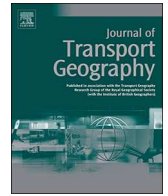




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Critical review

## An application of brand personality dimensions to container ports: A place branding perspective

Sedat Baştuğ<sup>a,\*</sup>, Gül Denктаş Şakar<sup>b</sup>, Seçil Gülmez<sup>a</sup><sup>a</sup> Barbaros Hayrettin Naval Architecture and Maritime Faculty, Iskenderun Technical University, Turkey<sup>b</sup> Maritime Faculty, Dokuz Eylül University, Turkey

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## ABSTRACT

In the light of developments in port competition and the need for differentiation in port services, branding has become a vital issue for seaport organizations. As of the critical nodes in global supply chain systems, seaports need to attract and retain customers through their marketing activities. This can be achieved by building a strong brand, communicating the brand's message properly, and enriching the message with brand personality components for successful positioning. This study analyzes how ports' brand personalities differ across geographical regions and how the brand personality of each port reveals the branding strategies of seaports. The study's multistage methodology consists of a longitudinal content analysis of Twitter messages of certain selected container ports and multiple correspondence analysis to determine the relationships between ports and different regions. The Twitter messages of the selected ports have been content analyzed and brand personality has been measured through Aaker's (1997) brand personality model and Opuku's (2005) dictionary of synonyms. The findings show that seaports develop clear and distinctive brand personalities alongside brand images, they also reveal a high level of isomorphism on the specific brand personality dimension.

## 1. Introduction

The competitive environment of globalization has changed the conservative structure of port competition. New developments have forced ports to compete more aggressively and implement more effective marketing strategies (Murati and Brokaj, 2014). Port marketing activities proceed along four basic dimensions, namely product, price, place, and promotion (Cahoon, 2007; Notteboom and de Langen, 2015; Laxe, 2010). Marketing efforts implemented within each dimension help develop a positive, strong brand image and ultimately increase ports' competitiveness by boosting their international trade (Branch, 1998; Cahoon, 2007). Branding adds value to products, people, ideas, organizations, services, and places. So, the concept can be applied to any case where customer preferences exist (Keller, 2002). Place branding is no different from the branding concept since it refers to exploring and to building unique value, which makes the place different from other places in order to create competitive brand value (Ashworth, 2009).

As a tool for competition and marketing activities, a port's brand image is closely associated with marketing tools like service quality, routing decisions, frequencies of calls, competitive prices, proficiency of managerial activities, IT implementations, and infrastructure

competencies in the port marketing literature (Branch, 1998; Cahoon, 2007; Laxe, 2010; Pando et al., 2005; Notteboom and de Langen, 2015). Previous research on brand personality has heavily focused on areas such as banking, tourism, hospitality, and events (Rutter et al., 2018), leaving the container port business unexplored. Little is known about place branding of seaports and the implications of brand personality on container ports as well as the changes in specific dimensions of brand personality over a certain period. Also, the way that the container ports differentiate themselves through social media messages by considering brand personality dimensions is considered critical for understanding the place branding strategies of ports. To address the above-mentioned gaps, this study investigates the social media (Twitter) contents of selected container ports to reveal their tendencies to use brand personality dimensions as a communication tool. Specifically, it analyses how port brand personalities vary across geographical regions by using Aaker's (1997) well-known brand personality dimensions and reveals the interaction of these dimensions between specific periods. Three research questions are addressed:

**RQ 1.** *What is the content shared by container ports on Twitter for place branding purposes? What data is provided by the descriptive information employed at Twitter?*

\* Corresponding author.

E-mail addresses: [sedat.bastug@iste.edu.tr](mailto:sedat.bastug@iste.edu.tr) (S. Baştuğ), [gul.denktas@deu.edu.tr](mailto:gul.denktas@deu.edu.tr) (G.D. Şakar), [secil.gulmez@iste.edu.tr](mailto:secil.gulmez@iste.edu.tr) (S. Gülmez).<https://doi.org/10.1016/j.jtrangeo.2019.102552>

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**RQ 2.** Which of the brand personality dimensions are distinguished in accordance with the specific period and geographical regions?

**RQ 3.** What words are used to differentiate the brand personality of seaport regions?

The paper consists of the following steps: First, it sets out the existing literature regarding place branding, brand personality and seaport marketing. The methodology section presents the details of the content analysis. Then, the findings of the content analysis basically including descriptive information and brand personality dimensions of the seaports investigated are provided. Finally, the paper's theoretical and managerial contributions are discussed and certain suggestions for future research are given.

## 2. Literature review: Place branding

Brands are marks or symbols that differentiate one product, service, business, or place from another (Ballantyne and Aitken, 2007). Branding aims to add value to branded objects, whether products, services, corporations, or places. (Andersson, 2014). Places concentrate on management and planning activities within the context of marketing for a long time (Florian, 2002). According to López-Lita and Benlloch (2006) and Ashworth (2009), place branding deals with discovering the unique features that differentiate one place from another to achieve brand value. As Cleave et al. (2016) state, place branding has been used by places of all geographic scales in order to increase local or regional competitiveness, and it is recognized as a way of competition in the field of economic development. Place branding literature can be observed in various perspectives. These perspectives may vary from the characteristics of places to main disciplines and topics employed in the research (Hall, 1999; Papadopoulos and Heslop, 2002; Medway and Warnaby, 2008; Rutter et al., 2018). Considerable research on place branding has attracted the interest of scholars in recent decades (Ashworth and Voogd, 1990; Gold and Ward, 1994; Trueman et al., 2004; Warnaby, 2009; Andersson, 2014; Boisen et al., 2018).

Recently emerging need for studying place brands for all different target groups has become one of the priorities of research (Zenker and Braun, 2010; Klijn et al., 2012; Kavaratzis and Hatch, 2013; Hanna and Rowley, 2008). As suggested firstly by Stubbs and Medway (2002), Kavaratzis and Ashworth (2008), branding strategies should be implemented by integrating multi-dimensional interests of various stakeholders including but not limited to target audiences, politicians, civil society groups, citizens etc. Since a place brand is not only a mixture of products and services but also its communication activities, existence and involvement of various stakeholders, and interaction between them is viewed as a main contributor to the brand (Sevin, 2016). Social media acts as a facilitator for such interaction since it is publicly available, observable and sometimes through user-generated content (O'Connor et al., 2011). Companies and organizations have widely integrated social media into their branding practices and strategies by applying “engage or die” perspective (Solis, 2011). Since social media has a strong potential for direct interaction with the target audience (Sevin, 2016), places may benefit such advantage by providing solid content regarding their characteristics, services, facilities etc.

The research integrating social media and place branding is limited with certain exceptions as; Björner (2013), Sevin (2013, 2016), and Cleave et al. (2016). As Sevin (2013) suggests, scholars can employ data obtained from social media platforms to investigate place branding processes. Little evidence exists regarding the brand personality dimensions communicated with the audience by container ports and the information communicated and shared through social media. Considering this need, this study investigates the selected container ports' posts by focusing on a specific social media platform (Twitter) in order to understand the content of information shared with the audience. Related with the first research question, the study sheds light on the content of the posts in Twitter. In order to assess whether container

ports are able to employ social media in place branding efforts, the first research question is posed at the content of the tweets as well as the engagement rates.

### 2.1. Brand personality and places

Brands convey information that helps people outside the company to achieve insights into the firm to assist them in evaluating the company and its activities (Brown et al., 2006). It is accepted that brands obtain a personality that customers view as an opportunity for self-expression experiencing the emotional benefits from that brand's differentiation of itself from other brands (Belk, 1988; Phau and Lau, 2000). This can be achieved by building an emotional attachment with consumers to succeed in a highly competitive market environment. Thus, companies often aim to achieve a connection between their brands and other entities, such as people, things, or places. (Keller, 2003). Places have emerged as novel fields for branding scholars to investigate their branding aspects and dimensions. Boisen et al. (2018) highlight the importance of having brand identity and image for places to distinguish themselves from another and to effectively communicate with target audiences. Acharya and Rahman (2016), in their literature review on place branding, assert that place brand identity related issues are found to be more dominant in research topics of articles. The main aim of place branding has been stated as to create and build a favourable place identity (Boisen, 2015), and understanding brand personality can be considered as a major step for achieving a solid place brand and identity.

