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En İnovatif Şirketler: Twitter'da Ne Söylüyorlar?

Most Innovative Companies: What Do They Apprise on Twitter?

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Abstract

The study aims to analyze how the World's Most Innovative Companies apprise themselves on the Twitter platform. To reach this aim, the data mining method is used. In the study, tweets published by the top 50 companies in the 2021 report of the World's Most Innovative Companies published by Forbes, were discussed as an example. Tweets contain the dates between 03.06.2021 and 10.06.2021. The tweets were evaluated through the Maxqda 20.04 program. According to 1200 tweets analyzed, the most frequently used words were new (12.2%), help (6.9%), and learn (6.7%). The most frequently used hashtags other than the companies' names were observed as #pride (10.3), #worldenvironmentday (5.8%), and #ai (5.2%). In the sentiment analysis which was performed on tweet contents, it was found that 39.1% of them were partially positive, 31% were positive, 25.1% were neutral, 4.1% were partially negative and 0.7% of them were negative. It is considered that this study, which is carried out on how businesses that want to take their place in the innovation world, share their "what" with the whole world and their stakeholders, whose innovation studies they follow, will be beneficial for the managers of companies trying to be innovative and academicians working in the field on innovation.

Keywords: Innovation, Semantic Analysis, Twitter, Innovative Companies, Forbes

Öz

Bu çalışma, Dünyanın En Yenilikçi Şirketlerinin Twitter platformunda kendilerini nasıl değerlendirdiklerini analiz etmeyi amaçlamaktadır. Belirtilen amaca ulaşmak için veri madenciliği yöntemi kullanılmaktadır. Çalışmada, örnek olarak Forbes tarafından yayınlanan Dünyanın En Yenilikçi Şirketleri 2021 raporunda yer alan ilk 50 şirketin yayınladığı tweetler değerlendirilmiştir. Söz konusu tweetler 03.06.2021 ile 10.06.2021 arasındaki tarihleri içermektedir. Tweetler Maxqda 20.04 programıyla değerlendirilmiştir. İncelenen 1200 tweet'e göre en sık kullanılan kelimeler, yeni (%12,2), yardım (%6,9) ve öğrenmek (%6,7) kelimeleridir. Şirketlerin kendi isimleri dışında en sık kullandıkları hashtag'ler ise #pride (10,3), #worldenvironmentday (%5,8) ve #ai (%5,2) dir. Tweet içerikleri üzerinde yapılan duygu analizinde %39,1'inin kısmen olumlu, %31'inin olumlu, %25,1'inin tarafsız, %4,1'inin kısmen olumsuz ve %0,7'sinin olumsuz olduğu tespit edilmiştir. İnovasyon dünyasında yer almak isteyen işletmelerin tüm dünya ve paydaşları ile "ne"lerini, nasıl paylaştıklarını, inovasyon çalışmalarını nasıl takip ettiklerini, araştıran bu çalışmanın yöneticilere, yenilikçi olmaya çalışan firmalara ve inovasyon alanında çalışan akademisyenlerin faydalı olacağı düşünülmektedir.

Anahtar Kelimeler: Inovasyon, Semantik Analiz, Twitter, Inovatif Şirketler, Forbes.

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1. INTRODUCTION

Innovation is the capacity that has the potential to transform organizations in today's world, from a start-up to the world's most expensive company, from a global brand to market leadership. It is an accepted basic element of competition and it is also the most important concept. Innovation is the development of a change that is new to an organization and its environment. In other words, innovation is beyond just developing new products.

Innovation, which is the driving and attractive force of change, is also a great competitive power for businesses. In other words, it has also the ability to transform individuals, organizations, and societies. Today, many global businesses which put innovation at the center of the company culture, are known as the most innovative companies in the world. They can become the largest companies in the world in terms of financial capital with their innovation capabilities. These companies systematically generate new ideas, as they see idea generation as a sine qua non of innovation, because of this they keep in touch with their customers and business partners and place a high value on their internal source of ideas. They also perceive innovation as a result of hundreds of contexts rather than just a word, and they try to be among the most innovative companies. The innovation races of many global companies are evaluated by various global research companies. Forbes and BCG which are the most known international evaluation institutions make evaluations about the most innovative firms every year. Forbes' evaluation includes only industries that are known to invest in innovation, excluding industries that have no measurable investment in R&D, so banks and other financial services, energy and mining whose market value is tied more to commodity prices than innovation firms don't make the list (Dyer & Gregersen, 2018).

