

Social media and CSR communication in European ports: the case of Twitter at the Port of Rotterdam

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Abstract

Purpose – The research objective of the paper is twofold. First, it scrutinises the current state of the art concerning adopting the most popular social media by European port managing bodies (PMBs). Second, it investigates the use of social media in the corporate social responsibility (CSR) communication strategies of European PMBs.

Design/methodology/approach – The paper carries out online field research on the use of social media by the top-25 European ports. Then, it provides an in-depth case study of the use of Twitter by the Port of Rotterdam for CSR communication. Finally, a content analysis of the tweets published in the 2017–2019 timeframe is performed.

Findings – Empirical results demonstrate the extensive use of social media by European PMBs to reach a wider array of stakeholders. Uneven approaches emerge considering port sizes and cultural clusters. The content analysis shows that one-third of tweets published by the Twitter account of the Port of Rotterdam address CSR issues, especially green initiatives, advocating the use of social media to communicate CSR.

Research limitations/implications – The study focuses on the European domain. A broader sample of ports worldwide should be examined to further investigate the drivers affecting PMBs' strategic adoption and use of social media, mainly to communicate CSR.

Practical implications – The paper provides port managers with insights to strengthen CSR communication. Given the increasing pressure of the public opinion on environmental and social issues, the ability of European PMBs to communicate their CSR commitment through social media represents a key driver when searching for consensus of stakeholders and “licence to operate”.

Originality/value – The paper adds to the existing maritime logistics literature by introducing a promising field of research.

Keywords Social media, CSR communication, Twitter, Content analysis, Rotterdam, Port managing bodies (PMBs)

Paper type Research paper

1. Introduction

The port management literature has been increasingly focussing on stakeholder management since port managing bodies (PMBs) have become aware of the importance of stakeholder relationship management (SRM) and corporate social responsibility (CSR) for



their competitiveness (Van Den Bosch *et al.*, 2011; Dooms *et al.*, 2013; Acciaro, 2015; Dooms, 2019; Ashrafi *et al.*, 2020). In 2018, the European Sea Ports Organisation (ESPO) started to refer to public, private or hybrid entities responsible for the activities traditionally managed by port authorities as “PMBs”. Although most European ports are still government-owned or state-owned enterprises, European PMBs are adopting more independent management structures and commercial approaches as private entities (ESPO, 2018). According to the theoretical constructs of stakeholder theory (Freeman, 1984; Donaldson and Preston, 1995), stakeholders’ objectives must be included in the planning process of firms and organisations. In this vein, PMBs are currently called to identify the critical stakeholders (i.e. those who can contribute to achieving corporate objectives) and related needs for carrying out specific strategies addressing their expectations (Dooms, 2019).

Over recent years, European PMBs have developed a stronger sustainability consciousness to meet the unprecedented pressure of public opinion (Acciaro, 2015; Bergqvist and Monios, 2019; Lim *et al.*, 2019; Stein and Acciaro, 2020). In addition, the current European institutional and cultural context is increasingly requiring ports to improve their environmental performance and employ more transparent communication (Di Vaio *et al.*, 2018; Geerts and Dooms, 2020; Puig *et al.*, 2020). Indeed, civil society and port stakeholders at large are more interested in and eager for information concerning the CSR initiatives performed by European PMBs that describe the commitment to integrate social, environmental, and ethical values into their operations and core strategy (Notteboom *et al.*, 2015; Ashrafi *et al.*, 2020). Furthermore, since 2007, European PMBs have been asked to establish a social dialogue with local stakeholders by the European Commission to harmonise the emerging interests on sustainability issues with port strategic objectives and disclose information about port strategies and investments. In this perspective, the European Union (EU) Directive 2014/95 (i.e. the Non-Financial Reporting Directive) has also laid down the foundations for the reporting of non-financial and diverse information. These drivers have been leading European PMBs to a profound strategic and organisational rethinking, including radical changes in stakeholder management and communication strategies (Parola *et al.*, 2013; Notteboom *et al.*, 2015).

In line with prominent studies of communication management (Grunig and Hunt, 1984; Dawkins, 2004; Morsing and Schultz, 2006; Sen *et al.*, 2006; Podnar, 2008), CSR communication is a pivotal strategic function of SRM because it gives visibility to the company’s CSR practices, boosting its reputation. Indeed, CSR communication can greatly influence the behaviour and judgements of stakeholders concerning the conduct of the business by managers. However, notwithstanding many organisations are strongly committed to ethical and social issues, they fail to effectively communicate CSR efforts because of the lack of communication skills or sufficient investment (Schoeneborn *et al.*, 2020). In this perspective, the advent of Web 2.0 and social media have brought new opportunities to reach stakeholders, shaping firms and organisations’ CSR communication strategies (Fieseler *et al.*, 2010; Cortado and Chalmeta, 2016; Saxton *et al.*, 2019). Furthermore, theoretical and empirical studies (Etter, 2014; Cortado and Chalmeta, 2016; Perks *et al.*, 2017; Farache *et al.*, 2018; Fatma *et al.*, 2020) confirm that adopting social media as a new way to communicate CSR can significantly support firms and organisations with meeting stakeholders’ growing expectations on sustainability issues.

While many European ports still maintain a conservative approach towards disclosure, empirical evidence prove that some leading European PMBs (e.g. Rotterdam, Antwerp, Hamburg) have started to exploit new digital tools (e.g. websites and social media) to manage and balance the interests and expectations of various stakeholders, especially when searching for consensus and “license to operate”. This is paving the way for adopting innovative communication strategies aiming to strengthen the ports’ sustainability image and brand awareness from a port user’s perspective (Notteboom *et al.*, 2015). European PMBs are thus expected to keep pace with other European industries and exploit the features of Web 2.0 and social media tools to boost their CSR communication strategies (Santos *et al.*,

2016). However, few academic contributions have been addressing European PMBs' strategies to effectively report CSR efforts (e.g. Di Vaio *et al.*, 2018; Geerts *et al.*, 2021; Rodrigues *et al.*, 2021). In particular, no prior study has already investigated the use of social media for CSR communication in the port domain. Therefore, the present manuscript aims to deepen knowledge of the use of social media by PMBs and investigate their implementation in CSR communication strategies.

To summarise, two research objectives are set:

- RO1. to scrutinise the current state of the art related to European PMBs' adoption of social media;
- RO2. to investigate the use of social media in the CSR communication strategy of European PMBs.

After providing the main theoretical constructs of CSR communication strategies (Section 2), the paper explains the methodological approach (Section 3). In particular, to address the pioneering and ambitious RO2, the paper carries out an in-depth case study analysis on the use of Twitter by the Port of Rotterdam. First, it develops a framework to detect and code CSR-related content. It then performs a content analysis of the tweets published by the English account of the Port of Rotterdam in the 2017–2019 timeframe. The empirical results are discussed in Section 4. Finally, the main insights for PMBs are reported in Section 5 along with a tentative research agenda for future academic studies on this emerging topic.