Brand personality is defined as “the set of human characteristics associated with a brand” (Aaker, 1997: 347). Various direct and indirect encounters with the brand influence the development of the brand personality (Brodie et al., 2009). Martineau (1958) suggests evaluating brands from the perspective of traits, which has then been developed by Plummer (1985), who has investigated how brand personality affects soft drink choices in the United States. Aaker (1996) highlights the importance of brand personality in developing brand power built on the “Big Five” human personality dimensions of extraversion/introversion, agreeableness, conscientiousness, emotional stability, and openness, and a 42-item Brand Personality Scale (BPS) to evaluate any brand along five key dimensions has been developed (Aaker, 1997). These are sincerity (e.g. being honest), excitement (e.g. being imaginative and exciting), competence (e.g. being intelligent, confident), sophistication (e.g. being charming) and ruggedness (e.g. being strong). This scale measures the extent to which a specific brand carries any of these traits. Brand personality concept has attracted attention since it differentiates brands from other brands (McEnally and Chernatony, 1999), increases the personal meaning of a brand for consumers and provides awareness regarding the brand image (Dobni and Zinkhan, 1990). Demirbag Kaplan et al. (2010) and Gertner (2011) highlight that there is a need to extend brand personality research towards places. Of 147 articles reviewed in a recent thematic literature review on place branding, it is stated that only 3 studies (5.88%) have used brand personality concept in place branding (Acharya and Rahman, 2016). The need for differentiation, recognition, and positioning for cities, regions, and countries is recognized due to increasing competition between places. Hence, brand personality can be used as a valuable concept for places to establish a connection with various stakeholders as well as to differentiate themselves from others to develop a successful positioning strategy. The limited research linking brand personality with place branding concentrate on various places. Places that have been studied mainly include tourist destinations (Hosany et al., 2006; Usakli and Baloglu, 2011); cities (Merrilees et al., 2009; Demirbag Kaplan et al., 2010; Glińska and Kilon, 2014); regions (Murphy et al., 2007) or countries (d'Astous and Li, 2009; Kim and Lehto, 2012). Apart from cities, regions, countries and tourism destinations, there is limited research on brand personality of specific places or economic entities (e.g. seaports). For example, Rutter et al. (2018) has provided the only study focusing

on seaports as places. No other study has focused significantly on seaports (specifically container ports) and considering the economic and social contribution of container ports to the world economy (UNCTAD, 2018), study of container ports' online brand personality dimensions through the detailed analysis of their Twitter posts can be viewed as a different approach to place branding and seaport marketing research.

Use of various communication media such as websites and social media in brand personality of places has also been employed in academic research. These studies have positioned brand personality as a concept that can be created by organizations rather than consumer perceptions (Pitt et al., 2007), and they have examined how brand personality can be communicated through different marketing tools (Opoku, 2006; Rutter et al., 2017a, 2017b). Additionally, other studies have analyzed brand personality through websites and prospectuses (Opoku, 2005; Opoku and Pitt, 2006; Rutter et al., 2015). Given the increasing use of social media in both business-to-business (B2B) and business-to-customer (B2C) communication, recent studies have turned to specific social media platforms (de Moya and Jain, 2013; Sevin, 2013, 2016). These can be considered as a significant contribution to brand personality of places. The main reason is that large number of influential stakeholders is considered as a big challenge with place brands (Konecnik and Go, 2008). Accordingly posts of various places through social media platforms to reach their stakeholders can be accepted valuable in understanding the unique characteristics of the places as well as their basic brand personality dimensions. Building upon this need, this study analyzes brand personality as a cluster of human characteristics linked to container ports and investigates how they are conveyed through seaports' Twitter accounts for the purposes of differentiation and positioning. Since brand images are developed through traditional and virtual, formal and informal communications (Brown et al., 2006; Duriu et al., 2007), content of these communications (e.g. brand personality dimensions) as well as differences and similarities over a certain period play an important role in understanding how brand personalities shape port-level brand strategy. This can be achieved by understanding how places communicate their brand personalities by using which dimensions as well as revealing the dimensions being differentiated or communalized. This leads to the need regarding the analysis of online brand personalities of container ports (as the basic unit of analysis in this study) through detailed investigation of their posts in social media (specifically Twitter). So, the second and third research questions are posed to reveal the dimensions of brand personality of the container ports in the sample and to understand whether or not such dimensions are differentiated or communalized over a certain period. In addition, specific words used to differentiate the brand personality of the seaport region are investigated to shed light on the branding strategies of the container ports.

## 2.2. Seaport marketing and branding

A seaport is defined as a node in international logistics which accommodates ships and provides cargo transportation, warehousing and transformation processes linked to global supply chains (Robinson, 2002; Song and Panayides, 2008; Notteboom, 2016). These supply chains are constantly being modified due to changing distribution strategies, new hub locations and changing transport requirements (Monios et al., 2018) which put pressure on seaports to constitute solid marketing and branding strategies for their survival. Specifically, container ports are not only "goods handlers", but also they are comprehensive container logistics centres (Ha, 2003). As key components in global supply chains and main infrastructural assets in maritime logistics, container ports have recorded a considerable improvement in the throughput volume reaching 752 million TEUs (UNCTAD, 2018), due to the recovery in the global economy, growth in containerized cargo throughput and container ship sizes (Santos and Soares, 2019). Considering such growth, it is inevitable for container ports to implement effective marketing strategies for long-term growth and

competitiveness (Cahoon, 2007). Communications with various stakeholders, trade and business development, and Customer Relationship Management (CRM) are the basic elements for seaport marketing activities (Cahoon, 2007; Parola et al., 2013a). The majority of these studies explain the factors contributing to the marketing and communication strategies of seaports from a marketing communications perspective (Pando et al., 2005; Cahoon, 2007; Parola et al., 2013b; Parola et al., 2018). Previous research on seaport marketing indicates that ports mainly need to interact with the community through the promotion lens of marketing strategies. Such efforts direct seaports to review and analyse their branding strategies by considering the content, messages, and target groups in their communication processes.

Although branding has been widely recognized and studied in different industries, the analysis of seaport branding and brand personality is limited in the port marketing literature as well as in place branding literature. According to Andersson (2010), firms should connect various activities to establish a long-term strategy and achieve a relationship between the branded place (seaport) and the target group. Since brand will be a critical asset as a representation of a place to attract investment, labor, infrastructural developments, partners and events (Vela, 2013), seaports must give more emphasis to place branding. Place-related components, such as localization, geo-strategic position, accessibility to transport networks, logistical development, and the development of the brand concept are critical elements in seaport marketing activities (Laxe, 2010). Rutter et al. (2018) claims that seaport brands can provide useful insights into the "isomorphic and competitive pressures on the organization". Rutter et al. (2018) has defined seaport brand personality as "the way in which ports operate and behave" before adding that a seaport's activities, behaviors, relationships, and communications constitute its brand personality. Branding efforts of seaports (including brand personality) are closely linked to understanding and considering the needs of their stakeholders. As multi-actor arenas, modern ports need to focus on understanding and developing their branding strategies based on the needs of each stakeholder (Dooms et al., 2013). In ports' communication processes, in addition to traditional methods (advertising, personal selling, organizing port days, press days and conferences, direct mailing, attending school visits, and speaking at conferences, websites) (Cahoon, 2007; Notteboom, 2016), social media is considered as a critical tool for branding by facilitating up-to-date and direct end-consumer contact more cheaply and efficiently (Kaplan and Haenlein, 2010; Parola 2013b). Since, direct communication with the port community is important for seaports (Cahoon, 2007), social media platforms of seaports can provide a valuable means for delivering messages related to seaport brand value and brand personality.

Building on this perspective and gap in the seaport marketing and branding literature, this study concentrates on Twitter posts of selected container ports. By extending Aaker's (1997) framework to the container port industry, seaport brand personality dimensions of ports in the sample of the study have been analyzed. Amidst an increasingly turbulent environment, container ports of all sizes should adopt branding strategies to distinguish themselves from their competitors and attract customers, investors and public attention. Considering operations, management structure, and characteristics, ports and their services are highly heterogeneous, and their branding strategies as well as brand personality dimensions are also expected to differ in practice.

## 3. Methodology

This study analyses brand personality through the information communicated by container ports in their Twitter accounts. As Ballantyne and Aitken (2007) note data obtained from Twitter is consistent with the belief that companies construct images through explicit communications. This shows that brand meanings are constructed through the interactions, discussions, and opinions of various stakeholders of the companies (Ballantyne and Aitken, 2007). Moreover, slogans and logos may support operationalization and visualization

efforts to place branding by delivering the main brand promise to buyers (Andersson, 2010).

