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To what extent did the COVID-19 pandemic influence the port of Rotterdam's social media usage?

By

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Abstract

In the past few years, the whole world was hit by the COVID-19 pandemic, which disrupted everyone's regular routine. While the working and study areas became online, shops and restaurants suspense dining in; all hospitals were packed and lacking medical equipment; the question arose: Does the port industry also changing its communicating method or content to adapt to the current world? In this paper, the port of Rotterdam, as the largest port of Europe, is being examined on the social media page, namely Facebook and Twitter.

The research has found that the focus of social media posts on these two channels is varied. With Facebook targeting the local community and most frequently posting content relating to sustainability, Twitter has its target audience towards the business/commercial stakeholders. The focus of the posts also shifted from software digitalization innovation before COVID-19 to transport and digitalization during COVID-19.

Although there exist some differences in the targeting audience and the content between the two social media channels, both have proven the increasing concentration on transport and logistics during COVID-19. Besides, this research found the tonality of the post from both social media account of the port of Rotterdam has changed to more positive oriented rather than natural.

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Chapter 1: Introduction

In the last decade, the digitalization of economy and society, as well as the rapid adoption of smartphones has increased the use of social media. The COVID-19 pandemic accelerated this trend even further, as people have been forced to work and live primarily online during the lockdowns to combat the virus. Today, the use of social media has become an integral part of people's daily lives with an average usage of 145 minutes per day (Statista,2020).

Notably, also companies that do not directly interact with individual citizens or have not been fully dependent on digital means during the COVID-19 pandemic have also turned increasingly to social media. The maritime industry, specifically ports, have also turned to social media platforms more in recent years. This is interesting, as ports are an integral part of a marine ecosystem and not dependent on the whims of customers. Cahliskan and Esmer (2018) argue that ports use social media for port promotion and public relations, thereby creating a favorable image for their business. This is also visible in the biggest port of Europe: Rotterdam.

For instance, on the official website of the port of Rotterdam, you will be redirected on various pages to the social media accounts with which the port of Rotterdam works. However, it is clear that communication to the broader public mainly occurs via Twitter and Facebook (portofrotterdam, 2021).

This thesis will analyze the use of social media of the Port of Rotterdam before and during the COVID-19 crisis. As aforementioned, numerous businesses have adopted new digital means, including social media, during the COVID-19 pandemic. Examining the use of social media of this port prior and during the COVID-19 pandemic provides insights in the ports' incentives to use social media as well as a possible shifting focus during the COVID-19 pandemic. Even though other European ports are geographically close to this port, governments have applied different regulations in different countries, including within the European Union. This makes the various challenges ports faced very different and not comparable. As a result, it was decided to focus solely on the port of Rotterdam.

1.1.   Research background

Marketing communications have always played an essential role in a business organization. Through marketing communications, the company's stakeholders are identified and attached to the company, as well as encouraged to be engaged in the company's development.   (Mäläskä,2011). Subsequently, social media has become a useful channel to allow interactions with and between the stakeholders. According to Notteboom (2015), the traditional marketing tools, including but not limited to advertising, mailing, personal selling, networking, attending organizing events, can all be integrated into social media accounts and their reach has become much larger through social media.

Also, within the port industry, the majority of ports have official websites displaying their daily business and necessary company information. At the same time, the port industry also embraced the use of social media as official communication channel. Kounoupas(2015) indicated that social media platforms function as a hybrid component of the promotional mix for ports, enabling the communication and interactions between consumers and organizations instead of solely the website and information being presented. Bae (2012) indicated online social platform as follows: It changes the instrument and the strategy of the traditional communication method and builds a channel for customers to engage with the company on a new level. This shift from a purely informative relationship to a mutual beneficial and interactive relationship with stakeholders have created an extra dimension to build a long-term relationship between the stakeholders and companies on. (Çalışkan 2018).

1.2.   Problem discussion

Almost all companies that have private or small-scale companies as their primary target customers have changed their market strategies during the COVID-19 pandemic. The change in social media use can be traced back to mandatory government measures regarding the number of customers in a specific store or even a period in which the store had to be fully closed. Social media allowed stores and companies to still interact with customers, and even sell their products through this online tool.

As the total throughput by commodity ranking in Rotterdam is iron ore and scrap, coal, and agribulk (Port of Rotterdam, 2021), it is apparent the primary target customers of the port are industrial instead of private or small-scale company operators. Nevertheless, the Port of Rotterdam is active on social media. Therefore, it is interesting to exam whether ports have also changed their social media topics/ categories during the COVID-19 pandemic. And if so, to what extent or in which way.

1.3. The aim of this study

In short, the aim of this thesis is to analyze whether the Port of Rotterdam has changed their social media behavior during the COVID-19 pandemic. By analyzing data prior and during COVID-19 of the social media accounts of the ports of Rotterdam, the social media behavior of the port will be outlined and discussed. This will create insight in the social media usage and can support future studies that exam ports' social media strategies as well as studies that compare social media patterns of small and medium sized enterprises to large companies and full sectors such as the port industry.

In addition to this, this thesis will add value to the debate whether companies tend to shift their perspective in sync with current political, economic and social context even if those elements do not directly impact daily business. This information could also be of interest to marketeers that are supporting ports and to other large industries and sectors that are in doubt whether to change their social media behavior.

1.4. The research question

The following research question derives from the above described discussion and aim of the research:

To what extent did the COVID-19 pandemic influence the Port of Rotterdam authority's social media usage?

In order to answer this question, the main focus of the port authority's social media accounts will be examined for the period both prior and during the COVID-19 pandemic, specifically from 1 January 2019 to 31 July 2021. The 11th of March has been taken as the date to divide between prior and during COVID-19, because this is

the date the World Health Organization declared the COVID-19 situation an international pandemic. Literature on the use of social media by companies in general and specifically by ports will be discussed to create a theoretical overview as the foundation of this thesis.

1.5. Data collection

In order to obtain the necessary information to formulate an answer to the research question, a mix-method analysis will be used. The primary data will be obtained by a quantitative research approach that analyses the available numbers of the port (including, but not limited to, the number of posts, followers, retweets, shares, and likes). This data will be complemented by a qualitative research approach, consisting of desk/literature research on the content of the port's websites and (news) articles from reliable news sources such as national newspapers or digital newspapers.

1.6. Thesis structure

This thesis will be divided into the following chapters: a literature overview, the methodology, the data analysis and the results and discussion of the analysis (empirical chapter), a conclusion and finally a discussion and avenues for further research. The first chapter has been this introduction, providing clarity for the reader and presenting the research question of this thesis. The second chapter will consist of the literature review. This chapter will discuss relevant literature related to social media use in general and by ports. The different stakeholders will also be discussed. The third chapter will be outlining the methodology used in this thesis. It will justify the choice of the port that will be central to this thesis and detail the research approach. The research design will also be presented in the methodology. The fourth chapter will be data analysis on the port of Rotterdam, analyzing the Facbeook and Twitter data of this port. The fifth chapter will be the concluding chapter, answering the research questions, a discussion on the research conducted and avenues for further research.

Chapter 2: Literature review

This chapter will outline the literature review of this thesis. First, it will go into detail about the port sector. Ports are part of a large ecosystem, showing there are necessary hub function between maritime logistics and inland shipping and freight trains. The literature will first detail the ecosystem ports function in, the stakeholders of the port, and port activities worldwide. Thereafter, the literature review will move to the use of social media by ports. Starting off by introducing the general definition and history of social media, the process of evolution, followed by present social media implementation of business organizations, the reason company uses social media, and each major/ popular company's implementation on its operation will be discussed. Furthermore, the modification regarding the major crisis on the uses of social media is also being examined, especially in the light of the COVID-19 pandemic.

2.1 Port types

Ports have always been a part of Europe throughout history and are still the main gateways for transport in Europe and worldwide. (Martinez, 2021) 80 percent of the world's trade transport is carried out by the shipping industry, and ports are of paramount importance to the trade linkages between all continents. (UNCTAD, 2018). Ports can be defined as wave-sheltered berths for vessels equipped with infrastructure and technical facilities to load or unload cargo from one means of transport to another (Roa et al., 2013). Ports as a concept is a collective term under which at least seven types of ports can be classified. According to Roa et al. (2013), eight ports are (1) deep water seaports, characterized by the depth of at least 13.72 m in the entrance channel and the terminal area of the port; (2) river ports, that are located in a bank of a river and with no depth limitations; (3) Harbors, that include all installations used for (un)loading goods; (4) a pier, jetty or wharf: provide access to water, but do not have to be sheltered from foreign waters; (5) Port Terminal, also known as dedicated terminals. These are terminals, not per se ports, that always handle the same type of cargo, especially soybeans, coal, and other minerals. Hence, the material these port terminals handle is always the same. (6) Off-shore terminals, which are characterized by their location within the sea. These are specifically designed to house the equipment for the management of merchandise. They are 'devoted exclusively to the deconsolidation of inbound cargo and shipment by short sea shipping to its hinterland

and the consolidation of the projecting load coming through the same channel" (7) canals, similar to river ports, but always connected to the sea or ocean by a single point. It does not cover the waterway canals that are man-made and only cover the passage of ships such as the Suez Canal.

Globally, there are 835 active seaports and inland ports. The port of Shanghai has been considered the largest port since 2010, and it handles 744 million tons of cargo on an annual basis. The port of Rotterdam is the largest port in Europe, handling 14.8 million tons of cargo each year. In the period 1962 to 2004, it was the largest port in the world (Shipafreight, 2021).

2.2 Port activities

International, regional, and local transportation systems are at the core of the economic activities of every country. Wealth is often linked to trade and distribution, and the added value ports have to an economic system is enormous. First, ports can support the economy by enabling a country to manage trade flows and develop an ecosystem of inland transportation around the port. In other words, ports can be considered economic catalysts for the specific region they are located in. As globalization increased and international trade grew, the indirect and secondary impacts of ports on regions became even larger. Ports provide employment, fiscal revenue, and investments.

Figure 1: The Economic significance of ports
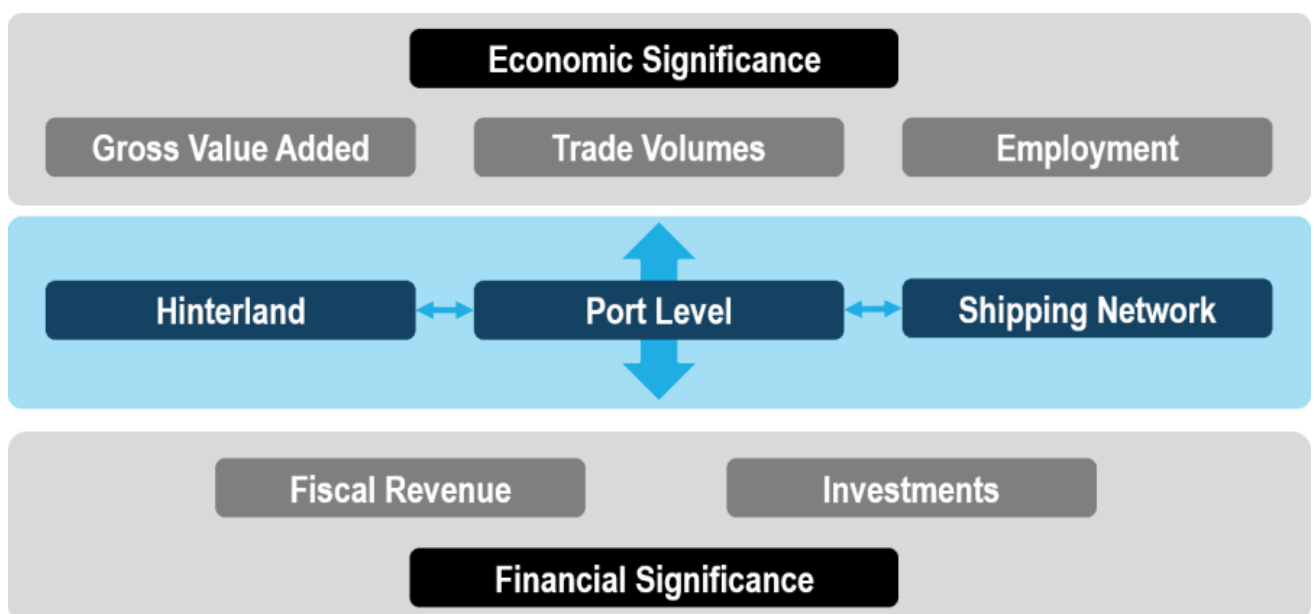
Source: Economic Significance of Ports, 2021

Traditionally, ports have primarily been handling cargo without any other particular business. However, over time, ports have been transformed into nodes within global supply chains. They are clusters of economic activities, promoting innovation and strategic cooperation within the region of the port and beyond (Notteboom, 2021). De Langen, Nijdam, and van der Horst (2007) distinguish three port products. First, as mentioned, the cargo product, which consists of (un)loading ships. The stakeholders and users of this product are identified as the shipping lines. The cargo product is considered the most important element of ports, as this is the necessary element a port needs to operate successfully. It includes, among others, towage, pilotage, customs, terminal handling, and transfer of goods from one means of transportation to another. Secondly, ports have adding-value activities, thereby categorizing the second product as a logistics product. It covers re-packing, labelling and quality inspections according to De Langen, Nijdam, and van der Horst (2007). Logistics service provides and importing/exporting companies are able to decide whether to locate logistics facilities in seaports. Rotterdam is such a port that has developed a logistics zone in the surrounding area of the port with the aim to draw logistics facilities for economic benefits. The rise of logistic zones close to ports also shows a second type of competition between ports. If a specific port can offer better conditions for logistic facilities, this will be a competitive advantage. Thirdly, the port manufacturing product covers the provision of space and conditions for investments in manufacturing facilities (De Langen, Nijdam, and van der Horst, 2007). The main aim is to attract manufacturers to move their businesses close to ports, thereby attracting and appealing to other types of users and investors.

Another category of products is the inclusion of activities that are not related to the port activities themselves but exploit and build the mainstream port activities and products to promote another activity. The masterplan of Piraeus to include hotel management in their port is as such activity (Parola et al., 2018).

It is important to distinguish these port activities and the relation to the port of Rotterdam, as every port activity is attracting and appealing to other types of users and investors. The port of Rotterdam has a strong position on the first two-port products, while the port of Antwerp – geographically close to the port of Rotterdam – is focusing

on the third port product, thereby not always a strong competitor for the port of Rotterdam.

2.3 Stakeholders of the port

The activities of a port also directly translate to the stakeholders of the port: who supports the port and how are the ports stakeholders precisely supporting the port, and why? Especially after the 'renaissance of Port authorities' in which the new products are introduced in the port authorities' efforts to attract customers and compete with other ports, thereby acting as port cluster managers, the stakeholders of ports have become extremely important. (Verhoeven, 2015; De Langen and Visser, 2005)

First, a user device in the literature to analyze stakeholders and public opinion in general, is the position importance matrix: relevant stakeholders and publics are identified in terms of whether they oppose (0 / -5) or support (0/+5) the organization in an issue. The importance is measured horizontally from 0 (least important) to 10 (most important) (Cornelissen, 2017). After the positioning of stakeholders, the positions give us the result of the analysis:

Problematic: stakeholders who are very likely to oppose the organization but have little power or are generally not recognized as essential stakeholders. It is essential to keep these stakeholders satisfied. You can achieve this by keeping these stakeholders involved in the company. However, these stakeholders have only a moderate priority for the company since – in the end - they are of little importance to the company (Cornelissen, 2017).

Antagonistic: stakeholders who are likely to oppose the organization and have a lot of power whit in the organization. These are the stakeholders that should have the highest priority for a company. Not only are they likely to oppose the company in times of crisis, but they are also essential to the company. For this reason, they should be monitored managed closely, and an active engagement with those stakeholders is necessary (Cornelissen, 2017).

Low priority: stakeholders who are likely to support the organization and have less power. These stakeholders have the lowest priority. Since they will likely support the company during a crisis and have little power in the company, no intensive form of communication should be carried out on this group of stakeholders. However, it is vital to keep communicating with this stakeholder group since you do not want people from the low priority group to become problematic stakeholders (Cornelissen, 2017).

Supporter: those who are likely to support the organization and have a lot of power within and outside of the organization. This group of stakeholders should be informed about events that affect the company. This stakeholder group will support the company in times of crisis. Still, since they also have a lot of power within the company and are therefore of great importance to the company, this group should be seen as a moderately important stakeholder group. Through a continuous flow of information, a company will try to sustain the interest of these stakeholders (Cornelissen, 2017).

Figure 2: The importance of stakeholders
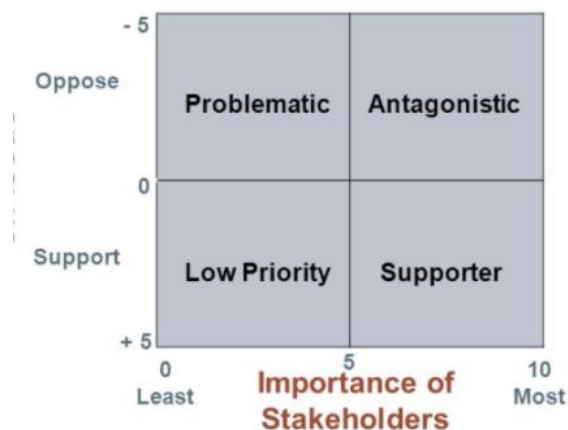
Source: Cornelissen, 2017

This general description of the importance of stakeholders can be translated to the port industry. Ports are increasingly interested in their stakeholders as they have transformed to private terminal operations and port authorities are increasingly marketing-orientated to promote the ecosystem of the port and the aforementioned port products Notteboom, Pallis and Rodrigue (Fortcoming, 2022). For ports, the stakeholders can be divided into commercial stakeholders, institutional stakeholders

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and the local community, according to Notteboom, Pallis and Rodrigue (forthcoming, 2022). The commercial stakeholders can be described as the most business-focused stakeholders. They are at the core of marketing strategies, as these stakeholders will invest and develop infrastructures or superstructures. Secondly, the institutional port stakeholders can be divided as the stakeholders covering policy and regulations. The governmental institutions are the foremost stakeholders, but also trade groups and municipalities are included in this stakeholder type. Thirdly, the community stakeholders. While Notteboom, Pallis and Rodrigue (fortcoming, 2022) see this as a group covering the public relations, including employees, special interest groups, port-related economic activities, foundations and tourists and passengers, in this thesis the community stakeholders are divided into internal stakeholders, hence the employees, and the local community that is indirectly influenced by the port activities, either in a positive or negative way. In figure 3, the different stakeholders are visualized:

Figure 3: Marketing strategies of port authorities: a multi-dimensional framework

Commercial	**Institutional**	**Community**	
Traffic and investments	**Policy and regulations**	**Public relations**	
• Lessees (terminals, logistics facilities, industrial sites, commercial real estate, etc.) • Carriers (container, ro-ro, bulk) • Cruise lines • Port service providers (bunkering, towing) • Logistics operators • Shippers • Road, rail and barge operators • Inland ports	• Governmental institutions • Trade and investment agencies • Financial institutions • Trade groups • Municipal governments • Regional and provincial governments • Non-governmental organizations	• Employees and labor unions	internal stakeholders
		• Special interest groups • Port-related economic activities (trade, manufacturing, tourism) • Foundations • Tourists and passengers	local community

Port Authority Marketing Strategies and Stakeholder Types

Adapted from: Parola, F., Pallis, A.A., Risitano, M. and Ferretti, M. (2016). Marketing strategies of Port Authorities: A multi-dimensional framework. Paper presented at EURAM Conference 2016, 1-4 June, Paris, France.

