overall performance (Karakasnaki, 2016). According to Tari et al. (2012), such standards are not intended to serve as a quality control system for the company's products and/or services, but rather to provide adequate guidelines for the organisation to achieve a high level of formalisation and documentation of its main processes and procedures. This results in more consistent and predictable services, which can lead to higher customer satisfaction. To delve deeper into this specific QMS, a high level of quality is the main requirement to guarantee an efficient response to shifting customer requirements concerning shipping services (Lagoudis et al., 2006). Lagoudis and Theotokas (2007) concluded, via the same quality parameters and after looking at a number of Greek shipping companies, that the quality of human capital or the workforce of the business is the most significant factor when accounting for competitiveness, followed by reputation. It should be mentioned however, that the ISO 9001 standard, as a process-oriented management system, emphasises the importance of organisations developing their own quality systems.

The ISO 9000 core family includes a variety of standards that all seek to create a quality management system (ISO, 2009). Implementing the ISO 9001 standard illustrates an organization's ability to provide products/services that effectively correlate to the wants and expectations of its customers. The ISO 9000 is divided into sections that highlight the importance of implementing specific activities in the areas of overall requirements, management responsibility, resource and process management, monitoring and measurement. ISO 9004, on the other hand, considers the benefits of all interested stakeholders and aims for long-term success and continuous improvement of an organization's overall performance. Last but not least, ISO 19011 specifies internal and external auditing procedures for quality and environmental management systems.

Critical success factors for the adoption of the ISO 9000 series have also been identified by a number of researchers. Psomas et al. (2010), using data from Greek service sector businesses certified to ISO 9001:2000, the essential elements for the successful application of ISO 9001 standards were identified. They demonstrated the manner in which ISO 9001 effectiveness has a direct and favourable impact on operational performance and the quality of products and services. According to their study, the operational performance dimension included things like business productivity and efficiency, while the product/service quality dimension dealt with things like service consistency, dependability, and specification compliance. Furthermore, Marín and Ruiz-Olalla (2011) made an effort to look into the connection between business outcomes and ISO 9000:2000 certification in the context of the Spanish furniture industry. They showed that ISO-certified businesses outperformed their non-certified counterparts in terms of quality and operational outcomes. In particular, the operative results included, for instance, cost and flexibility measures, while the quality results included various aspects of customer satisfaction and loyalty or conformance and complaints issues. Wu and Chen (2012) examined the extent to which an ISO 9000 certification can improve a company's performance in terms of internal processes, customers, learning and growth, and finances. They showed how ISO certification boosts overall performance in the service and manufacturing industries. Melo and Guia (2015) found that implementing ISO 9001:2008 improved processes, employee motivation, internal communication, and job design in small and medium-sized social service companies using a multiple case study approach. It also enabled employees to better tailor their work to the specific needs of social service users. Kammoun and Aouni (2013), on the other hand, supported the idea that the adoption of ISO 9000 reduced conflict and improved employee motivation and

communication in Tunisian manufacturing firms. (Prajogo et al., 2012) investigated the connections between important supply chain management techniques and the three facets of ISO 9000 adoption (basic, advanced, and supportive). According to their observations, while supportive implementation is only positively associated with internal and customer process management, advanced ISO implementation has a positive effect on supplier, customer, and internal process management. Furthermore, Huo et al. (2014) found that supportive ISO 9000 implementation is only positively related to process flow management, whereas advanced implementation is positively related to both product (product and logistics) and process (human, information, and decision) flow management in a more recent study. As a result, while ISO 9001 implementation and certification do not guarantee performance improvement, the results show that an ISO 9001-based QMS does improve many aspects of a service company's performance (Psomas et al., 2014).

2.2.2. ISO 14000 Series Standard

Following the success of the ISO 9000 series, ISO entered the environmental arena in 1993, establishing a Technical Committee (TC) to prepare an assortment of 207 environmental management standards, the ISO 14000 series (Delmas & Montiel, 2008; Morris, 2004). The ISO series 14000 is the result of hundreds of environmental management experts that through cooperation achieved their target. Their initiatives have resulted in a set of standards that will assist managers in developing and implementing a sound Energy Management System (EMS) without having to design every component of the system themselves (Epstein et Roy, 1997). ISO 14000 is an assortment of six standards that cover environmental management systems, environmental auditing, environmental performance evaluation, environmental labelling, lifecycle assessment, and environmental aspects in product standards. All the standards provide supplemental tools and techniques, as well as guidance through the EMS implementation and maintenance process.

They are important for improving corporate environmental performance and lowering corporate costs, but only ISO 14001 can be certified to (Epstein et Roy, 1997). The ISO 14001 standard outlines the fundamental components of an effective environmental management system. These components are part of the overall management system, which includes organisational structure, planning activities, responsibilities, practises, procedures, processes, and resources for developing, implementing, achieving, reviewing, and maintaining environmental policy (Epstein et Roy, 1997). Delmas and Montiel (2008) proved that ISO 14000 supports the quality management system by establishing a similar system for managing environmental impact; however, these standards address slightly different audiences.

According to Sayre (1996), ISO 14000 promotes "sustainable development for each and every nation and sustainable development for each and every person" (p. 1). This means that a company dedicated to ISO 14000 ensures that its activities, products, and services are beneficial to people and the environment. Furthermore, ISO 14000 promotes resource allocation, responsibility and accountability, and continuous performance evaluation for improvement, all of these factors assist to the competitive advantage provided by superior environmental performance (Aba et al., 2013). ISO 14000, according to Johnson (1997), creates a single worldwide management system that enables effective management of environmental responsibilities. It also reduces liability, controls cost, documents a company's commitment to government, and fosters a company's concern for the public. Furthermore, ISO 14000 has the potential to provide businesses with competitive advantages in areas such as improving raw material and supply management, to explain and make the administration of legally binding environmental laws safer, and to ameliorate corporate image (Renzi &

Cappelli, 2000). Related to the prior debate is the question of whether ISO 9000 and ISO 14000 provide any value to certification organisations. Many studies strongly support the benefits of ISO 9000 certification for businesses (Sharma, 2005; Briscoe et al., 2005). For example, Poksinska et al. (2003) summarise the following ISO 9000 and ISO 14000 benefits: Internal performance advantages (cost savings, environmental/quality enhancements, increased productivity, and improved employee morale) Relationship advantages (better relationships with communities and authorities) External marketing benefits (improved corporate image, increased market share, higher customer satisfaction, and faster delivery). Moreover, the advantages that companies gain from ISO 9000 and ISO 14000 certification—for example, "improved performance," "acquisition of best practises," or "improved communication" in the supply chain (Castka et Balzarova, 2008).