Although there are many types of social media sources available (Facebook, LinkedIn etc.), this study uses Twitter as information sources for the sample as it includes audience, engagement and functionality. Twitter is a social networking web site which allows its users to write tweets, which are short messages and share them with the world (Sevin, 2013). Since 2017, Twitter has doubled its character count of short message from 140 to 280. It is accepted as a new communication platform where people can easily disseminate messages and create social relationships (Jansen et al., 2009). Companies can engage with their target audience by using retweets, using hashtags and following other users (Fortin et al., 2011). Twitter has an advantage of audience access, and it is popular not only with the average customers, but also journalists, researchers, politicians and celebrities frequently use it. Twitter also allows users to communicate directly with one another as well as indirectly as a group (Sevin, 2016). Twitter is one of the most widely-used social media sites among Fortune 500 companies, such that approximately 73% of them use it to communicate with followers (Barnes et al., 2012). This means that Twitter is often a platform to find trending news. Another reason why Twitter is used in this study is the engagement that the fast-paced nature of Twitter helps companies to communicate with customers who are easily-distracted and overwhelmed by short attention spans. As Palmer and Gildea (2002) has declared, Twitter acts as a facilitator for the creation of place brands and increases the online presence of the places. It gives the seaport a chance to hone branding message into conversation-ready bite-sized chunks. Twitter is like an elevator pitch for port brand—a way of getting the brand equity quickly and connect the port to important news topics. With “Live Events”, the port promotes its content to a wider audience and achieves some great social public relations.

Container ports are identified in Lloyd's List (2016) to be the top 100 container ports. However, only 50 of these ports from four different regions (Middle East and Africa, Europe, America, and Asia) have their own Twitter accounts. The brand image may influence brand personality through several instruments, such as feelings and emotions (Keller, 1993; Keller, 2013; Patterson, 1999), since our emotional responses to brand features determine brand personality (Patterson, 1999). Thus, this study has used Aaker's (1997) five dimensions of brand personality to evaluate container port brand personalities. Whereas ports have not used the mass media as a marketing communication tool, they can now communicate with their customers and stakeholders through different tools like social media and websites.

This study consists of three research stages for three research questions. First, the combination of research techniques has been performed to analyse all the tweets of the specific period for the first research question. As insightfully observed by Grimes and Schulz (2002), “descriptive studies often represent the first scientific toe in the water in new areas of inquiry. A fundamental element of descriptive reporting is a clear, specific, and measurable definition of the disease or condition in question.” The social media statistics, distributions of languages in Twitter and the distribution of informational tweets are very useful to researchers so that this can also help give an idea of the scope of the place branding efforts made by the ports regarding their geographical regions.

Second, a longitudinal content analysis has been conducted on 17,340 Twitter messages from the sampled container ports taking into account Aaker's (1997) five dimensions of brand personality for the second research question. Content analysis has been provided to determine whether the ports have used brand personality dimensions as a communication tool or not. Additionally, longitudinal design of this analysis has allowed for examining changing trends of the port's brand expression across the different periods by using Aaker's scale. At the beginning of the content analysis, the descriptive analysis, which consists of qualitative analysis, has been performed. In order to find the

frequency distribution of dimensions, the matrix query in NVIVO has been carried out.

Third, a multiple correspondence analysis (MCA) has been conducted to reduce complexity in the tabular data for the third research question. Correspondence Analysis (CA) is a multidimensional data analytical method, suitable for graphically exploring the association between two or more non-metric variables without a priori hypotheses or assumptions (Markos and Sridevi, 2010). It is also typically used to reduce complexity in tabular data and is often used in marketing and positioning research to visualize relationships between organizations (Rutter et al., 2018). The specific technique has already been used in various research aiming at mapping the intellectual structure of a field (Furrer et al., 2008 in the field of strategic management, Dabic et al., 2014 in the field of international business strategy, or Rutter et al., 2018 in the field of port industry). The main outcome is a low-dimensional map where the keywords are depicted in two axes. The positions represent an actual distance between the pairs of keywords in terms of association. Multiple correspondence analysis (MCA) is an extension of correspondence analysis (CA) which allows one to analyse the pattern of relationships of several categorical dependent variables (Abdi and Valentin, 2007). MCA is used to analyse a set of observations described by a set of nominal variables. MCA can accommodate quantitative variables by recoding them as “bins.” For example, a score with a range of  $-5$  to  $+5$  could be recoded as a nominal variable with three levels: less than 0, equal to 0, or more than 0. In this study, a score with a range of  $-2.5$  to  $+2.5$  is recorded as a nominal variable. This is often used in marketing and positioning research to visualize relationships between regions (Fig. 1).

### 3.1. Content analysis

Longitudinal content analysis has been employed to investigate the content of the sampled Twitter messages. Longitudinal content analysis of the tweets can reveal the tendency of the ports to use the brand personality dimensions as a communication tool as well as the brand personality dimension differentiated or commonalized by the ports regarding the periods. Content analysis is a research method used for determining the content of communication in an objective, systematic, and quantitative way (Berelson, 1952). It is also used for codifying text (Weber, 1990), collecting, and analysing text content (Neuman, 2003), dividing texts into groups based on certain criteria to predict and make valid inferences from the data (Opoku, 2006). Content analysis typically consists of five steps: (i) determining the research question or formulating the hypothesis; (ii) determining the sample; (iii) defining the coding categories; (iv) training the coders and (v) examining and interpreting the coded data (McMillan et al., 2000; Riffe and Freitag, 1997).

### 3.2. Sample and data collection

The data for the content analysis has been collected by the NCapture tool of NVivo. The sample has been taken from the 2017 Lloyd's List top 100 container ports regarding their annual cargo throughput. Table 1 shows the time periods: when period 1 started and finished, and when period 2 started and finished.

Fifty of these ports have official Twitter accounts, and located in four different regions (Middle East and Africa, Europe, America, and Asia). While some accounts belong to seaport authorities, others are managed by port operators. These operators use their Twitter accounts not only for port marketing activities but also for activities in other areas, such as port operations, personnel management, and other supporting activities. Since this study mainly concentrates on container port brand personality, only the tweets addressing port or terminal marketing activities have been considered in the content analysis. The research strategy aims to balance feasibility with a comprehensive



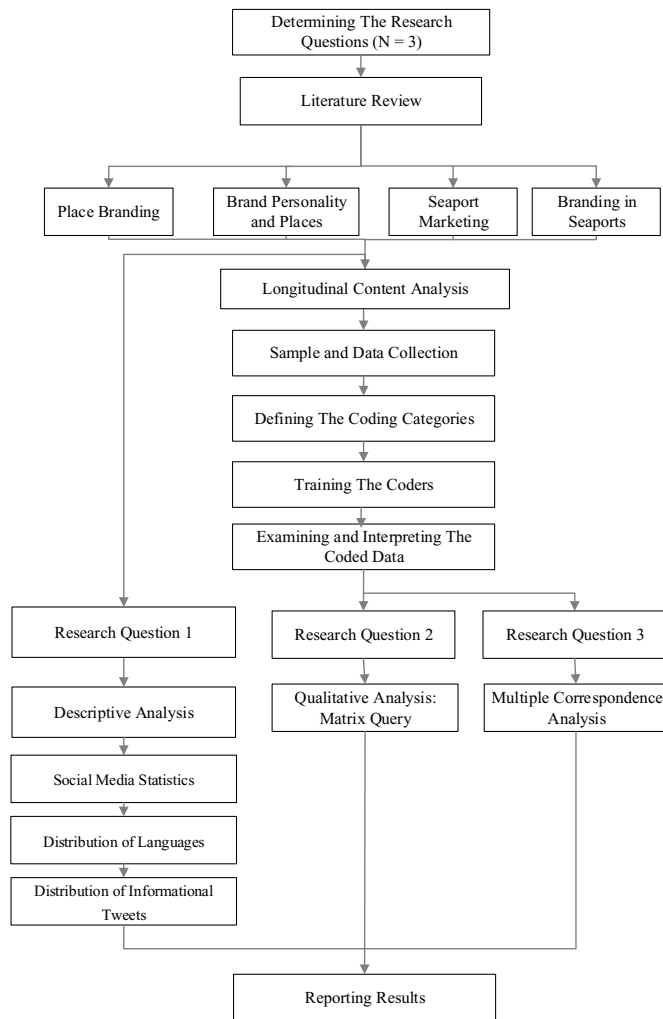


Fig. 1. Research design.