Source: Parola et al, 2016

This classification also matches with the classicifaction of stakeholder categories targeted by the port authorities of Dooms et al. (2013).

Figure 4: B2B, B2C stakeholders and B2A/A2A stakeholders of a port.

B2B stakeholders	B2C stakeholders
Concessionaires (terminals, industrial sites, logistics facilies, etc.)	Citizens & societal groups of interest
Feeder carriers	Employees and labor unions
Foreland port & logistics players	Financial and banking institutions
Foreland port authorities	Port-induced economic activities (manufacturing, tourism, other service industries, etc.)
Inland terminals	Private/public foundations
Intermediate hubs	Tourists and passengers
Logistics operators & auxiliary service providers in the cluster	Trade associations (logistics, inland transport, tourism, etc.)
Marinas	
Ocean carriers (container, ro-ro, bulk, cruise, etc.)	**B2A/A2A stakeholders**
Port service providers (ancillary services, Coast Guard, Customs, etc.)	Governmental institutions (Ministries, Embassies, trade and investment agencies, etc.)
Ports in proximity	Chambers of Commerce
Road, rail and barge operators	Multilateral support institutions (EIB, etc.)
Shippers (foreland)	Municipalities
Shippers (hinterland)	Non-Governmental Organizations (NGOs)
Tour operators, tourism-related & entertainment firms, etc.	Regional and provincial government

Source: Dooms et al, 2013.

2.4 ports and social media

Bastug et al. (2020) pointed out that "many ports live and die by the numbers: value, volume, container throughput, etc.; each year, the influential journals would rank the ports by the total container throughput," although the public still tends to measure ports' total throughput when evaluating the brand equity, the indicator may not necessarily be appropriate. For example, the port that has the highest volume throughput does not inherently provide the best service.

However, with the aforementioned growing number of products and related stakeholders, ports are struggling to compete with competitive ports in the same region. As Cahoon (2007) argues, ports have been turning to marketing communications to retain and attract their customers. However, this is not the sole purpose of communication strategies by ports. Cahoon (2007) argues that this communication can be vital to inform all stakeholders, the above-mentioned commercial, institutional, internal and local community stakeholders in a way that the content of the message is similar to all stakeholders but understandable in their specific situation or perception.

In the changing role of the port authorities, and the importance of stakeholders, two main marketing objectives of ports can by identified and work in synergy with each other. First, the port as a whole ecosystem has to work perfectly well. Secondly, the port can be promoted internationally, but without a functioning, effective and presentable port, the marketing and promotion efforts of the port authorities cannot be fully utilized (Parola et al, 2007). Dooms et al (2013) argue that marketing by port authorities is used for three reasons (1) the customers seeking principle, in other words, to present the port worldwide; (2) the efficiency and effectiveness principle: to influence and control the international logistics framework and supply chain that the port is part of; and (3) the competitive advantage principle which focuses on benefits for the port itself such as technologies, business opportunities and revenue streams. Social media is one of the marketing and communication means a port is able to use, next to direct stakeholder outreach and for example events to promote the ports' activities. BAŞTUĞ et al. (2020) argues that: the number does not describe the ports operation, functionality, and role in stakeholders point of view; therefore, "creating a solid brand image for themselves can embrace the sophisticated concept of the brand that goes beyond old ideas of merely giving more valuable marketing information." This underlines the importance of building a brand through social media to be able to achieve the principles outlined by Dooms (2013).

The use of social media by ports also relates to the brand equity of companies, including ports. Research by Lassar, Mittal, and Sharma (1995) indicates that companies should focus on brand equity management as there are many financial benefits to having positive brand equity. Positive brand equity strengthens a brand's position within the market, and sales can increase significantly. Properly managing brand equity can also influence public opinion about a product or service. In addition to this, a study from Taylor, Celuch, and Goodwin (2004) shows that a company's positive brand equity can lead to customer loyalty. The more loyal the customer is to the company, the more willing this customer is to try to adopt, for example, brand extensions. Customer loyalty is also crucial in times of crisis, as customer loyalty is often put to the test in a crisis situation. It is especially crucial for companies that offer a service (product intangibility) to have excellent brand equity. Often the entire experience with the service is tied to the company's brand. This means that a service company eventually transforms into its own brand (Berry, 2000).

There are three methods by which a company can obtain this brand equity. First, a company can generate positive brand evaluations by offering quality goods or services. In addition, a company can encourage an accessible brand attitude to influence consumer behavior. Finally, a company can develop a logical and consistent brand image to build a long-lasting relationship with the customer (Farquhar, 1989).

2.5 The origin and rise of social media

After outlining the port ecosystem, and the use of media by ports to achieve the three principles (customer-seeking, the efficiency and effectiveness principle, and the competitive advantage principle) and to increase their brand equity, this part of the literature review will focus on the emergence and use of social media by companies. It will also go into detail about the influence of a crisis on social media strategies.

Along with the invention of the smartphone, the internet's development has entered an entirely new era of digitalization. From there, the word" social media" appears more and more often in people's daily life. Despite the fact that the concept of social media may seem new, it has been a phenomenon that evolved from human interactions (Edosomwan et al., 2011). As Carton (2009) indicated, social media are technologies that people have developed throughout human history to make our communications with one and another easier.

The Merriam-Webster dictionary (n.d) gives the following definition to "social media": "forms of electronic communication through which users create online communities to share information, ideas, personal messages, and other content (such as videos)." According to Merriam- Webster dictionary, the first occurrence of the word "social media" was in 2004, and up to today, this word still has the top 1 percent look-up popularity. This creates even more necessity to understand the creation of social media and its implication on today's world.

The earliest information regarding social media could be traced back to 1792, the implementation of the telegraph which was used for communication in long distances(Ritholz, 2010); meanwhile, the use of telephone, radio in the late 1800s also contributed to the advancement of social media today(Rimskill, 2011).

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In the mid-1900s, phone phreaking – experimenting with phones as a communication tool – started and increased rapidly. This was followed by the invention of 'email' in 1969. However, at that time it was limited to exchange the message from one to another computer when both are online., In 1991, 'the internet' became publicly available. This can be marked as the start of the internet revolution (Edosomwan et al., 2011). In the following decade, social networking sites were created to cater the public needs, including Epinions (for sharing the review of products), ThirdVoice(for posting comments on the webpage), Napster(file sharing), and many more applications (Edosomwan et al., 2011).

After this first wave of internet innovation, social media platforms began to emerge from the early 2000 onwards. Following the success formula of the social networking sites in the 1990s, an increasing amount of social media platforms emerged. Some of those platforms are still widely used today, including Wikipedia, LinkedIn, Facebook, YouTube. This profoundly encouraged and transformed the interaction between individuals and organizations with a common interest base as they could easily find each other and connect on a global level. (Edosomwan et al., 2011).

2.6 Social media and companies

According to Pourkhani et al. (2019), initially, consumers uses the internet to expand their options while trying to select products or services. Nowadays, the use of social media and the web is not only used by customers, but also increasingly by companies as social media can substantially affect a company's sales and reputation and, inevitably, affect a company's survival. For instance, online social platforms like Facebook create virtual customer environments where online communities are formed regarding the specific firm, brand, or products (Culnan et al., 2010).

The existence of social media enables the scattered customer group from different corners of the world to communicate about the products or the firm. "Social media is a hybrid element of the promotion mix because, traditionally, it helps firms communicate to their customers, while in a nontraditional sense, it assists customers to talk directly to one another" (Pourkhani et al., 2019). Therefore, the impact of consumer-to-

consumer interaction has significantly been integrated and magnified in the market, Pourkhani et al. (2019) added.

In addition to this, the implementation of social media considerably facilitates brand awareness and customer relations by enabling companies to reach out to customers on a global level through social media platforms. This could potentially cultivate more customers and, therefore, co-promote and expand the local business in the region (Jones et al. 2015). According to Ravi&Ravi (2015), the evolution of social media also provides a transparent platform for electronic word of mouth in which is much more prevalent nowadays. Carraher et al. (2006) also indicated that upon using social media to interact with a company in which the consumer purchased the product, they experience a brand privilege which helps reinforce the brand name in their minds. "If a company is approachable, people-friendly, then the company must make itself visible by inclusion on the web "(Carraher, Parnell, & Spillan, 2009).

Furthermore, social media integration attributes to more effective communication within an organization by reaching a wider audience leveraging the "long tail concept" (Edosomwan et al., 2011). The traditional communicating method has its own limitations, such as the misinterpretation when messages/information are passed to multiple receivers or forgotten to deliver the message. While social media empowers communication to be as easy as just one click. Hollier (2009) indicates that the application of social media is much less time-consuming as it became much more straightforward for one person/management to announce information through a post or a tweet and have people being notified simultaneously. This way, social media have ultimately enhanced the collaboration of the team members. Furthermore, providing a convenient platform to share ideas and progress alleviates the communication between the management and the employees by ensuring the delivery of the updates and development, bringing connections between top leaders and employees (Edosomwan et al., 2011).

2.7 Identifying social media usage

According to the data collected by (Statista, 2021), Facebook, YouTube and Instagram have the most active user-base worldwide. That said, WhatsApp is listed above Instagram, however, it is a message service that is primarily used for private

conversations and personal contacts. Only a few companies offer customers services through WhatsApp. This thesis will focus on the use of social media by companies, therefore, the following discussion will not go into detail about the use of WhatsApp but instead focus on Facebook, YouTube and Instagram.

Among all the social media platforms, Facebook holds 2853 million active users, which easily takes the top position in the ranking (Statista 2021). Facebook was launched in February 2004 by Mark Zuckerberg while studying at Harvard University (Facebook, 2004). Boyd (2007) indicated that, in the beginning, Facebook was limited only within Harvard, but later on, it became available to the public. In addition, Edosomwan et al. (2011) indicated that users could create a profile, add other users as friends, build an online social network; Facebook also allows users to join groups based on their shared interest or common background filed or other characteristics.

The second position is followed by YouTube in which holds 2291 million active users (Statista 2021). YouTube is the most popular internet video community, where people can create, share, watch and discover videos of all different kinds, including music, movies, blogs, etc. (YouTube, 2021). Edosomwan et al. (2011) describe YouTube as a platform for people to connect and share ideas, inspire one another around the world, and act as a distribution platform for original content creators. Later on, YouTube launched a Beta site for the benefit of content creators to keep a close track of their video performance, and the site is growing rapidly daily (YouTube, 2021).

Instagram has 1386 million active users by 2021 July (Statista 2021). It is an online sharing community in which initially became trending by its unique filter added function. Instagram allows users to post and share photos, hashtags, and, most significantly, geographical tagging; users can like and comment on the post of each other, also follow the account of their interest, including official brands or celebrities (Instagram, 2021)

Besides the top 3 most popular social platforms, it is also worth mention the existence of LinkedIn. Social media such as Facebook, YouTube have become major sources of hiring. LinkedIn is another similar source used by recruiters, and about 80 percent of companies use it for the recruiting process (Edosomwan et al., 2011). On top of that,

LinkedIn ranked as the most trusted social media platform by Insider Intelligence's 2021 Digital Trust Report (Businessinsider, 2021). Unlike other social media platforms, LinkedIn has its unique focus in the business environment (LinkedIn, 2020). It still allows users to connect and build profiles but in business orientation. Instead of a profile, LinkedIn allows user to update their CV, working experience, educational background, etc.

2.8 social media and crisis communication

Due to the rapid improvement of social media tools, consumers are being influenced by companies, but consumer opinion is also more substantial and more public than ever. Therefore, in times of crisis, it is necessary to communicate faster, more flexibly, and more thoughtfully towards consumers (Civelek, et al., year). Furthermore, because the current organizational climate is constantly changing, organizations must respond appropriately to various risks.

Identifying a crisis

Karl Weick (1988) defines a crisis as an instant issue that threatens the very existence of an organization in ways of its values and way of operating. Civelek, Cemberci, & Eralp, (2016) therefore argue that organizations that do not have a suitable approach to a crisis have a lower chance of survival in the current organizational climate.

A useful way to think about the difference between issues and crisis is to consider the process of how an issue develops over time. Latent issues may become active through media attention or because of a group of stakeholders who mobilize themselves in relation to the issue. An issue can go from latent to active because of the change of the public opinion about an issue.

Figure 5: The development of an issue into a crisis

The Development of an Issue into a Crisis (Cornelissen, 2009, p.216)
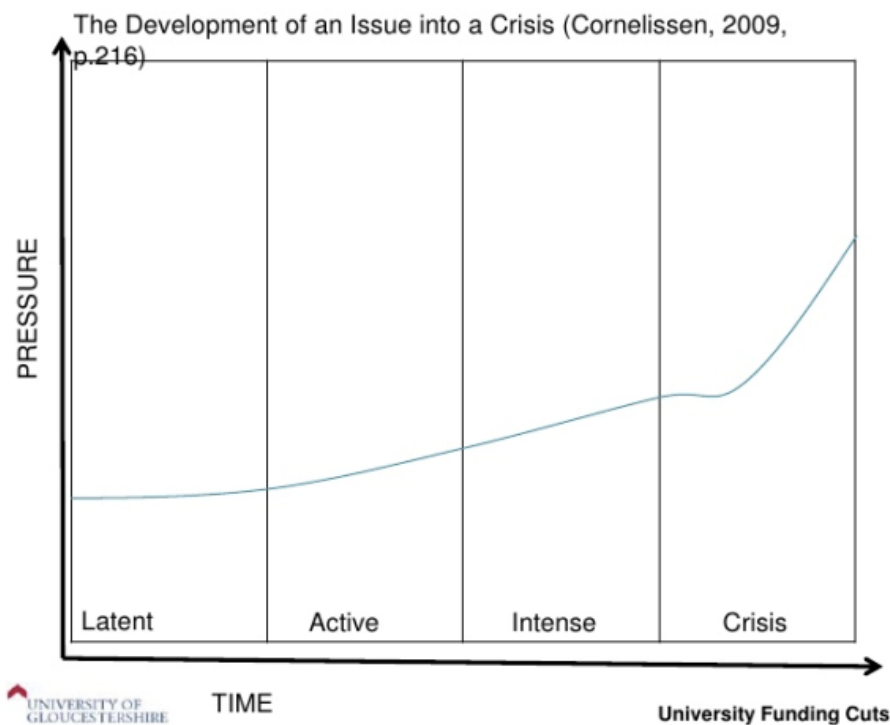
Source: Cornelissen, 2009

The process is often occurring through media presence and also accelerated by it. Once an issue has reached the 'active' status, as visualized in figure 5, it easily transforms to an intense issue. This will develop national and sometimes even international pressure to an organization to provide their customers with an adequate and effective response. Otherwise, the company has a high risk that the issue even transforms into a crisis situation. (Cornelissen, 2017).

In general there are two ways a crisis can arise. Firstly, the crisis stems from people's actions, the failure of the organizational structure, economic changes, or the modernization of a market (Parnell, 2015). This crisis slowly moves from the latent state, into the active and intense state before becoming an actual crisis. Companies are able to identify the crisis upfront and are able to prepare for such a crisis. This way, the company is sufficiently equipped to deal with the crisis once it occurs. Secondly, a crisis can also emerge unexpectedly and is oftentimes caused by a sudden external event. The COVID-19 pandemic has been the most prominent and influential example of such a crisis. The unexpected aspect of the crisis makes it virtually impossible for organizations to prepare sufficiently (Civelek, Cemberci, & Eralp, 2016).

2.9 The use of social media and brand equity

Before the concept of brand equity is elaborated in detail, it is essential to know precisely what this concept entails. Farquhar (1989) describes brand equity as 'the "added value" with which a brand endows a product/service'. In other words, brand equity is the value that arises from a customer's comprehension of the brand of a product or service rather than from the product or service itself.

Huang (2006) describes a crisis as an abrupt and unexpected event that could threaten a brand's reputational and financial position. In addition, Coombs (2007) argues that customers place the responsibility of a crisis on a person or organization. This makes it essential for companies to respond to a crisis after a crisis occurs. However, different response strategies can influence brand equity in various ways, so choosing an appropriate response strategy for the crisis in question is essential since this response strategy is used to minimize the influence on brand equity or even positively influence it. (He & Ran, 2015).

Vassilikopoulou et al. (2009) show that strong brand equity can weaken the influence of negative situations, such as an unexpected crisis, within the company's market. In other words, when an external factor, so through no fault of one's own company, negatively influences the market, brand equity can limit the damage.

This indicates that brand equity and a crisis mutually affect each other. A crisis affects the market and customer, for example, influencing purchasing behavior, and thus endangers brand equity. Conversely, brand equity influences the trust, loyalty, and reputation of and in the brand, influencing the brand's position in a crisis. This mutual influence is illustrated by He and Ran (2015) in figure 6.