Regarding the application of the ISO 14000 in shipping companies, regulations have compelled shipping companies to improve operational standards and increase environmental protection (Mathiesen, 1994). Combining the ISM Code with ISO 14001:2004, the most recent generic environmental management standards, adds new challenges for shipping companies (Celik, 2009). To assist shipping organisations in managing compliance with the ISM Code and ISO 14001:2004 standards, it may be necessary to devote considerable effort to effectively carry out all of the requirements of ISO 14001:2004, particularly in terms of defining the scope of environmental policy, designing new implementation procedures, and improving operational processes (Celik, 2009). The ISM Code and ISO 14001:2004 equally have an achievable objective of developing an environmentally sound Integrated Environmental Management System (IEMS) for shipping companies (Celik, 2009).

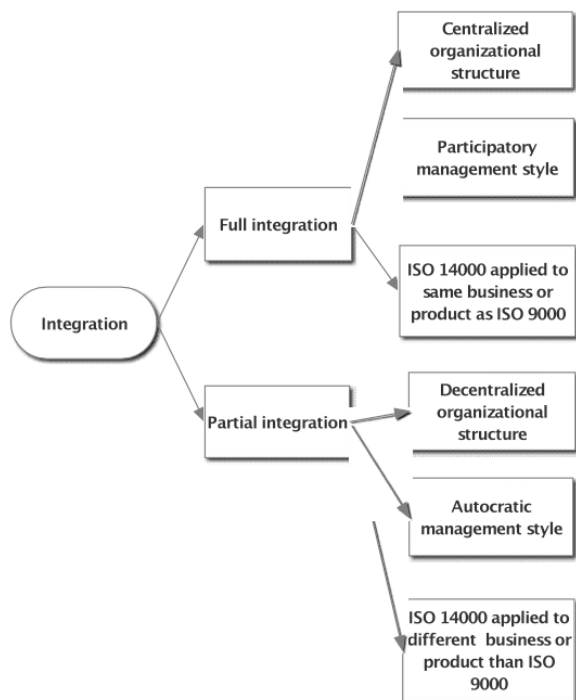


Figure 1. Factors Influencing Full vs. Partial Integration (Block & Marash, 1999)

2.2.3. International Safety Management (ISM) Code

Most multinational industrial and service firms now place a high priority on quality assurance. It was also necessary for shipping companies to put in place a quality management

system. The International marine Organization created the International Safety Management Code (ISM Code) in response to the critical need for safety in marine transport operations. A quality management system can now be established in shipping firms as a subset of a safety management system thanks to the general management system principles included in the maritime ISM Code and generic ISO standards. An international standard for the safe management and operation of ships as well as the prevention of pollution is the International Safety Management (ISM) Code (IMO, 2010). The International Maritime Organization (IMO) states that the ISM Code's explicit goals are aimed at ensuring maritime safety, prevent harm to people or loss of life, and prevent environmental damage, particularly to property and the marine environment (IMO, 2010). Since coming into effect in 1998, the ISM Code has offered a worldwide legal framework. Its various components all work towards advancing an all-encompassing and integrated safety management philosophy in the shipping sector (Batalden and Sydnes, 2014). To be compliant with the Code's mandatory requirements and accomplish its goals, shipping companies were also compelled to redesign their management systems and routine procedures. The ISM Code must be adhered to, but it additionally enables shipping companies to create their own safety protocols and policies (Bhattacharya, 2012), highlighting the self-regulating nature of the Code. The ISM Code generally consists of two parts: Part B covers various aspects of certification and verification processes, while Part A deals with implementation issues. First, Part A of the ISM Code (clause 1) defines an assortment of maritime terms in detail. These terms consist of non-conformity, document of compliance, safety management certificate, safety management system, and others as well. Additionally, Part A outlines the safety management objective that all shipping companies ought to attain. More specifically, it demonstrates what it takes to create an efficient safety management system that guarantees, among other things, that all laws and regulations are obeyed, that risks are carefully assessed, and that all staff members—both onshore and aboard—continuously acquire safety management expertise (IMO, 2010). The necessity of creating and upholding a safety and environmental protection policy across the shipping company is also emphasized (clause 2), as are the functional requirements for the implementation and upkeep of a safety management system. In addition, clauses 3 and 4 of Part A of the ISM Code outline the duties of the shipping company, the designated person or persons, and the master, respectively (clause 5). To be more precise, any shipping company must specify the duties of the person or people involved in safety and pollution prevention-related activities and name the person or people (designated person) who oversee overseeing all safety protocols for each ship and who serve as a liaison between the shipping company and the crew members on board. Finally, but just as importantly, the shipping company should specify exactly what the master's duties and authority are. The master is responsible for carrying out the company's environmental protection and safety policies, making sure the rest of the crew follows the safety protocols, and reporting any potential inadequacies to the management onshore (IMO, 2010). A shipping organization's personnel quality and resources are specifically addressed in Part A of the ISM Code (clause 6). Any shipping company should ensure that the seafarers and the ship's master are suitably qualified, certified, and able to perform their duties. When required, they should receive training, and good communication should be made sure of. Furthermore, to prevent recurrence, the Part A emphasizes the significance of creating plans for shipboard operations (clause 7), being ready for emergencies (clause 8), and reporting and analyzing non-conformities, accidents, and hazardous situations (clause 9). A shipping company is mandated by Part A to provide assurance that the vessel and its technical equipment are preserved in compliance with applicable guidelines (clause 10). Regular inspections are the recommended means of achieving this goal. At last, the ISM Code's Part A emphasizes the prerequisite of all data associated with the safety management system to be recorded (clause 11) and organised

in a safety management manual, and that any shipping business implement verification, review, and evaluation processes (clause 12) to ensure compliance with obligatory rules, assess the effectiveness of the company's safety management system, and establish corrective actions (IMO, 2010). However, certification (clauses 13 and 14) and verification (clause 15) concerns have been addressed in Part B of the ISM Code. Clause 13 pertains specifically to the certification and verification of the safety management certificate and the document of compliance. It defines the rules and regulations that must be carried out by the appropriate regulatory bodies in conjunction with the associated deadlines. The ISM Code permits the issuance of the interim document of compliance and the interim safety management certificate (clause 14), which reiterates the duties of the shipping companies and the regulatory bodies, since it considers the possibility of newly established shipping companies, newly acquired vessels, or flag changes. Lastly, the forms for the (interim) safety management certificate alongside the (interim) document of compliance are enclosed in clause 16 of Part B (IMO, 2010).

The International Maritime Organisation (IMO, 2010) illustrates that the primary objective of the ISM Code's implementation should be to encourage and facilitate the growth of a safety culture within the maritime sector. The commitment, values, and beliefs of a shipping organisation are considered essential to achieving this goal and succeeding in the effort to instill this safety culture. Additionally, top management's commitment to the development of a strong safety management strategy is regarded as a crucial prerequisite for the effective implementation of the ISM Code (IMO, 2010).