Table 1  
Period intervals for data collection.

Periods	From - To	Number of Tweets
Period 1	27.01.2012–12.10.2017	8625
Period 2	27.01.2012–10.11.2017	8715

Table 2  
Inclusion and exclusion criteria.

Inclusion criteria	Exclusion criteria
Port Authority and Port Terminal Operator Twitter Pages	Irrelevant Twitter Messages (such as seafarers' postings)
Tweets, Retweets (Informational)	Non-English text
English Language	Non-Textual (Unicode Characters)
	Irrelevant Advertisement (Celebrations, and Holidays)
	Other Social Media Platforms

scoping process by focusing only on tweets posted in English. As shown in Table 2, postings subjected to the content analysis have been decided according to the following inclusion and exclusion criteria.

Inclusion and exclusion criteria have been applied through NCapture Tool of Nvivo, which has filtering function when retrieving the data. Language option has been used to extract non-English tweets. Besides, some criteria such as irrelevant postings and irrelevant advertisements have been eliminated manually.

### 3.3. Defining the coding categories and training the coders

After the tweets have been imported into NVIVO, several analytical options have been considered. Coding is a crucial part of content analysis in forcing the researcher to assess the meaning of the text (Ryan and Bernard, 2000). Coding allows Twitter data to be logically corrected and transformed into meaningful categories (Forman and Damschroder, 2007). Before proceeding with the coding process, two independent researchers have helped to code data for period 1 and 2. The coders have participated in the training session to fully understand the critical concepts of the coding scheme. The two coders have collected two parallel lists of synonyms to enhance the validity of the instrument (Kolbe and Burnett, 1991). No details regarding the study's research questions have been provided to the coders to prevent any tendency to give what the researcher wants. Banerjee et al. (1999) highlights the possible risk of bias occurring due to the coder's knowledge of variables extraneous to the content analysis. Following the coding process, the two coders have met to discuss and justify the choice of words in the analysis to enhance intercoder reliability. Intercoder reliability has been calculated through a randomly selected sample of 17,340 messages from a separate dataset. Intercoder reliability for the message strategy variables and the communication type variable have been calculated using Rust and Cooil's (1994) proportional reduction in loss index (PRL), whereby a value of 0.70 is acceptable, but 0.90 is desirable. To perform effective intercoder reliability analysis, non-overlapping portions of the Twitter messages have been collected at period 1 and 2.

This study uses deductive approaches for coding which enables researchers to formulate pre-set coding schemes. In traditional content analysis, a research team formulates a coding scheme and trains coders prior to analysing message characteristics. Researchers and scientists have developed various algorithms and software to aid in content analysis (Evans, 1996; Krippendorff, 2004; Scott, 1996, 2008; Smith, 2000), which has helped reduce subjective interpretation among coders. There are several types of computer-assisted qualitative data analysis software. Some simple software produce word counts whereas others produce both word counts and co-occurrences. Most software packages generate a list of keywords along with their respective frequency counts. Content analysis through software can thus be applied repeatedly in several similar documents to create a frequency table.

Although NVIVO uses the wordnet lexical database (dictionary) for text relates synonyms search, it is not enough to analyse all the synonyms in the brand personality. This should be supported by another dictionary in order to adapt to the branding concept. Meanwhile, a brand personality has been operationalized using Aaker's (1997) brand personality framework and Opoku's (2005) dictionary. For the data collection instrument, a comprehensive yet appropriate dictionary of terms has been designed by collecting and compiling synonyms of Aaker's (1997) five brand personality dimensions. This has been achieved with the help of the online version of Encyclopaedia Britannica's thesaurus function ([www.britannica.com](http://www.britannica.com)) and the dictionary builder of the software. A frequency count of words associated with brand personality across Aaker's five dimensions has been conducted. Opoku (2005) dictionary has been utilized as it includes synonyms for each of the five dimensions of brand personality and has previously been used to apply Aaker's dimensions to different sectors, such as tourism (Pitt et al., 2007). The dictionary consists of 1203 synonyms distributed almost equally across Aaker's five dimensions. Examples of commonly found words are shown in Table 3.

### 3.4. Findings and discussion

The study has used a longitudinal design in which the same questions are asked at two or more points of period. Longitudinal design can be further classified into three subtypes: trend design, cohort design, and panel design. Trend design has been selected for this study. This

**Table 3**  
Brand personality synonyms.

Dimension	Associated word	Number of synonyms
Sophistication	captivate, charming, exclusive, distinguished, royal	340
Sincerity	accurate, authentic, decent, frank, reliable	254
Competence	dependable, responsible, systematic, thorough	215
Excitement	bold, courageous, determined, fresh, inventive, new	210
Ruggedness	challenge, desert, endeavour, robust, tough, unrestrained	157

Source: Adapted from [Rutter et al. \(2018\)](#).

compares sample surveys describing the same population at two or more points in period. The coders have identified 17,340 tweets across the four geographical regions, with 8625 from period 1 and 8715 from period 2.

### 3.4.1. The descriptive information

**3.4.1.1. Social media statistics.** Researchers use Twitter for a huge range of subjects by keywords and especially parameters: number of tweets, average engagement/tweets, tweets per day, and average favourites etc. The social media metrics have been calculated by using “Vicinitas.io” which allows analysing data on a specific period (Period 2: 10/11/2017) and pre-defined keywords. Most preferred parameters are as follows:

- Number of tweets: it refers to total number of tweets received from specific username.
- Average engagement/tweets: It is defined as the average number of likes and retweets for this user's post in a specific duration. It is also the total number of times which a user interacts with a tweet and aims to understand how strongly an audience cares about the content. To measure the engagement rate, it is required to calculate the engagements (likes, comments, retweets etc.) across all of the influencers' posts on a particular profile then divide it by the total number of followers and divide that by the number of posts. Engagement rate ranges for Twitter are defined as follows:
  - An engagement rate between 0% and 0.02% is considered to be low. An influencer with a low engagement rate on Twitter could expect between 0 and 0.2 reactions for every 1000 followers.
  - Engagement rates between 0.02% and 0.09% are considered to be good. An influencer with a good engagement rate on Twitter could expect between 0.2 and 0.9 reactions for every 1000 followers.
  - An engagement rate between 0.09% and 0.33% is considered to be high, where an influencer would expect 0.9–3.3 reactions for every 1000 followers on Twitter.
  - Finally, an engagement rate between 0.33% and 1% is considered to be very high, with expected reactions to be between 3.3 and 10 for every 1000 Twitter followers.
- Tweets per day: It is the average number of tweets posted by the user per day since the opening of the account.
- Average favourites: It is defined as the average number of favourites, which is often used in casual conversation in reference to something someone really likes. They can also reference social-media activity.

**Table 4** provides an insight into engagement rates of container ports ranked by Lloyd List (2017). Message contents of almost all container ports have interacted with the people. North American container ports have the most significant share of engagement rate compared with the other container ports located in different regions. Six of the total ports are in “Very High” category, and five of them are in the “High” category. Also, North American ports have the highest daily posting rate when compared with those located in other region. Besides, daily posting rates of Asian and M.E./African ports are less than the European and North American ports. Engagement rate balance between the “Very

**Table 4**  
Social media statistics of Seaports in the sample.

Regions	Total number of tweets	Average engagement/ tweet*	Tweets per day	Avg. fav.*
North America	5435	0,47	1,83	0,56
Asia	2529	0,30	0,81	0,36
Europe	7480	0,43	3,28	1,12
Middle East and Africa	1896	0,32	1,10	0,94

\* Percentage values of the tweets.

High” and “High” category is different in Asian and the Middle East/African container ports. According to engagement rates of these ports, “High” category is higher than “Very High” engagement rate. No engagement rate has been recorded for Port of Felixstowe and Alexandria Port. In terms of geographical spread, Spanish is the most tweeted language in Europe when compared with North America. The latest edition of this report lists a series of figures which consolidate the position of the Spanish language as one of the languages with the best future worldwide.

**3.4.1.2. The distribution of languages in twitter.** As [Fig. 2](#) illustrates, container ports show the steady rise in the use of English language, which indicates a remarkable usage by Twitter users in the social media. According to [Cervantes Institute Report \(2015\)](#), Spanish is the second most used language worldwide on social media networks, and this has been confirmed by this analysis. Spanish is the mother tongue of about 500 million people, and it is also an official language in about 22 countries.