With another point, how these companies express themselves to their stakeholders is especially important in the adoption and dissemination of innovations. For this reason, like many institutions and organizations, these companies also attach great importance to social media applications. Social media platforms like Twitter are a hub for sharing information and support (Almossa, 2021: 3). As known, Twitter was launched in October 2006, and grow into the worlds' largest microblogging service. Twitter, which is one of the important tools of corporate communication, has been of critical importance for companies in reflecting and creating these contexts in recent years. In this study, Twitter is selected for collecting data among other social networks. Because it has the world's largest network of users, can publish globally at any moment, allows users to generate content, is not designed exclusively for news releases, as opposed to other service providers, and allows the user to participate actively (Weller et al. 2014: 25). Also, it is more formal than other social media applications.

From this point of view, the study aims to determine in which components the World's Most Innovative Companies consider innovation on the road to innovation. It also focuses on examining how companies are known for their innovative products and services that shape competition express themselves on social media platforms that are heavily used by institutions and individuals. However, physical access to these companies was not possible due to pandemic conditions and economic and time costs. For this reason, it has been decided that the most objective and most economical way to reach these companies and obtain data is to access the content they have created. Therefore, the dataset of the study was created by accessing the official, publicly accessible Twitter accounts of these companies.

2. LITERATURE REVIEW

2.1. Innovation

Nowadays, "innovation" is one of the most popular concepts. Innovation is the driving force of the era and is, therefore, a strategic issue where companies and governments allocate resources. For this reason, innovation is at the center of many studies that try to define, classify and investigate its impact on the

performance of organizations, in different disciplines or interdisciplinary. The fact that there is a large number of studies on innovation has led to many definitions of innovation. The most general of these definitions is specified in the Oslo Manual 2018 that is published by OECD. Accordingly, innovation is a new or improved product or process (or a combination thereof) that differs significantly from the unit's previous products or processes and that has been made available to potential users (product) or brought into use by the unit or a process (OSLO Manual, 2018: 20). It also heard dozens of days in business, and its literature since 1960.

By the late twentieth century, the term innovation had become entangled with advancement, technological change, social change, and development across many strands of knowledge, across society, and personalized to the individual (Godin, 2008: 26). Studies conducted in these years mostly indicate the definition of innovation and its importance in development and competition for businesses and nations. As an example, Thompson's classic definition explains innovation as "generation, acceptance, and implementation of new ideas, processes, products or services" (Thompson, 1965: 36). According to Knight, innovation is the adoption of a change that is new to an organization and its relevant environment (Knight, 1967: 478). It is a tool that enables entrepreneurs to make changes to produce a different business or service, and it has the feature of being shown as a discipline, ability to learn, and practice (Drucker, 1985: 10). While innovation is frequently linked with the main product or process advances, the vast majority of successful innovations are based on the cumulative effect of incremental change in products and processes, or in the creative combination of current techniques, ideas, or methods (Tushman & Nadler, 1986: 75). Roberts expresses that innovation is the equal sum of the invention that covers all efforts aimed at creating new ideas and getting them to work, and exploitation that includes all stages of commercial development, application, and transfer, including the focusing of ideas or inventions toward specific objectives, evaluating those objectives, downstream transfer of research and/or development results, and the eventual broad-based utilization, dissemination, and diffusion of the technology-based outcome (Robert, 1988: 13). Freeman (1995: 16) states that innovation encompasses technical, manufacturing, design, management, and commercial activities, with the marketing of new or personalized products or the initial commercial use of new or improved processes or equipment. On the other hand, Verloop, states that innovation is an opportunity-oriented business process that can be inside or outside the business; indicated that it should be phased out (Verloop, 2004: 141). Barker perceived innovation as changing, taking risks, going out of the known region, and focused on the direction of innovation as a discipline of change (Barker, 2002: 16).