Many academics have tried to perform various research studies concerning the ISM Code and its application to the shipping world. Lappalainen et al. (2012) found that enforcing the ISM Code, among other things, increased safety levels in the shipping industry, resulting in increased safety awareness, improved communication channels, and better allocation of responsibilities and duties within maritime organisations. Pun et al. (2003) proposed a 15-stage strategy for successfully registering a company's safety management system in accordance with the ISM Code's mandatory requirements. The ISM Code is an effective policy measure for shipping safety (Tzannatos and Kokotos, 2009), establishing an international standard for ship safety management. The code's fundamental doctrine is a commitment from the top, verification of competence, clear assignment of responsibility, and work quality control (Kristiansen, 2005). Moreover, the ISM Code is based on quality management and introduces a systematic approach to all aspects of the organisation, both on and off the ship (Kristiansen, 2005). The formalisation of prescribed work for key shipboard operations via procedures, manuals, instructions, checklists, and detailed definition of tasks and assignments of shore and shipboard personnel has been proposed as a method for maintaining a systematic approach to maritime safety management within the ISM Code content (Asyali et al., 2014).

2.2.4. Tanker Management Self-Assessment (TMSA)

The Tanker Management Self-Assessment programme was launched by OCIMF in 2004 as an instrument to assist maritime organizations and vessel operators in monitoring, evaluating, as well as improving their management safety systems and procedures. In addition to industry quality codes, it aims to support tanker operators' ongoing improvement by fostering self-regulation and assessment (INTERTANKO, 2008). To improve merchant shipping safety and achieve incident-free, high-quality operations, international conventions such as SOLAS (Safety of Life at Sea) and the International Safety Management (ISM) code have been put in place. However, vessel operators must first establish an efficient safety management system in order for these regulations to be implemented effectively. All vessel operators can enhance

their safety management systems with the help of the TMSA programme (INTERTANKO,2008). In addition, this programme offers leading-edge guidance on how to obtain acceptable standards of safety performance and encourages vessel operators to evaluate their own safety management system against listed key performance indicators. Operators of vessels are urged to share TMSAs with prospective charterers via the TMSA database and to utilise the results of their assessments to create phased improvement plans that can be implemented as needed throughout their whole fleet. The TMSA has quickly acquired international recognition and acceptance as an apparatus for raising safety standards; today, 90% of operators, including all the major oil companies, use the program (INTERTANKO, 2008).

With the launch of the Ship Inspection Report Exchange (SIRE) system, the Oil Companies Marine Forum (OCIMF) has taken the lead in the effort to establish a uniform, common vessel inspection procedure. A consistently high standard of routine inspections is encouraged by this system. In other words, member companies are at ease to incorporate the findings to their own screening processes. The ISM code was introduced to establish a culture of safety and environmental excellence for the management and operation of vessels (INTERTANKO, 2008). To achieve incident-free operations, vessel operators are required by the aforementioned code to put in place a safety management system. The standards of vessel operators who assist the ISM code concept and those who only strive to meet its limited requirements, however, undoubtedly differ from one another. Because of this distinction, a character due diligence concern might have the responsibility of assessing each vessel operator's operational standards (INTERTANKO, 2008).

The program offers guidance on best practices and encourages vessel operators to evaluate their safety management systems in comparison to a list of key performance indicators. Using best practices can help prevent issues from happening again by generating opportunities and improving performance in critical areas like environmental excellence and safety.

Organizations ought to concentrate on applying enhanced processes and procedures consistently throughout their fleet in order to spread standards of excellence (INTERTANKO, 2008). Although it is acknowledged that non-SOLAS ships function outside of the ISM code, their operators can still use this guide as a tool to assess and enhance their performance. Even if a shipping company does not have an ISM management system or is not inspected under the SIRE scheme, it may still be deemed to have an active assessment process if it integrates the TMSA guidelines into its organizational structure (INTERTANKO, 2008). Furthermore, vessel operators can create a phased improvement plan that enhances environmental performance and safety using the assessment results. While the TMSA program offers guidance, the vessel operator bears sole responsibility for vessel operations and data distribution. The majority of oil companies choose well-maintained and well-managed vessels for charter by exercising due diligence (INTERTANKO, 2008). The TMSA expands on the ISM code and can offer the charter insightful commentary regarding the efficiency of the vessel operator's management system. It is about having a standard method for obtaining data and information, which will save operators from having to work twice.

This TMSA initiative offers guidance on what OCIMF deems to be current industry best practices and encourages vessel operators to reach high standards of vessel management and continuous ameliorations (INTERTANKO, 2008). According to Turker (Turker & Er 2008, p. 132), "the TMSA is in fact a quality management system standard" because it is like ISO 9001.

2.3. Definition of Environmental, Social, Governance (ESG) Principles

In the last 20 years, an increasing number of people have become intrigued by social responsibility investing (SRI) due to the pressing need for sustainable development and the rise in pro-social preferences (Chen et al., 2021). A new aspect of socially responsible investing (SRI) is the environment, social responsibility, and governance (ESG) criteria. SRI is an ethical investing strategy that entails removing specific industries from a portfolio based on moral or ethical considerations (Syed, 2017). The primary objective of SRI investments and ESG criteria is to have a beneficial effect on the environment, society, and the company's own governance issues. SRI involves scrutinizing out specific businesses or sectors and making investments based on one's values. ESG is just another tool for evaluating companies; it focuses on environmental, social, and governance factors. Organisations, asset managers, and stockholders have begun to take the ESG factor into account (see, e.g., Orsato, Garcia, Mendes-Da-Silva, Simonetti, and Monzoni, 2015). Gregory et al. (2014) observe that organisations with high ESG scores are more competitive than others in the same industry given that they can use resources more wisely, have better human capital, and use innovative approaches to leadership. ESG is growing rapidly, particularly in North America and Europe. In recent years, there has been a sharp increase in interest in ESG. From 63 in 2006 to 1714 in 2017, there was a significant increase in the number of organisations declaring to conduct responsible investment, and during this time, the assets owned or managed by these organisations went from \$6.5 trillion to \$68.4 trillion (Daugaard, 2020). In recognition of this, some refer to this trend as "the investment opportunity of the century" and predict that, at least in developed markets, ESG investment will dominate from 2022 to 2025 (PWC, 2020). Enhancing ESG reporting, which is commonly regarded as a gauge of a business' commitment to carrying out its social obligations (Zhang et al., 2022). Using three dimensions to map a company's performance, ESG is utilised by regulators, buyers, investors, and other stakeholders (Asif et al., 2023). Globally, regulations related to environmental, social, and governance are evolving. The US SEC published its consultation report in March 2022, requesting that Scope 1 (a company's internal greenhouse gas emissions), Scope 2 (emissions connected to the energy supply), and possibly Scope 3 (external/supply chain emissions) be disclosed in a mandatory manner, contingent on materiality. A more in depth look at the reporting that is being conducted for the ESG report, illustrates that in order for the report to be as accurate as it can be, internal and external data sources are both incorporated into ESG (Tamimi and Sebastianelli, 2017). Environmental management systems, financial and governance reporting are internal data, whereas external data are collected through media, news and social media. According to Eccles et al. (2020), third-party ESG evaluation firms, such as Bloomberg and MSCI, are involved in data collection, analysis, verification, benchmarking, grading, and the preparation of risk analysis reports. The ability to obtain pertinent data, data accuracy, firms' capacity to process information, and the strength of communication and disclosure structures are all necessary for converting raw data into ESG reports (Hutton et al., 2001). The integrated use of emerging technologies is becoming a more fundamental component of these activities. An institution's environmental, social, and governance (ESG) report can only be as reliable as the data it is based on. The goals of ESG, namely, to interact with shareholders and improve the firm's social alignment, social utility, and social congruence, are explained by the theories of stakeholders (Freeman, 1984) and legitimacy (Suchman, 1995; Archel et al., 2009) (Reber et al., 2021). According to institutional theory, businesses embrace ESG initiatives for institutional reasons that are mediated by normative, coercive, and mimetic forces, in addition to their economic allure (DiMaggio and Powell, 1983).