**3.4.1.3. The distribution of informational tweets.** [Hutto et al. \(2013\)](#) highlights the dual nature of Twitter as both a social media network and as a news/information medium.

[Naaman et al. \(2010\)](#) suggests two basic categorizations of Twitter users as Informers (those who share informational content) versus “Meformers” (those who share content about themselves). Meformers were reported to have almost three times fewer followers than Informers. [Hutto et al. \(2013\)](#) notes that “the direction of the casual relationship between information sharing behaviour and extended social activity is not clear”.

In order to find informational tweets, the qualitative analysis technique should be performed. In this study, the researchers have decided to use a customized Python code in order to interpret the tweets of seaports. The search string is identified regarding informational and “Meformers” content indexes developed by [Hutto et al. \(2013\)](#).

Informational content index is the ratio of tweets containing either a URL, “RT” (Retweet), “MT” (Modified Tweet), “HT” (Hat Tip), or “via” to total number of tweets in the period. According to [Hutto et al. \(2013\)](#), its index rate should be between 0 and 1. If the rate is above 0.5, it is considered to be high. It means that the tweets are very informational and when the rate is below 0.5 it is considered to be low, and the tweets have the “Meformer” content.

**Table 5** illustrates the number of informational tweet contents of the

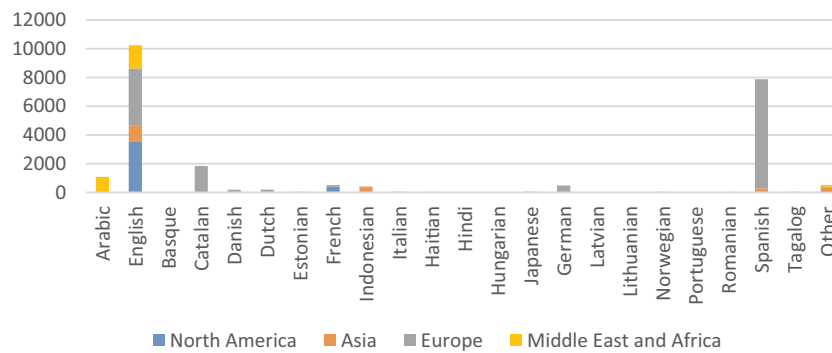


Fig. 2. Distribution of tweets languages.

Note: Other remark in Fig. 2 refers to languages: Turkish, Chinese, Croatian, Russian and etc.

container ports. Generally, all ports have posted informational tweets, but the number of informational tweets have differed by the region. For example, European ports have posted the highest number of informational tweets among the other ports. North American ports have followed the European ports. However, Twitter message contents of Middle East and Asian ports are less than the European and North American ports.

3.4.2. Dimensions of brand personality at seaports

The second research question focuses on the content-based uses of those who have tweeted regarding longitudinal methodology. Longitudinal studies of online data, including social media data and search query logs, have proven effective in helping understand the behaviors of people in various situations (Kiciman et al., 2018). These studies have been targeted to explore and understand how situations evolve over time, identify predictive factors involved in positive and

Table 5  
Informational content index list of Seaports in twitter.

Regions	Port names	Informational content index		
		No of total tweets	Inf. tweets No	Inf. content index
		149	144	0,97
	Port de Montréal (@PortMTL)	220	217	0,99
	Port of Long Beach (@portoflongbeach)	428	423	0,99
	Port of Los Angeles (@PortofLA)	220	215	0,98
	Port of Oakland (@PortofOakland)	602	597	0,99
	Port of Seattle (@PortofSeattle)	329	326	0,99
	Port of Vancouver (@PortVancouver)	135	130	0,96
	The Port of Virginia (@PortofVirginia)	288	283	0,98
	Port Authority NY&NJ (@PANYNJ)	68	63	0,93
	Port Houston (@PortHouston)	957	952	0,99
	South Carolina Ports (@SCPorts)	189	184	0,97
Asia	Chennai Port (@PortofChennai)	19	14	0,74
	Hutchison Ports PPC (@HutchisonPPC)	69	64	0,93
	IPC Tanjung Priok (@IPTanjungPriok)	57	54	0,95
	JNPT (@JNPort)	194	189	0,97
	MPA Singapore (@MPA_Singapore)	324	319	0,98
	Port Klang Authority (@pkamalaysia)	179	176	0,98
	Yokohama (@yokohamaportpc)	15	10	0,67
	Philippine Ports Authority (@phports)	29	24	0,83
	Adani Group (@AdaniOnline)	175	174	0,99
	Port of Melbourne (@PortofMelbourne)	67	62	0,93
Europe	ABP Southampton (@ABPSouthampton)	456	455	1,00
	Hafen Hamburg (@PortofHamburg)	1878	1869	1,00
	London Port Authority (@LondonPortAuth)	201	196	0,98
	Port de Barcelona (@portdebarcelona)	15	13	0,87
	Port of Antwerp (@PortofAntwerp)	51	46	0,90
	Port of Felixstowe (@felixstowe_port)	288	283	0,98
	Port of Rotterdam (@PortofRotterdam)	541	536	0,99
	Port of Zeebrugge (@Port_Zeebrugge)	85	80	0,94
	Porto di Genova (@PortsofGenoa)	57	52	0,91
	Puerto de Algeciras (@PuertoAlgeciras)	38	33	0,87
	Puerto de Cartagena (@PuertodeCtg)	170	165	0,97
	Valenciaport (@AutPortValencia)	168	163	0,97
	Autoridad Portuaria de Guayaquil (@PuertoGye)	3	2	0,67
Middle East and Africa	Abu Dhabi Ports (@AbuDhabiPorts)	374	369	0,99
	Alexandria Port (@AlexandriaPort)	51	36	0,71
	DP World (@DP_World)	346	341	0,99
	Port of Salalah (@port_salalah)	23	8	0,35
	Port of Jeddah (jeddahport)	8	3	0,38
	Nigerian Ports (@nigerianports)	386	381	0,99
	Transnet NPA (@TransnetNPA)	428	419	0,98

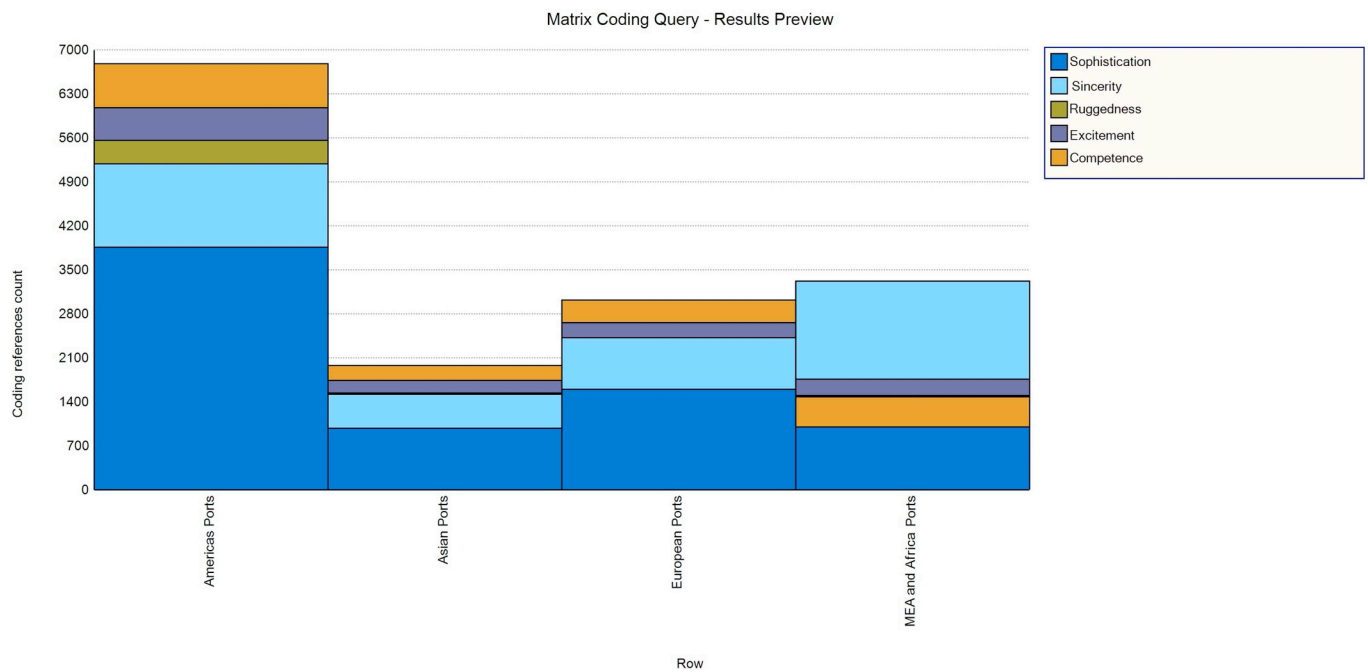


Fig. 3. Matrix coding query of Seaports regarding different regions (Period 1).

negative outcomes, and help identify at-risk individuals. With regard to the B2B context, social media has created an environment in which companies are gaining increased control and flexibility, enabling them to access content through multiple paths. The context in which they receive messages is therefore increasingly dynamic and individualized. Twitter accounts of seaports also usually offer customized contents for users' interest, and this study has focused on dynamically changing content of port's Twitter account between specific periods.