Innovation must have an element that creates difference or value, different from previous ones. Innovation is the result of innovation rather than itself; it refers to an economic and social system dependent on differentiation and change (Elçi, 2006: 1), and represent an important factor for social and economic change as well as for increasing competitive advantages at both the national and firm levels (Zoroja, 2016: 39). Fisk emphasizes the change aspect of innovation by stating that innovation requires seeing things differently, thinking different things, developing new insights, finding better ideas, and catching the best opportunities (Fisk, 2011: 133).

Innovation is a key factor to social and economic change, which implies new product–market–technology–organization combination (Cheng, et al. 2013: 2561). It is understood from these definitions that innovation is not just R&D; it is just as important are marketing, sales, commercialization, and production. In other words, it is the process of effective management of all activities from the formation of an idea to the market, unlike discovery, invention, creativity, and innovation, in which it includes innovations that create added value (Meesapawong et al., 2010: 312; Ramadani & Gerguri, 2011: 267; Wan et al., 2005: 262).

In addition to that innovation is the complex and often unpredictable combination of phenomena, facts, concepts, variables, constants, techniques, theories, laws, questions, goals, and criteria (Minor, 2011); and it reveals the idea, knowledge, new, novel, improved, product, process, benefit, beneficial, solution, and value to be among the terms that are recurrent in several definitions (Varadarajan, 2018: 151). But innovation isn't equal to any of these it is more than the sum of these words. Also, innovation is not only a new product or a new service so it can be defined as the successful conversion of new concepts and knowledge into new products, services, or processes that deliver new customer value in the marketplace.

Recent studies on innovation indicate that innovation depends on many factors; that innovations have social, sociological, and economic consequences; revealed that innovation refers to activities and relations, especially including collaborative/complementary and competitive/substitute relations, as well as the co-evolving nature of innovation ecosystems (Granstrand & Holgersson, 2020: 3). Salkovska et al. (2019: 80) specify that innovation has four component groups as market components of innovation of the company; functional/technological process advantage innovation components; consumption components of innovation, and its comparative advantages compared to analogous products, and the group of mission (ideological) components of innovation that measures the benefits of the innovative ideological mission that a particular innovation includes.

Belloso (2020: 1072), developed the characteristics of innovation as innovation attributes (relative advantage, complexity, cost-efficacy, and feasibility, evidence and compatibility, facilitators, and barriers, risk, trialability, relevance), organization characteristics (absorptive capacity/readiness for change, leadership, networking, norms and values, social climate, operational size and structure, training readiness), staff/individuals (culture, feedback on execution, skills, and experience, attitudes and motivation, client characteristic), and external influence/environment (external environment, policy, and regulation, financial incentives, social networks). As a result, it can be said that innovation is an output that is based on many different factors and formed with dynamic processes.

2.2. Social Media and Twitter

The internet network, which emerged at the end of the 20th century and has become widespread until today, both changed and caused various changes in the lives of individuals, organizations, states, and societies. This change, which started with Internet Web 1.0, became Web 2.0 technology has entered a critical period.

Web 2.0 is not only a version of Web 1.0. According to Sir Tim Berners-Lee, who is the inventor of the Web, says that "Web 1.0 was all about connecting people. It was an interactive space, and I think Web 2.0 is of course a piece of jargon, nobody even knows what it means. If Web 2.0 for you is blogs and wikis, then that is people to people. But that was what the Web was supposed to be all along. This 'Web 2.0' means using the standards which have been produced by all these people working on Web 1.0." in an interview for a podcast, published on IBM's website (Anderson, 2007: 5).