Figure 6: the mutual influence of brand equity and a crisis
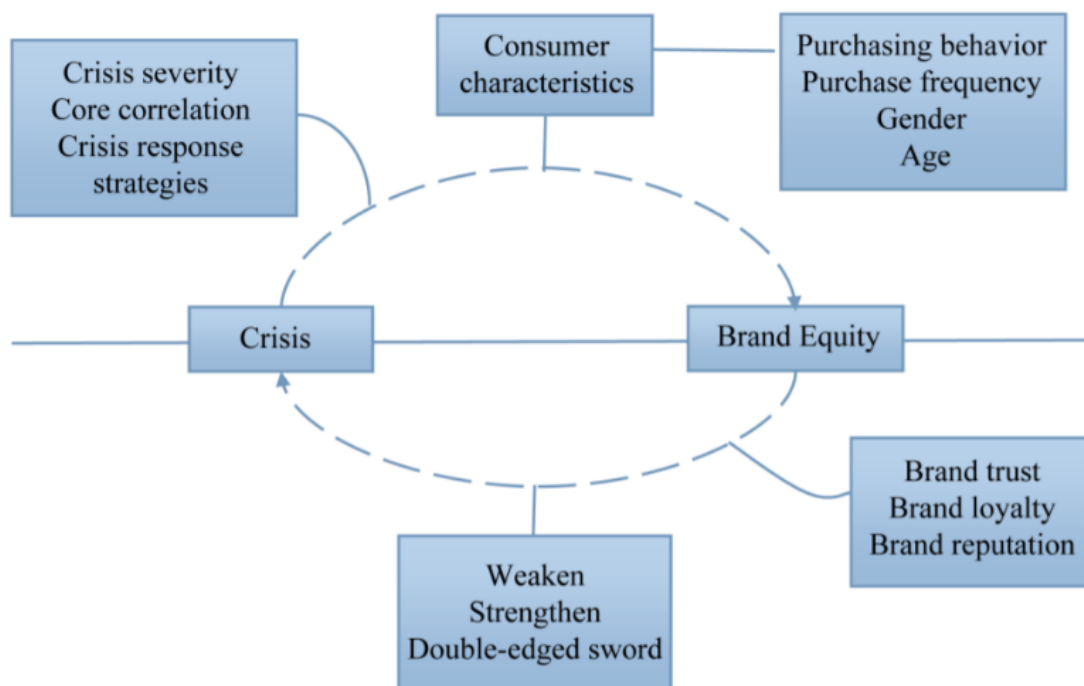
Source: He and Ran, 2015

Chapter 3: methodology

In this chapter, the methods to gather and analyze data necessary to formulate an answer to the research question '*To what extent did the COVID-19 pandemic have an influence on the port of Rotterdam's social media usage?*' will be presented. The chapter will start with a conceptual framework and present the hypotheses that derive from the literature review. Secondly, the methods used will be described, explained and justified.

3.1 Research philosophy

In determining a suitable methodology to answer a specific research question, it is important to first discuss the research debate between positivists and post/anti-positivists in social research. Positivist social science researchers consider solely observation and measurement as trustworthy, with methods to review, confirm or falsify hypotheses deriving from theories and eventually observe regularities that can be transformed to generalizable theories (Fisher, 1998). This strand of research uses research methods and techniques similar to natural research, thereby excluding 'not-observable factors' such as thoughts or social norms. The main goal of positivist research is to explain, predict and inductive reasoning is used to develop hypotheses that can be tested. In other words, inductive reasoning aims to develop a theory based on empirical evidence. On the other end of the spectrum, post/anti-positivists argue that social research considerably differs from natural research. Social research requires context, in particular language and concepts that researchers use in their projects are of paramount importance in defining a specific context or problem. Anti-positivists are less about explaining and focus on understanding a particular situation with a small number of cases that are selected for a particular subject (Business Research Methodology, n.d.).

This research method is thus deductive, with a hypothesis that is based on a theory and a study to test the theory in a particular situation and at a particular time (Wilson, 2010). Considering this thesis, an anti-positivist research method will be used. The use of this research method is deriving from the idea that social media posts will be multi-interpretable considering the social context, historical timing or even personal

experiences a reader has. This means that 'non-observable factors need to be taken into account when gathering empirical evidence to confirm or refute the hypotheses. This also assumes that the outcomes of this thesis cannot be generalizable to other contexts or actors, such as ports outside of Europe. To generalize the outcomes of this thesis, a cross-continental study needs to be carried out to examine whether social context or geographical location and even impact of COVID-19 and the health system in a respective country have an influence on the port strategies of those countries. Lastly, it is a deductive research method as the cases of the different ports will be used to assess the hypotheses that have been deduced from the theories that are outlined in chapter two.

3.1.1 Case selection

To determine the impact of COVID-19 on the port of Rotterdam's social media strategies, a single case study will be conducted. A single case study design is characterized by two defining features: it requires a situation that is continuous or ongoing and the measures of the data are similar but measures on multiple occasions within separated phases, and secondly, if two data sets are being used for the single case study, the intervention should be replicated over time. (Kazdin, 2021) Hence, in this study, the Facebook and Twitter page of the port of Rotterdam will be analyzed in two phases: 1 January 2019 to 11 March 2020 and 11 March 2020 to 31 July 2021.

This thesis will specifically look at the port of Rotterdam's social media strategy and whether or not this strategy / the content of the social media profiles is affected by the COVID-19 pandemic.

In this thesis, the port of Rotterdam has been selected as port of interest. This port is the largest port in Europe and also one of the most active ports on social media within Europe. The port of Antwerp and Hamburg could be considered as other cases that can be included, making it a comparative case-study, but while these are direct competitors in the container industry, these ports have close cooperation within, for example, safety procedures showing similarities in their companies structures and mechanisms (de Jong et al, 2019). Therefore, doing a more in-depth study of the port of Rotterdam will be more reasonable to do in the limited time frame. In addition to this, the COVID-19 measures between Belgium, Germany and the Netherlands has

significantly differed, with, for example, different or other periods of time for the lockdown measures. Therefore, a comparative analysis of these ports would not be suitable for this research.

3.2 Propositions

The theoretical framework shows the importance of communication, branding, rebranding and social media for companies. The use and effect of social media have been described and researched in numerous publications. Companies can extend their customer base worldwide, (Pourkhani et al, 2019) and the implementation of social media considerably facilitates brand awareness and eases the relationship between the customer and company (Jones et al., 2015).

3.2.1. The use of social media by the Port of Rotterdam – categories in the dataset

Ports are an interesting case as one would not directly suspect ports to use social media, including Facebook, YouTube, Twitter and Instagram. Their customer base primarily exists of large and global companies, while their social media channels are focusing on individuals. Secondly, ports do not benefit from a large social network to show the daily business of the ports and the companies located within the ports. Caliskan and Esmer (2017) even discovered that ports most attractive social media posts do not include any statement, image or video about their port services, infrastructure and superstructure. Even investments and success stories of the port are not attractive to the broad audience. Nevertheless, ports that are active on social media, use multiple social media platforms and social media usage is considered beneficial for the ports promotion and increased public relations (Caliskan and Esmer, 2017). Ports use social media to increase their positive image among a large audience and to promote specific events. Especially the port of Rotterdam is active in this as it also organizing business meetings to inform shippers or events that are sponsored by the Port of Rotterdam (Port of Rotterdam, 2021).

Hence, ports are increasingly recognizing the importance of 'brand equity of the port' (Bastug et al, 2020). The port's strategies are becoming more sophisticated and reach beyond sharing solely marketing information or commercial content, such as their container throughput, the volume of the container and the tax revenue generated. The ports are even sharing non-commercial content to build their port brand, for example,

social responsibility projects. This has been discussed in detail in 2.6.1 Brand equity and ports.

In order to determine the effect of COVID-19 on changing port's social media usage, this thesis will distract five categories based on port brand equity research. While this domain remains a niche within the research community, several scholars have connected ports and brand equity. Robinson (2002) has added a new paradigm to the literature by discussing the position of the port in the value-driven supply chain. He argues that ports' products are intangible, as they provide the service of the trading process from port to port. Yao et al. (2008) added to this paradigm that the port's competitiveness shifted from hardware to service criteria. Woo et al (2011) started analyzing port trends from 1980 onwards and concluded that the propensity was primarily divided into economics and operation topics. Based on the port brand equity and the port service quality, nine specific topics that ports use as a focus area to promote themselves can be distracted: sustainability (people), sustainability (planet), sustainability (profit), industrial (incl. energy generation), transport & logistics, knowledge & research/development, social innovation, software (digitalization) innovation, and hardware innovation. It is important to note that the categories are not mutually exclusive, a specific social media post can even relate to all five categories.

- o   Sustainability

The first three focus pints that could have been incentivized and accelerated by the COVID-19 pandemic is the topic of sustainability. The maritime sector has been experiencing a transition towards a greener and cleaner business model. International regulations from the International Maritime Organization (IMO) are aiming to reduce CO_2 emissions from international shipping by 70 per cent in 2050 and new ballast water treatment systems need to be installed on vessels before the renewal of the International Oil Pollution Prevention (IOPP) certificate (Deloitte, 2020). The COVID-19 pandemic exposed the interdependence and the pollution of the shipping industry and the added pollution of ports to a broad audience. Ports are likely to implement initiatives related to the growing role of environmental and social considerations due to the increased pressure and attention on ports during the COVID-19 pandemic. Notteboom and Haralambides (2020) argue: "*The growing role of environmental and social considerations shape the behaviour and strategies of port-related actors, with a*

greater role attributed to setting and achieving sustainability goals and to rolling out initiatives in the field of corporate social responsibility (CSR), stakeholder relations management and green supply chain management" The increasing importance of sustainability within the port industry is also visible and emphasized by the annual World Ports Sustainability Report since 2018 (Verhoeven, 2020).

In order to include the three dimensions of sustainability, namely people, planet and profit, these three have been included in the codebook as separate categories.

- o Industrial (including energy generation)

The port of Rotterdam, similar to numerous other ports globally, are not 'just' a port on their own. The port has been surrounded by a diverse ecosystem of industries, from storing natural resources to the packaging industry and also some commercial businesses making use of the closeness of the port to limit the shipping time from port to factory. In addition to this, energy generation has been a large topic in the port's industry business, for example wind energy or hydrogen ships. Therefore, this specific category has been included in the codebook.

- o Transport & Logistics

Transport and logistics are at the heart of the port's daily routines. Ships are entering the port, making use of the numerous quays. Next to the shipping routes and the entering or exiting of ships, ports are also the hub between the maritime sector and inland shipping by road or train. The COVID-19 pandemic disrupted operations and supply chains on a global level, exposing the high level of interdependence between countries and continents. While the full impact of the disruptions still has to be understood, the consequences nor the adaptive capacities of ports have been the same. (IAME, 2021). Ports have particularly been affected by this sudden attention to international dependencies as ports are considering themselves as *'crucial nodes, linking competing global supply chains' (*Notteboom and Haralambides, 2020). In other words, *ports transformed their public image from pure cargo handling centres to pivotal entities in a comprehensive and complex mesh of intertwining global supply chains.* Content on the daily business of the port, their international partners and their importance in various competing global supply chains can be considered economics and operational content.

o   Knowledge, Research and Development

Ports, including the Port of Rotterdam, are breeding grounds for new ideas concerning ports, transport and logistics, social sustainability and software/hardware innovation. The close proximity of the quays, the inland export opportunities and the industry availability makes it a perfect foundation for companies to develop their own products. In addition to this, much research has been conducted on the flora and fauna of the port and the ways the port can become greener, digital and more attractive for the local community. All these elements are included in 'knowledge, research & development'.

o   Innovation

Lastly, innovation is also split into three separate elements, just like sustainability, namely social innovation, software innovation and hardware innovation. This will make it clearer to which category the messages belong, as software innovation will cover mostly digitalization while hardware innovation can also cover the development and building of a large new type of crane in the port. Software industry is encompassing digitalization. The port industry, however, has been lacking in the adoption of technological tools and digitalization. 80 per cent of the 4,900 ports worldwide have yet to introduce new technologies for basic elements within the port infrastructure and supply chain (The Maritime Executive, 2021). The COVID-19 pandemic has accelerated the digital economy and society with lockdown measures that forced citizens to continue their lives online. Technological innovation holds immense opportunities for ports, such as the use of robotics, decision-making automation to optimize equipment scheduling and the use of the Internet of Things, blockchain and big data to turn traditional ports into 'smart ports' (Sinay, 2021). Lastly, social innovation is encompassing the innovation made in personal regulations, for example, policies to create a better working environment. In other words, social innovation includes 'upgrades' for employees.

3.2.2 The COVID-19 pandemic

The second part of the research question consists of the 'crisis' that may have prompted rebranding in the port industry: the COVID-19 pandemic. According to the

literature review, a crisis can appear either gradually and companies can prepare for it, or it appears suddenly, and companies have no time to adjust to the new situation. Yong-feng et al. (2020) pointed out the transmission mechanism influenced by the pandemic in the global shipping industry; The study shows the effect of the sudden "city close down," including the closure of the office, schools, factories, cancellation of flights, and blockage of highways overnight, is highly detrimental to the economy and supply chain worldwide. The reason is that the shipping industry is acting as a vital hub between the transformation of raw material, semi-finished products, and completed products (Yong-feng et al., 2020). When the end consumption and the intermediate transportation hub are paused, the global supply chain will fracture (HAJDU L et al.,2018).

For instance, China has long continued to provide car parts to automotive manufacturers in the US and Europe; the lack of supply could tremendously affect the global automotive market (DU Zhi-li. et al. 2019). On the other hand, China relies on Japan and Korea for its electrical parts and accessories. Yong-feng et al. (2020) illustrate, *"lacking such materials, in turn, will impact the midstream industry such as chemicals, plastics, metal, etc. and, the downstream products such as consumer electronics, semiconductors, and automobiles will be therefore significantly affected ".*

If people maintain the living situation at COVID-19 pandemic, with high restrictions on physical contacts, the automotive, electronics, textile, retail industries, etc., will be particularly under concern. Yong-feng et al. (2020) reason that the demand decreases dramatically while inventory is high on the stock, which leads to an imbalance between sales and production; As a result, the prices drop, ultimately resulting in shrinkage of international trade and currency liquidity. It is well-known that shipping and trade facilitate each other; with trade being affected by the global economy under the pandemic, the shipping industry is also at an unstable stake.

3.3 Method used: discourse analysis

For this thesis, discourse analysis will be used. This method is a leading method in social media analysis after Urquhart and Vaast (2012) stated that the important information systems research does not fully cover the methodological aspects of social media research. Discourse analysis is *"the analysis of language that looks at patterns*

of the language across texts as well as the social and cultural contexts in which the texts occur." (Palridge, 2012) Discourse analysis methods are widely defined and can range from a textually oriented analysis that will primarily focus on the specific language used in a text to discourse analysis that emphasizes and try to understand the social and cultural context in which the analyzed language is used. There are various paths of discourse analysis, for example, in social science numerous researchers are labelled discourse analysis but these differ in definition and execution (Fairclough, 2003). In other words, discourse analysis can help to understand what the goal is of a certain language and how language is used to create a specific image of a person, company or country. Chimombo and Roseberry (2013) argue that discourse analysis aims to explore the meaning of language beyond the words, and how text can be meaningful and used by the users.

This notion is also important when applying a discourse analysis on social media content. Companies as well as individuals that are using social media to disseminate information or highlight a particular issue are operating in a specific social and cultural context. Their audience – or followers when it comes to social media – are characterized by their global nature. This leads to the situation that different followers can interpret the same social media content differently. In addition to this, the messages shared on social media need to be interpreted in the context of the platform they are shared on. On Twitter, messages will be much shorter on average, as Twitter limits the number of characters that a user can share in one message to 280 characters (Boot, et al., 2019). Using shorter sentences that are not grammatically correct or consist of unofficial abbreviations are no exception.

3.4 Data used

The data used in this thesis will be split into four categories to develop a holistic view of the social media usage of the ports of Rotterdam, Antwerp and Hamburg. All data will be gathered in the period 1 January 2019 to 31 July 2021. This period will be divided into a 'pre-Covid period', covering the period between 1 January 2019 to 11 March 2020, and the 'COVID-19 period' which covers the period from 11 March 2020 to 31 July 2021. This timeframe has been selected as on the 11th of March 2020, the World Health Organization officially declared the outbreak of the COVID-19 virus a global pandemic.

The data used in this research will consist of: Tweets (Twitter), Facebook Posts, Instagram Posts and YouTube videos. The first three will primarily consist of written language and the use of pictures. The pictures will be categorized, as visible in the Code Book in section 3.6. The videos on YouTube will be divided into 'title' 'general topic of the video' and 'focus of the message' and this will also be detailed in the codebook in section 3.6.

In addition to the discourse analysis, the general user data of the social media accounts of the port will be used and secondary written resources, including official documents, newspaper articles and the websites of the ports, will be used to describe the context and background of the ports to take into account the context of the social media usage in the discourse analysis.

3.5 Codebook

This codebook will be the basis of the discourse analysis. In this codebook 'the content' refers to Tweets or Facebook messages. In addition to this, the codebook will refer to the nine elements described above, sustainability (people, planet, profit), industrial (incl. energy generation), transport and logistics, knowledge / R&D, innovation (social, software and hardware). After this, all data will be divided into the stakeholder orientation: local community stakeholders, commercial stakeholders, institutional stakeholders and internal stakeholders. Lastly, the data will be divided into the sentiment of the message (positive, negative or neutral) and whether it mentions COVID-19 or not.

Table 1: Codebook

CODEBOOK		
TOPICS OF THE CONTENT		
Topic	**Description**	**Key words**
Sustainability (people)	This topic refers to everything that will be done to engage individuals or groups to actively visit, support and promote the port of Rotterdam.	Invitation; visit; see now; havenkrant; photography; port days; website; open days; subscribe now; new website; join World Hydrogen Advisory Board of Industry Leaders; Supply Chain Talks;

	It includes messages including invitations to visit specific parts of the port of Rotterdam or the surroundings of the port, but also messages to increase knowledge about the port and to give individuals or groups insights within the ports' daily routines.	supply chain efficient and customer centric; Supply Chain Talks; sustainable global economy; customer centricity, attractive customers; Supply Chain Talk; online talk show; WorldHydrogenSummit; donation
Sustainability (environment)	This topic includes all messages concerning the environment, including but not limited, the flora and fauna of the port, the ways the port authorities are trying to contribute to the environmental goals of the Netherlands and to preserve wildlife in and outside the port. Sustainability (environment) includes messages on the wildlife, the nature and possibilities to preserve and sustain these two elements. In addition to this, it includes messages on how several aspects – such as hydrogen or digitalization – add to the decrease in CO_2 or the increase in green fuel. Plastic waste management is also included in this topic.	SPERAHydrogen technology; hydrogen-powered boat; zero-emission, full-electric shunting locomotives; Sustainable Energy Council; Sustainable Aviation Fuel; supply chain sustainable; sustainable global economy; energy transition; green port project; Carbon emissions; sustainable alternative; one-way containers; carbon footprint reduction; green hydrogen; hydrogen pipeline; sustainable fuels; WorldHydrogenSummit; hydrogen hub; hydrogen-powered fuel; plastic granule pollution; World Hydrogen Summit; Hydrogen plants; climate change; building biorefinery; HydrogenFSummit; bioplastics port of Rotterdam; CO_2 capture; project for CO_2 transport; carbon-neutral smoothie; Clean port; LNG-powered container; water injection dredging; sustainable energy; CO_2 emissions; ecosystem; shore-based power strategy; energy transition; Sustainable; Future Fuels Network; port of the future; Porthos carbon storage;
Sustainability (profit)	This category refers to the economic side of sustainability. Hence, when the sustainability of the economic system of the port has been discussed.	first LNG-powered trailing suction hopper dredger in the Netherlands; Ecodelta; accessible port; LNG-powered short-sea vessel;
Industrial (incl. energy generation)	This category includes all industrial activities in the port of Rotterdam, including the ones generating energy or related to the projects generating energy.	Electrification; hydrogen development, solar energy; wind energy; wind farms; mega battery, greenchoice mega battery, Haliade-X; offshore wind turbine generators; offshore; turbines; sustainable energy generation; SOHAR; solar power plant; building biorefinery in Rotterdam; Economy Action Plan; hammer mill; scale up to Limburg Express;

Transport & logistics	The category transport and logistics covers everything related to port routes, inland transport via trains or by highway and also includes updates on where or when a boat enters the port of Rotterdam. It can also include messages about the specific cargo of a vessel.	Breakbulk; arrival of a ship; preventing delays; Brexit; specific cargo, such as fruit, being shipped to Rotterdam; chain collaboration; agrofood supply chain; ensure fast transport; cargo; newly developed route; cruiseport; rail connection; sourcing; supply chain; Logistics; delayed Suez vessels; Suez Canal refloated; Viable value chains; KeepingBritainTrading
Knowledge / R&D	This includes all messages that try to transfer in-depth knowledge on one specific project based on a scientific outlet. In other words, research papers or other research carried out by the Port of Rotterdam.	Pilot; successful pilot; experience; experient; old acquaintances, history; ask the harbor master; question; numbers; facts; figures; want to know more about; webinar; deepdive of Venture café
Innovation (social)	Social innovation includes the upgrades of the teams, management and the measures being taken to uplift and upgrade the working conditions of the employees of the port of Rotterdam.	Large scale safety exercise; new accessibility of the port by public transport; new experience; various partners; renovate;
Software (digitalization) innovation	Software innovation is referring to projects and daily activities, foremostly including digitalization and new software programmes.	manage port with data; ProjectCargoSum Online;smart port;Submersible robot; FutureLandRdam; chainPORT annual meeting; digitalization; drones; automatic
Hardware innovation	Hardware innovation includes all innovation consisting of physical innovation, including new cranes, machines, bridges, boats, highways and quays.	maritime operations.; construct the quays; sustain flood risk; deep-sea quay; Bunkering Permit livestock checkpoint digital; Theemswegtracé track; Brexit; crane vessel; new warehouse complex; creating new waterway; development of new bridge; development of new road; porthos; development

Source: based on discourse analysis

3.6 Research limitations

There are four limitations within this research that have to be taken into account while reading the analysis below.