2. CSR communication strategies on social media

2.1 CSR communication strategies

Since the 1980s, several scholars have tried to clarify and make explicit the principles underlying effective CSR communication (Grunig and Hunt, 1984; Dawkins, 2004; Morsing, 2006). In his outstanding work, Podnar (2008) defines CSR communication as a “*process of anticipating stakeholders' expectations, articulation of CSR policy and managing of different organisation communication tools designed to provide true and transparent information about a company's or a brand's integration of its business operations, social and environmental concerns, and interactions with stakeholders*”. Therefore, organisations disclose CSR information to legitimise their role in society and strengthen the relationships with stakeholders (Michelon *et al.*, 2019). CSR communication is used to give visibility to corporate social and environmental commitment consistent with the increasing expectations of both internal and external stakeholders on these topics (Ellerup Nielsen and Thomsen, 2018; Schoeneborn *et al.*, 2020). It must generate consensus and participation by addressing the needs and values sought by salient stakeholders (Sen *et al.*, 2006). In this perspective, according to the stakeholder theory (Freeman, 1984), Maignan and Ferrell (2004) suggest that the stakeholder identification approach should be incorporated in CSR communication strategies to proactively involve stakeholders and their opinions in the decision-making process. Indeed, when stakeholders identify themselves with the company doing CSR, they tend to show more favourable attitudes toward the company. This has positive ramifications on stakeholder relationship management and corporate reputation (Morsing, 2006).

One of the main strengths of CSR communication is to potentially reach a broad audience, consisting of policymakers and institutions, media, investors, non-governmental organisations (NGOs), local communities, consumers and employees interested in CSR issues in various ways (Dawkins, 2004). Over the years, numerous and heterogeneous recipients have proved to be eager to obtain as much information as possible about the social and environmental commitment of the company (Du *et al.*, 2010). However, they tend to easily yield to scepticism, especially when communication is over-hyped. In this regard, Kim (2019) advocates that when CSR communication has an evident promotional tone, it may increase

stakeholder distrust in the company's CSR commitment and negatively affect corporate reputation. On the other hand, transparent and open communication can counter the scepticism that stakeholders nurture towards the CSR commitment of modern organisations. Indeed, CSR messages' content is challenging to verify and evaluate by the recipients (Du *et al.*, 2010). For this reason, Morsing and Schultz (2006) suggest the adoption of subtle CSR communication instead of a conspicuous exaggerated communication campaign. Nonetheless, the recent study of Kim and Ferguson (2018) demonstrates even when a promotional tone is used or a message is broadcast in the mass media, stakeholders may become more aware of the company's CSR initiatives, having a more positive perception of the corporate reputation.

Much research argues that CSR communication messages should target different stakeholders to effectively meet their expectations (Dawkins, 2004; Kim and Ferguson, 2018). Strategic decisions should also address preferences toward specific communication or media channels to draw stakeholders' attention and properly deliver the message (Du *et al.*, 2010). In this perspective, the rise of social media as the main channel for engaging stakeholders has radically changed how organisations communicate their CSR efforts to appear reliable and trustworthy (Kollat and Farache, 2017).

2.2 Communicating CSR on social media

The emergence of social media platforms (e.g. Facebook and Twitter) has been reinventing communications between organisations and their stakeholders (Fieseler *et al.*, 2010). Social media are Web 2.0-based applications that promote the creation and exchange of user content. They enable aggregating individuals and groups with pre-existing social ties (e.g. work or family relationships) or common interests to explore topics and freely share opinions, experiences and perspectives using texts, images and videos (Cortado and Chalmeta, 2016). Moreover, organisations can use these platforms to communicate directly and mutually with their stakeholders, reducing information asymmetries and building stronger relationships (Saxton *et al.*, 2019).

Previous studies have researched CSR in social media providing a better understanding of using these tools to specifically communicate CSR. In the next years, it is widely believed that organisations will increasingly exploit social media features to effectively disclose their CSR efforts (Kollat and Farache, 2017; Okazaki *et al.*, 2020). Moreno and Capriotti (2009) argue that social media platforms have a wide-ranging potential in this domain because of their transparency and neutrality, which are particularly appreciated by public opinion when debating CSR. Organisations can also involve reliable and well-known interlocutors (e.g. government institutions, NGOs, etc.) or refer to institutional sources (e.g. specialised websites, data, statistics, reports of prominent consulting firms and organisations, etc.) to advocate CSR messages on their social media profiles. In addition, users and followers can freely participate in and feed the debate on specific CSR topics by commenting or creating and sharing new related content (Perks *et al.*, 2017). This promotes the birth of communities capable of orienting public opinion and favouring positive word-of-mouth about the corporate commitment to CSR (Fatma *et al.*, 2020).

Therefore, social media constitutes an effective way to influence the perception of corporate reputation and listen and collect stakeholders' opinions concerning expected or required CSR initiatives (Burton and Soboleva, 2011; Trapp, 2014). To seize these opportunities, organisations are called to revise CSR communication strategies to engage a broader range of stakeholders through these digital platforms (Fatma *et al.*, 2020). In this perspective, the well-known conceptual work of Morsing and Schultz (2006) defines three types of CSR communication strategies that can be also used to manage CSR communication on social media. The first one is the "stakeholder information strategy". It is a one-way

communication model aimed at disseminating information about corporate CSR initiatives. A low level of interactivity characterises it, and thus it hardly affects the perception of corporate image.

Conversely, the “stakeholder response strategy” and the “stakeholder involvement strategy” are two-way communication models consisting of a continuous dialogue between the organisation and its stakeholders. While in the “stakeholder response strategy” (i.e. asymmetric two-way communication), the organisation keeps control of the dialogue and content debated, the “stakeholder involvement strategy” is a “balanced dialogue” (i.e. symmetric two-way communication). In this case, persuasion may occur from both parties, stimulating collaboration, strengthening the relationships, and generating beneficial outcomes for both the organisation and its stakeholders.

According to [Perks et al. \(2017\)](#), social media has a broad untapped potential for facilitating the development of symmetric CSR communication strategies, which are considered the most promising for effective CSR communication ([Farache et al., 2018](#)). Indeed, the absence of gate-keeping mechanisms and formal hierarchies encourage stakeholders to express their opinion on CSR issues freely and directly interact with the organisation ([Okazaki et al., 2020](#)). Moreover, the combination of ethical premises of CSR and these features of social media allows organisations to create, reinforce or expand a trustworthy relationship with stakeholders by accepting criticism and responding to questioning on CSR messages ([Perks et al., 2017](#); [Ellerup Nielsen and Thomsen, 2018](#)).

Given the above, an increase in the use of social media for CSR communication in many different industries would be expected. However, research focussing on practical implications of implementing social media for engaging stakeholders on CSR issues is still at an embryonic stage ([Kollat and Farache, 2017](#)). Moreover, previous empirical studies ([Etter, 2014](#); [Cortado and Chalmeta, 2016](#); [Farache et al., 2018](#)) stress that organisations are not completely exploiting the potential of social media for symmetric CSR communication strategies. The management literature, therefore, is still deficient in demonstrating how organisations should use social media as part of their CSR communication and which opportunities would emerge for organisations operating in different domains.

2.3 CSR and social media: a new opportunity for port managing bodies (PMBs)?

PMBs worldwide are seeking to improve their sustainability performance ([Bergqvist and Monios, 2019](#); [Lim et al., 2019](#); [Puig et al., 2020](#); [Stein and Acciaro, 2020](#)). This is mainly due to the maritime logistics industry’s need to catch up with international trends related to sustainability agendas and the increasing pressure from port stakeholders, especially local communities and civil society organisations ([Ashrafi et al., 2020](#)). These groups are increasingly monitoring maritime logistics activities and related social and environmental impacts, demanding from PMBs more accountability and transparency ([Notteboom et al., 2015](#); [Dooms, 2019](#)). Legitimation from stakeholders, indeed, is crucial for the competitiveness of PMBs ([Denktas-Sakar and Karatas-Cetin, 2012](#); [Acciaro, 2015](#); [Ashrafi et al., 2020](#)), and stakeholder engagement is essential for minimising conflicts and ensuring a fair distribution of costs and benefits arising from the industry ([Lam and Yap, 2019](#)).