Matrix coding query reveals that the ports well reflect the brand personality dimensions in their Twitter posts. For Period 1, the most common use of social media messages concerned American seaports (75% of coding references), which consists of five brand personality dimensions. The second most common message source is Middle East and Africa seaports (25%), referring to dimensions of competence, excitement, ruggedness, sincerity, and sophistication. For Period 2, American seaports (85%) again appear more frequently than the other ports in different regions (15%).

In Fig. 3, the query result of American ports reveals that competency is more frequent than the other dimensions in Period 1. Surprisingly, Asian ports have the lowest frequency, with their social media content being particularly low for sophistication despite considerable investment in their port infrastructure. Therefore, their social media content does not represent actual events in their regions (Fig. 4).

Period 2 shows the same trends for social media content, and ranking of dimensions seems not to have changed. It can be said that the importance of ruggedness dimension for North American ports have decreased in Period 2. Instead of promoting the ruggedness dimension, North American ports mostly have concentrated on sincerity within the specified period. Table 6 illustrates the word frequencies of this trend.

It can also be inferred from Table 6 that ports adopt particular brand personality dimensions when communicating to their customers. Using the brand personality dimension as a communication tool shows how the selected ports actually express their own brand.

Although the dimensions reflected in the informational tweets of the ports do not show a significant change over two periods, the frequencies of these words have prominently increased. The linear increase of these word frequencies in particular dimensions and promoting the same dimensions at two different periods can indicate that the ports adopt established communication strategy and more explicit brand

expression. For instance, M.E./African ports mostly have adopted sincerity and sophistication dimension rather than competence, excitement, and ruggedness dimensions across two different periods. North American ports mostly have featured sincerity and competence dimensions, yet a notable variation has not been recorded between competence and sophistication dimension in the period 1. For the second period, sincerity has overlapped competence in North America and these ports have prioritized sincerity and sophistication motives as M.E./African ports have. Asian ports have actively communicated through excitement dimension. Surprisingly, these ports have increased their communication efforts by promoting competence. The other dimensions, especially sincerity and sophistication, gradually have decreased within the specified periods. Besides, European ports mostly have communicated competence and ruggedness.

Regarding the second research question, multiple correspondence analyses (MCA) have been performed to analyse the word coding of the study. Whilst it is possible to identify differences between seaport regions using the tables (for example: North America is the most Sophisticated seaport's region), it is much easier to interpret the complex inter-relationship between the five dimensions and four seaport's regions using a two dimensional MCA solution, which also eliminates the problems related to inter-spatial differences to aid interpretability (Hoffman and Franke, 1986; Greenacre, 2010).

Fig. 5 is the joint display of regions of seaports and brand personality dimensions in the plane defined by the two principal axes. It defines the images associated with each seaport region to demonstrate both differences and commonalities. The proportion of variance explained in the two factors is high ( $69.2\% + 21.46 = 90.75\%$ ). It means that the reliability of the two dimensions is confident. According to Lebart et al. (1984), confidence circles should be calculated at 95% to interpret the level of distinction of each region and the dependence on the five brand personality dimensions.

The results show that these seaport regions have greatest level of isomorphism and some areas of distinction for certain dimensions in each period. Fig. 5 represents the degree of uncertainty surrounding each seaport through confidence circles. It shows that excitement is positioned to the left while ruggedness and competence are positioned to the right of the y-axis “@ABPSouthampton for an *exciting* new series showing 300 #BMWMinis being unloaded from one of our daily train



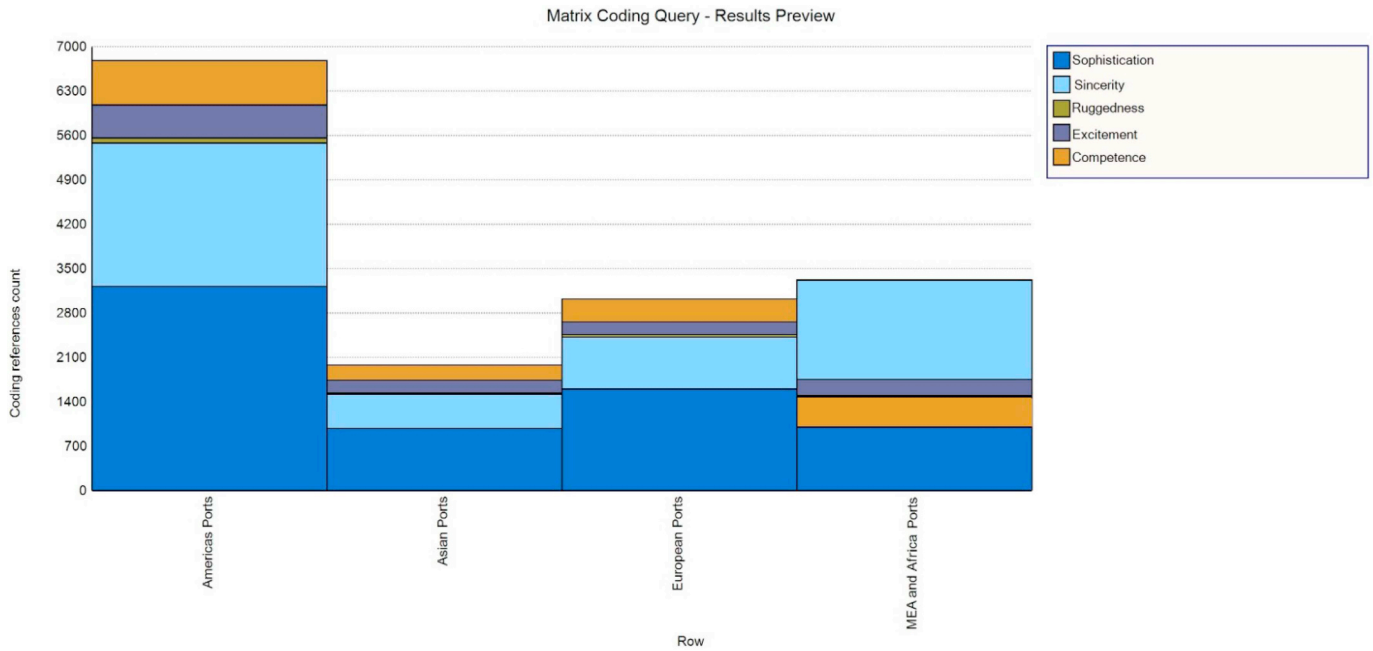


Fig. 4. Matrix coding query of Seaports regarding different regions (Period 2).

deliveries” ports to more “We’ve enjoyed welcoming #EbbaMaersk for the first time today @PortofRotterdam and look forward to seeing her call in the coming months this is the true evidence to show our marketing strategy **competent** enough” and “@Port\_Zeebrugge The Port’s small, **rugged**, vital assets!” ones. As shown in Fig. 5, excitement moves from left to right on the y-axis, meaning that the trend of the dimension becomes more important from period 1 to period 2. Sophistication and sincerity are the main components of seaports in the Middle East/Africa and North America regions. The origin is where the x - and y - axes are both at zero. It is shown below as the intersection of two dashed lines. The further the labels are from the origin, the more discriminating they are. Therefore, Middle East Ports are highly differentiated. Similarly, sophistication is a highly discriminating attribute. One of the main parts of overseas transportation is port-hinterland haulage. Carrying out efficient transportation between the port and hinterland, accessibility of the transportation networks and availability of the related facilities (warehouse, inland container depot, distribution centres etc.), where value-added services are provided contributes to increasing the customer engagement and to making the ports more attractive. For the African ports (especially Nigeria, where roadways mostly are used for cargo transferring between port and hinterland) suffer from the constraints in port-hinterland connection, efficient cargo flow and security of the cargo (Ubogu et al., 2011). Ongoing modernizing efforts in Nigerian railways by China Civil Engineering Construction Corporation (CCECC) may be the main reasons why container ports in this region

have increasingly exhibited sincerity and sophistication.