The first limitation is a methodological limitation. As discussed in 3.3 Method used: discourse analysis, the variety and differences between discourse analysis will create a problem with the internal validity of this research (Cuncic, 2021). The large range between textually oriented discourse analysis and a discourse analysis that primarily focus on social and cultural context could result in diverging conclusions based on the discourse analysis method used. In addition to this, discourse analysis also shows another problem with the internal validity, because this theory argues that every reader will most likely be biased by the cultural, historical and social context and therefore it is possible that two researchers will analyze the same message differently. In order to mitigate the risks, this thesis has clearly stated the discourse analysis that will be used and develop a code book that should guide research towards similar conclusions. In other words, the codebook is developed in such a way that if another researcher would carry out the research again, he or she would come to similar conclusions.

The second limitation is also a methodological limitation, as the thesis only uses discourse analysis to answer the research question. This creates a heuristic answer to the research question. Due to time constrains, holding in-depth interviews and visiting the port of Rotterdam will not be in the scope of this research. However, if this could have been done, this research would have a triangular research approach – meaning it has been researched with multiple research methods – and the answer to the research question could have been considered holistic.

The third limitation is related to the generalizability of the conclusion of this thesis: the external validity (Cuncic, 2021). As only the Port of Rotterdam in a specific time frame has been included in this research, it will not be possible to generalize the conclusion of this thesis to other ports worldwide. Therefore, this study should be considered an explorative study that will try to identify a specific phenomenon in a specific time frame and social context. In order to generalize the findings of this thesis, further research should be carried out to ports in Europe and eventually other continents. If the conclusion of this thesis is comparable to the research of ports on other continents, one can consider generalizing the conclusions. However, also with this, the social and historical background should be taken into consideration.

Lastly, the fourth limitation, relates to the language barrier in this thesis. Despite the global character of the port of Rotterdam, data will not always be available in English. Therefore, sources that have been written in Dutch will be translated to English before analyzing. Oftentimes, the social media platforms offer translations of the specific posts. This will be used to understand the text, whereafter the text will be coded in one of the categories of the codebook.

Chapter 4: data analysis

4.1 The port of Rotterdam

In this chapter, the analysis of the Twitter and Facebook data of the port of Rotterdam will be executed. For this chapter, over 1.200 Facebook and Twitter messages have been coded in different categories. As aforementioned in the methodology, the analysis has been split into three elements: topic of the message, tone of the message and whether or not the message mentions the COVID-19 pandemic. It is important to note that the total of the tweets and Facebook messages, 572 and 689 respectively, are not always equal to the number of topics or addressed stakeholders of the message. A tweet or message can have several topics in one post, while the tone and the mentioning of the COVID-19 pandemic has been equal to the number of tweets in total.

First, this chapter gives a general overview and some history background for the port of Rotterdam, before delving into the details of the analysis.

4.1.1 History of the port of Rotterdam

The history of Rotterdam can be traced back to around the year 1250. In this year, a fishing village arose in the west of the Netherlands due to the construction of a dam in the river Rotte. By constructing the dam, goods from seagoing vessels could easily be transferred to riverboats. This is considered the starting point of the port of Rotterdam. However, the first harbor master, Jacobsz Wildehaer, did not come into the picture until 1554.

Several new harbors were built in the 17th century, including the Leuvehaven, the Wijnhaven, the Scheepmakerhaven, the Glashaven, and the Bierhaven. Because the VOC (United East India Company) was also established, trade and shipping in the port increased enormously. In 1872 Lodewijk Pincoffs founded the Rotterdam Trade Association.

After the bombing of the Waalhaven airport by Germany in 1940, the airport was not repaired. Instead, this site was developed into a business park, also known as Waalhaven-South. Then, in 1958, the start of the Europort's construction ensured a

direct connection of the port of Rotterdam with the North Sea. In 1962, the port of Rotterdam was declared the largest port in the world. The port retained this title until 2004 when Shanghai took over this position.

Today, Rotterdam is seen as the fifth largest port globally, with a cargo throughput of 466 million tons. In 2020, the number of sheep visits to the port increased by 5,262 compared to 2019, leading to a number of 120,772 ship visits in 2020. The net result of the Port of Rotterdam Authority amounted to EUR 351.7 million. The most significant part of this result will be invested in improving the port structure and realizing social impact. Gross investments, including participating interests in 2020, therefore, amounted to 265.8 million Euros.

In the future, the port of Rotterdam aims to have a net negative impact on the climate. This pursuit is a consequence of and in line with the climate goals of the Paris Climate Agreement.

4.2 Social media usage of the port of Rotterdam in general

Similar to other ports globally, the port of Rotterdam started using social media to engage with its business clients and to improve their image in the local community who inhabit the surrounding areas of the port of Rotterdam. Looking at the Twitter account of @PortOfRotterdam, this account has a total number of 27,561 followers. This number of followers has been reached since the account was established, which was on May 12, 2009. In addition, it can be concluded that the account itself follows 317 accounts, has received 5554 likes, and has received 2226 retweets between 1 January 2019 until 31 July 2021, the timeframe of this research.

The Facebook account of the port of Rotterdam was founded on March 30, 2012 and has since then managed to achieve 1,299 likes on the page itself. In addition, 1,522 people follow this account. In total, 689 messages have been posted on the account, and this post has achieved a total of 24,180 likes between 1 January 2019 until 31 July 2021.

Below, the analysis will detail the use of Facebook and Twitter by the Port of Rotterdam. First, an extract of the data set used will be given to give a general overview

of the analyzed data. Then, the stakeholders will be discussed, and the topical focus of the tweets will be analyzed. Thereafter, the tone of the messages will be discussed and the extent to which the social media channel has been used for messages related to COVID-19.

4.3 Facebook usage by the Port of Rotterdam

4.3.1 Extract of the data analysis Facebook

The following pages show the categories, topics, and translated Facebook pages including the date. In total, the Facebook dataset encompassed 689 posts. This dataset can be requested, however, due to the readability of this thesis, only the first 31 lines have been included below.

Table 2: data analysis Facebook

Date	translation	Sustainability			Industrial (incl. energy generation)	Transport and Logistics	knowledge + R&D	Innovation			Local community	Business community	Government	Port authority / internal stakeholders	Negative	Positive	Neutral	Yes	No
		People (Social)	Planet (environmental)	Profit (Economical)				Social	Software	Hardware									
9-1-2019	As of today, Erasmus MC is one of the seven Rotterdam Make It Happen brand alliance partners. The goal: to work together to increase the national and international appeal of the most beautiful city in the Netherlands. Read more: https://bit.ly/2AEK8fx	x									x					x			x

Date	Text																			
11-1-2019	First Dutch trailing suction hopper dredger dredges on LNG in the port of Rotterdam. Today Mrs. Jolies van der Kamp christened the Ecodelta at the Holland Americakade. This is the first LNG-powered trailing suction hopper dredger in the Netherlands. The Ecodelta will maintain the depth of the western port area of Rotterdam in the coming years. http://bit.ly/2H9mJZe		x	x	x	X					x		x					x		x
16-1-2019	PORT NEWSPAPER | The Ecodelta is the first LNG-powered trailing suction hopper dredger in the Netherlands. As a result, the port of Rotterdam will be kept at its depth in an environmentally friendly manner in the coming years. Watch the vlog and read more in the Havenkrant Online: http://bit.ly/2FB9QEY		x	x	x	X					x		x					x		x
21-1-2019	On Sunday 27 January it's Fossil Day again in FutureLand. On this fossil day, the 'bone doctors are ready to identify all your finds and tell you exactly what you have found. Do you have any finds at home? Take them with you and have them assessed by the experts! http://bit.ly/2FDu55O	x										x						x		x

Date	Content																		
22 -1- 20 19	The harbor not romantic? Really. Be enchanted on Valentine's Day by the lights of the harbor on FutureLand's 'Love Boat'. Enjoy a delicious dinner during the cruise and fall in love with the port of Rotterdam. Are you coming? Register and more information: https://bit.ly/2FSOcMO	x									x						x		x
22 -1- 20 19	PORT NEWSPAPER | Reading is fun! And reading together is even more fun; especially with the winter weather today and next week. This week it's the National Reading Days (January 23 to February 2), so time for some good port book tips. For yourself, your (grand)son or daughter, or perhaps the class where you are going to read. And immediately participate in our competition and have a chance to win 'Fred in the harbour', a beautifully illustrated children's book including audio CD by the Rotterdam writer and actor Joris Lutz. http://bit.ly/2FOiXIX	x									x						x		x
25 -1- 20 19	PORT NEWSPAPER | Winners #photo competition Havenkrant announced | The port of Rotterdam is a rewarding subject for photographers. This was evident from the number of entries to the	x									x						x		x

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	photo competition of the Havenkrant Online on Instagram. It wasn't easy, but in the end we picked six winners. You can read their story on Havenkrant Online: https://www.portofrotterdam.com/.../winners...																				
30-1-2019	Would you later like to contribute to the largest port in Europe, but are you not yet sure with which training this can be done? De Havenkrant found out for you which educational institutions you can go to for a port-related training. Read more at: http://bit.ly/2GaLsdK	x								x				x				x		x
31-1-2019	PORT NEWSPAPER | The harbor is a rewarding subject for poets. Today is #PoemsDay and that is why Havenkrant selected five harbor poems. Which poem should not be missing from this list? http://bit.ly/2Tq7kWm	x								x				x				x		x
1-2-2019	The newest ship of the Holland America Line, the Nieuw Statendam, will be christened tomorrow in Florida by Oprah Winfrey. Are you curious about the ship? Watch the livestream on the Holland America Line Facebook page. What is your favorite HAL ship?	x								x				x				x		x
6-2-2019	The port of Rotterdam offers 1000 MBO students a job guarantee if they opt for a process engineering,	x		x						x				x	x			x		x

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Date	Content																			
	maintenance or logistics course. Over the next 4 years, SMEs will have a job for 600 job seekers through a work-study program. https://bit.ly/2GdYyHI																			
8-2-2019	PORT NEWSPAPER | 'In every child there is an artist!' | FutureLand Maasvlakte 2 organizes creative workshops, a free treasure hunt and technical experiments for children during the spring break. But there is even more to experience for young and old. From a tour or cruise through the most modern port in Europe to the temporary exhibition about deepening the Nieuwe Waterweg. And we ask art teacher Joanna Smolarz what she teaches the children during her children's workshop. "There is an artist in every child," she says. Read more quickly: https://bit.ly/2HZYf53	x										x						x		x
13-2-2019	Is the harbor not a place for romance? It really is, and we can prove it. Especially for Valentine's Day, the Havenkrant made a top-3 of romantic harbor spots to visit with your loved one. Or with the person you hope will become your beloved, of course… You will certainly score the originality prize	x										x						x		x

Date	Text																	
	with this. So quickly follow the link and read our article in the online Havenkrant. http://bit.ly/2SOC9H5																	
14-2-2019	At 469.0 million tons, the total transhipment volume of the port of Rotterdam ended up just higher in 2018 than in the record year before (2017: 467.4 million tons). Container transhipment was again the driving force with 4.5 per cent more volume in tons. https://bit.ly/2tmsrx9			x							x	x		x			x		x
14-2-2019	Come to FutureLand during the spring break (February 25 to March 3). There are all kinds of activities for young and old, such as creative workshops, a free kids quiz, technical experiments for children and a fossil expedition. A tour or cruise through the most modern port in Europe is also on the program. http://bit.ly/2UXN8LS	x									x						x		x
19-2-2019	'A playground for circular companies, where we head with brains, balls, guts and fun towards an economy in which waste does not exist.' This is how BlueCity 010 describes itself on its website. BlueCity has now been around for almost 4 years. Four years in which	x									x						x		x

Date	Text																						
	the initiators experienced the necessary ups and downs. One thing is clear. They have balls at BlueCity. Brain, vision, guts and fun too by the way. Read the showcase of the #RotterdamMakeItHappen partner: https://bit.ly/2SbSUHZ																						
20 -2- 20 19	Great ideas for the #spring break! #futureland	x										x							x			x
22 -2- 20 19	Aadje is a little pirate who has many adventures with his father and all the other pirates. Ten years ago, Aadje Piraatje's first book was published, reason for celebration! De Havenkrant is therefore giving away tickets for a performance in De Doelen. Are you in? http://bit.ly/2Ve4YKy	x										x							x			x
26 -2- 20 19	The Leuvekolk is undergoing a major metamorphosis! And the Port of Rotterdam is participating in this.	x										x							x			x
26 -2- 20 19	The weather is beautiful! Are you going to the Maasvlakte beach? Then visit FutureLand Maasvlakte 2! Take a break with a drink, while the kids do experiments or a workshop. For all tips, look at Havenkrant Online: http://bit.ly/2Vidrwd	x										x							x			x

Date	Post																					
1-3-2019	PORT NEWSPAPER | Every week, 200 liters of shampoo, 200 trucks and 160,000 liters of water pass through HB Truckwash. Just a few impressive figures from the largest truck wash in Europe on the Maasvlakte. But cars can also go there. After a ride through the harbor, have your oldtimer scrubbed at HB Truckwash Maasvlakte! Read more: http://bit.ly/2UiuQoI OPEN Rotterdam	x										x						x		x
5-3-2019	PORT NEWSPAPER The Pioneering Spirit. The largest ship in the world will return to its home port of Rotterdam from 6 March. Want to see this colossus with your own eyes? Book a cruise now via futureland.nl/activity/rondvaart-pioneering-spirit. Curious about what is so special about this maritime wonder? Read the most important facts on Havenkrant Online. http://bit.ly/2Ujv0Mk	x										x						x		x
6-3-2019	Can't come at 2 pm? Don't worry, the next few days there will be more cruises dedicated to the Pioneering Spirit! Book your tickets via the link.	x										x						x		x

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Date	Text	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
7-3-2019	Not one, but two cruise ships are today berthed at the Wilhelminakade in the heart of Rotterdam. Today they officially opened the cruise season. The AIDA Mar (2194 passengers) and AIDA Cara (1186 passengers) can be admired until late this evening. Are you coming to see?	x									x					x	x
8-3-2019	PORT NEWSPAPER | Harbor women, you see them more and more. Also in professions that until recently were the exclusive domain of men. But there could be some more! That is why the Havenkrant uses International Women's Day on 8 March to portray 8 inspiring port women. Such as bridge engineer Denise, laboratory technician Ursula and mechanical engineer Juliette. Tough women doing the work they love. Read their story here. https://bit.ly/2J2bPWb	x									x					x	x
9-3-2019	A busy afternoon on the water at the Wilhelminakade. The cruise ships have left and are making way for inland skippers, container skippers, Spidos, RPAs and water taxis.	x									x					x	x
12-3-2019	2018 was another busy year in the port of Rotterdam. Watch the annual film and read more	x		x							x	x		x		x	x

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| about the developments in our 2018 Annual Report: https://jaarverslag2018.portofrotterdam.com/ | | | | | | | | | | | | | | | | | | |

Source: based on data analysis

4.3.2 Stakeholders

Stakeholder orientation is of paramount importance for social media accounts, as described in the theoretical framework *2.3 Stakeholders of the port,* by the classification of commercial, institutional and community stakeholders. After analyzing the 689 Facebook messages that have been posted in the period 1 January 2019 to 31 July 2021, figure 7 is showing the number of messages that are targeting the different stakeholders. It is important to note that the amount of times the four categories target the different stakeholder groups does not add up to the total amount of 689. This can be explained by messages that are categorized in two groups, as these messages target, for example, both the local community as well as the commercial stakeholders. An example of such a Facebook post is a message dated 29 September 2020:

HAVENKRANT | Capturing CO_2 and storing it underground is one of the ways to achieve the climate targets. Industry in the port of Rotterdam can reduce its climate impact so quickly, while companies are working on sustainability in the meantime. Porthos is planning an underground pipeline that will transport CO_2 to empty gas fields under the North Sea from 2024. Wondering how that works? We explain it in this infographic: https://bit.ly/36b9Ets

This message is attracting both stakeholders, as it aims to increase knowledge among commercial stakeholders, as well as trying to engage local community stakeholders.

If you analyze figure 7, Facebook posts are primarily used to target the local community. Before the WHO declared the COVID-19 pandemic an international pandemic on 11 March 2020, the stakeholder orientation of the Port of Rotterdam was a bit more balanced, with also numerous messages being addressed to the internal stakeholders of the port. After 11 March 2020, the stakeholder orientation has been primarily on the local community. One explanation for this is the amount of messages dedicated to keeping the local community engaged and up to date on the port activities via the digital route, as this has been the only way to actively communicate with this stakeholder group when visits to the port could not be made anymore due to the COVID-19 restrictions.