In this perspective, PMBs are expected to adopt or improve CSR communication strategies to give visibility to their social and environmental commitment and, thus, meet stakeholders’ expectations. The recent study of [Geerts et al. \(2021\)](#) identifies the most significant determinants to begin disclosing CSR practices, that is, the proximity of the port to a city, the history of performance data gathering (i.e. the willingness of PMBs to invest in collecting and analysing non-compulsory social and environmental data), and the number of obtained certifications for social and environmental performance. As PMBs have a large degree of control over the last two determinants, these results advocate the growing strategic interest in CSR practices and related disclosure. In addition, [Parola et al. \(2013\)](#) and [Notteboom et al. \(2015\)](#)

demonstrate that communicating CSR has a high potential to improve stakeholder relationships and ports' reputation. For this reason, CSR reporting and disclosure are entering into the strategic decision-making and mission statements of many PMBs (Santos *et al.*, 2016; Puig *et al.*, 2020; Rodrigues *et al.*, 2021).

Recent research has been focused on traditional tools for communicating CSR in the port domain, such as sustainability reports (Ashrafi *et al.*, 2019; Geerts and Dooms, 2020; Geerts *et al.*, 2021; Rodrigues *et al.*, 2021) and environmental performance indicators (Di Vaio *et al.*, 2018; Puig *et al.*, 2020; Teerawattana and Yang, 2019). However, empirical evidence suggests PMBs are also voluntarily investing in Web 2.0-related tools to disclose their CSR commitment and reach a wider audience informally. Furthermore, as shown by the behaviour of some of the most relevant ports worldwide (e.g. Los Angeles, Rotterdam, Singapore and Mombasa), a higher number of PMBs are creating a corporate account on well-known social media platforms (e.g. Facebook, Twitter, and Instagram). Nonetheless, academics have neglected to investigate the use of social media by PMBs, especially for CSR communication purposes. Considering the strengths and opportunities described in Section 2.2, an interesting gap emerges in both theory and practice regarding adopting social media by PMBs and related implications and benefits for CSR communication strategies. Since empirical research in port management is still lacking, the present study aims to add initial evidence to the literature by focussing on the European domain.

3. Data and method

The research design and methodology are reported in Figure 1.

Consistent with RO1, the paper scrutinises the current rate of adoption of social media by European PMBs. We selected a sample of the top-25 European ports in cargo according to the most recent available ranking provided by Eurostat (2020). In February 2020, online field research on the use of five of the most popular social media in Europe, namely Facebook, Twitter, Instagram, YouTube and LinkedIn (Statista, 2020), was performed. First, we visited the corporate webpage of the PMBs of selected ports to verify if they report the hyperlinks for directly connecting to their social media profile. Although all sample PMBs have a corporate webpage, it turns out that only some provide information about their use of social media. Therefore, a further investigation in maritime-port press news and reports was performed. Finally, we used the search function of each social media platform to look for the profile of sample ports.

Both official and institutional names and (possible) screen names (e.g. "Ports of Genoa" for the PMB of the port of Genoa) were used to guarantee the reliability of the empirical

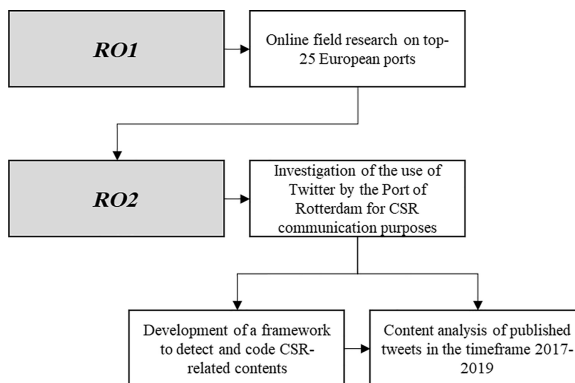


Figure 1.
Research design and
method

methodology. As a result, ad-hoc databases were developed collecting data from the social media profile of each investigated PMB, which includes the following information: adoption of the specific social media; year of initial registration; the number of followers/subscribers; the number of likes to the page/profile/channel; the number of views (only for YouTube); the number of contents published, or photos/videos uploaded; and the number of employees with a registered profile (only for LinkedIn). According to the methodology of data gathering and analysis provided by [Buratti et al. \(2018\)](#), the databases (see [Appendices](#)) identify the most used social media and provide valuable insights on PMBs' proactivity on these platforms, including metrics for evaluating user engagement (e.g. number of followers).

Given the study's explorative nature, to address [RO2](#) the research focuses on an in-depth case study analysis, that is, the use of Twitter by the Port of Rotterdam for CSR communication. Rotterdam is the leading European port in cargo throughput and covers a pivotal role in international trade and shipping ([Drewry, 2020](#); [Eurostat, 2020](#)). It is widely considered one of the most pioneering ports worldwide for the innovative approach towards the market and the introduction of SRM practices, including CSR communication and disclosure ([Van Den Bosch et al., 2011](#); [Notteboom et al., 2015](#)). The port, indeed, is fundamental for the economic growth of the city of Rotterdam and the prosperity of the whole Dutch territory. This has driven port managers to create a strong relationship with the city to meet local stakeholders' expectations. In this perspective, the PMB of Rotterdam has been working to strengthen CSR strategies, as evidenced by its efforts to counter climate change and ensure Dutch prosperity and employment. Moreover, it began to widely use digital communication to reach stakeholders and disclose its sustainability performance, including adopting several popular social media.

Twitter was selected for the present research for several reasons. First, it is broadly used by European institutions and private entities because it is considered a valuable tool for two-way communication strategies and addressing CSR topics ([Cortado and Chalmeta, 2016](#); [Kollat and Farache, 2017](#); [Okazaki et al., 2020](#)). Second, the standard structure of tweets makes the content analysis easier to perform and the results more reliable to compare ([Burton and Soboleva, 2011](#); [Etter, 2014](#)). Indeed, Twitter is a micro-blog launched in 2006 whose primary goal is to disseminate information rapidly. It is not about socialising or sharing content with friends but sending a direct message of 280 words to be read by as many people as possible in the shortest possible time, creating a fruitful exchange of ideas. Although Twitter cannot be considered a perfect democratic mirror of society, previous studies have demonstrated that it is widely used by politicians and national/local governments, journalists, investors, NGOs, activists and consumers that are involved in CSR issues for various reasons ([Waters and Jamal, 2011](#); [Burton and Soboleva, 2011](#); [Farache et al., 2018](#); [Fatma et al., 2020](#)). [Cortado and Chalmeta \(2016\)](#) argue Twitter is the perfect place for organisations to publish CSR-related messages and debate sustainability issues with stakeholders since most are registered users. Indeed, the contents address anonymous public and interested stakeholders (i.e. "followers"), especially local communities and societal groups of interest, typically active Twitter and CSR-enthusiastic users ([Etter, 2014](#)). Therefore, Twitter is expected to be a valuable tool for the CSR communication strategy of European PMBs, especially for the Port of Rotterdam, because of its closeness to the citizens and continuous commitment to SRM practices.

When it comes to the methodological approach to address [RO2](#), we carried out a content analysis of the tweets published by the English Twitter account of the Port of Rotterdam (i.e. [@PortOfRotterdam](#)). Data gathering was performed by using the software Nvivo. The initial sample consisted of all available tweets of [@PortOfRotterdam](#) (i.e. 3,198), representing 61 % of the total amount of tweets posted by the account since 2009 (the year of initial registration). However, Twitter limits the number of available tweets that Nvivo can capture. Furthermore, it depends on the privacy settings of the posting user and the age of the tweet. In this perspective, to reduce uncertainty and validate the procedure of data mining, we manually collected all available tweets on the browser.