The brand personality dimensions indicate some overlaps between the regions. There is some distance between sophistication, sincerity, competence, excitement and ruggedness. However, sophistication significantly overlaps sincerity, and competence partly overlaps ruggedness, whereas excitement does not overlap other dimensions. The similar term “After the **excitement** of the HKSAR Establishment Day on Monday, we had 5 container ships visiting on Saturday as well as car ships and passenger vessels” has been used in the Asian ports. Moreover, sophistication does not change between period 1 and 2. These findings may indicate that the majority of seaport regions communicate a brand personality.

The third research question deals with the words used to differentiate seaport regions. According to Rutter et al. (2018), small trading seaports have roots in fishing villages so that many aspects of their infrastructure and management are relics from the mid-century. The term “@Rotterdam **emerging** as global maritime hub, says major European report” has often been displayed as well as “@Rotterdam assured the delegation that authority is committed to **developing infrastructure** around the proposed Maasvlakte deep sea Port”. While ports across Europe and Asia are becoming more modern and productive, Middle East and American ports risk becoming obsolete without significant upgrading and investment. American ports have limited space with narrow navigation channels, shallow harbours, and congested truck and rail access routes. Their navigation channels require maintenance and expansion,

Table 6  
Frequencies of Aaker’s dimensions by geographical regions for period 1 and 2.

Regions	Competence		Excitement		Ruggedness		Sincerity		Sophistication		
	*%	**CR.	%	CR.	%	CR.	%	CR.	%	CR.	
Period 1	North America	20	5355	16	4260	13	3560	20	5562	31	8560
	M.E. and Africa	16	1652	12	1243	21	2115	25	2612	26	2623
	Asia	9	939	30	3130	15	1530	24	2530	22	2230
Period 2	Europe	26	1250	21	1040	30	1453	18	866	5	249
	North America	20	5505	16	4410	13	3710	20	5712	31	8710
	M.E. and Africa	17	2773	20	3193	14	2265	24	3762	24	3891
	Asia	23	2280	33	3250	11	1090	15	1430	17	1680
Europe	24	1402	20	1190	28	1644	21	1203	7	402	

\* %: Row Percentage, \*\* CR: Coding Reference.

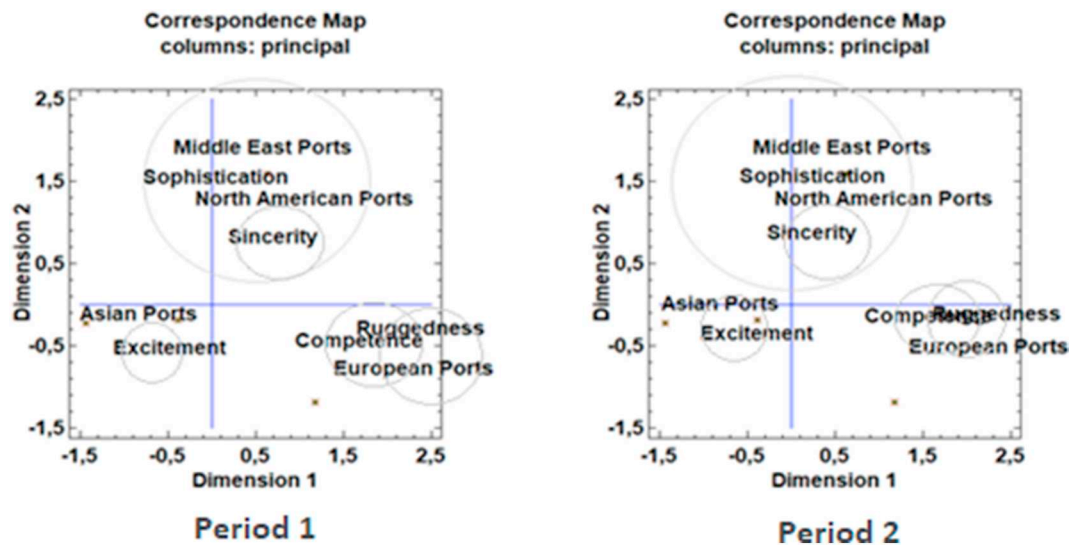


Fig. 5. MCA - Biplot Showing Seaports and Dimensions by periods.

which often causes delays in granting permits, a complex web of environmental regulations, and disagreements about how to dispose of the dredged material. As mentioned on Infrastructure Report Card (2017), the increase in ship size requires deeper navigation channels. The continual increase in ship sizes hinders the rapid adaptation of existing port infrastructure in terms of serving to larger vessels. US State or local allowances restrict the port-related investments, and funds are mostly used for the other purposes. Considering the restrictions in port investment-related issues, they need to promote their seaport regions by using different marketing instruments such as differentiating their services and featuring accessibility. In this regard, professional teams may provide a competitive advantage by using sincerity motives, such as “@SCPorts Board touring the terminals before a lunch with our **experienced and professional team!** The best in the business.”, or “**Friendly employees. Hardworking team. Wider than a Texas smile.** @PortHouston is the nation’s largest port for foreign waterborne tonnage”, “The Green Port @SCPorts Gateway works to improve the **speed, reliability & safety** of on-dock rail operations.” in social media to attract customer attention. It has also been noticed that North American ports significantly highlight operational speed, reliability, and safety in their intermodal implementations. Despite its inadequate port infrastructure, there is an explicit growth in US intermodal transport infrastructure. Recording a significant growth in US’s warehouse system, increasing network accessibility of such facilities with the ports (Bowen, 2008), providing better connection with the ports through intermodal transport implementations (Thill and Lim, 2010) and building value chain strategies on distributional efficiencies (Rodrigue and Notteboom, 2010) may be other underlying reasons of promoting sincerity motive. However, sincerity in North American and Middle East and Africa port tweets has decreased from Period 1 to 2.

On the other hand, tweets from Middle East seaports have more sophistication-related words than other regions. The reason for this could be that they position themselves in the market as trans-shipment points in global trade together with expanded capacity and the sophistication of their facilities. Consequently, Rutter et al. (2018) points out that ruggedness, sophistication, and excitement are the ways for seaports to break out of the isomorphic pressures to form more unique facility configurations. They emphasize sophistication by using words like “Quality of port infrastructure in United Arab Emirates ranked 4th globally Global Competitiveness Report. #AbuDhabiPorts provides **vital most advanced infrastructure** for maritime industry to promote imports & exports flow by sea and supports local communities and **sustainable outstanding businesses**” or “DP World celebrated its 30-year port concession

for the **excellent seaport management** and development of a **Jebel Ali Port**” in social media. They try to create the highest customer perceptions of seaports services. Sophistication is supported by sincerity through words like “Expo 2020 Dubai will leave an economic legacy in the form of **new business generation**”, “DPWorld welcomes the world to port of Jebel Ali on the 8th to find advanced solutions for **unique seaport services**”, or “View of the Dubai today with **mosques** in the foreground and City of Dubai **skyscrapers** in the background”. In a sense, they try to communicate with customers and explain how carefully and humbly they operate seaport services to ensure that their terminals achieve the highest safety standards to offer the best personnel despite weak infrastructure.

For European seaports, competence and ruggedness are important dimensions to promote customer services. In this region, ports mostly attempt to integrate simulations in terminal operations with the aim of increasing nautical accessibility. Finding innovative solutions to ensure efficient cargo handling systems, as well as increasing land productivity by using terminal software is the distinctive characteristics of these ports (Notteboom, 2016). European ports have continuously invested in information exchange platforms to provide smoother hinterland connectivity for many years (Van der Lugth et al., 2014). Nowadays, the direction of these investments of ports (especially Rotterdam and Hamburg) tends to Industry 4.0. implementations to gain new business opportunities and provide operational excellence. The suite of Industry 4.0 technologies (Internet of Things etc.) enables almost any object to become a source of information. So, European seaports promote service quality through social media and other omnichannel tools that provide online information services. Primarily, they highlight these information services through wordings like “we are teaming up with @PortofRotterdam to bring **thorough information** on seaport service process,” or “@HafenHamburg collects and transmits air quality **information in real-time**”.