Figure 7: Stakeholder orientation of the Port of Rotterdam's Facebook page before and during COVID-19
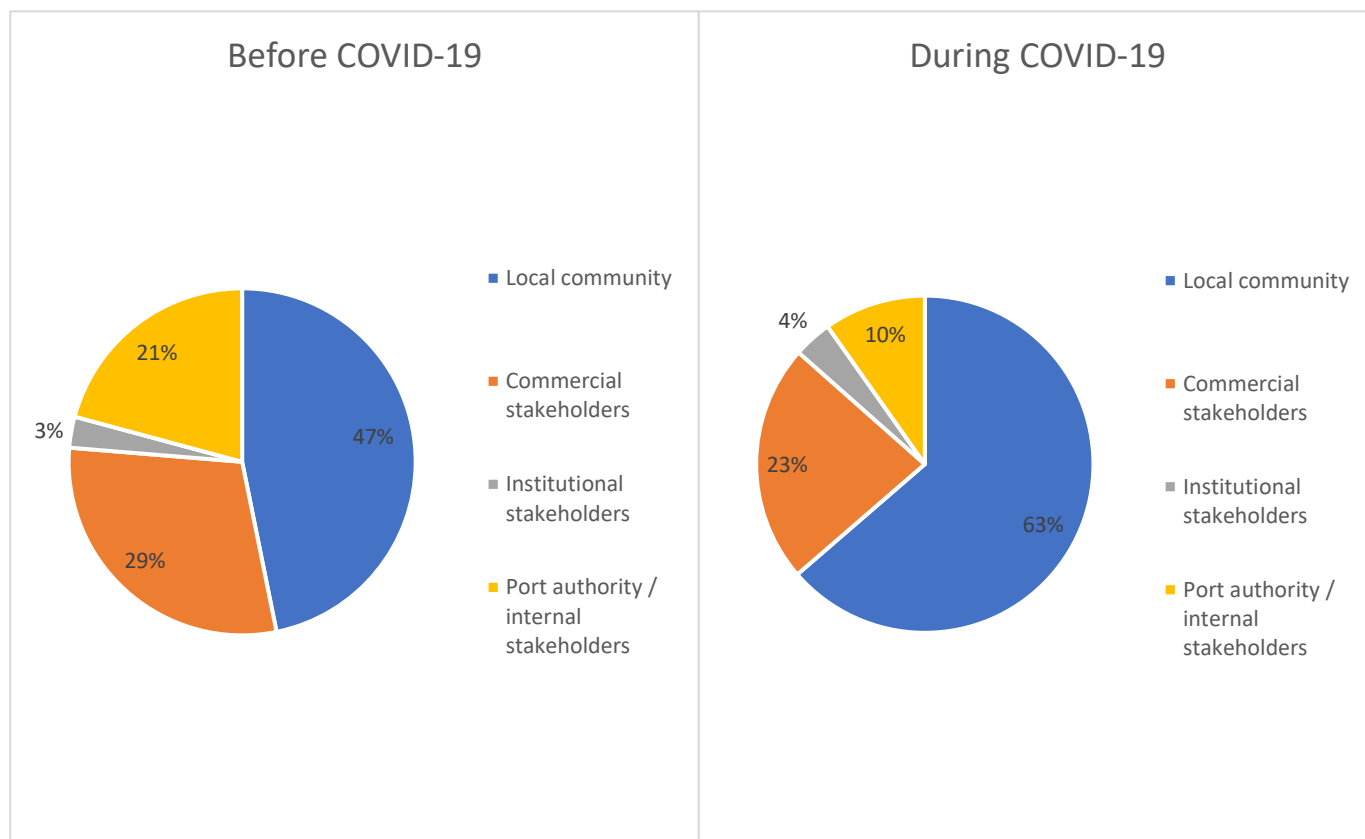
Source: based on data analysis

4.3.3 Topics of the messages

The topic of the messages have been divided into five categories, with two categories being divided again making it 9 topics, to capture the essence of every message on Facebook. Of those topics, sustainability (people) is by far the most important topic for the Port of Rotterdam on Facebook. This can be seen in Figure 8. Both before and during the COVID-19 pandemic, this topic was mentioned in 229 and 250 messages respectively.

Figure 8: Facebook messages topic division based no total of Facebook messages

Figure title: Facebook messages topic division based on total of Facebook messages
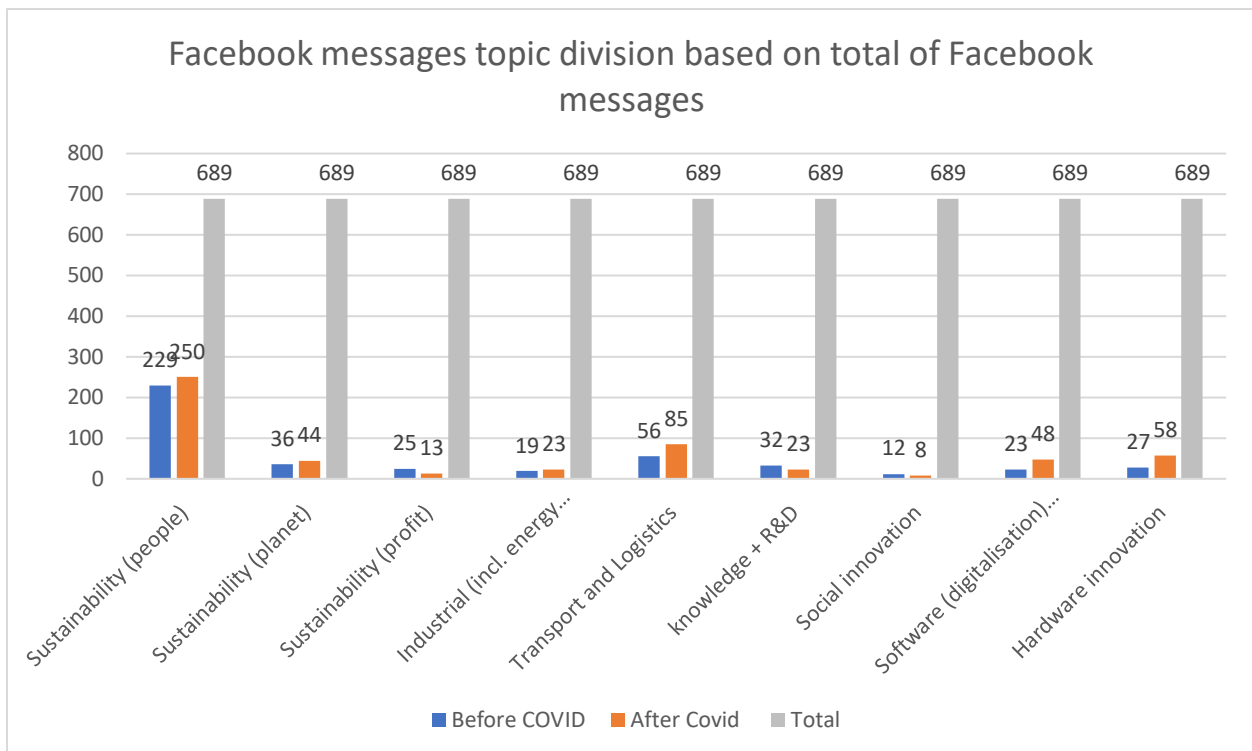
Source: based on data analysis

If you look at the pie chart, figure 9, before corona, it shows that even if all links to the topics are taken together, hence analyzing the percentage a topic has been mentioned based on all coded topics rather than taking the total of the messages as the total, sustainability (people) is mentioned in half of all messages – individually or together with another topic.

Figure 9: Percentage of how many time a topic is mentioned before the COVID-19 pandemic.
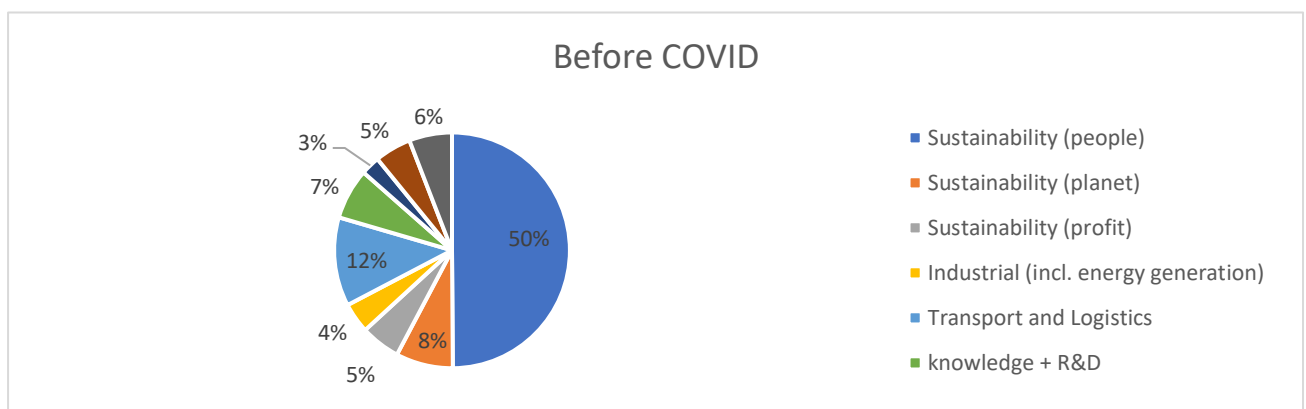
Source: based on data analysis

Interestingly, the percentage of sustainability (people) mentions has decreased during the COVID-19 pandemic. Instead, transport & logistics and software (digitalization) innovation has been increasing. This is unsurprising, as sustainability (people) is, among other things, dedicated to inviting people to the port, keeping them invested in the daily business of the port the way people can be active in and around the port. During the COVID-19 pandemic, the delays in shipping have raised many questions, that could only be explained on social media to the civil society. Therefore, an increase in mentions of transport and logistics can be explained by this. The increase in software (digitalization) innovation can also partly be explained by the COVID-19 pandemic, as the port had to rethink their social media strategy by offering digital alternatives for the physical activities for the local community. This is for example true for the Port days, that were completely digital in 2020. In addition to this, the port of Rotterdam is a 'smart port' and with the increase in interest concerning digital means due to the COVID-19 pandemic, the port has also increasingly been sharing messages on the 'digital port' developments.

Figure 10: Percentage of how many times a topic is mentioned during the COVID-19 pandemic
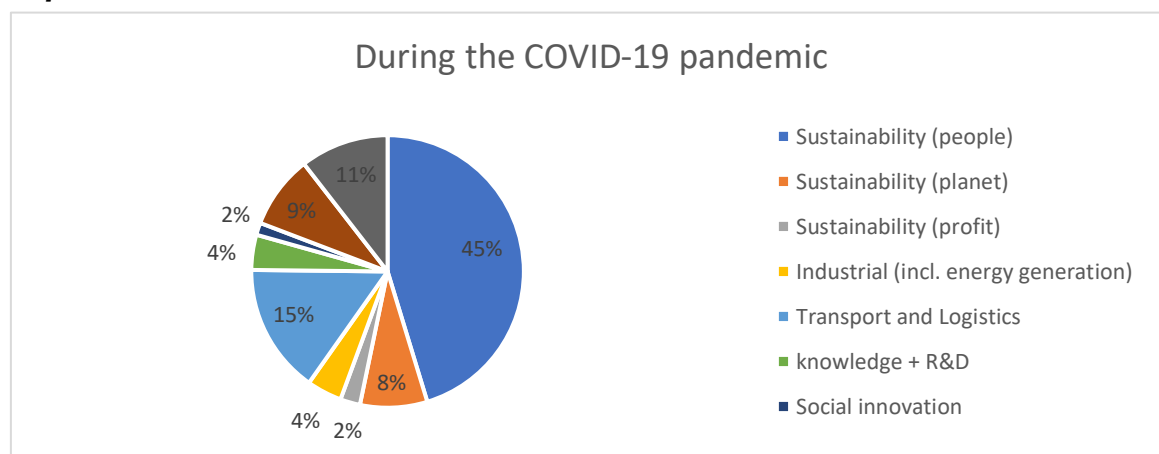
Source: based on data analysis

### 4.3.4 Tone of the messages and the references to COVID-19

Tone of the messages

The tone of the messages is slightly more positive on Facebook before the COVID-19 pandemic as during the COVID-19 pandemic. This can be explained by the number of messages mentioning actions for the local community, for example the Port Days, spots to photograph or places to visit. These messages are all having a positive tone,

encouraging citizens to positively engage with the Port of Rotterdam. During the COVID-19 pandemic, those messages became less and focused on the digital 'alternative', thereby oftentimes hitting a neutral tone rather than a positive tone in the message.

Figure 11: The COVID-19 pandemic references before and during COVID-19
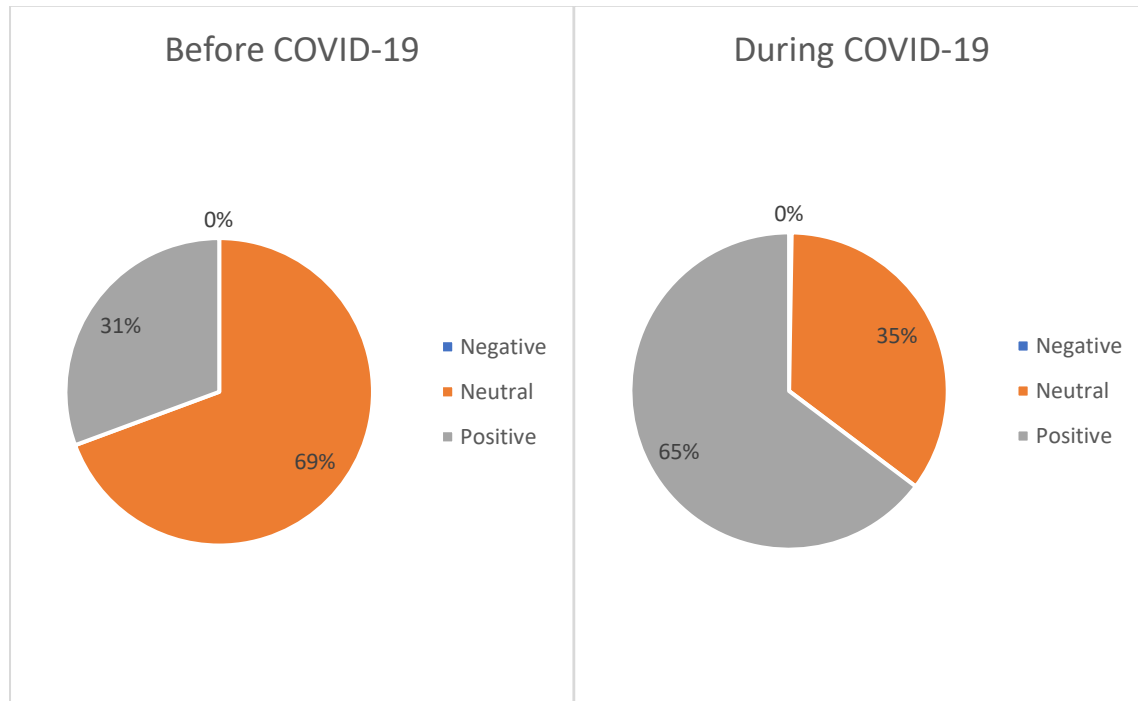
Source: based on data analysis

On Facebook, there are no references of COVID-19 prior to March 11, 2020. This indicated that before the WHO declared COVID-19 an international pandemic, the port did not mention COVID-19 in their posts, thereby not yet anticipating on potential delays in the transport and logistics department. During the COVID-19 pandemic, 44 of the 378 messages mention the COVID-19 situation. This is 11.6 percent of all messages during the COVID-19 pandemic, and 6.4 percent of all messages that have been analyzed for this research. The 44 messages target primarily the local community, and secondly the commercial stakeholders. The messages also targeting the internal stakeholders are foremostly messages supporting the personnel of the port (with, for example, the action that all ships in the port of Rotterdam were honking for 30 seconds). The stakeholders targeted by the messages mentioning COVID-19 are visualized in figure 12

Figure 12: the target audience of the Facebook messages mentioning COVID-19.
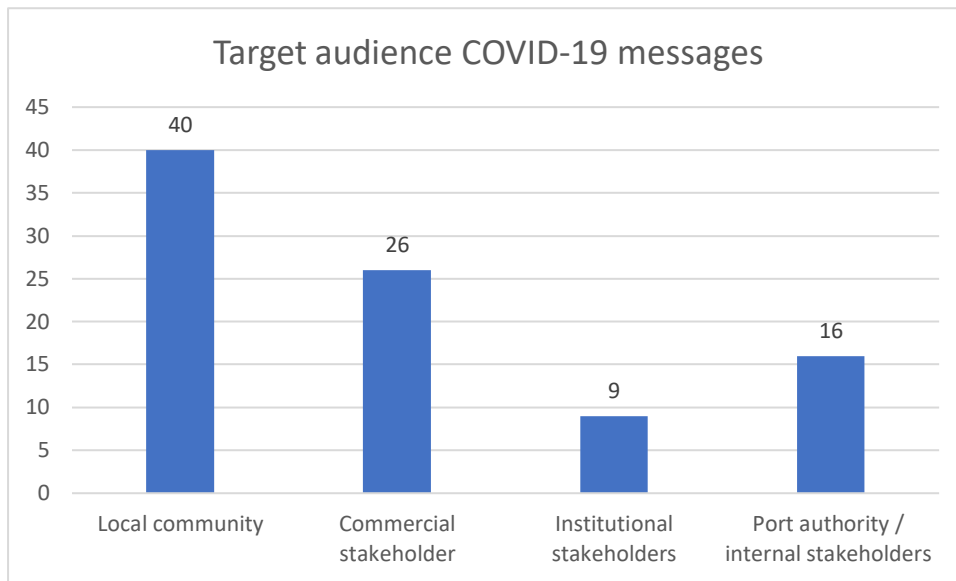
Source: based on data analysis

4.4 Synopsis of the finding

In sum, it can be concluded that the Port of Rotterdam has a strong focus on the local community prior to and during the COVID-19 pandemic. However, the number of messages mentioning sustainability (people) decreased as the links to transport & logistics and software (digitalization) innovation increased during the COVID-19 pandemic. In general, the tone of the messages shifted from a more positive-oriented message to a slightly more neutral-focused messages. The local community was also the most important stakeholder in the messages mentioning the COVID-19 pandemic.

4.5 Twitter usage by the Port of Rotterdam

4.5.1 Extract of the data analysis Twitter

The following pages show the categories, topics, and translated Twitter pages including the date. In total, the Twitter dataset encompassed 572 posts. This dataset can be requested, however, due to the readability of this thesis, only the first 31 lines have been included below.