The procedure has led to 834 tweets from 2 September 2016 (the last date accessible) to 10 February 2020 (the date of data mining). These results were compared with the outcomes of data mining performed through Nvivo, considering the same timeframe. It turned out that Nvivo captured 98% of tweets published by @PortOfRotterdam in the period under review, which confirms the high reliability of the software and procedure of data mining. As a result, the final sample is made of 760 tweets published in the three years 2017–2019. Then, data were organised in an ad-hoc database which includes the following information for each sample tweet: the content of the tweet, tweet type (i.e. tweet vs retweet), date and time of publication, number of retweets, hashtags, mentions and number of replies received for each tweet.

The content of sample tweets (i.e. units of analysis) was investigated by performing a two-step qualitative content analysis, combining the features of Nvivo and the experience of the authors and a panel of experts in CSR communication. The first step consists of using Nvivo to detect all the tweets containing specific keywords concerning the CSR domain in the maritime port industry. We inserted in the software a list of terms reflecting CSR topics (e.g. “welfare”, “volunteerism”, “safety”, “social”, “employee”, “energy transition”, “environment”, “green”, “pollution”, “recycle”, etc.). We included multiple terms and synonyms referring to the same concept to collect all potentially relevant tweets. Before performing the content analysis, the list was debated and validated with a panel of corporate communication and CSR experts composed of two external research colleagues and one port manager to avoid missing significant terms. In the second step of the analysis, the tweets detected by Nvivo were exported in Microsoft Excel.

Two authors (defined “coders”) coded the tweets in one category and subcategory according to the framework proposed in Table 1. The framework was developed consistent with the prominent academic literature on sustainability reporting in the port domain (e.g. Santos *et al.*, 2016; Geerts and Dooms, 2020; Ashrafi *et al.*, 2020; Rodrigues *et al.*, 2021; Geerts *et al.*, 2021). It reports three subcategories for each main category (i.e. environmental, social and governance) to investigate the specific CSR-related topics addressed by the PMB of Rotterdam. This crucial step goes beyond merely detecting and counting words. It brings to light the actual underlying meaning of the tweets, improving the quality and reliability of the analysis. As a result, the tweets containing CSR-related terms but not addressing CSR-related issues were eliminated. Finally, the authors who were not involved in coding cross-validated the evaluation and classification, solving all inconsistencies until 100% agreement was reached.

4. Empirical results

4.1 Social media adoption by European port managing bodies

The results of the online field research reveal a wide use of social media by European PMBs. Indeed, the top-25 European PMBs have, on average, an active profile on at least 3 out of 5 investigated social media (Table 2). Considering the average rate of adoption, Twitter ranks first (88% of sample PMBs have an active Twitter account), followed by LinkedIn (80%), Facebook and Instagram (68%), and YouTube (56%).

The port size represents an interesting criterion to explore the results (Santos *et al.*, 2016). In this perspective, we classify the ports consistent with the annual cargo throughput (thousand tonnes) reported in 2018. Therefore, three categories are outlined: “large”, throughput (t) > 100,000; “medium”, $50,000 < t < 100,000$; and “small”, $t < 50,000$. The empirical results indicate that a direct correlation exists between the volume of cargo throughput and adoption rate. The three largest ports of the sample (i.e. Rotterdam, Antwerp and Hamburg) report a rate equal to 100% (Table 3), whereas the ports labelled as “medium” to 77% and small to 58% average. However, there are some significant differences between medium and small ports when considering single social media. Instagram is almost neglected by small ports (40%), which prefer Facebook (70%). Conversely, medium ports report a

Table 1.
The framework to detect and code CSR-related contents: categories and subcategories

Environment	Social	Governance
<p>Energy management & Climate change</p> <p>It reflects PMB's effectiveness in addressing climate change by suitable strategies, energy-efficient operations, the development of renewable energy and other alternative environmental technologies. This subcategory includes green strategies addressed to reduce harmful emissions and other Greenhouse Gas Emissions (GHG) as well as the carbon footprint of the port</p>	<p>Community Outreach & Philanthropy</p> <p>It covers the relationship between the PMB and the local community. This subcategory reflects the community citizenship of the port reporting charitable giving, donations, volunteering, and social initiatives. Moreover, it includes all measures for protecting public health and managing the social impacts of port operations. This subcategory reports PMB's commitment to respect fundamental human rights and gain the license to operate</p>	<p>Leadership Ethics</p> <p>It reports PMB's effectiveness in treating stakeholders equitably. It includes the PMB's culture of ethical decision making and measures its commitment to integrate sustainability principles into the overall core strategy and day-to-day activities</p>
<p>Environmental policy & Reporting</p> <p>It comprises PMB's policies and intentions to reduce environmental impact. The subcategory also includes the PMB's environmental reporting performance, adherence to environmental reporting standards (e.g., Global Reporting Initiative), and other reports and publications referring to environmental performance. It deals with compliance with the regulatory framework, reporting limits and accidental releases</p>	<p>Employees</p> <p>The subcategory addresses PMB's policies and practices to guarantee the fair and non-discriminatory treatment of port workers. It also deals with the PMB's capacity to increase the loyalty of employees through rewarding, fair and equal compensation procedures, involving port community actors. The subcategory deals with benefits and initiatives aimed to engage employees and improve their performance. It reports PMB's effectiveness in providing and promoting a healthy and safe workplace as well as job training programs</p>	<p>Transparency & Reporting</p> <p>It covers corporate policies and practices aligned with sustainability goals. It reflects the transparency in communication with stakeholders. Moreover, the subcategory includes periodical reports and results. It also comprises the disclosure of the port's major stakeholders, including public entities and institutions, and how the PMB engages with them (e.g., new agreements of collaboration)</p>
<p>Resource management</p> <p>It covers how efficiently resources are used in port operations and activities. It refers to PMB's capacity to reduce the use of materials, water and to find more efficient solutions by improving maritime supply chain management. This subcategory comprises waste and recycling performance, as well as land use and real estate management</p>	<p>Products responsibility</p> <p>It refers to the responsibility of the PMB for the development, design, and management of products and services directed to customers, port community and society at large. The subcategory reflects PMB's capacity to create new market opportunities and stimulate collaborations. Moreover, it relates to the safety and quality of the products and services</p>	<p>Board independence</p> <p>It covers PMB's effectiveness in following best practices in corporate governance principles, board activities and functions, and board structure and composition. It deals with how a PMB provides competitive and proportionate management to achieve both financial and extra-financial targets without using political contributions to obtain unduly favourable treatment and illegal practices</p>