Web 2.0 is the term given to describe a second generation of the World Wide Web that refers to the transition from static HTML Web pages to a more dynamic Web that is more organized and is based on serving Web applications to users (Pal, 2012: 107). Web 2.0 created an interaction between the website and the user and enabled the creation of social media environments in the early 2000s. Its technologies are chat (one-to-one relationships (o2o), one-to- many-relationships (o2m), many-to-many relationships (m2m)), instant messaging (o2o, o2m), voice over IP (o2o, o2m, m2m), video conferencing systems (o2o, o2m, m2m); e-mail (o2o, o2m), mailing-lists (m2m), bulletin board systems (usenet, m2m), web-based discussion boards (m2m), blogs (o2m, m2m), video blogs (v-blogs)/photo blogs (o2m, m2m), group blogs (m2m), social network services (e.g. online dating and friendship services like MySpace,

Facebook o2o), social guides (o2m, m2m), mobile telecommunication (e.g. SMS and cellular phones; o2o, o2m), online rating, evaluation, and recommendation systems (e.g. Tripadvisor, eBay- and Amazon Market Place-user ratings, the listing of similar items at Amazon, o2m, m2m) (Fuchs, 2008: 99-105).

Web 3.0, which came after Web 2.0, is the web technology called "Semantic Web" but there is not a clear definition of it. Some believe that emerging technologies such as the Semantic Web will transform the way the web is used, and lead to new possibilities in artificial intelligence, based applications. Other visionaries suggest that an increase in Internet connection speeds, modular web applications, or advances in computer graphics will play a key role in the evolution of the new version of World Wide Web (Rajiv & Lal, 2011: 335). Multi-User Dungeons (MUDs) (o2o, o2m, m2m), MUDs Object-Oriented (MOOs) (o2o, o2m, m2m), graphical worlds (o2o, o2m, m2m), MMORPG (Massive Multiplayer Online Roleplaying Games, o2o, o2m, m2m) Synchronous groupware (collaborative real-time editing shared whiteboards, shared application programs, m2m) wikis (m2m), shared workspace systems (e.g. BSCW) (m2m), asynchronous groupware (m2m), knowledge communities (e.g. Wikipedia) are the technologies of Web 3.0 (Fuchs, 2008: 99-105). In summary, Web 2.0 created new media, and new media changed the rules of the game "all-around" in strategic communication (Argenti & Barnes, 2009: 3).

It can be said that the frequently used websites and mobile applications are almost products of Web 2.0 as Twitter, Youtube, Facebook, Instagram. They are also called social media applications that are a hub for sharing information and support. Twitter and Instagram are 2 of the most frequently used social media platforms (Graf, et al., 2020: 221). Twitter has now become a goldmine for organizations and individuals who have a strong political, social, and economic interest in maintaining and enhancing their clout and reputation with 186 million daily active users (Jianqiang, et al., 2018: 23253). One of the reasons for the popularity of the Twitter application is that users can easily share their feelings and thoughts about modern issues. It is possible to get people's insight from their profiles in contrast to traditional ways of obtaining information about perceptions by it (Hasan, 2018: 2).

3. Method

3.1. Sample

The main mass of the study consists of the "Most 50 Innovative Companies in the World" latest list, which is determined by Forbes[2] every year according to various criteria. The reason why the world's most innovative companies are determined as the main mass in the study is that innovation is not only limited to R&D, but is a concept consisting of many elements, especially with the cooperation of employees and customers, and the question is how these companies, which have managed to be the best in the world in such a complex subject, express the innovation to the components that make up the innovation. Accordingly, the official Twitter accounts of these 50 companies were analyzed. The name of the companies and their official accounts are listed in Table-1.