2.3.1. The Three Criteria of ESG Principles

2.3.1.1. Environmental

According to Vrensen et al. (2020), there has been a shift in public opinion due to climate change, and investors, the government, and the media are now focusing more on ESG. Although environmental research is undoubtedly at the forefront of its field, environmental sustainability is seen as lagging globally, particularly in developing nations, according to Newell and Marzuki (2022). Environmental requirements look at how a business affects the environment and how committed it is to reducing negative environmental effects. Environmental criteria that are important include greenhouse gas (GHG) emissions, energy efficiency, waste management, conservation of water, and biodiversity protection (Scholtens, 2017). Because they demonstrate proactive efforts to mitigate environmental risks and contribute to long-term sustainability, companies with robust environmental performance are often more attractive to investors. One of the most pressing environmental issues of our day is climate change. To prevent the worst effects of climate change, the Intergovernmental Panel on Climate Change (IPCC) has emphasised the need to limit increases in global temperature to 1.5°Celsius over preindustrial levels (IPCC, 2018). Companies that reduce their greenhouse gas (GHG) emissions—the main contributor to global warming—have a crucial role to play in this effort. Companies that disregard these emissions run the risk of financial losses, reputational damage, and regulatory penalties (Carney, 2015). ESG assessments also need to consider another important environmental factor: efficient resource management, which includes the responsible use of energy, water, and raw materials. Businesses that optimize their resource utilization can cut waste, save operating costs, and improve their environmental impact (Epstein & Buhovac, 2014). Inadequate disposal of waste can lead to contamination, degradation of the land, and hazards to public health, making waste management a significant environmental concern (Hoorweg & Bhada-Tata, 2012). Policies pertaining to the environment play a major role in encouraging businesses to implement sustainable practices. These laws frequently seek to protect the environment, reduce pollution, and promote waste management. Businesses that disobey these rules risk fines, penalties, and reputational harm, all of which could have a detrimental effect on their bottom line (Bansal & Roth, 2000). On the other hand, proactive environmental compliance and management can lead to increased market opportunities, cost savings, and improved stakeholder relations (Porter & van der Linde, 1995). Environmental factors are the most important part of ESG assessments and have a big impact on how sustainable a company can stay. Businesses can effectively reduce risks, strengthen their position, and improve their financial performance over time by addressing issues like resource management, waste control, biodiversity preservation, and adherence to environmental regulations. Transparent ESG reports and disclosures are essential for businesses to convey their commitment to environmental sustainability and draw in ethically conscious investors. As businesses come to understand the importance of environmental responsibility, it will be even more critical to incorporate these elements into corporate strategy and decision-making processes in order to achieve long-term success.

2.3.1.2. Social

An assessment of a company's relationships with its suppliers, customers, workers, and communities is one of the social criteria. Social criteria include things like product responsibility, workplace safety, diversity and inclusivity, human rights, labor practices, and

community involvement (Khan et al., 2016). Businesses that put social responsibility first are more likely to cultivate positive relationships with their stakeholders, lower the probability of social risks, and support inclusive and equitable policies. Two important social factors that are taken into account in ESG assessments are the provision of safe work environments and equitable labor practices. According to Gjørberg (2009), companies that adhere to fair labor practices by providing competitive wages, guaranteeing safe working conditions, and honoring the rights of their workers tend to increase worker satisfaction, lower employee turnover, and boost overall productivity. However, as Locke (2013) discusses, businesses that disregard these factors risk legal obligations, reputational harm, and regulatory threats. Furthermore, a company's capacity to draw in and keep talent, foster innovation, and improve decision-making is impacted by diversity, equity, and inclusion (DEI)—important social factors (Hunt, Layton, & Prince, 2015). Businesses that put a high priority on DEI are more likely to do better than their rivals in terms of overall competitiveness, employee satisfaction, and financial performance (Bärtschi et al., 2021). Promoting DEI requires laws and procedures that ensure everyone has equal access to opportunities, representation, and treatment, regardless of their gender, sexual orientation, age, race, or any other attribute (Oswick & Noon, 2014). In ESG assessments, ensuring the health and safety of employees is an essential social factor. Businesses that put their employees' health first can see decreases in healthcare expenses, absenteeism, and increased productivity (ILO, 2005). Organisations can reduce occupational hazards and the likelihood of accidents and injuries at work by putting in place comprehensive health and safety policies and programs (ILO, 2014). Businesses can gain goodwill, enhance their reputation, and build trust with stakeholders by getting involved with local communities and helping them grow (Porter & Kramer, 2011). Philanthropy, volunteer programmes, and collaborative initiatives to address social and environmental issues are examples of community engagement activities (Waddock, 2004). Companies can generate long-term benefits for both the community and themselves by investing in community development, which can also create shared value and foster a positive environment for operations (Porter & Kramer, 2011). Throughout the value chain, social and environmental risks must be effectively managed, and this requires responsible supply chain management. Businesses are under growing pressure to handle problems in their supply chains, including labour rights, working conditions, and environmental effects (Carter & Rogers, 2008). Companies can reduce risks, strengthen the resilience of their supply chains, and improve their overall ESG performance by putting responsible sourcing policies into place, working with suppliers on sustainability projects, and performing routine audits (Seuring & Müller, 2008). Subsequently, the importance of social factors in the ESG analysis play out a detrimental role and contribute to the catholic sustainability and ethical character of organizations. Businesses can improve their long-term competitiveness and generate value for all involved parties by addressing labor practices, human rights, diversity, equity, and inclusion, health and safety, community engagement, and responsible supply chain management. Long-term success will depend more and more on companies incorporating social responsibility into their corporate strategy and decision-making as they continue to realize its significance.