Ranking	Throughput (2018)	Top-25 EU ports	Port dimension	Cultural cluster	Facebook	Twitter	Instagram	YouTube	LinkedIn	Coverage
1	441.473	Rotterdam	Large	Germanic Europe	✓	✓	✓	✓	✓	100%
2	212.010	Antwerp	Large	Germanic Europe	✓	✓	✓	✓	✓	100%
3	117.627	Hamburg	Large	Germanic Europe	✓	✓	✓	✓	✓	100%
4	99.503	Amsterdam	Medium	Germanic Europe	✓	✓	✓	✓	✓	100%
5	88.645	Algeciras	Medium	Latin Europe	✓	✓	✓	✓	✓	60%
6	75.672	Marseille	Medium	Latin Europe	✓	✓	✓	✓	✓	80%
7	64.902	Le Havre	Medium	Latin Europe	✓	✓	✓	✓	✓	80%
8	61.972	Valencia	Medium	Latin Europe	✓	✓	✓	✓	✓	80%
9	57.380	Trieste	Medium	Latin Europe	✓	✓	✓	✓	✓	60%
10	55.617	Inningham	Medium	Anglo cultures	✓	✓	✓	✓	✓	80%
11	54.560	Barcelona	Medium	Latin Europe	✓	✓	✓	✓	✓	40%
12	53.196	London	Medium	Anglo cultures	✓	✓	✓	✓	✓	100%
13	51.570	Genoa	Medium	Latin Europe	✓	✓	✓	✓	✓	100%
14	51.160	Bremerhaven	Medium	Germanic Europe	✓	✓	✓	✓	✓	60%
15	50.925	Piraeus	Medium	Eastern Europe	✓	✓	✓	✓	✓	60%
16	44.314	Bergen	Small	Nordic Europe	✓	✓	✓	✓	✓	60%
17	44.310	Sines	Small	Latin Europe	✓	✓	✓	✓	✓	80%
18	41.083	Dunkerque	Small	Latin Europe	✓	✓	✓	✓	✓	80%
19	40.635	Goteborg	Small	Nordic Europe	✓	✓	✓	✓	✓	80%
20	39.530	Constanta	Small	Eastern Europe	✓	✓	✓	✓	✓	40%
21	34.468	Southampton	Small	Anglo cultures	✓	✓	✓	✓	✓	20%
22	34.392	Riga	Small	Nordic Europe	✓	✓	✓	✓	✓	80%
23	30.935	Milford Haven	Small	Anglo cultures	✓	✓	✓	✓	✓	60%
24	28.836	Tees and Hartlepool	Small	Anglo cultures	✓	✓	✓	✓	✓	80%
25	28.296	Wilhelmshaven	Small	Germanic Europe	✓	✓	✓	✓	✓	0%

Sample rate of adoption

Note(s): Throughput of thousands of tonnes

Table 2.
Empirical results:
social media adoption
by top-European PMBs

Table 3.
Empirical results:
social media adoption
per port dimension and
cultural cluster

		No. of ports	Facebook (%)	Twitter (%)	Rate of adoption			Average (%)
					Instagram (%)	YouTube (%)	LinkedIn (%)	
Port size	Large	3	100	100	100	100	100	100
	Medium	12	58	92	83	58	92	77
	Small	10	70	80	40	40	60	58
Cultural cluster	Germanic	6	83	83	83	67	67	77
	Europe							
	Latin	9	67	89	56	67	100	76
	Europe							
	Nordic	3	100	67	100	33	67	73
	Europe							
	Anglo cultures	5	40	100	60	60	80	68
Eastern Europe	2	50	100	50	0	50	50	
	<i>Rate of adoption of sample ports</i>	<i>25</i>	<i>68</i>	<i>88</i>	<i>68</i>	<i>56</i>	<i>80</i>	<i>71</i>

higher adoption rate for Instagram (83%) than for YouTube and Facebook (58%). Regardless of the port dimension, Twitter appears the most promising social media for communication since it reaches higher adoption rates than 80% for each category.

Another interesting criterion of analysis consists of the cultural cluster to which the ports belong. The cultural cluster of societies provides valuable managerial and practical insights. The criterion goes beyond geographical and political boundaries and groups ports according to the cultural similarities of their respective countries. This may contribute to comparing the adoption and use of social media originating from different cultural environments. In this perspective, Santos *et al.* (2016) argue that online communication strategies varied among ports from different countries regarding both types of channels and contents. Table 3 shows that the Germanic Europe cluster reports the highest rate of adoption (77% of 6 cluster ports [1]), followed by the Latin Europe cluster (73% of 9 cluster ports) and Nordic Europe cluster (73% of 3 cluster ports). The empirical results denote similarities between Germanic and Nordic ports, which display almost the same adoption rate for each social media, excluding YouTube that is neglected by Nordic ports. Germanic and Nordic ports are the primary users of Facebook and Instagram, suggesting a prominent interest in sharing media content that characterises these social media platforms. Conversely, PMBs belonging to Latin and Anglo clusters are oriented to more formal and sober communication via Twitter and LinkedIn.

The empirical results demonstrate that Rotterdam is particularly active on each investigated social media when it comes to the Port of Rotterdam. As reported in the Appendices, it ranks first in the sample for both the number of contents published and followers. Furthermore, Twitter turns out to be the most promising communication channel since the @PortOfRotterdam reaches an impressive number of 23,837 followers, far more than the port of Antwerp, which ranks second (i.e. 15,300 followers). This vast audience increases the relevance and scope of a well-planned communication strategy. Moreover, it highlights the strategic decision concerning the types of content shared, including CSR-related issues.

4.2 The content analysis of CSR-related tweets

The content analysis investigates 760 tweets published by the account @PortOfRotterdam in the three years 2017–2019 (Figure 2). The empirical results reveal 270 tweets (36% of the

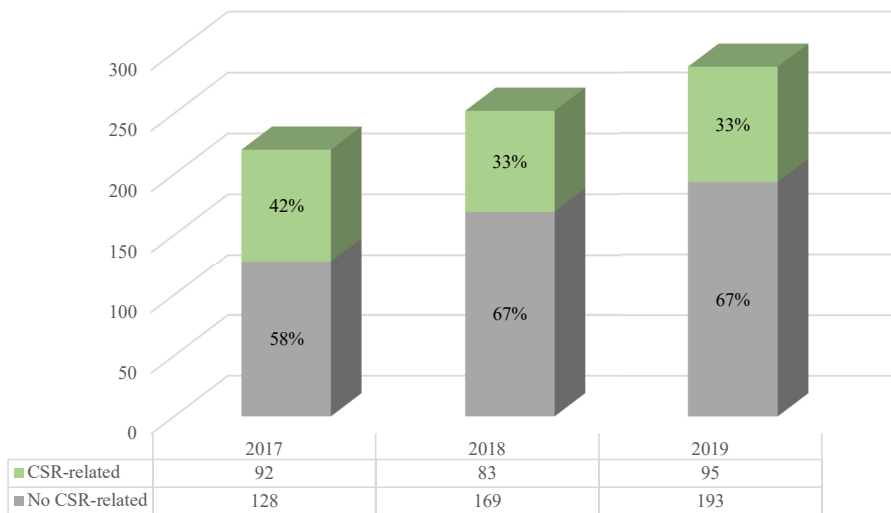


Figure 2.
Empirical results of
content analysis: CSR-
related tweets

sample) address CSR-related issues. Although there is gradual growth in the yearly number of tweets, the analysis shows a slight decrease of CSR-related tweets in percentage.

According to the applied framework for coding content (Table 1), the most debated CSR-related issue (Figure 3) is “Environment” (53% of the sample), followed by “Social” (24%) and “Governance” (23%).

The outcomes underline the strong commitment of the Port of Rotterdam to green initiatives, especially in reducing the carbon footprint. Indeed, the most populated subcategory is “Energy management and Climate change”, which comprises 103 CSR-related tweets (Figure 4), including, for instance, “*In the port of #Rotterdam we are working towards a CO₂-neutral port in 2050. As well as industry, the transport of freight to, in and from the port area needs to become more sustainable #energytransition #sustainability*”. The subcategory “Resource management” (24 tweets) aims to communicate the ports’ efforts in using resources sustainably. Moreover, it promotes the circular economy and waste management using tweets like “*In the port of #Rotterdam we are working towards a #circular economy in 2050. The #CO₂ release and #waste from industries and consumers will be the raw material for new products. Curious how? #energytransition #sustainability*”. The 15 tweets coded into “Environmental policy and Reporting” provide users and followers information concerning the environmental performance achieved by the port: “*We are anticipating #climate change. Read the results of the study that focussed on water #safety in the #port area*”.