Table 3: data analysis Twitter

		Categories										Stakeholders				Tone			COVID	
		Sustainability			Industrial (incl. energy generation)	Transport and Logistics	knowledge + R&D	Innovation			Local community	Commercial stakeholders	Institutional Stakeholders	Port authority / internal stakeholders	Negative	Positive	Neutral	Yes	No
Text	UTC	People (Social)	Planet (environmental)	Profit (Economical)				Social	Software (digitalisation)	Hardware									
Port of Rotterdam Authority, @KooleTerminals, Chiyoda Corporation and @MitsubishiBRK signed an agreement to a joint study on the feasibility of	30-7-2021		x		x		x				x	x				x			x

commercial-scale import of hydrogen, utilinzing the SPERAHydrogen technology. All info: https://t.co/YdBJdlcTx2 #hydrogen																		
Port of Rotterdam rebounds after corona dip. Port can make genuine contribution to Dutch prosperity and reducing carbon emission. Read more: https://t.co/iFHL1HUyvH #rotterdammakeithappen https://t.co/HjvjDfzhXc	22-7-2021		x	x							x	x	x			x		x
Step aboard our new website. Are you ready to explore? Make it happen. https://t.co/DEmvWGgvDQ #portofrotterdam #newwebsite #makeithappen	17-7-2021							x	x		x	x				x		x

https://t.co/RDVDhG7gCO																	
The first 'hovering' hydrogen-powered boat holds trials in the port of Rotterdam. Have a look: https://t.co/KfULLaQOCB #hydrogen #europeshydrogenhub #energytransition	29-6-2021	x		x	x				x	x				x		x	
Production on the first zero-emission, full-electric shunting locomotives will start soon. The locomotives will be used in the port of Rotterdam, aim is to replace the diesel locomotives. Get to know more: https://t.co/BdJ495f6tS #portofrotterdam #electric	23-6-2021	x	x		x			x	x	x	x			x		x	

https://t.co/oLoAWPdbhF																	
Our CEO Allard Castelein will join the Sustainable Energy Council World Hydrogen Advisory Board of Industry Leaders. Read the article: https://t.co/KC9SCoMLX8 #hydrogen #portofrotterdam #sustainability https://t.co/IPJpUlj6Zn	23-6-2021		x								x			x		x	x
Study shows shipping green hydrogen from Iceland to Rotterdam to be realistic before 2030. Read more: https://t.co/cEa7eF4Y4D #energytransition #greenhydrogen #renewableenergy	15-6-2021		x	x			x					x	x			x	x

#rotterdammakeithappen @landsvirkjun https://t.co/pS5BqXsnta																	
Trade in refrigerated products via reefer containers is seeing spectacular growth @PortOfRotterdam. To ensure that customs clearance is faster, more efficient and safer, @HavenRotterdam, Customs, @gfhuis, @Portbase have joined forces. Read more https://t.co/XJwpJ1NGI6 https://t.co/cVaJg96ODo	11-6-2021				x						x		x		x		x
Preparations for the 3rd edition of the Port of Rotterdam 'Supply Chain Talks' on June 15 at 12:00h CEST are in full swing! Don't	10-6-2021				x					x	x	x			x		x

Text	Date																				
forget to register: https://t.co/JszL5KSQAn #portofrotterdam #logistic #supplychain https://t.co/D43Tj5v97v																					
Partners repurpose the Rotterdam waste-to-chemicals project to waste-to-jet based on substantial targets and demand for Sustainable Aviation Fuel. Read the full article on https://t.co/NJik5r6CX3 #portofrotterdam #sustainability https://t.co/oBsn64RwRk	8-6-2021		x					x	x			x	x	x				x		x
When is the food supply chain most sustainable, efficient and customer centric? We spoke with Gerard	7-6-2021	x					x					x	x					x		x

Harleman (Bakker Barendrecht BV) and Reinder Zuidhof (HANOS) about the trends and developments they see in both retail and foodservice: https://t.co/LUIxQkqLQV #PortOfRotterdam https://t.co/nlwd2EazoK																			
Mark your calendar for the 3rd edition of the Port of Rotterdam 'Supply Chain Talks' on June 15 / 12:00h CEST and register now for this free webinar: https://t.co/vMfARhaeOV #portofrotterdam #supplychain #logistics https://t.co/5L2sIcHQKq	27-5-2021					x						x	x	x			x		x

How is the largest port in Europe accelerating the shift to a more sustainable global economy? Listen to the latest #responsiblebusiness podcast from @Deloitte where Allard Castelein enriches us with insights. https://t.co/DjHfh7jmgQ #sustainability #podcast #energytransition https://t.co/UiGoEK2qBU	25-5-2021		x	x										x	x			x			x
Gerard Harleman (@BakkerBarendrecht) and Reinder Zuidhof (@HANOSISPC) share their vision on customer centricity, sourcing, sustainability and more.	21-5-2021																	x			

What drives success in the retail and foodservice supply chain? Read our latest trend paper: https://t.co/AM0VzPOKOc #Fastestroutetofreshness #Agrofood #supplychain #RotterdamMakeItHappen https://t.co/KvN0u637p1	21 -5- 20 21					x						x					x		x
Broekman Logistics in @HavenRotterdam where #Smyril meets Smyril https://t.co/vK1k5dMdRs	19 -5- 20 21					x						x					x		x
We are looking forward to virtually meet you all at Breakbulk Connect 21, the online Breakbulk event of the year organized by @Hyve. Join us at the kick off of the event on	14 -5- 20 21					x						x					x		x

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
wednesday 19th may 11 am CEST. Register here: https://t.co/WfiiYDl1YG #breakbulk #portofrotterdam https://t.co/Gjz2Wa1xm5																			
We should not see the coming digitisation and energy transition as a threat but as an opportunity,' says CEO Allard Castelein in the @nytimes & @Accenture podcast #BuiltForChange. Listen to the entire episode now: https://t.co/11TPDIPUKa #portofrotterdam #podcast https://t.co/7VksPTEGmS	14-5-2021	x	x	x				x			x	x	x	x		x			x
EU awards nearly € 25 million in funding to 'green port project' Rotterdam.	11-5-2021			x								x	x	x		x			x

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Text	Date																			
https://t.co/RK45QI6KME #sustainability #energytransition #logistic #greenport																				
@PortOfRotterdam believes it is important to keep #Rotterdam attractive for its customers. That is why it is sponsor of #ESF2021 #Eurovision #EurovisionVillage https://t.co/bQs8IRL6uC	10-5-2021	x						x			x							x		x
Real-time digital overview accelerates handling of delayed Suez vessels in port of Rotterdam. Read more: https://t.co/hvK0IFcBEi #containershipping #suezcanalblockage #transparancy #datasharing #rotterdammakei	9-4-2021					x			x		x	x						x		x

thappen @Portbase																		
Carbon emissions in port of Rotterdam drop swifter than national average. The port's total emissions volume combines those released by industrial production and electricity generation. https://t.co/vW7PaSBZdX #energytransition #carbon #carbonneutral #rotterdammakeithappen	9-4-2021	x			x					x		x			x			x
Rotterdam solution for empty #containers. The Rotterdam firm K-tainer has come up with a new sustainable alternative to this procedure: one-way containers. This	6-4-2021			x		x		x			x				x			x

solution helps avoid unnecessary costs and carbon emissions. https://t.co/ZtbE eB8JDS #sustainability #carbon #logistics https://t.co/9Gib HYC5s2																			
This Easter Weekend, we can once again find water stewards out on the water along the Nieuwe Maas in Rotterdam – for the first time this season. Read more: https://t.co/W5e1 BnzV9z @varendoejesa men @RBDordrecht #varendoejesam en #rotterdammakei thappen https://t.co/dG0 mZQPuxu	2-4-20 21	x										x					x		x

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Text	Date																		
We are ready for #Eurovision! Only 51 days to go till the final. Let's countdown together. #SingAlong #ESC2021 #Songfestival #OpenUpToRotterdam #ESF2021 #ESF2021Rotterdam #ESC2021Rotterdam #Rotterdammakeithappen #51daysToOpenUp #letscountdowntogether Desgin by: VollaersZwart https://t.co/bLAfyoSczA	1-4-2021	x										x					x		x
Now that the container ship blocking the Suez Canal has been refloated, this key East-West trade route has once again opened for business. Read more: https://t.co/4T2ZlNYT6J	31-3-2021					x						x	x				x		x

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#logisticss #suez #evergiven #rotterdammakeithappen																		
IMO publishes short list of actions for quick carbon footprint reduction in shipping. Read more: https://t.co/0ZL0DqtYWk #shippin #energytransition #greenhousegas emissions	31 -3- 20 21		x									x				x		x
VoltaChem is organizing an online talk show to be held on Wednesday March 31st from 11.00 – 12.30 CET: Viable value chains: The Northwest European industry region as electrified supercluster. Read more and sign up: https://t.co/v6qTpgdM9u @VoltaChem_	27 -3- 20 21		x						x			x				x		x

https://t.co/p5f0Y 1VW69																	

Source: based on data analysis

When analyzing the messages from the Twitter account of the port of Rotterdam, a slightly different picture was created. First of all, the stakeholder orientation before and during COVID-19 shows a divergent picture from the stakeholder orientation of the Facebook messages. The twitter account is targeting the business community, with more than 60 percent of the messages before the COVID-19 pandemic being addressed to the business community. The port of Rotterdam's stakeholder orientation maintains relatively the same during COVID-19. The main focus from the port of Rotterdam are the commercial stakeholders, taking up to more than 50 percent before and during COVID-19. However, the posts targeting on local community increases from 15 percent to 20 percent. Notably, the port of Rotterdam is paying more attention to the local community during the COVID-19 period. One reason for this could be the inclusion of messages targeting the local community with messages on COVID-19 and the digital, alternative options to the physical events as well as the inclusion of messages that support and encourage the local community to work together during the COVID-19 pandemic. The focus on internal stakeholders slightly decreased during the pandemic, from 14 percent to 11 percent ,and the focus on government slimly rose from 9 percent to 11 percent.

Figure 13: stakeholder orientation Twitter before and during the COVID-19 pandemic
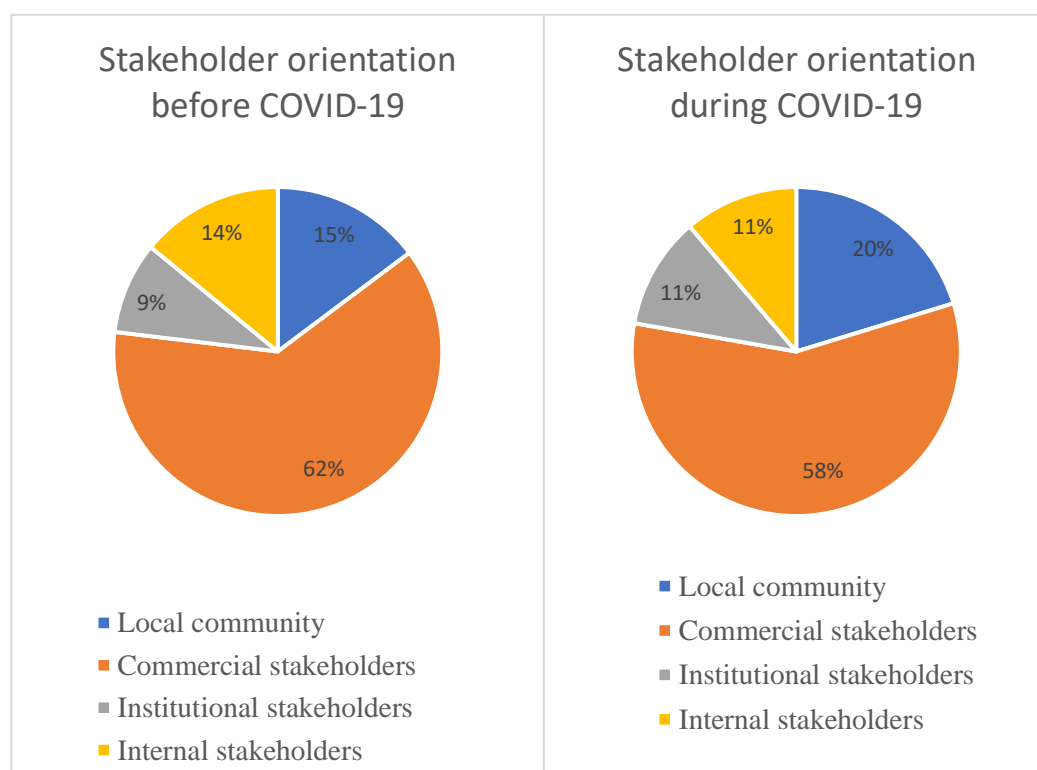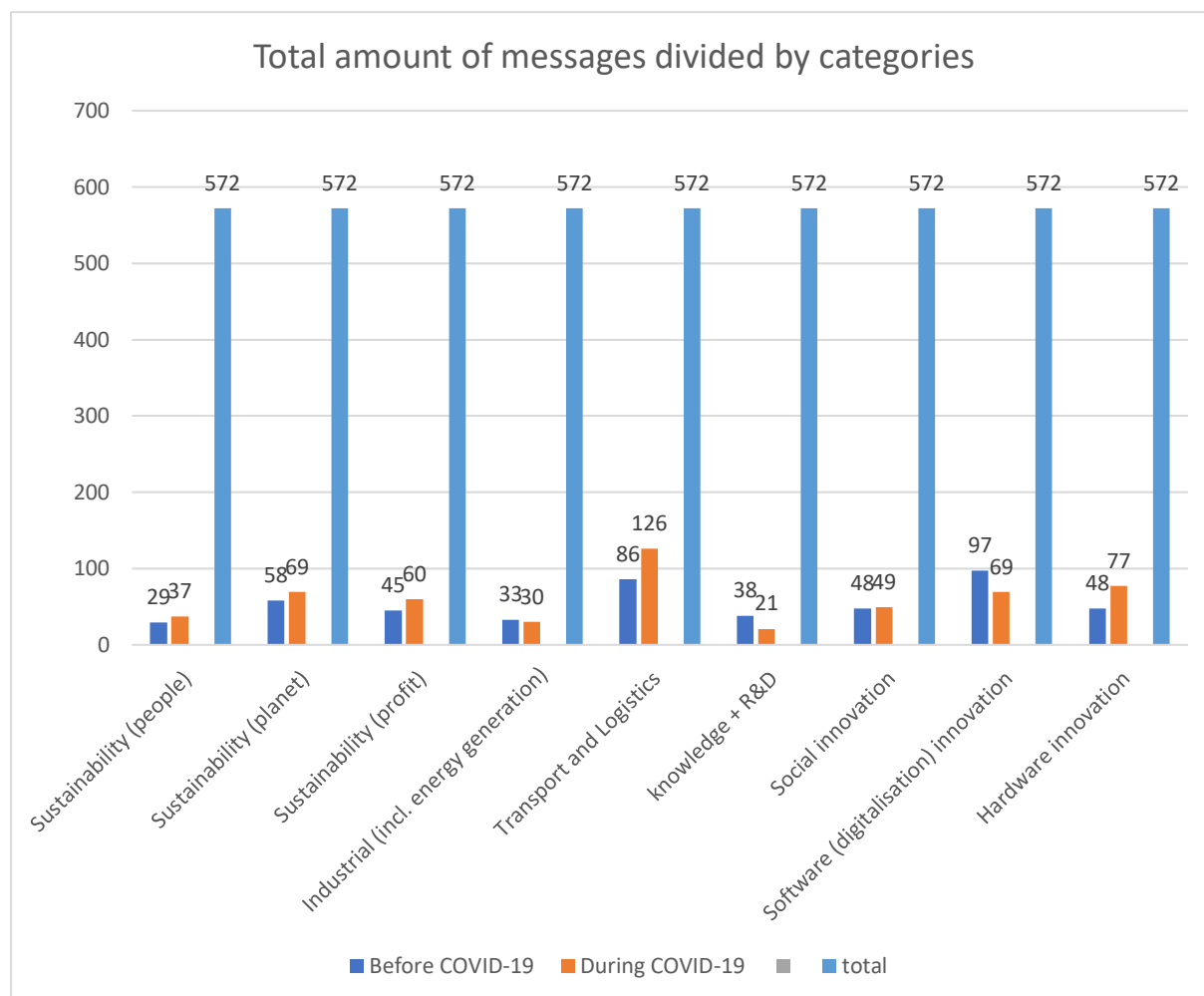

Source: based on data analysis

4.5.1. Topics of the messages

The post's orientation is spread under nine categories in the table chart of the total amount of messages divided by categories. With Transport and Logistics being the

most prominent among others, it exceeds more than 100 in the "during covid" becoming the highest amount of message orientation category. Followed by software digitalization innovation, it was the largest amount of category before COVID-19. We can see that, both before and during the pandemic, transport and logistics, as well as software digitalization innovation, are the two large proportions in the total amount of message categories.
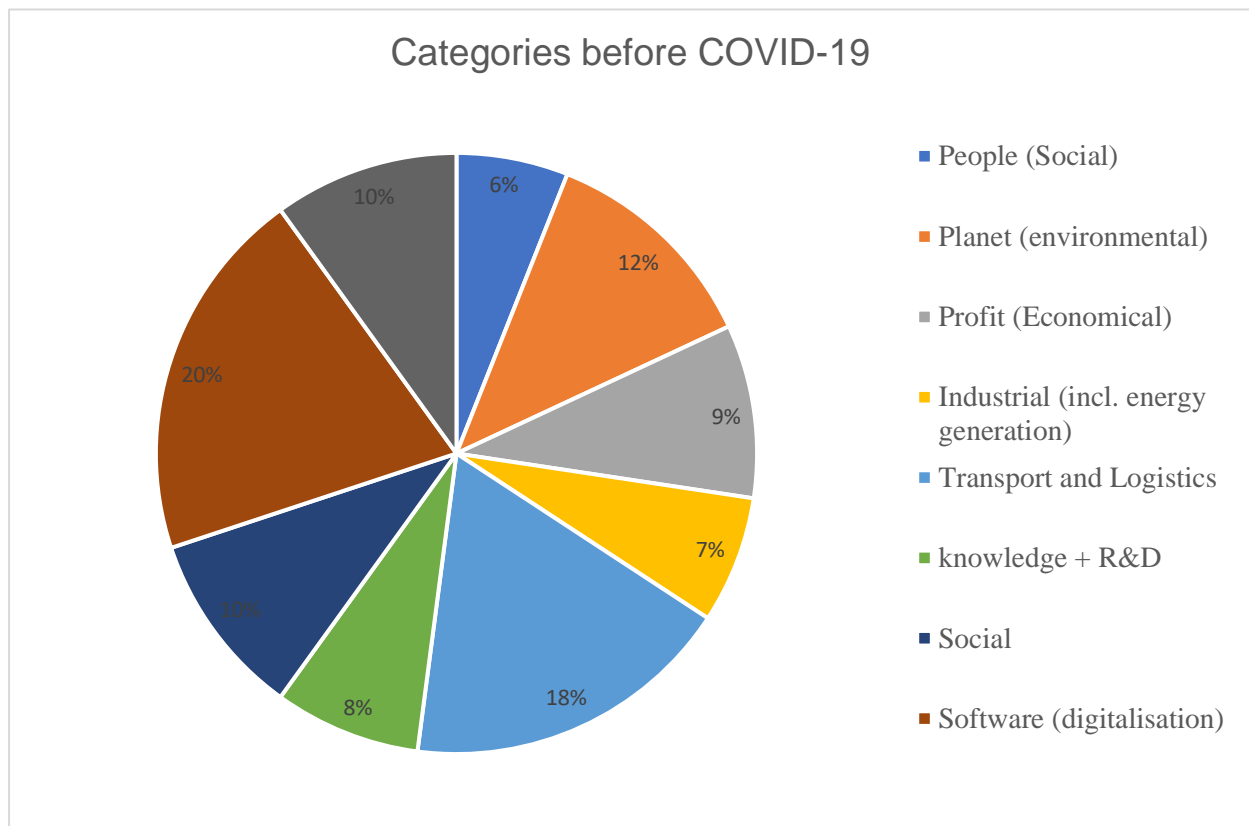
Figure 14: Total amount of messages divided by categories on Twitter

Source: based on data analysis

Figure 15: Percentage of how many times a topic is mentioned before the COVID-19 pandemic on Twitter

Source: based on data analysis

The figure categories before COVID-19 indicated the division of social media post orientation from the Twitter account of the port of Rotterdam. The data is presented in a pie chart, figure 16, under nine different segments. It is obvious the division of the category orientation is relatively evenly distributed. Among them, the software(digitalization) category represented the largest percentage, comprising one-fifth of the total post, followed by the transportation and logistics category, taking up to 18 percent. Planet (Sustainability) represents the third largest portion of the pie chart, 12 percent. Social innovation and Hardware innovation are both 10 percent in the pie chart. Lastly, followed by Sustainability (Profit), knowledge(R&D), industrial (incl energy generation), and Sustainability(people), representing 9 percent, 8 percent,7 percent, and 6 percent respectively.