2.3.1.3. Governace

The focus of governance guiding principle is on the internal procedures, frameworks, and guidelines that guide a business's oversight and decision-making. According to Gompers et al. (2003), key components of governance criteria are executive compensation, shareholder

rights, board diversity and independence, accountability, and transparency. Ensuring responsible management, lowering potential risks, and maintaining investor confidence all depend on strong governance procedures. Important facets of corporate governance include the makeup and structure of a company's board of directors (Adams, Hermalin, & Weisbach, 2010). To encourage balanced decision-making and prevent groupthink, a well-structured board should be diverse in terms of gender, race, and professional experience (Carter, Simkins, & Simpson, 2003). In addition, having a sufficient number of independent directors can help to ensure objectivity, minimize conflicts of interest, and improve the board's ability to efficiently supervise management (Fama & Jensen, 1983). Given that it directly affects management's alignment of interests with shareholders, leadership compensation is an important component of corporate governance (Jensen & Murphy, 1990). Executive compensation plans should be designed to incentivize long-term value creation and deter excessive risk-taking (Bebchuk & Fried, 2004). Shareholders can assess how well directorial incentives align with the company's strategy and performance by reviewing the transparent reporting of leadership compensation policies and practises (Murphy, 2012). A fundamental component of corporate governance is the protection of shareholder rights, which ensures that investors can effectively watch over and impact management's decisions (Shleifer & Vishny, 1997). According to La Porta et al. (2000), voting on important decisions, having access to relevant information, and taking part in annual meetings are all essential shareholder rights. Strong shareholder rights help companies attract investments, foster trust, and improve their overall governance performance (Gompers, Ishii, & Metrick, 2003). Since they enable stakeholders and investors to evaluate a company's performance and decision-making, transparency and information sharing are essential components of corporate governance (Healy & Palepu, 2001). According to Leuz and Wysocki (2016), complete and timely disclosure of both financial and non-financial data, including ESG performance, can reduce information asymmetry, build trust, and increase market efficiency. Firms that follow strict guidelines for transparency and disclosure are likely to attract long-term capital and enhance their overall performance in terms of corporate governance (Lang & Lundholm, 1993). One of the most important facets of corporate governance is encouraging moral behavior and legal and regulatory compliance. Businesses can lower their legal, financial, and reputational risks by fostering strong ethical cultures and enforcing strict compliance programs (Kaptein, 2008). Organisations can maintain high standards of integrity and build trust among shareholders by putting anti-corruption measures, whistleblower protection policies, and codes of ethics into practice (Sims & Brinkmann, 2003). Corporate governance components are crucial to ESG assessments because they have a big impact on a company's ability to manage risks, safeguard stakeholders' interests, and produce long-term value. By paying attention to elements like the composition and structure of the board, executive remuneration, shareholders' rights, extent of transparency and disclosure, and compliance with regulations and ethical standards, organizations can improve their corporate governance standards and foster an atmosphere of ethical and long-term business procedures. The incorporation of these elements into a business's plan of action and decision-making procedures will increasingly become crucial to its long-term viability due to the growing importance of corporate governance.

2.3.2. Regulatory Trends

Global regulatory trends have evidently gotten more intense in response to the pressing environmental, social, and governance (ESG) issues. These regulations aim to enforce corporate responsibility, improve investor transparency, and match financial activities with sustainable development goals. Businesses, financial institutions, and investors face a distinct

set of opportunities and challenges as the regulatory environment changes (Schoenmaker & Schramade, 2019).

2.3.2.1. EU Taxonomy Regulation

Regulation (EU) 2020/852 established the EU Taxonomy, a classification scheme that enumerates economically viable environmentally sustainable activities. A list of economically viable socially conscious ventures is absent from that regulation. It's possible that environmentally conscious sustainable investments will fit into the Taxonomy or not (European Commission, 2023/363). According to technical screening criteria, the Taxonomy Regulation classifies some economic activities as sustainable or non-sustainable. In June 2021, the technical screening standards, also known as NACE, or the Nomenclature of Economic Activities, were adopted for economic activities that must significantly contribute to climate change adaptation and mitigation. The discussion focused on economic activity in emission-intensive industries, which produce nearly 80% of Europe's direct greenhouse gas emissions: energy, manufacturing, transportation, forestry, and buildings. These economic activities are classified using NACE codes (PwC, 2023).

2.3.2.2. Sustainable Finance Disclosure Regulation (SFDR)

One of the main components of the set of regulations putting the EU Action Plan on Sustainable Finance into effect is the Sustainable Finance Disclosure Regulation, or SFDR. The goal of SFDR is to increase sustainability transparency in the European financial markets through uniform disclosure requirements for financial institutions. This will help to avoid greenwashing and maintain comparability (PwC, 2023). The SFDR is part of the European effort to encourage investor confidence in sustainable investments, to reduce greenwashing, and, in turn, increase sustainable practices.¹ The SFDR requires financial actors in Europe (banks, insurers, asset managers, and investment firms) to disclose two levels of social and environmental information: entity and product level disclosure (Birindelli et al., 2023).

2.3.2.3. Task Force on Climate Related Financial Disclosures (TCFD)

The Task Force on Climate-Related Financial Disclosures (TCFD) was formed by the International Financial Stability Board to offer recommendations for gathering and sharing climate-related data that is useful for making decisions. This will enable investors, decision-makers, and supervision units to better understand and evaluate climate-related risks and opportunities (Chiu et al., 2023). The Task Force on Climate-related Financial Disclosures (TCFD) has published its final recommendations. These offer businesses and other organisations a framework for creating climate-related financial disclosures that are more efficient using their current reporting procedures (TCFD, 2022).

2.3.3. Corporate Social Responsibility (CSR)

In order to meet their stakeholders' needs for sustainable development on the social, economic, and environmental fronts, organisations are coming under more and more pressure to implement corporate social responsibility (CSR) programmes (Smith, 2003). Public relations, business ethics, corporate sustainability, and leadership have all benefited from CSR-related research (Chen et Hung-Baesecke, 2014). Recently, CSR has been redefined by

management scholars as a business theory that establishes a causal relationship between profitability and stakeholder management (Freeman, 1984). The business community has come to accept corporate social responsibility (CSR) more widely because of the prospect of long-term profitability (Burke and Logsdon, 1996; Serafeim, 2014). The concept of social responsibility gained widespread acceptance in the global business community, and in 2010 the International Organisation for Standardisation (ISO) released ISO 26000, a voluntary standard titled "Guidance in Social Responsibility," which is meant to be implemented by businesses in the public, nonprofit, and private sectors (Hemphill, 2016). Lastly, as businesses work towards proving their dedication to social and environmental responsibility, CSR has influenced the creation of sustainability reporting and disclosure frameworks (Carroll, 1991). Investors can now more easily evaluate and compare the ESG performance of companies thanks to frameworks like the Sustainability Accounting Standards Board (SASB) and the Global Reporting Initiative (GRI), which have helped standardise ESG reporting and disclosure. In summary, the emergence of ESG investing has been greatly aided by corporate social responsibility. CSR has established the groundwork for the all-encompassing ESG approach by encouraging moral behaviour, involving stakeholders, and emphasising long-term value creation (Carroll, 1991; Freeman et al., 2010). Due to this, ESG investing is becoming more and more well-known. Its goal is to produce financial gains while simultaneously tackling global issues pertaining to the environment, society, and governance. Shipping companies have recently given corporate social responsibility (CSR) more consideration as a tactic to support their traditional competitive strategies. As per Pawlik et al. (2012), the definition of corporate social responsibility (CSR) is "the integration of social and environmental concerns in the business operations of shipping firms and in the interaction with stakeholders on a voluntary basis." According to Drobetz et al. (2014), the majority of shipping companies now engage in CSR and incorporate it into their operations on a strategic and visionary level. Their results are in line with those of Lam and Lim (2016), who found that 94% of the shipping companies surveyed engaged in some kind of corporate social responsibility (Yuen et al., 2017). Nonetheless, not every shipping company benefits equally from corporate social responsibility practices. Studies by Lu et al. (2009), Drobetz et al. (2014), and Yuen et al. (2016) have demonstrated this. In order to explain this phenomenon, Yuen et al. (2016) introduced contingency theory, which holds that the favorable internal and external environments of shipping firms support the benefits of CSR. The size of the company, financial leverage, ownership structure, and industry are a few of the contingency factors that have been studied and found to moderate the relationship between CSR and performance. For example, large shipping companies typically gain more from CSR implementation because there are more resources available for them to use and because stakeholders put more institutional pressure on them to practice CSR (Yuen et al., 2017).