[2] https://www.forbes.com/innovative-companies/list/

Table 1. List of the Most Innovative Companies

Rank	Name of the Company	Name of Tweeter Account	Rank	Name of the Company	Name of Tweeter Account
1	ServiceNow	@ServiceNow	26	FleetCor Technologies	@FLEETCOR
2	Workday	@Workday	27	LG Household & Health Care	@LG_GoodLife
3	Salesforce.com	@salesforce	28	Ctrip.com International	@xmxiong
4	Tesla	@Tesla	29	Hermès International	@Hermes_Paris
5	Amazon.com	@mazon	30	Starbucks	@Starbucks
6	Netflix	@ netflix	31	Align Technology	@AlignTechInc
7	Incyte	@Incyte	32	Fast Retailing	@Fast_Retailing
8	Hindustan Unilever	@HUL_News	33	Ihs Markit	@IHSMarkitPMI
9	Naver	@matomenaver	34	Expedia	@Expedia
10	Facebook	@Facebook	35	Sirius XM Radio	@SIRIUSXM
11	Monster Beverage	@MonsterEnergy	36	Visa	@Visa
12	Unilever Indonesia	@UnileverIDN	37	Anheuser-Busch InBev	@abinbev
13	Adobe Systems	@Adobe	38	Keyence	@Keyence_Int
14	Celltrion	@CelltrionDream	39	Bard	-
15	Autodesk	@autodesk	40	Oriental Land	@Oriental_Land
16	Regeneron Pharmaceuticals	@Regeneron	41	Molson Coors Brewing	@MolsonCoors
17	Vertex Pharmaceuticals	@VertexPharma	42	Booking Holdings	@BookingHoldings
18	Amorepacific	@AmorepacificJ	43	China Molybdenum	-
19	AmerisourceBergen	@Healthcare_ABC	44	Intuitive Surgical	@IntuitiveSurg
20	Illumina	@Illumina	45	Baidu	@Baidu_Inc
21	Marriott International	@MarriottIntl	46	Mastercard	@Mastercard
22	Alexion Pharmaceuticals	@AlexionPharma	47	Falabella	@FalabellaAyuda
23	CP All	@cpall_7eleven	48	Dassault Systemes	@Dassault3DS
24	Red Hat	@Red Hat	49	General Mills	@GeneralMills
25	Tencent Holdings	@TencentGlobal	50	Roper Technologies	-

When the distribution of companies by regions is examined, it is seen that 62% of them are from North America, 26% of them are from Pacific Rim, 8% of them are from Western Europe, 2% of them are from Central Asia, and 2% of them are from South America. There is also no company from Eastern

Europe. When the sectors in which the companies operate are examined, it is seen that 28% of them are Software &Services, 14% of them are Retailing, 12% of them are Pharmaceuticals, Biotechnology & Life Sciences. The percentage of companies in the Food, Beverage & Tobacco, Health Care Equipment & Services, and Household & Personal Products sectors are 8%. The rate of Consumer Services is 6%. The percentage of companies in the Capital Goods, Commercial & Professional Services, Consumer Durables & Apparel, Food & Staples Retailing, Materials, Media, Technology Hardware & Equipment, and Automobiles & Components are same, they are %2.

But the account of Celltrion is protected; Amorepacific is Korean, CP All is Thai, Falabella is Chilean, Naver is Japanese. Any tweeter accounts have not been found for Bard, and China Molybdenum, and Roper Technologies. Ctrip.com did not write any tweets. Also, some companies are universal so they have some accounts of national/regional representatives. But in this study is only focused on the account of the company's headquarters or international accounts. Therefore, the sample of the study was limited to the tweeter accounts of 41 companies.

3.2. Data Acquisition

It was used a text-mining approach to analyze main patterns and extract meaningful relations inunstructured text data. In this study, Twitter is used as the source of data. The dataset is created from Twitter messages that were captured from June 3, 2021, to June 10, 2021. Tweets published by the World's Most Innovative Companies' official accounts. These accounts were accessed from Twitter's search application program interface as permitted by the platform's terms and conditions. Tweets, retweets, and replies were collected using MAXQDA 2020. Web Collector, which is a utility in MAXQDA, is used to capture the tweets for analyzing the sentiments about the companies.

3.3. Findings

The dataset was created from 1200 tweets in the specified date range. 470 of them are replies (51,7%), 111 of them are retweets (9,3%) and the others are tweets (39,0%). 95,6 % of tweets are English.

As it is known, innovation consists of many different elements related to each other such as new, team, experience, help, learning, detail, technique, study, thoughts, and sharing. Word Cloud was created based on frequency and percentage of words at tweets for better visualization of the results. When the word cloud created for innovation-related lexical frequencies is examined in the dataset, it is seen that the most frequently used 5 words in 1200 tweets are new (12.2%), help (6.9%), learn (6.7%), details (6.4%), and team (6.1%). The other frequently used words are from Figure-1.

Figure 1. Word Cloud of Tweets, Retweets, and Replies

In this direction, it can be said that these frequently used words are the words in the definitions of innovation. Also, the most innovative companies in the world whose Twitter accounts are examined see innovation as a part of organizational culture beyond being a mere word, and collaboration is the most important motivational tool for creating innovations.