We can conclude that before COVID-19, the port of Rotterdam's Twitter usage is mainly focused on the orientation of software digitalization innovation and Transport

and logistics, which is in line with Europe's largest port and constant pursue of process improvement.

4.5.3 Twitter categories during COVID-19

**Figure 16: Percentage of how many times a topic is mentioned during the COVID-19 pandemic on Twitter**
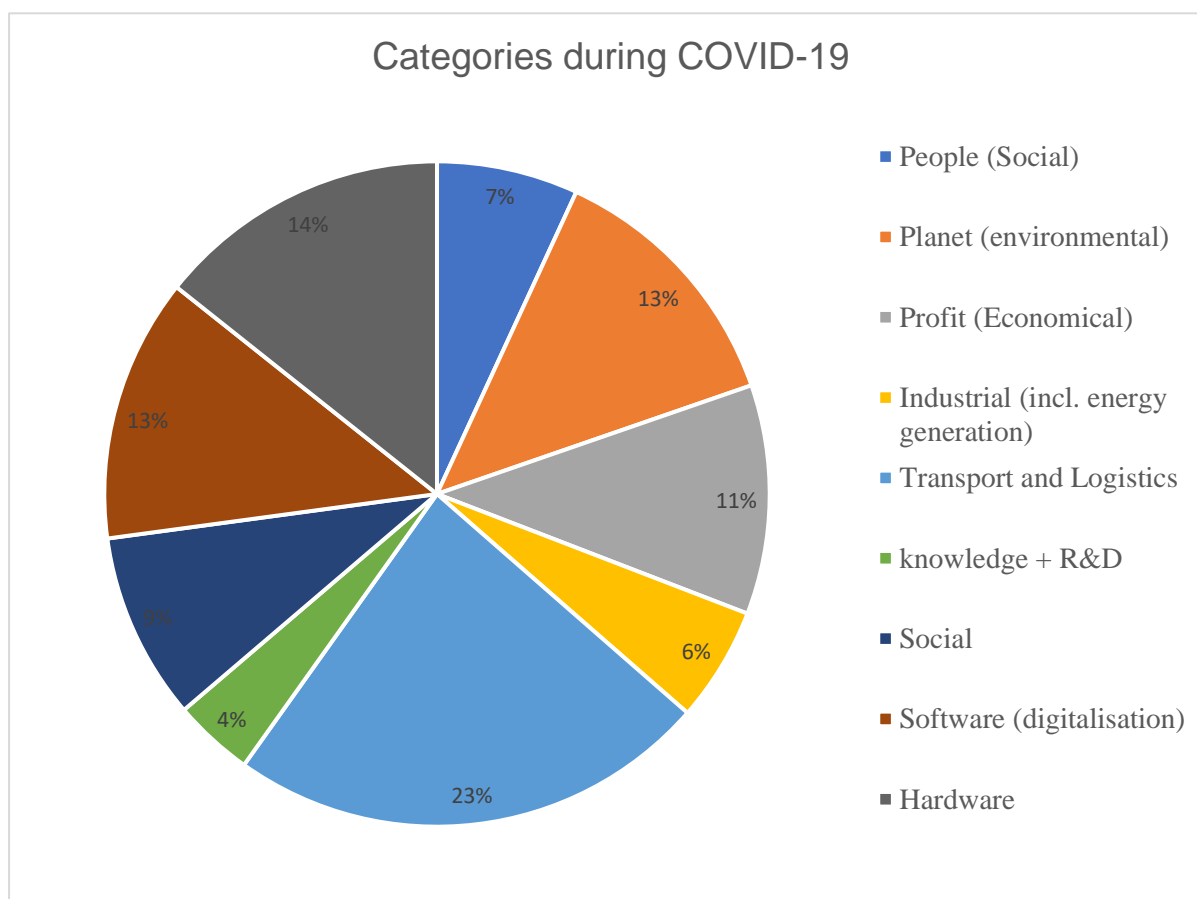
Source: based on data analysis

The categories after COVID-19 on the Twitter post orientation from the port of Rotterdam indicated the Transport and Logistics posts take up to 23 percent, followed by Hardware innovation representing 14 percent of the total posts. While software digitalization innovation and sustainability(planet) make up an exact same portion, both 13 percent, sustainability profit follows by and represents 11 percent of the pie chart. From the pie charts, we can see that the post oriented regarding Transport and Logistics is increasing, from the second largest proportion surpass digitalization, becoming the most significant proportion of the pie chart, taking up to 23 percent. While the rest of the category proportion remains relatively the same level, notably, the

Twitter post in which orient hardware innovation also expanded from 10 percent to 14 percent, taking over the second-largest proportion during COVID-19. Consequently, the post relating to software innovation and R&D shrinks during COVID-19, from 20 percent to 13 percent, and from 8 percent to 4 percent, respectively. From the data variation, we can conclude that the port of Rotterdam expanded the focus on transport and logistics as well as hardware innovation during COVID-19, reasoning that the port is dedicating to infrastructure innovation and upgrading in order to host the high demand and container shortage as well as traffic congestion such issues that can repetitively occur under the pandemic period.

4.5.4 Tone of the messages

***Figure 17: Tone of the Twitter messages before and during COVID-19***
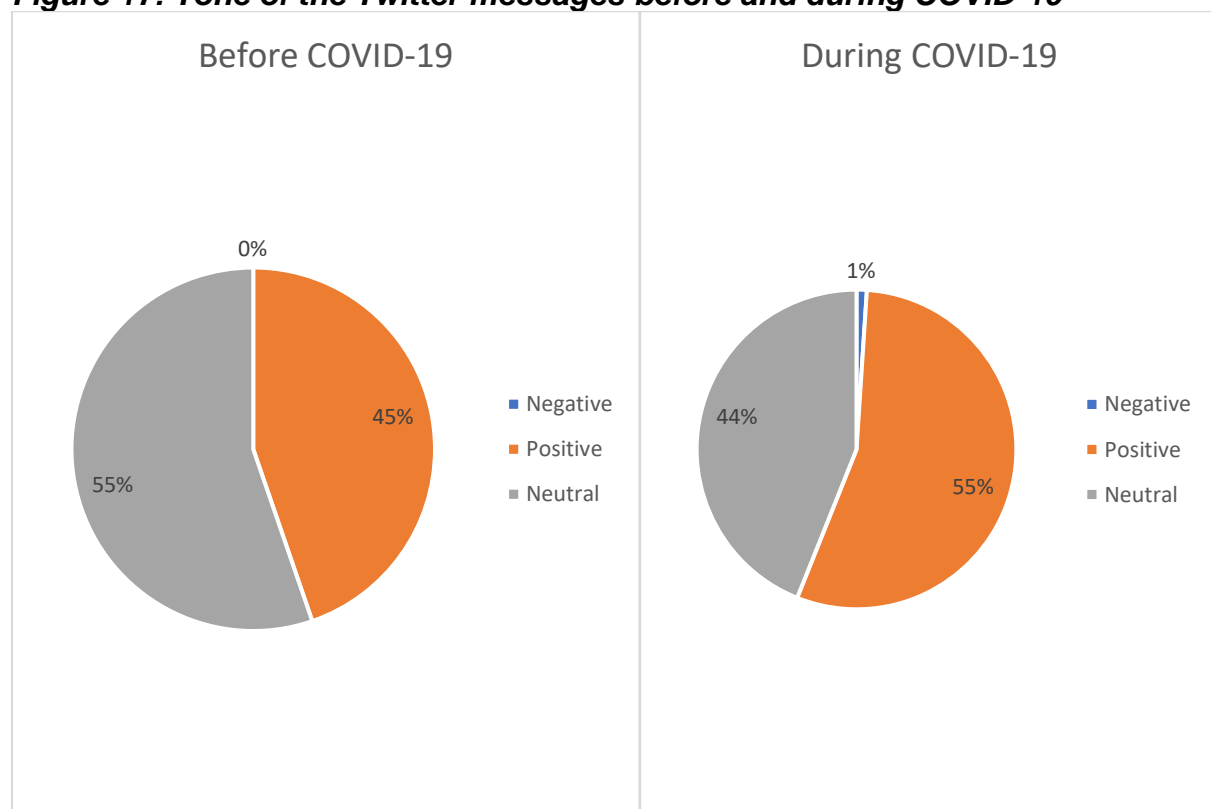
Source: based on data analysis

The tone of Twitter, as visualized in figure 18, shifted from mainly being neutral before COVID-19 to have a more positive tone during the COVID-19 pandemic period. Thus, it can be considered that the port of Rotterdam wants to obtain a leadership role in

spreading positivity during the pandemic period to its audience, namely, the business community, local community, government, internal stakeholders.

Figure 18: stakeholders targeted by messages mentioning COVID-19
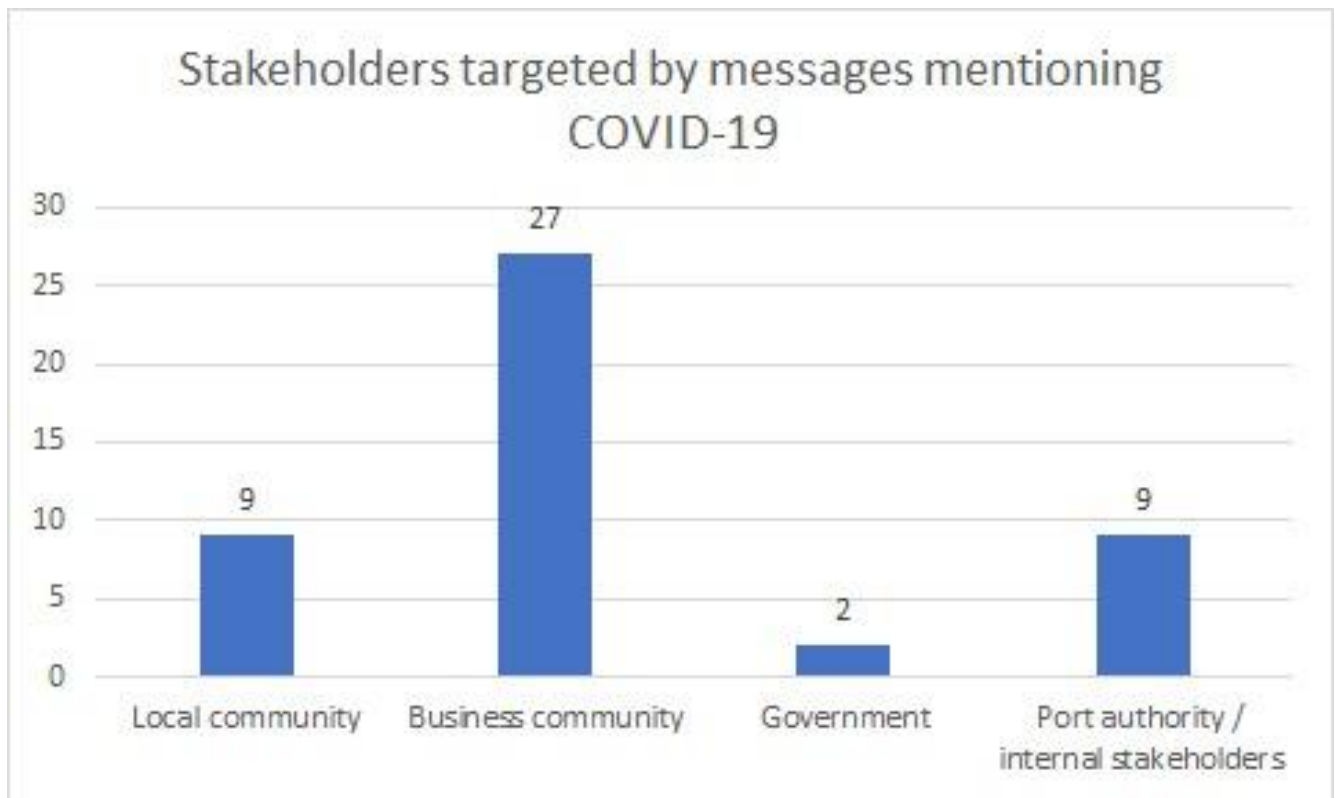
Source: based on data analysis

On Twitter, there are no references of COVID-19 before March 11, 2020. This indicated that before the WHO declared COVID-19 an international pandemic, the port did not mention COVID-19 in their posts, thereby not yet anticipating potential delays in the transport and logistics department. During the COVID-19 period, there was 30 messages mentioning COVID-19from the port of Rotterdam's Twitter account by the time of researching. The Twitter account mainly targets the business community, followed by the local community and port authority, with the least targeting the government. Among the 30 messages mentioning COVID-19, one post could be targeting one or multiple stakeholders in one message.

4.6 Synopsis of the findings

In sum, the main target audience of the port of Rotterdam's Twitter account are the commercial stakeholders. While the numbers shift a little bit in favor of the local community, the commercial stakeholders are also the primary stakeholders during the COVID-19 pandemic. In addition to this, it can be concluded that the topic most discussed on Twitter is the transport and logistics topic, which can be related to the Twitter account primary stakeholder. The commercial stakeholders are most likely interested in updates on the transport and logistics matters in the port of Rotterdam and can be kept up to date through Twitter.

5. Conclusion& discussion

5.1 Conclusion

This research has been conducted to find an answer to the research question: *To what extent did the COVID-19 pandemic influence the Port of Rotterdam authority's social media usage?*

In order to answer this research question, a discourse analysis on the Facebook and Twitter social media account of the port of Rotterdam has been carried out. From the data, it can be concluded that the social media usage has been shifting during the COVID-19 pandemic; both in terms of stakeholder orientation and topics mentioned. However, the data also shows that it is only a variation in accents, rather than a massive shift.

The analysis has showed the following conclusions on the data:

The port of Rotterdam has a different target audience and post category orientation on different social media platforms. Facebook is strongly focused on the local community but shifts a bit towards the commercial stakeholders during COVID-19. The opposite appears to be true for the Twitter messages. Prior to the COVID-19 pandemic, 62 percent of the messages was targeting the commercial stakeholders. During the COVID-19 pandemic this shifted to 58 percent, benefitting the local community as a stakeholder in the Twitter messages.

When it comes to the category's posts can be divided into, there are minor changes before and during COVID-19. In particular the posts on Twitter and Facebook mentioning transportation and logistics during COVID-19 has been increased. This can be explained by the extra attention given to the delays in transportation due to the COVID-19 pandemic. This finding appeared to be true both for Facbeook and Twitter.

On the port of Rotterdam's Facebook post analysis, Sustainability(people) has the most mentioning. While the number decreases during COVID-19, it still takes the most significant portion, almost half of the total category mentions. Besides, the post relating

to software digitalization innovation also seeming climbing during the COVID-19 period on the port of Rotterdam's Facebook page.

The content of the Twitter page from the port of Rotterdam is divergent from its Facebook page. The content mentioning all nine-category is relatively evenly distributed. With software digitalization innovation drop from the most dominant position before COVID-19, the transport and logistics as well as hardware innovation surpassing and became the most and the second most content category being mentioning during COVID-19.

In addition, both Twitter and Facebook account from the port of Rotterdam transition to a more positive tone during the COVID-19 period.

To sum up, the social media usage of the port of Rotterdam increased its focus and mentions in transport and logistics to host and resolve the possible delay that could occur under the influence of pandemics. Although Facebook and Twitter are showing different results in mentioning software digitalization innovation, it still is one of few primary focuses of the port of Rotterdam's social media page. The Facebook page from the port of Rotterdam has sustainability as its main focus, targeting the local community, while their Twitter page concentrates on software digitalization innovation and transport and logistics, aiming at the commercial stakeholders. However, both Facebook and Twitter accounts from Rotterdam port are delivering the message in a more positive tone during COVID-19.

5.2 Discussion

This thesis has been centred around a single case study, the Port of Rotterdam. While this has been a useful study for this particular case-study, it is important to note that to generalize the propositions made in this thesis a larger comparative case study analysis should be conducted. To provide a comprehensive answer to the research question and provide evidence by including other ports to create a generalized view of the effect of COVID-19 on the social media behavior of ports, other ports of Europe should be included foremostly.