2.4. ESG Principles in the Shipping Sector

Given that ships are able to handle large volumes of trade and transportation (i.e., cargo, tonnage, freight rates, passenger traffic), maritime transportation has historically been the most significant mode of transportation for civil societies. Over 90% of global trade now occurs through international seaborne trade, which has grown dramatically over the past 20 years (23.89% from 2010 to 2018 and 43.3% between 2000 and 2018). (UNCTAD, 2018). Seaport operators, consulting services providers, and maritime suppliers are essential components of the maritime supply chain, possessing distinct operational attributes such as

size, type, and location, as well as unique sectoral issues and priorities, despite the fact that the shipping industry has historically been the backbone of the global economy (Karagiannis et al., 2022). The maritime sector has significant effects on the environment and society in addition to its advantages in trade and the economy. Two environmental and social aspects that stand out are air pollution and occupational risk. The International Maritime Organisation (IMO) estimated in 2012 that emissions of greenhouse gases (GHG) from international shipping made up 2.2% of emissions of anthropogenic carbon dioxide. Future projections indicate that emissions could rise by 50% to 250% by the year 2050 (IMO, 2014). Despite the fact that the maritime sector greatly increases the global warming potential (GWP), GHGs from shipping were brought to light in 2011 when the International Maritime Organisation (IMO) adopted a set of operational and technical guidelines and measures intended to lower emissions from international shipping (UNCTAD, 2011a; United Nations Conference on Trade and Development, 2011). After the 2015 Paris Agreement, the IMO created a plan in 2016 to minimize greenhouse gas emissions from ships (International Maritime Organisation, 2016; annexe 11). In 2018, the organisation adopted the first phase of this plan, which called for a minimum 50% reduction in GHG emissions from international shipping by 2050 compared to 2008 and a final elimination before 2100 (International Maritime Organisation, 2018; annexe 11). Several international, regional, and national laws pertaining to labour practises, environmental protection, and safety standards must be followed by shipping companies (IMO, 2020). Including ESG factors in their investment decisions can help ensure compliance with these regulations and minimise risks of fines, sanctions, or operational disruptions (Poulsen, Johnson, & Ponte, 2018). The financial performance and long-term sustainability of a shipping company can be greatly impacted by ESG factors (UNCTAD, 2020). Shipping companies can enhance their overall risk management capabilities by implementing environmental, social, and governance (ESG) criteria into their investment decisions. This allows them to identify, assess, and manage potential risks associated with these aspects (Psarros, Skjong, & Eide, 2010) more effectively. Moreover, Shipping companies are under increasing pressure from investors, customers, and other stakeholders to show that they are committed to sustainability and ethical business practises (UNCTAD, 2020). Shipping entities can better line up their operations with shareholder expectations and potentially draw in more capital, customers, and strategic partners by incorporating ESG criteria into their investment decisions (Poulsen et al., 2018).

2.4.1. Application to the Shipping Sector

According to UNCTAD (2020), shipping companies can reap various advantages by integrating environmental, social, and governance (ESG) criteria into their investment decisions. These benefits include better risk management, enhanced PR, and easier access to capital. Nevertheless, the complexity of the industry, the need for specialised knowledge, and the availability and quality of data are obstacles to ESG integration in the shipping sector (Poulsen et al., 2018). In an effort to strengthen risk management, satisfy stakeholder expectations, and guarantee long-term business success, shipping companies must incorporate environmental, social, and governance (ESG) factors into their investment decisions. Shipping companies can enhance their reputation, gain a competitive advantage in a business environment that is increasingly focused on sustainability, and effectively manage ESG-related risks and opportunities by implementing best practises and guidelines for ESG integration. In light of the high capital investment required in the maritime sector, investors may find that a company's ESG profile is important when making an investment. Strong ESG implementation is now one of the most important factors in boosting competitiveness at the corporate and regional levels (Nömmela et al. 2022). A maritime state needs to be able to

optimise the most out of all of its assets at its disposal, including those from a strategic geopolitical environment and natural, human, political, and cultural resources (Rochwulaningsih et al. 2019). In order to do this, maritime actors will need to consistently cooperate, which should be founded on a fresh framework for policymaking (Bochenski et al., 2021). The maritime industry is unique to other economic sectors in a number of ways. Various writers have noted the unique characteristics of the maritime industry that influence the formulation of maritime policies and play a significant role in the framework for policy design (Braid 2005; Al-Bisher et al. 2012; Van de Voorde and Verhoeven 2016; Bochenski et al. 2021; Kivalov 2021). The maritime industry's actions are also impacted by ESG factors (Lee et al. 2019; Koilo 2019; Woo et al. 2018; Lee and Lam 2017), although the concept's application is not entirely satisfactory (dos Santos and Pereira 2022). Among the three, policymaking and the literature have given the greatest weight to the environmental and social aspects (Lee et al. 2019). According to Egorova et al. (2021) the ESG concept advises businesses to create and employ management strategies and instruments that enable them to gauge their ESG performance targets. For instance, the Norwegian Shipowners' Association has suggested indicators to gauge the effectiveness of operating in the field and published guidelines for ESG reporting in the shipping and offshore industries (Norwegian Shipowners' Association 2021). According to the guidelines, the ESG report ought to be a part of the annual report, and the company website can offer more details. A method comprising more than 20 metrics to assess the ESG score for ports was proposed by dos Santos and Pereira (2022) to quantify the ESG performances of international ports. Any maritime policy should incorporate a similar ESG performance indicator system, which focuses on local and regional issues while concentrating on environmental, social, and governance issues as broad goals. Increased demand for sustainable shipping methods, increased regulatory pressure, and raised shareholder awareness have all contributed to the implementation of ESG factors in the shipping industry (UNCTAD, 2020). Corporate governance, energy efficiency, crew welfare, waste management, and emissions reduction are important ESG factors that have an impact on the shipping sector (ITF, 2019). Shipping companies can achieve improved financial performance, increased market resilience, and stronger stakeholder relationships by implementing ESG principles (Drobetz et al., 2020). The integration of Environmental, Social, and Governance (ESG) factors into investment strategies has become more popular in the past few years due to the growing recognition of the potential benefits of sustainable investment practises by investors and stakeholders (Eccles & Klimenko, 2019). Numerous studies have demonstrated a positive relationship between financial results and ESG performance, indicating that companies with strong ESG policies typically beat rivals in areas like profitability, cost of capital, and stock returns (Friede, Busch, & Bassen, 2015; Drobetz et al., 2020). Shipping companies can identify and capitalise on opportunities for value creation while simultaneously reducing risks associated with environmental, social, and governance issues by incorporating ESG factors into their investment strategies (Hoepner & Schopohl, 2018). By encouraging a progressive approach to addressing environmental, social, and governance challenges, ESG integration can support the long-term viability of shipping companies (UNCTAD, 2020). Furthermore, as companies work to develop and apply cutting-edge models and technologies that promote sustainable shipping practises, such as digitalization, energy efficiency, and alternative fuels, ESG-focused investment strategies can encourage innovation (ITF, 2019).