#### 4. Conclusions, managerial and theoretical implications

The present study has been designed to examine the prominent dimensions of brand personality provided by Aaker (1997), the interaction of these dimensions, and the relative importance of geographical region. The Twitter messages of 50 of the top 100 container ports ranked by Lloyd’s List (2016) have been analyzed through longitudinal content analysis and multiple correspondence analysis across two different periods. The findings of both analyses show that language of

ports differentiates through Aaker's (1997) five dimensions of the brand personality.

The empirical findings make significant contributions to the literature on port marketing, place branding and transport geography. This study's measurement of brand personality from container seaports' perspectives through analysis of Twitter messages is a novel approach that can determine whether brand personality model and its dimensions are applicable to the online context. While previous research focusing on brand personality has provided valuable insights, to the best of authors' knowledge, no research has examined brand personality from a place branding perspective by concentrating on container seaports located in different geographies. Considering that conventional consumer marketing methods are not an effective way in creation of place image, a place may need to improve its strategic and unique attributes to sustain competitive and attractive position of the region (Bergqvist, 2009; Anholt, 2008; Cassel, 2008). Featuring the attractiveness of the regions provides awareness to potential users about distinctive characteristics of the regions (Kotler et al., 1999). Ports can use the distinctive characteristics of their regions to increase inter-regional port competitiveness, and it can enhance awareness of the regional potential. Unique and strategic capabilities of the port region can attract the attention of the port investors. These investments may provide ports with certain opportunities to make them transshipment points.

The results of the longitudinal content analysis provide that the words used by the ports in social media messages to communicate with their customers reflect the brand personality dimensions across the two periods. The dimensions highlighted by the ports' tweets differ across regions. Each region has created a distinctive differentiation strategy. Geographically, North American ports have established the most distinctive brand expression on sincerity and sophistication. The most prominent brand personality dimension for Asian ports is excitement. While European ports promote ruggedness and competence in their messages, the Middle East and African ports prioritized sophistication and sincerity. One contribution of this study is the analysis of container ports' Twitter contents across different periods. Longitudinal analysis of the message contents has provided insights into the sustainability of communication strategies of the ports. As far as is known, Twitter content of the container ports has not been conducted to measure changing communication trends of the ports. Longitudinal content analysis also shows that there is not a significant difference between the two periods. The noticeable increase in word frequencies and highlighting the same dimensions across two different periods can show that the ports have an established communication strategy and more explicit brand expression.

Although categorical data provide sources for marketing research, incapability of related research tools restricts analysis of such data. Implementation of the multiple correspondence analysis can give a chance to researchers to identify and demonstrate relationships among the complicated marketing events (Hoffman and Franke, 1986). In this study the multiple correspondence analysis, employed to reveal the relationship between the regions and the dimensions, shows that the ports' social media messages are clustered around particular dimensions. Emphasizing the particular dimensions by particular container port enables to interpret the relevance of the ports with their regions.

In addition, the application of MCA has helped to better test the relationship between the Aaker's brand personality dimensions and geographical regions. MCA has confirmed that Asian ports mostly emphasize excitement, perhaps because Chinese ports especially dominate the container transport market at national, regional and urban scale (UNCTAD, 2017; Loo, 2009). Introducing new routes from Asia to several destinations, and increasing cargo volume boosts the physical expansion of the ports to meet increasing demand (UNCTAD, 2017; UNCTAD, 2018; Van der Van der Putten and Meijnders, 2015). Competence and ruggedness are specific to European ports. European ports mostly transmit these messages by highlighting their information services and Industry 4.0. implementations. Especially Hamburg and

Rotterdam attach importance to Industry 4.0. as a unique attribute.

North American ports' tweets cluster around sophistication and sincerity. Regarding the absence of the new investments in ports, they tend to reflect their uniqueness by promoting experience, professionalism, honesty, reliability, and being hardworking. Unlike the findings of Rutter et al. (2018) from the websites of the Middle Eastern and African ports, the ports located in this region mainly prioritize sophistication and sincerity in their Twitter messages. Specification of services, excellent management abilities, size and characteristics of its hinterland, natural environment, and scenic beauty are featured by these ports to improve customer perceptions.

The relationship between ports and their host country/city/region, geographic structure and dynamics are significant for the development of both port system and its hinterland (Veenstra and Notteboom, 2011; Zhao et al., 2017). Returning to the research questions presented in the methodology section, it can be concluded that the ports reflect brand personality dimensions in their social media messages. A more general conclusion can be drawn from longitudinal content analysis and MCA. Each region uses all dimensions in their Twitter contents but strongly differentiates specific dimensions. Acquiring such results by the analysis gives a clue about specific isomorphic pressures on the ports.

Increasing a brand's presence and brand personality on social media can boost sales performance, and other financial and brand outcomes (Kumar and Mirchandani, 2012; Rapp et al., 2013). The digital presence of container seaports can be a promising research area for port managers and brand executives in container ports. Development of social media messages by considering their brand personality dimensions can help practitioners to interact with their target market and differentiate themselves. Container port organizations may gain from associating their brand with a certain personality. Port customers can differentiate between port brands based on their distinctive personalities. Moreover, customers can clarify the brand's image as it becomes personally more relevant.

Findings of the study have also some implications for the transport geography community. Branding is viewed as a geographical issue as it is related to spaces and places in addition to its communicative characteristic (Pike, 2009, 2011). Geography, on the other side, aims to find out the spatial order of things and their interactions. Based on such role of geography, seaports involved in transport networks emerge as critical spaces since they are one of the bases of these interactions (Rodrigue et al., 2013). Acting as an essential node in complex spatial system, seaports are expected to review their communication practices, in a broad sense, their branding efforts in order to achieve competitiveness. Through the detailed analysis of how seaports' brand personality dimensions change according to the geographical region, current outlook of the seaports activities as well as priorities for investment (connection to main shipping networks, hinterland connectivity etc.) and role of seaport in the overall development of the region can better be understood by the port management.

Ports have used several logistics arguments to promote their distinctive characteristics in their message content such as material flow, transport operation, infrastructure, information technology, inter-connectional and collaborative-related arguments that have been defined as common logistics layers by OECD (1992) and Bergqvist (2009). The parties such as transport-related institutes, policy makers, investors can also evaluate both spatial structure of their transport geography and strengths, weaknesses, opportunities, and threats of the region. In transport context, it is possible to identify strategic capabilities with the purpose of increasing or maintaining and sustaining competitive positions of the places. Place branding concept can open a different perspective for transport geography community in terms of designing the transport infrastructure, discussing the transport potential of the region in question. Transport policies, transport routes, networks can be planned or rearranged according to distinctive logistics attributes of the regions on a macro scale by analysing place images of the regions.



## 5. Limitations and recommendations for further research

This study has some limitations. Although 100 top container ports have been determined for the research sample, Twitter messages of only 50 ports with official Twitter accounts have been analyzed. Additionally, only English tweets have been involved in the analysis. However, the sample size and the inclusion of different regions may suggest common implications for those ports that had to be excluded from this study.

Compared to English spoken social media networks, there are a multitude of non-English language networks (such as CyWorld, Sina Weibo, VK, QZone, Taringa, Kuaishou, Baidu Tieba and Badoo etc.) with a huge market share outside of the United States, United Kingdom and other English-speaking nations. However, most of them do not offer any tool to researchers to collect the Big Data or do not offer any service to build corporate web pages so that companies can use them for branding efforts. In the meantime, the non-English social media networks may be examined in the future when they offer API service to collect the messages.

No difference has been found in the message trends of the ports within the periods. The time span may be extended to provide more comprehensive insights into message trends of the ports in the further studies.

Another limitation is that the research sample has included only container ports. However, the characteristics of port messages may differ across port types. Thus, this study can be extended to different types of ports (i.e. dry bulk, RO-RO, ROPAX, general cargo, cruise, or liquid bulk ports) to identify their brand personality dimensions.

The popularity of social media tools can vary from region to region. While social media users tend to use Twitter in some regions, Facebook may be more preferred in some other regions. In the meantime, future studies could investigate social media messages on different social media tools (Facebook, Instagram, Google Plus, YouTube, LinkedIn, etc.).

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