The tweets coded into the category “Social” are 65. Quite surprisingly, the subcategory “Community Outreach and Philanthropy” includes only 24 tweets. It reports the social and philanthropic initiatives promoted by the PMB for community well-being. The following tweets are some examples “*The @PortofRotterdam wins 2018 ESPO #Award with its ‘People in and around Ports’ programme @ESPOSecretariat*”, “*Port Authority sponsors Rotterdam Philharmonic Orchestra*” and “*Tomorrow is World Health Day. Check Port Health Authority for #health matters in and around the port*”. As concerns the subcategory “Product responsibility” (20 tweets), it discloses the products and services provided by the PMB to create new market opportunities for the local community of Rotterdam and the whole Dutch territory. These are some examples: “*Do you have a brilliant idea which has to be prototyped? Join the #makermovement! Pitch your idea, become a @RDMMakerspace member for free and*

Figure 3.
Main topics of CSR-related tweets

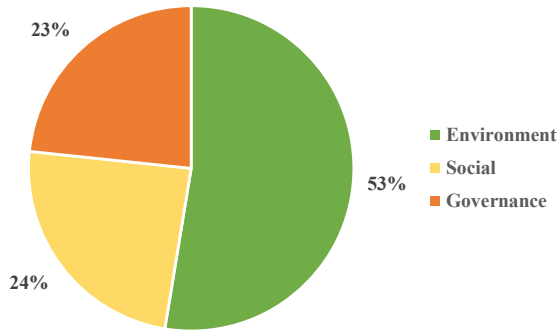
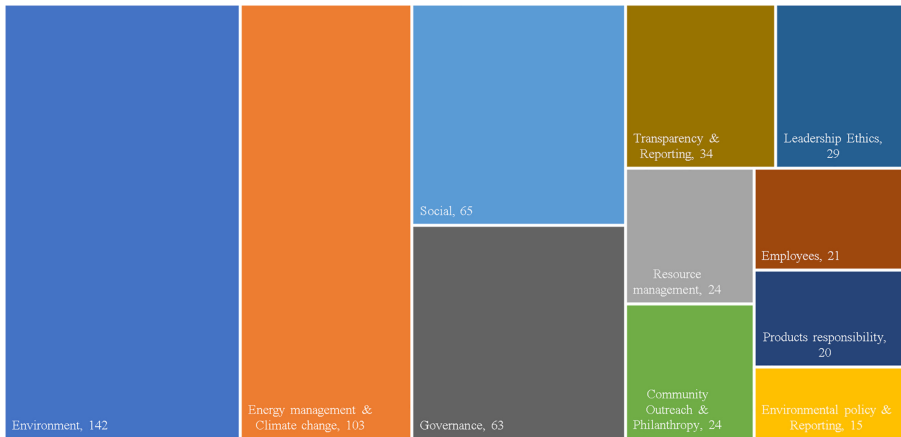


Figure 4.
Empirical results of content analysis: CSR subcategories and related tweets



#MakeitHappen in #Rotterdam and *“Would you like to go on a speed date with the Port of Rotterdam @GITRNL? Start-ups can apply here”*. The subcategory “employee” consists of 21 tweets. It concerns training courses for employees, safety procedures and implementation of new technologies for enhancing job quality and satisfaction of port workers. The subcategory includes tweets such as *“Working together on a safe and flood risk proof port. Now and in the future! #sustainableport #safeport”* and *“The Port of Rotterdam Authority signed a contract with @Securitas_NL for the installation of 227 cameras in the #port and #industrial area”*.

The empirical results also draw attention to the use of Twitter for disseminating the values and ethics pursued by the governance in managing the port. Indeed, the topic “Governance” (63 tweets) comprises the subcategory “Transparency and Reporting” (34 tweets) that addresses the efforts to build more transparent communication with stakeholders. This subcategory consists of the tweets that provide the periodical results and objectives achieved by the port and the links for downloading the official reports, for instance, *“2017 Annual Report: Results create new scope for ambitious investment programme.”* The subcategory “Leadership ethics” (29 tweets) describes how PMB integrates sustainability purposes in the port vision and ethics. Amongst others, some examples are *“Revised port vision gives direction to Port of Rotterdam ambition. #energytransition #digitisation”* and *“Together with our partners and clients, we’ve*

experienced special moments and taken fantastic steps in 2019 to make the Port of Rotterdam even smarter, safer and more sustainable. View our annual film". Finally, no tweets address the topic "Board independence".

4.3 Discussion

The empirical results provide a qualitative and quantitative analysis of the use of social media by the top-25 European PMBs. The study suggests European ports make extensive use of these tools to connect with stakeholders and disseminate corporate messages, including CSR-related content. Indeed, the 25 European PMBs use, on average, 3 out of the 5 most popular social media (i.e. Facebook, Twitter, Instagram, YouTube and LinkedIn). Nonetheless, empirical results show uneven approaches within the sample. Port size and cultural cluster seem to affect the strategic decision of adopting a specific platform. In this vein, both endogenous characteristics and specificities of the sample ports (e.g. commercial vs touristic port, typologies of cargos handled, volumes of cargo or passengers, proximity to the city, etc.), as well as intrinsic features of social media platform (typologies of contents, targets of messages, the scope of messages, etc.) are argued being potential drivers for different approaches. Twitter turns out to be the widely used social (88% of the sample), followed by LinkedIn (80%), Facebook and Instagram (68%), and YouTube (56%).

European PMBs can use these empirical results to compare their approach towards social media with those of competitors (e.g. ports belonging to the same cultural cluster). In this perspective, appendices provide some insightful information concerning the stakeholder engagement (e.g. number of followers) and the proactivity (e.g. number of posts or media contents published) of the sample PMBs on the investigated social media platforms. These data may thus constitute a benchmark and can stimulate imitative behaviours, especially from European PMBs that are currently introducing social media in their communication strategy.

The content analysis of the tweets published by the Twitter account of the Port of Rotterdam in 2017–2019 reports that one-third of tweets address CSR issues (36% on average). Most CSR-related contents advocate the strong commitment of the Port of Rotterdam to green initiatives, especially in reducing the port carbon footprint and energy transition (53% of the sample). Although the PMB of Rotterdam is particularly committed to social issues and relationships with the local community, quite surprisingly, the CSR communication on Twitter almost neglects the topics related to "Community Outreach and Philanthropy" (24 tweets). According to previous studies (Denktas-Sakar and Karatas-Cetin, 2012; Acciaro, 2015; Dooms, 2019; Ashrafi *et al.*, 2020), CSR communication towards local communities was expected to be more emphasised, given the importance of consensus and licence to operate from these categories of stakeholders.

A possible explanation, which urges further investigation, is that Twitter is being principally used by the PMB of Rotterdam for business-to-business communication. In practical terms, the features of Twitter appear suitable to disseminate rapid and unemotional messages for mainly informative purposes. This is also confirmed by the results reported in Table 4 regarding the analysis of interactive CSR-related tweets. Only 17% of the tweets

	2017		2018		2019		Total	
	Total	%	Total	%	Total	%	Total	%
CSR tweets	92		83		95	100%	270	
CSR tweets with responses	13	14%	11	13%	21	22%	45	17%
CSR tweets with @PortOfRotterdam-user dialogue	0		0		0		0	

Table 4.
Interactive CSR-related
tweets – Port of
Rotterdam

published by @PortOfRotterdam in the investigated timeframe receive responses from other users, but the @PortOfRotterdam never replied. Thus, no interaction with stakeholders on CSR issues is created, corroborating that Twitter is only a CSR informative channel.