3. Discussion

The shift in the focus of the international development agenda from the Millennium Development Goals to the recently adopted Sustainable Development Goals (SDGs) demonstrates how sustainability has become a mainstream concern in the functioning of the global economy (Poulsen et al., 2018). The above research tried to introduce the three Quality Management Systems that are more popular in the maritime sector alongside the ESG Principles and how are they being implemented/adopted by the shipping companies. As already illustrated, the ESG Principles are a novel introduction to the maritime world and the IMO alongside the EU and various organizations are currently trying to create frameworks and policy standards to further ease the implementation of the ESG Principles. Before formulating the research questions of this paper, it's crucial to mention that the ESG Criteria should not be oversimplified and narrowed down. Their many depths play a crucial role into the new era of sustainability that is upon us. The body of research on sustainability issues related to shipping is growing, but there is still not an abundance of studies on sustainability and ESG implementation in the maritime sector.

On the other hand, QMS have been around the maritime sector long enough to have been extensively documented in relevant research literature (Psomas et al., 2013) and in practice by shipping companies and regulatory authorities. The quality management systems (QMS) receive a lot of attention and time in an organization's quality management work (Elg et al., 2011). As a result, it is critical that QMS benefits the organisations (Lenning and Gremyr, 2017). The ability of QMS to enhance environmental management systems by applying lessons learned from QMS, or to assist sustainability initiatives through integrated management systems, has increased interest in the system (Siva et al., 2016). However, this promise has not yet been fully realised. It is suggested that one reason given for situations where quality management impedes rather than facilitates the implementation of sustainability efforts is the increased formalisation and bureaucracy brought about by a certified QMS (Allur et al., 2018; Barouch and Kleinhans, 2015). However, research indicates that QMS offers a vital and well-established framework that has the ability to add value (Rönnbäck et al., 2009), enhance operational performance and product quality (Iyer et al., 2013; Kafetzopoulos et al., 2015b), enhance net asset value and promote ongoing development (Lenning and Gremyr, 2017; Okieng et al., 2015). Support from management and an appreciation of quality management work are essential for ensuring that the QMS adds as much value as possible (Beer, 2003; Dubey et al., 2018; Joiner, 2007; Kaynak, 2003; Kafetzopoulos et al., 2015a; Lakhal et al., 2006). Additionally, management must demonstrate and communicate their awareness of the QMS's purpose (Zelnik et al., 2012). However, organisations that implement and seek certification of their QMS for external motives, such as image or customer requirements, do not benefit as much from their QMS implementation as organizations that focus on real quality improvements and organisational needs, as evidenced by studies conducted by Boiral and Amara (2009), del Castillo-Peces et al. (2018), Poksinska et al. (2002), and Sampaio et al. (2009). According to Maguad (2006), an improvement-oriented perspective on quality encourages an integrated approach to process improvement, entails the entire organization, and has many applications, including on service and support operations. To facilitate increased QMS usage and raise the perceived value added by a QMS, it is necessary to go beyond the general definition of QMS usage and towards the adoption of the ESG Principles.

In the maritime industry, Environmental, Social, and Governance (ESG) principles and Quality Management Systems (QMS) can complement each other, but they are not synonymous. QMSs are mainly concerned with guaranteeing the effectiveness and quality of procedures and goods, whereas ESG principles are a more comprehensive set of guidelines that tackle environmental, social, and governance concerns in organizations. Nonetheless, there are ways that QMS can help the maritime industry achieve its ESG goals. Firstly, as far

as the Environment is concerned, environmental management systems that support the environmental objectives of ESG can be implemented and monitored using QMS. This could entail cutting back on waste production, energy use, and emissions. For example, ports are essential hubs for the operation of Global Value Chains (GVC) because they combine various modes of transportation. According to UNCTAD (2017), over 80% of global trade passes through port quays. Additionally, maritime transportation is a significant source of greenhouse gas emissions, primarily CO₂, SO_x, NO_x, and PM, which includes black carbon (BC) (Smith et al., 2014). In order to address the effects of maritime transportation on the environment, human health, ocean acidification, and marine environments, as well as to reduce the overall environmental impact of GVC operations, there is an urgent need to reduce emissions (Poulsen et al., 2018). According to Hoornweg & Bhada-Tata (2012), inappropriate disposal of waste can lead to pollution, land degradation, and health risks for the general public. For these reasons, waste management is a significant environmental concern. Organisations that disobey these rules risk fines, penalties, and reputational harm, all of which could have a detrimental effect on their bottom line (Bansal & Roth, 2000). Meeting ESG environmental objectives can be facilitated by implementing ISO 14001, an environmental management standard, within a QMS framework. Moving on to the second criteria of ESG, Social, an organization's social obligations can be fulfilled with the use of QMS. This could entail setting up and keeping an eye on worker safety procedures, abiding by labor laws, and offering equitable working conditions. For instance, firms that maintain fair labor standards - that is, pay fairly, provide safe working conditions, and respect workers' rights - can improve productivity, lower employee turnover, and increase employee satisfaction (Gjølberg, 2009). According to the ILO (2014), companies can reduce occupational hazards and lower the likelihood of accidents and injuries at work by putting in place comprehensive health and safety policies and programs. Additionally, Organisations can generate long-term benefits for both the community and themselves by investing in community development, which can also create shared value and foster a positive environment for operations (Porter & Kramer, 2011). Social factors are important according to ESG principles, and a well-executed QMS can help make sure these requirements are met. Last but not least, by establishing transparent and accountable procedures and decision-making, QMS can assist with governance aspects. This can assist in conforming to the ESG governance principles, which address matters such as executive compensation, diversity on boards, and moral business conduct. To encourage balanced decision-making and prevent groupthink, a well-structured BoD should be diverse in terms of gender, race, and professional experience (Carter, Simkins, & Simpson, 2003). Executive rewards should be intended to encourage the development of long-term value and deter excessive risk-taking (Bebchuk & Fried, 2004). As stated by Healy and Palepu (2001), transparency and information sharing are essential components of corporate governance because they enable stakeholders and investors to evaluate a company's performance and decision-making. Thus, in practice, shipping companies must establish specific environmental goals and targets as part of their QMS and keep a close eye on their progress and keep reporting it on a regular basis. By putting in place safety measures, seafarer and office personnel training, fair labor practices, and social impact reporting, they can make sure social responsibility is a part of their QMS. And lastly, by integrating governance components into their QMS to uphold moral conduct, openness, and compliance with pertinent laws and guidelines. Therefore, Quality Management Systems (QMS) and ESG (Environmental, Social, and Governance) principles can complement one another when applied in tandem within an organization. There are various advantages that might stem from their interaction. Increased sustainability is the first benefit that is observed. In other words, environmental sustainability is emphasized by ESG principles. ESG integration in a QMS promotes the creation of