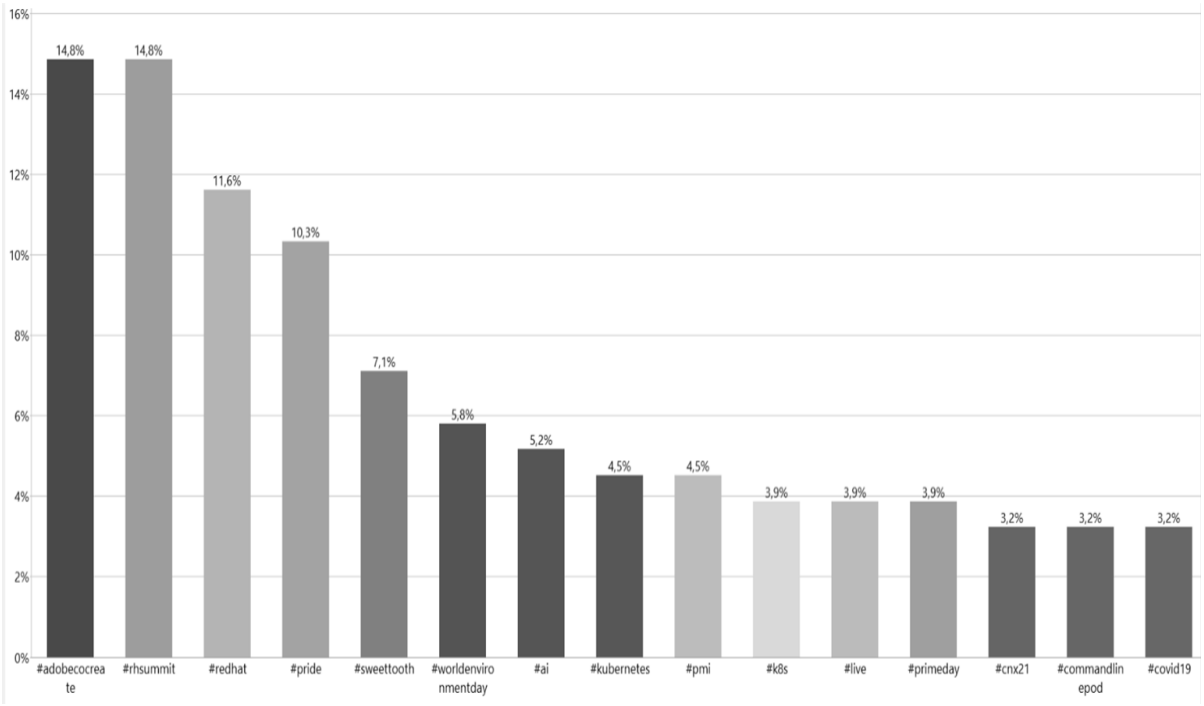
When the word cloud was applied only for tweets, the used words seen in Figure-2

Figure-2. Word Cloud of Tweets

According to Figure-2 the most used words are new (12,3%), learn (7,1%), world (5,5%), people (5,5%), and community (4,7%) at tweets.

The most frequently used hashtags other than the companies' own names observed as adobecreate %23, rhsummit 23, redhat %18, #pride (10.3), #worldenvironmentday (5.8%), #ai (5.2%), #pmi (4.5%), #primeday (3%). 9) and #covid19 (3.2%). The distribution of 1200 tweets according to the hashtags is as follows at Figure-3.

Figure-3. Frequencies of Hashtags



As seen from Figure-3, some of the hashtags are about organizations but other hashtags are about pride day, technology, and pandemic. It is seen that these ratios and hashtags are suitable with a word cloud. It can be said that the hashtag #pride is frequently used because of the pride marches in June when the data were created. In this direction these companies are sensitive to issues that employees and society care about; and also give importance to managing diversity.

The usage rates of the Twitter accounts and the number of followers of the companies included in the research were examined. Obtained data are in Figure-4 and Figure-5.