5. Conclusion

Over the last years, European PMBs have shown an increasing commitment to CSR to reinforce the relationships with stakeholders (Bergqvist and Monios, 2019; Lim *et al.*, 2019; Puig *et al.*, 2020; Ashrafi *et al.*, 2020). Therefore, CSR communication has become an essential function in port management since sustainability practices and initiatives must be communicated correctly to achieve the expected outcomes (Santos *et al.*, 2016; Di Vaio *et al.*, 2018; Geerts and Dooms, 2020; Rodrigues *et al.*, 2021). Although the advent of Web 2.0 and social media has provided organisations with valuable tools to redesign and strengthen CSR communication strategies (Kollat and Farache, 2017; Perks *et al.*, 2017; Okazaki *et al.*, 2020), no prior studies have empirically investigated whether and how CSR efforts are effectively communicated to port stakeholders via social media platforms.

According to the empirical results, the paper deepens knowledge of CSR communication strategies in the port domain. In particular, it would pave the way for developing a broader and more structured stream of literature addressing the use of social media by PMBs to communicate CSR. Indeed, the content analysis of the tweets published by the Port of Rotterdam suggests the potential of social media for CSR communication. However, this requires further investigation to validate the empirical results and further explore the topic.

Practical implications for port managers also emerge from the paper. Indeed, the present exploratory study brings to light that European PMBs are keeping the pace of other industries and integrating social media into CSR corporate communication. This result is not entirely unexpected since European PMBs have been moving forward to new managerial and governance practices for running the business and managing the relationships with port stakeholders, similar to private companies (Parola *et al.*, 2013; Dooms, 2019; Ashrafi *et al.*, 2020). In this perspective, social media can radically change the way PMBs communicate with their stakeholders because they are very inclusive and popular among the target recipients of corporate messages, like local communities, societal groups of interest and port workers susceptible to CSR issues. Nevertheless, each platform's diffusion and strategic adoption are related to different variables, including the port size and the cultural cluster, as demonstrated by the empirical results.

Despite the academic and practical implications, the manuscript still suffers several limitations. First, it investigates the social media adoption of only European PMBs. Thus, a broader sample should be examined to further understand the role of several variables (e.g. port size, cultural cluster, port governance settings, human and financial resources available for social media, managerial style of the organisation, etc.) in shaping the attitude of PMBs towards digital communication. Second, the study focuses on one single case study for examining CSR communication. Although it provides a valuable and replicable methodology to perform a content analysis of CSR-related tweets, comparative multiple-case studies should be performed.

Moreover, diverse social media platforms are urged to be scrutinised and compared for validating the empirical results of the present explorative research. Academics and practitioners would also benefit from this comparison to better understand which social media is most appropriate for CSR communication in the port domain. Finally, the application of the conceptual work of Morsing and Schultz (2006) would support research to comprehend the CSR communication strategy of PMBs on social media. Indeed, the present study suggests the Twitter account of the Port of Rotterdam is mainly used for "stakeholder information strategy" which is a one-way communication model. However, future research

would provide further insights into whether PMBs use social media platforms to create a two-way dialogue with stakeholders on CSR issues that are expected to generate higher benefits.

Note

1. The Germanic Europe cluster includes Wilhelmshaven which is the only port of the sample that does not use social media for corporate communication. Accordingly, it significantly affects the average rate of adoption of the cluster.

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Appendix 1

Table A1.
Facebook database

Ranking	Port	Port dimension	Cultural cluster	Adoption	Registration	Followers	Uploaded photos	Uploaded videos	Uploaded media contents
1	Rotterdam	Large	Germanic Europe	Yes	2012	14.446	1.140	207	1.347
2	Antwerp	Large	Germanic Europe	Yes	2013	15.670	1.066	98	1.164
3	Hamburg	Large	Germanic Europe	Yes	2012	14.727	285	10	295
4	Amsterdam	Medium	Germanic Europe	Yes	2013	5.439	367	107	474
5	Algeciras	Medium	Latin Europe	Yes	2011	3.981	659	23	682
6	Marseille	Medium	Latin Europe	Yes	2015	2.545	521	31	552
7	Le Havre	Medium	Latin Europe	Yes	2013	2.327	710	11	721
8	Valencia	Medium	Latin Europe	No	2018	110	12	0	12
9	Trieste	Medium	Latin Europe	No	n.a.	n.a.	n.a.	n.a.	n.a.
10	Inningham	Medium	Anglo cultures	No	n.a.	n.a.	n.a.	n.a.	n.a.
11	Barcelona	Medium	Latin Europe	No	n.a.	n.a.	n.a.	n.a.	n.a.
12	London	Medium	Anglo cultures	Yes	2011	4.152	1.226	10	1.236
13	Genoa	Medium	Latin Europe	Yes	2017	4.348	1.098	27	1.125
14	Bremerhaven	Medium	Germanic Europe	Yes	2019	970	135	9	144
15	Piraeus	Medium	Eastern Europe	No	n.a.	n.a.	n.a.	n.a.	n.a.
16	Bergen	Small	Nordic Europe	Yes	2018	1.000	87	8	95
17	Sines	Small	Latin Europe	Yes	2016	14.807	4.588	5	4.593
18	Dunkerque	Small	Latin Europe	Yes	2010	7.307	963	88	1.051
19	Goteborg	Small	Nordic Europe	Yes	2016	624	81	52	133
20	Constantia	Small	Eastern Europe	Yes	2015	4.320	1.632	27	1.659

(continued)

Ranking	Port	Port dimension	Cultural cluster	Adoption	Registration	Followers	Uploaded photos	Uploaded videos	Uploaded media contents
21	Southampton	Small	Anglo cultures Europe	No	n.a.	n.a.	n.a.	n.a.	n.a.
22	Riga	Small	Nordic Europe	Yes	2013	2,355	912	62	974
23	Milford Haven	Small	Anglo cultures Europe	Yes	2012	3,192	805	11	816
24	Tees and Hartlepool	Small	Anglo cultures Europe	No	n.a.	n.a.	n.a.	n.a.	n.a.
25	Wilhelmshaven	Small	Germanic Europe	No	n.a.	n.a.	n.a.	n.a.	n.a.
<i>Sample rate</i>				68%	2014	5,684	905	44	949

Table A1.

Ranking	Port	Port dimension	Cultural cluster	Adoption	Registration	Followers	Tweets
1	Rotterdam	Large	Germanic Europe	Yes	2009	23,837	5,252
2	Antwerp	Large	Germanic Europe	Yes	2009	15,300	5,334
3	Hamburg	Large	Germanic Europe	Yes	2010	4,220	39,700
4	Amsterdam	Medium	Germanic Europe	Yes	2010	5,956	1,681
5	Algeciras	Medium	Latin Europe	Yes	2012	6,770	1,636
6	Marseille	Medium	Latin Europe	No	n.a.	n.a.	n.a.
7	Le Havre	Medium	Latin Europe	Yes	2014	1776	675
8	Valencia	Medium	Latin Europe	Yes	2015	4,229	3,259
9	Trieste	Medium	Latin Europe	Yes	2015	3,494	2,367
10	Immingham	Medium	Anglo cultures	Yes	2012	539	2,956
11	Barcelona	Medium	Latin Europe	Yes	2009	11,800	18,100
12	London	Medium	Anglo cultures	Yes	2010	18,200	24,100
13	Genoa	Medium	Latin Europe	Yes	2019	166	165
14	Bremerhaven	Medium	Germanic Europe	Yes	2015	291	166
15	Piraeus	Medium	Eastern Europe	Yes	2019	10	n.a.
16	Bergen	Small	Nordic Europe	Yes	2018	208	107
17	Sines	Small	Latin Europe	Yes	2016	2,384	1,163
18	Dunkerque	Small	Latin Europe	Yes	2012	3,017	3,222
19	Goteborg	Small	Nordic Europe	Yes	2011	2,751	3,801
20	Constanta	Small	Eastern Europe	Yes	2015	209	243
21	Southampton	Small	Anglo cultures	Yes	2015	341	8
22	Riga	Small	Nordic Europe	No	n.a.	n.a.	n.a.
23	Milford Haven	Small	Anglo cultures	Yes	2011	3,151	3,366
24	Tees and Hartlepool	Small	Anglo cultures	Yes	2012	539	2,956
25	Wilhelmshaven	Small	Germanic Europe	No	n.a.	n.a.	n.a.
	<i>Sample rate</i>			88%	2013	4.963	5.727