environmentally friendly procedures and services. In the end, this alignment results in cost savings and better resource management by lowering waste, energy use, and emissions. Furthermore, another advantage is that organizations that incorporate ESG principles into their QMS are perceived as being more ethical and socially conscious, which translates into an improved image. Enhancing one's reputation has the potential to confer a competitive advantage by fostering greater trust among stakeholders, such as investors, customers, and regulators. Moreover, ESG principles encourage risk identification and mitigation, which can be incorporated into a quality management system. This assists organizations in identifying potential quality and compliance risks and taking proactive steps to address them, lowering the likelihood of quality issues and regulatory violations. Another important benefit is that it promotes innovation by encouraging responsible product development and fostering sustainability. This approach not only meets the needs of socially and environmentally conscious consumers, but it also provides organizations with new markets and revenue streams. Furthermore, by incorporating ESG considerations into the QMS, employee engagement is increased because employees are motivated to work for a company that shares their values, particularly when it comes to social and environmental issues. This increased engagement has a positive impact on productivity and employee retention, ultimately contributing to the success of the organization. On top of that, incorporating ESG principles into the QMS necessitates stronger stakeholder communication. The QMS facilitates regular reporting on ESG performance, which improves transparency and accountability to investors, customers, and the broader community. This open communication not only builds trust but also strengthens relationships, enhancing the organization's reputation. Finally, in a world where ESG-related regulations and reporting requirements are becoming increasingly stringent, a well-implemented QMS is critical to ensuring regulatory compliance. It simplifies data collection and reporting processes, allowing organizations to meet changing obligations while reaffirming their commitment to environmental and social responsibilities. In summary, aligning ESG principles and QMS is a strategic move that can drive innovation, boost employee engagement, improve stakeholder communication, and ease regulatory compliance, positioning organizations for long-term growth and success in an increasingly ESG-focused world.

Regarding the second research question on the interrelation between QMS and ESG Principles, how does the effect of QMS on ESG Principles aids the shipping sector? The interaction between Quality Management Systems (QMS) and Environmental, Social, and Governance (ESG) principles in the maritime sector is undeniably important, fostering a harmonious alignment that reaps significant benefits. QMS enables the shipping industry to chart a course towards a greener horizon in terms of environmental responsibility (E). It steers vessels towards increased fuel efficiency, reducing the industry's carbon footprint, and fostering compliance with stringent environmental regulations by optimizing operations and reducing emissions. On the social front (S), safety and welfare are paramount, ensuring the safety of crew members and passengers. Furthermore, QMS supports fair labor practices, crew training, and the protection of seafarers' rights, thereby upholding the maritime industry's social responsibilities. QMS fortifies governance (G) by erecting a fortress of transparency, documentation, and accountability, laying the groundwork for informed, ethical decision-making. It enables shipping companies to navigate risky waters with grace, deftly managing legal and reputational risks, which is essential for good governance. Investor and stakeholder trust is anchored in QMS's reputation-enhancing capabilities, which attract capital and strengthen trust. The recent development of ESG regulations in the shipping industry is being met head on, with QMS guiding compliance efforts and ensuring long-term sustainability. The convergence of QMS and ESG principles charts a course for a shipping industry that is not only operationally efficient but also environmentally responsible, socially

conscious, and ethically governed, ultimately steering the industry towards a more sustainable and accountable future.

To further assess the impact of QMS on ESG Principles and incorporate case studies, this research must consider the human factor, which cannot be measured or closely predicted. This translates to a large percentage of companies not accepting and adopting the ESG Principles because the shipping sector exhibits some characteristics that the manufacturing and general service sectors do not. It is very common for the shipping industry to be resistant to new ideas that are presented to the business world. ESG Principles are not new to the business world, but shipowners and shipping companies are hesitant and distrustful of a new set of regulations that will cause them to spend more money while not earning them money in the short term. Producing an ESG Report, for example, is expensive, and many shipowners are unwilling to spend if their 'investment' is not guaranteed to be profitable. Can the QMS effect on ESG help to change this mindset and help the shipping community evolve and accept innovations more easily? However, it should be noted that the excessive regulations imposed on the shipping sector are causing serious problems that the organisations must resolve, and if they do not comply with the new regulations, they are heavily fined. But, for example, how can you follow new regulations that have not been tested or do not specify every detail, such as new biofuels?

4. Conclusion

Ultimately, the thesis "Quality Management Systems and their Effect on ESG Principles in the Shipping Sector" investigated the significance of incorporating Environmental, Social, and Governance (ESG) criteria into the Quality Management Systems of shipping companies. The study investigated the concept of ESG, as well as its regulatory trends and the significance of ESG integration in shipping companies. It has also addressed the concepts of Socially Responsible Investing (SRI) and Corporate Social Responsibility (CSR). In terms of Quality Management Systems, there was a thorough examination of the ISO 9000 Standards Series, the ISM Code, as well as TMSA and Vetting.

The thesis explored the general characteristics of the shipping industry, the benefits of incorporating ESG Principles into operational, safety and quality decisions, and the ESG framework and principles.

The results of the thesis demonstrate a positive outlook regarding the effect that QMS have on ESG Principles. Besides the three criteria that are being optimized by the simultaneous application of QMS, there is a high value output that improves the services provided by the shipping companies. Quality Management Systems (QMS) safety and quality standards play a critical role in facilitating the adoption of Environmental, Social, and Governance (ESG) Factors in shipping companies.

In conclusion, the impact of QMS on ESG criteria at maritime organizations is critical for promoting sustainable development, improving financial performance, and ensuring the industry's long-term viability. The thesis has contributed with high value insights into the role of QMS and ESG Principles in the maritime sector, emphasizing the importance of continuing efforts to integrate ESG factors into the decision-making processes of shipping companies worldwide.

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