Secondly, it is important to note that the COVID-19 pandemic is not the only element influencing the social media strategy of ports per se. In the time analyzed, several European strategies have been published, including the European Green Deal and the European Digital strategy. These strategies could have been important elements in influencing the social media strategy of the ports, as it impacts the foundation of the port's functioning. In addition to this, the International Maritime Organisation has published in 2020 the 'IMO 2020'. This determined that from the 1st of January onwards, the upper limit on the sulphur content of ships' fuel oil is reduced to 0.50 per cent. This reduction has been mandatory for every ship operating outside the certain desginated Emission Control Areas (IMO, 2020). This could also have a certain effect on the outcome of this study.

In addition to this, during the data analysis stage, some difficulties regarding the data has been experienced. Firstly, data gathering from the social media accounts has encountered difficulties. While Twitter allows users to download all the tweets from a public account page, Facebook no longer enables such a feature. Therefore, up to almost 700 posts from the Facebook account were all copied manually. In addition, the port of Rotterdam is only using Dutch content on their Facebook page. This created the extra step of translating all posts manually, to also include all Dutch posts into the Facebook dataset.

Besides, during the research, we discovered that many of the posts did not directly link to COVID-19, as in not directly mentioning the term Covid-19. Therefore, this research conducted a discourse analysis rather than a content analysis. A discourse analysis examines the language uses and explore the content on both direct and indirect links to COVID-19. Hence, every post has to be read, analyzed and categorized manually. In other words, the analysis process is no longer operated by the automatic search scanning function of the word COVID-19 but manually going through the content in a qualitative manner and discovering the indirect connection, which extensively prolonged the analysis workload.

In terms of the results of the data analysis, the doubles in the data set create an addition difficulty. In other words, while the amount of posts mentioning (or not mentioning) COVID-19 and the tone of the messages are cumulative equal to the

amount of Facebook or Twitter posts, the topics and stakeholder categories were not. This created a difficulty in the data analysis, as these doubles create a divergent number in comparison to the tone and COVID-19 mentions in the social media messages.

5.3 Avenues for future research

As aforementioned, the first avenue for future research is conducting the same study but with the inclusion of all social media channels used by the Port of Rotterdam. As shown in this discourse analysis, the Facebook and Twitter page have different stakeholders, tone and topics. It could be the case that the LinkedIn, Instagram and YouTube page of the Port of Rotterdam are addressing other topics and stakeholders in a different tone.

Secondly, a comparative case-study could be carried out. This would provide a heuristic explanation for ports within the European union (or not, depending on the results). If the port of Antwerp and the port of Hamburg, as an example, show similar patterns, it can be concluded that the COVID-19 pandemic has similar effects on the various ports within Europe.

Another, third, avenue of future research would be the inclusion of other explanatory factors next to COVID-19. The IMO 2020 and the European green and digital strategy – oftentimes referred to as the Twin Transition – can be examples for this. This could then again be conducted in a single or comparative case-study. For this, it would also be important to conduct interviews with the communication department of the respective ports, as – for example – the European Green Deal and the IMO 2020 goals overlap and a particular focus of either the Green Deal or the IMO 2020 in the social media messages may not be found.

Lastly, it would be interesting to compare the findings of the European ports to ports in other continents. Do Chinese ports or ports in the United States also change their social media strategies for the same reasons European ports do? Or do they experience other incentives to change their social media strategy, if they already changed their strategies in the period observed in this study.

Reference

Aaker, D. A. (2009). *Managing Brand Equity*. Amsterdam, Nederland: Amsterdam University   Press.

Bae, H. S. (2012). The effect of market orientation on relationship commitment and relationship
effectiveness of port logistics firms. The Asian Journal of Shipping and Logistics. 28(1):105-134.

BAŞTUĞ, S., ÇALIŞIR, V., GÜLMEZ, S., & ATEŞ, A. (2020). *Measuring port brand equity: A sentiment analysis on port social media messages*. DUMLUPINAR UNIVERSITY   JOURNAL   OF   SOCIAL   SCIENCES. https://dergipark.org.tr/en/download/article-file/955173

Berry, L. L. (2000). Cultivating Service Brand Equity. *Journal of the Academy of Marketing Science*, *28*(1), 128–137. https://doi.org/10.1177/0092070300281012

Boot, A. B., Tjong Kim Sang, E., Dijkstra, K., & Zwaan, R. A. (2019). How character limit affects language usage in tweets. Palgrave Communications, 5(1). https://doi.org/10.1057/s41599-019-0280-3

Boyd, D. (2007). Social Network Sites: Definition, History, and Scholarship. Computer Mediated Communication, 3-20.

Businessinsider. (2021, May 26). *US Digital Trust Study: Which social media platforms have the highest levels of digital trust among US social users*. https://www.businessinsider.com/us-digital-trust-study-from-insider-intelligence-2020-9?international=true&r=US&IR=T

Business Research Methodology. (n.d). Positivism Research Philosophy. Business Research   Methodology.   https://research-methodology.net/research-philosophy/positivism/

Çalışkan, A. and Esmer, S. (2018). Social media usage patterns in port industry: implications for port promotion and public relations. Journal of ETA Maritime Science, 6(1), 61-74.

Cahoon, SC,(2007). *Marketing communications for seaports: a matter of survival and growth*, Maritime policy and management, 34, (2) pp. 151-168. ISSN 0308-8839 (2007)

Carton, S. (2009). Defining social media. Retrieved December 05, 2010, http://www.clickz.com/clickz/column/1703507/defining-social-media

Carraher, S., Parnell, J., Carraher, S.C., Carraher, C., & Sullivan, S. (2006). Customer service, entrepreneurial orientation, and performance: A study in health care organizations in Hong Kong, Italy, New Zealand, the United Kingdom, and the USA. Journal of Applied Management & Entrepreneurship, 11 (4), 33-48.

Civelek, M. E., Cemberci, M., & Eralp, N. E. (2016). The Role of Social Media in Crisis Communication and Crisis Management. *International Journal of Research in Business and Social Science (2147–4478)*, *5*(3), 111–120. https://doi.org/10.20525/ijrbs.v5i3.279

Coombs, W. (2007b) Protecting organization reputations during a crisis: The development and application of situational crisis communication theory. Corporate Reputation Review 10(3): 163–176.

Cornelissen, J. (2017). *Corporate Communication* (5de ed.). Thousand Oaks, Canada: SAGE Publications.

Carraher, S.M., Parnell, J., & Spillan, J. (2009). Customer service-orientation of small retail business owners in Austria, the Czech Republic, Hungary, Latvia, Slovakia, and Slovenia. Baltic Journal of Management, 4 (3), 251-268.

Culnan, M. J., McHugh, P. J., & Zubillaga, J. I. (2010). How large US companies can use Twitter and other social media to gain business value. MIS Quarterly Executive, 9(4).

De Jong, O., Van den Bossche, M., Hintjens, L., Van der Lugt, L., & Van Saase, N. (2019). Onderzoek havensamenwerking. Ministerie Infrastructuur en Waterstaat (IenW). Geraadpleegd van https://www.rijksoverheid.nl/documenten/rapporten/2020/03/30/bijlage-2-eindrapport-havensamenwerking

De Langen, P.W., Visser, E.J., 2005. Collective action regimes in seaport clusters: the case of the Lower Mississippi port cluster. J. Transp. Geogr. 13 (2), 173–186 Marketing strategies of Port Authorities_ A multi-dimensional theorisation (sipotra.it)

De Langen, P., & van der Horst, M. (2015). *New indicators to measure port performance*.

ResearchGate. https://nmit.edu.my/wp-content/uploads/2017/10/New-Indicators-to-Measure

Port-Performance.pdf

Dooms, M., Verbeke, A., Haezendonck, E., 2013c. Stakeholder management and path dependence in large-scale transport infrastructure development: the port of Antwerp case (1960–2010). J. Transp. Geogr. 27, 14–25.

Dooms, M. (2020). Strengthening the social license to operate of ports during COVID-19: mixed blessings ahead? *ESPO*, 2.

DU Zhi-li, LIN Bo-qiang. Changes in automobile energy consumption during urbanization: evidence from 279 cities in China[J]. EnergyPolicy,2019, 132: 309-317.

Edosomwan, S., Prakasan, S., Kouame, D., Watson, J., & Seymour, T. (2011). *The history of social media and its impact on business*. Minot.Com. http://www.minot.com/tom/SocialMedia.pdf

Facebook. (2004, 2 4). Facebook Inc. Retrieved 12 5th, 2010, from Facebook.com: http://www.face.com

Fairclough, N., Norman (Emeritus Professor Fairclough, Lancaster University UK), & Ebooks Corporation. (2003). Analysing Discourse. Abingdon, Verenigd Koninkrijk: Routledge.

Farquhar, P.H. (1989) Managing Brand Equity. Marketing Research, 1, 24-33.

Fisher, F. (1998) Beyond Empiricism: Policy Inquiry in Postpositivist perspective. Policy studies journal 26(1): 129-146

Goertz, G., & Starr, H. (2003). Necessary Conditions: Theory, Methodology, and Applications. Rowman&Littlefield. https://books.google.nl/books?hl=nl&lr=&id=zq7sFOOi1YcC&oi=fnd&pg=PA95&dq=comparative+case-study+design&ots=c6JNs6KeJO&sig=yj_vnhUJVlPru47FtlHW8L1GdUw#v=onepage&q=comparative%20case-study%20design&f=false

HAJDU L,BOTA A,KRESZ M,etal．Discovering the hidden community structure of public transportation networks[J]．Networks and Spatial Economics, 2018, DOI: 10.1007/s11067-019 -09476-3

He, L., & Ran, Y. (2015). The Correlation of Brand Equity and Crisis: A Review and Directions for Future Research. *Modern Economy*, *06*(03), 392–397. https://doi.org/10.4236/me.2015.63036

Hollier, P. (2009). The "intangible" benefits of social media. Retrieved August 4, 2012, from seowizardry: http://seowizardry.ca/The_Wizards_Blog/the- %E2%80%9Cintangible%E2%80%9D-benefits-of-social-media/

Huang, Y.-H. (2006) Crisis situations, communication strategies, and media coverage a multicase study revisiting the communicative response model. Communication Research 33(3): 180–205.

IMO (2020). International Maritime Organization. Retrieved 22 9, 2020, from: https://www.imo.org/en/MediaCentre/PressBriefings/Pages/34-IMO-2020-sulphur-limit-.aspx

Instagram. (2021). Instagram. Retrieved 12 5, 2020, from Instagram:
 https://about.instagram.com/

Jones, N., Borgman, R., & Ulusoy, E. (2015). Impact of social media on small businesses. Journal of Small Business and Enterprise Development, 22(4), 611–632.

Kaikati, Jack G., Kaikati, Andrew M. (2003). – A Rose by Any Other Name: Rebranding Campaigns that Work, Journal of Business Strategy, Vol.24, No.6

Kazdin, A. (2021). *Single case experimental designs: Characteristics, changes, and challenges*.
Onlinelibrary.Wiley.Com.from https://onlinelibrary.wiley.com/doi/epdf/10.1002/jeab.638#:%7E:text=Two%20main%20characteristics%20are%20defining,participant(s)%20over%20tim.

Keller, K. L. (2019). Consumer Research Insights on Brands and Branding: A JCR Curation. *Journal of Consumer Research*, *46*(5), 995–1001. https://doi.org/10.1093/jcr/ucz058

Kounoupas, E. and Pardali, A. (2015). Adding some context to port marketing: Exploring the content and measurement of market orientation in the port industry. SPOUDAI-Journal of
 Economics and Business, 65(1-2):3- 26.

Lassar, W., Mittal, B., & Sharma, A. (1995). Measuring customer-based brand equity. *Journal of Consumer Marketing*, *12*(4), 11–19. https://doi.org/10.1108/07363769510095270

LinkedIn. (2020). *Why Social Media Managers Should Spend Time on LinkedIn*. LinkedIn Marketing Blog. https://business.linkedin.com/marketing-solutions/blog/best-practices--social-media-marketing0/2019/why-social-media-managers-should-spend-time-on-linkedin

Mäläskä, M., Saraniemi, S. and Tähtinen, J. (2011), "Network actors'participation in B2B SME
branding", Industrial Marketing Management, Vol. 40 No. 7, pp. 1144-1152.

Martínez, Í. (2021). *ANALYSIS OF SUSTAINABLE TRANSITION IN DIFFERENT PORTS OF EUROPE*. Comillas Universidad Pontificia. https://repositorio.comillas.edu/xmlui/bitstream/handle/11531/47441/TFG-%20Asensio%20Martinez%2C%20Inigo.pdf?sequence=1

Merriam-Webster. (n.d.). Social media. In *Merriam-Webster.com dictionary*. Retrieved August 20, 2021, from https://www.merriam-webster.com/dictionary/social%20media

Notteboom, T., Parola, F., Satta, G., and Penco, L. (2015). Disclosure as a tool in stakeholder relations management: a longitudinal study on the Port of Rotterdam. International Journal of
Logistics Research and Applications,18(3), 228-250.

Notteboom, T. E., & Haralambides, H. E. (2020). Port management and governance in a post-COVID-19 era: quo vadis? Maritime Economics & Logistics, 22(3), 329–352. https://doi.org/10.1057/s41278-020-00162-7

Paltridge, B. (2012). Discourse analysis: An Introduction. London, England: Bloomsbury Publishing PLC.

Parnell, J. A. (2014). Crisis Management and Strategic Orientation in Small and Medium-Sized Enterprises (SMEs) in Peru, Mexico and the United States. *Journal of Contingencies and Crisis Management*, *23*(4), 221–233. https://doi.org/10.1111/1468-5973.12060

Port of Antwerp. (2021). *Our presence on social media*. https://www.portofantwerp.com/en/port-antwerp-social-media

Port of Rotterdam. (2021). *Facts and Figures*. Portofrotterdam.Com. https://www.portofrotterdam.com/sites/default/files/2021-06/facts-and-figures-port-of-rotterdam.pdf

Port of Rotterdam. (2021). Events. Geraadpleegd op 30 augustus 2021, van https://www.portofrotterdam.com/en/events

Pourkhani, A., Abdipour, K., Baher, B., & Moslehpour, M. (2019). *The impact of social media in business growth and performance: A scientometrics analysis*. Www.GrowingScience.Com/Ijds. http://www.m.growingscience.com/ijds/Vol3/ijdns_2019_16.pdf

Ravi, K., & Ravi, V. (2015). A survey on opinion mining and sentiment analysis: Tasks, approaches and applications. Knowledge-Based Systems, 89, 14–46.

Rimskii, V. (2011). The influence of the Internet on active social involvement and the formation and development of identities. Russian Social Science Review, 52 (1), 79-101.

Ritholz, B. (2010) History of social media. Retrieved December 05, 2010, http://www.ritholtz.com/blog/2010/12/history-of-social-media/

Roa, I., Peña, Y., Amante, B., & Goretti, M. (2013). *Ports: definition and study of types, sizes and business models*. OmniaScience. https://upcommons.upc.edu/bitstream/handle/2117/20386/770-5448-1-PB_JIEM.pdf

Roseberry, R. L. (2013). The Power of Discourse: An Introduction to Discourse Analysis. Oxfordshire, England: Routledge.

Simon-Elorz, K., Castillo-Valero, J., & Garcia-Cortijo, M. (2014). Economic Performance and the Crisis: Strategies Adopted by the Wineries of Castilla-La Mancha (Spain). *Agribusiness*, *31*(1), 107–131. https://doi.org/10.1002/agr.21392

Sinay. (2021). Port Digitalization and the Implications for the Maritime Sector. Geraadpleegd op 26 augustus 2021, van https://sinay.ai/en/what-is-port-digitalization/

ShipaFreight. (2021). *10 Largest Ports in the world*.

https://www.shipafreight.com/knowledge-series/largest-ports-in-the-world/

Statista. (2021). *Most popular social networks worldwide as of july 2021, ranked by number of active users*. Statista.Com. https://www.statista.com/statistics/272014/global-social-networks-ranked-by-number-of-users/

Taylor, S. A., Celuch, K., & Goodwin, S. (2004). The importance of brand equity to customer loyalty. *Journal of Product & Brand Management*, *13*(4), 217–227. https://doi.org/10.1108/10610420410546934

Theo Notteboom, Athanasios Pallis and Jean-Paul Rodrigue (2022) *Port Economics, Management and Policy*, New York: Routledge, 592 pages. ISBN 9780367331559 Forthcoming.

The Charthouse Group, & Parola, F. (2016). *Port Authority Marketing Strategies and Stakeholder Types | Port Economics, Management and Policy*. Port Economics, Management and Policy | A Comprehensive Analysis of the Port Industry.

https://porteconomicsmanagement.org/pemp/contents/part4/port-authorities/port-

   authority

marketing-strategies-stakeholder-types/

The Maritime Executive. (2021). Majority of Global Ports Are Missing Out on Digitalization. Geraadpleegd op 27 augustus 2021, van https://www.maritime-executive.com/article/majority-of-global-ports-are-missing-out-on-digitalization

Todor, R.-D. (2014). THE IMPORTANCE OF BRANDING AND REBRANDING FOR STRATEGIC MARKETING. *Economic Sciences*, *7*(56), 60–64.

United Nations. (2018). *Review of Maritime Transport*. Unctad.Org. https://unctad.org/system/files/official-document/rmt2018_en.pdf

Vassilikopoulou, A., Siomkos, G., Chatzipanagiotou, K., & Pantouvakis, A. (2009). *Product-harm crisis management: Time heals all wounds? Journal of Retailing and Consumer Services*, *16*(3), 174–180. https://doi.org/10.1016/j.jretconser.2008.11.011

Verhoeven, P., 2010. *A review of port authority functions: towards a renaissance? Maritime Policy Manage.* 37 (3), 247–270. Verhoeven, P., 2015. Economic assessment of management reform in European seaports. Doctoral Thesis. University of Antwerp, Faculty of Applied Economics, ISBN 978-90-8994-130-5, Antwerp, Belgium

Verhoeven, P. (2020). *WORLD PORTS SUSTAINABILITY REPORT 2020*. WPSP. Geraadpleegd van https://sustainableworldports.org/wp-content/uploads/WORLD-PORTS-SUSTAINABILITY-REPORT-2020-FIN.pdf

Weick, K. E. (1988). ENACTED SENSEMAKING IN CRISIS SITUATIONS[1]. *Journal of Management Studies*, *25*(4), 305–317. https://doi.org/10.1111/j.1467-6486.1988.tb00039.x

Wilson, J. (2010*) Essentials of Business Research: A Guide to Doing Your Research Project* SAGE Publications, p.7

Yong-feng, Z., Jian-wei, G., & Ming, Y. (2020, June). *Influences and response measures of COVID-19 epidemic on shipping and port industry in China*. Journal of Traffic and Transportation Engineering. http://transport.chd.edu.cn/Upload/PaperUpLoad/b319fba5-793f-4a03-808b-8a3fe9811032.pdf

YouTube. (2020, 11). YouTube. Retrieved 12 5, 2020, from YouTube: http://www.youtube.com/t/about