Table A2.
Twitter database

Appendix 3

Ranking	Port	Port dimension	Cultural cluster	Adoption	Registration	Followers	Uploaded photos/videos
1	Rotterdam	Large	Germanic Europe	Yes	2018	6.544	263
2	Antwerp	Large	Germanic Europe	Yes	2013	7.396	490
3	Hamburg	Large	Germanic Europe	Yes	2015	12.400	306
4	Amsterdam	Medium	Germanic Europe	Yes	2019	1.054	45
5	Algeciras	Medium	Latin Europe	No	n.a.	n.a.	n.a.
6	Marseille	Medium	Latin Europe	Yes	2018	893	243
7	Le Havre	Medium	Latin Europe	Yes	2018	514	16
8	Valencia	Medium	Latin Europe	Yes	2018	639	27
9	Trieste	Medium	Latin Europe	Yes	2015	1.326	357
10	Immingham	Medium	Anglo cultures	Yes	2017	909	293
11	Barcelona	Medium	Latin Europe	No	n.a.	n.a.	n.a.
12	London	Medium	Anglo cultures	Yes	2017	1.409	132
13	Genoa	Medium	Latin Europe	Yes	2019	292	14
14	Bremerhaven	Medium	Germanic Europe	Yes	2019	879	79
15	Piraeus	Medium	Eastern Europe	Yes	2018	128	2
16	Bergen	Small	Nordic Europe	Yes	2018	543	50
17	Sines	Small	Latin Europe	No	n.a.	n.a.	n.a.
18	Dunkerque	Small	Latin Europe	No	n.a.	n.a.	n.a.
19	Goteborg	Small	Nordic Europe	Yes	2015	2.301	757
20	Constanta	Small	Eastern Europe	No	n.a.	n.a.	n.a.
21	Southampton	Small	Anglo cultures	No	n.a.	n.a.	n.a.
22	Riga	Small	Nordic Europe	Yes	2013	880	150
23	Milford Haven	Small	Anglo cultures	No	n.a.	n.a.	n.a.
24	Tees and Hartlepool	Small	Anglo cultures	Yes	2017	909	293
25	Wilhelmshaven	Small	Germanic Europe	No	n.a.	n.a.	n.a.
<i>Sample rate</i>				68%	2017	2.295	207

Table A3.
Instagram database

Ranking	Port	Port dimension	Cultural cluster	Adoption	Registration	Subscriber	Uploaded videos
1	Rotterdam	Large	Germanic Europe	Yes	2009	9.910	489
2	Antwerp	Large	Germanic Europe	Yes	2009	1.430	194
3	Hamburg	Large	Germanic Europe	Yes	2010	5.460	455
4	Amsterdam	Medium	Germanic Europe	Yes	2012	436	122
5	Algeciras	Medium	Latin Europe	No	n.a.	n.a.	n.a.
6	Marseille	Medium	Latin Europe	Yes	2015	170	63
7	Le Havre	Medium	Latin Europe	No	n.a.	n.a.	n.a.
8	Valencia	Medium	Latin Europe	Yes	2014	197	121
9	Trieste	Medium	Latin Europe	Yes	2017	39	61
10	Immingham	Medium	Anglo cultures	Yes	2013	45	38
11	Barcelona	Medium	Latin Europe	No	n.a.	n.a.	n.a.
12	London	Medium	Anglo cultures	Yes	2010	n.a.	110
13	Genoa	Medium	Latin Europe	Yes	2015	107	206
14	Bremerhaven	Medium	Germanic Europe	No	n.a.	n.a.	n.a.
15	Piraeus	Medium	Eastern Europe	No	n.a.	n.a.	n.a.
16	Bergen	Small	Nordic Europe	No	n.a.	n.a.	n.a.
17	Sines	Small	Latin Europe	Yes	2019	63	74
18	Dunkerque	Small	Latin Europe	Yes	2011	69	33
19	Goteborg	Small	Nordic Europe	No	2011	63	21
20	Constanta	Small	Eastern Europe	No	n.a.	n.a.	n.a.
21	Southampton	Small	Anglo cultures	No	n.a.	n.a.	n.a.
22	Riga	Small	Nordic Europe	Yes	2010	31	100
23	Milford Haven	Small	Anglo cultures	No	n.a.	n.a.	n.a.
24	Tees and Hartlepool	Small	Anglo cultures	Yes	2013	45	38
25	Wilhelmshaven	Small	Germanic Europe	No	n.a.	n.a.	n.a.
<i>Sample rate</i>				<i>56%</i>	<i>2013</i>	<i>1.290</i>	<i>142</i>

Table A4.
YouTube database

Ranking	Port	Port dimension	Cultural cluster	Adoption	Followers	Registered employees
1	Rotterdam	Large	Germanic Europe	Yes	47.728	1.206
2	Antwerp	Large	Germanic Europe	Yes	29.969	797
3	Hamburg	Large	Germanic Europe	Yes	2.507	n.a.
4	Amsterdam	Medium	Germanic Europe	Yes	9.118	287
5	Algeciras	Medium	Latin Europe	Yes	4.516	36
6	Marseille	Medium	Latin Europe	Yes	9.182	215
7	Le Havre	Medium	Latin Europe	Yes	999	201
8	Valencia	Medium	Latin Europe	Yes	3.248	139
9	Trieste	Medium	Latin Europe	Yes	1.461	20
10	Immingham	Medium	Anglo cultures	Yes	7.051	444
11	Barcelona	Medium	Latin Europe	Yes	11.519	231
12	London	Medium	Anglo cultures	Yes	6.374	270
13	Genoa	Medium	Latin Europe	Yes	1.450	53
14	Bremerhaven	Medium	Germanic Europe	No	n.a.	n.a.
15	Piraeus	Medium	Eastern Europe	Yes	471	101
16	Bergen	Small	Nordic Europe	No	6	n.a.
17	Sines	Small	Latin Europe	Yes	574	42
18	Dunkerque	Small	Latin Europe	Yes	4.101	123
19	Goteborg	Small	Nordic Europe	Yes	5.539	156
20	Constanta	Small	Eastern Europe	No	n.a.	n.a.
21	Southampton	Small	Anglo cultures	No	n.a.	n.a.
22	Riga	Small	Nordic Europe	Yes	84	33
23	Milford Haven	Small	Anglo cultures	Yes	1.821	95
24	Tees and Hartlepool	Small	Anglo cultures	Yes	7.051	444
25	Wilhelmshaven	Small	Germanic Europe	No	n.a.	n.a.
<i>Sample rate</i>				<i>80%</i>	<i>7.370</i>	<i>258</i>

Table A5.
LinkedIn database

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