Figure-4. Activity of Accounts

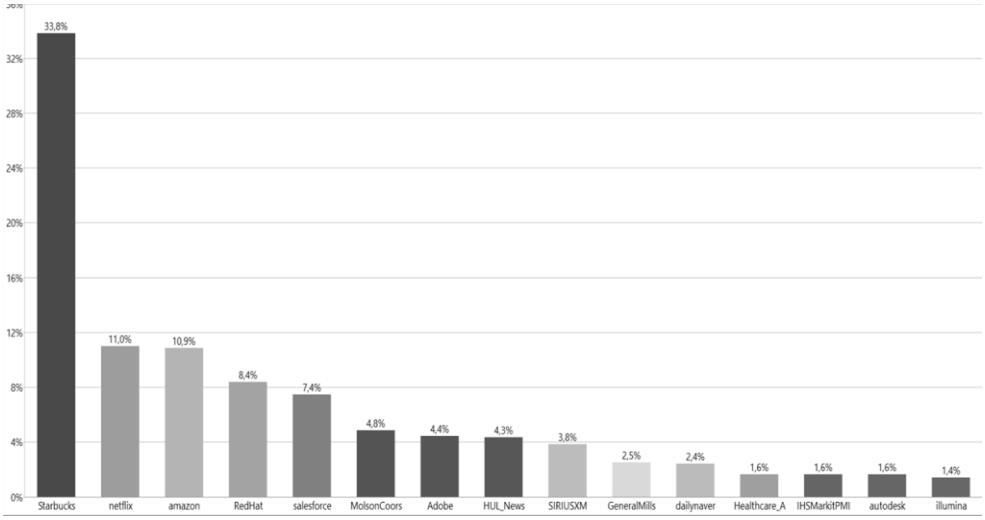
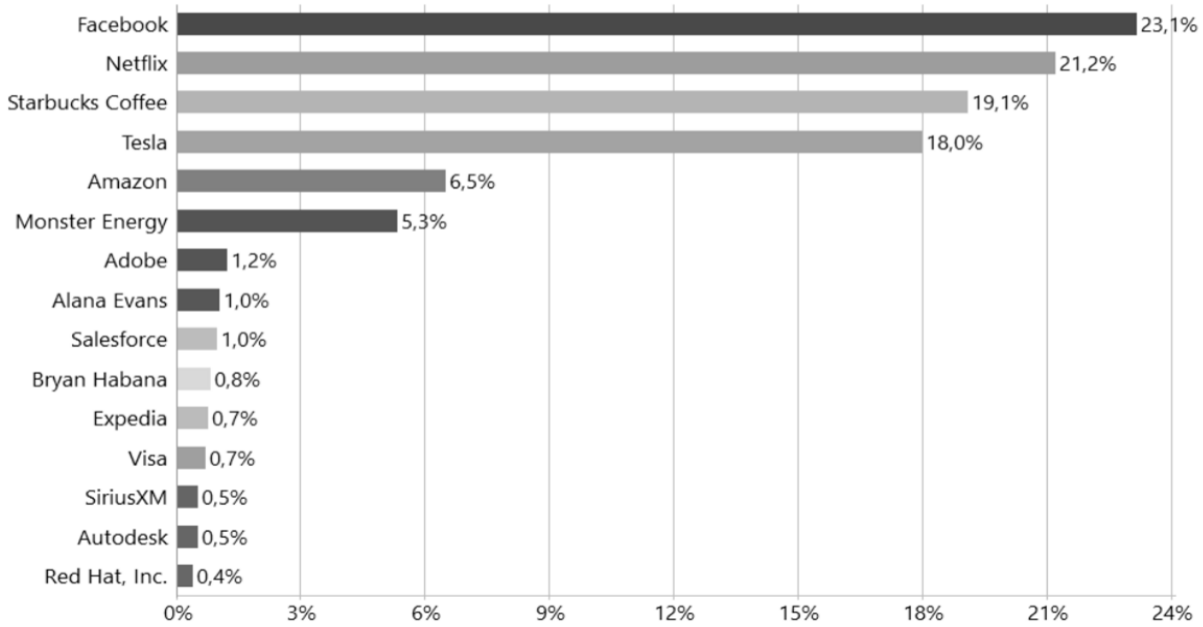


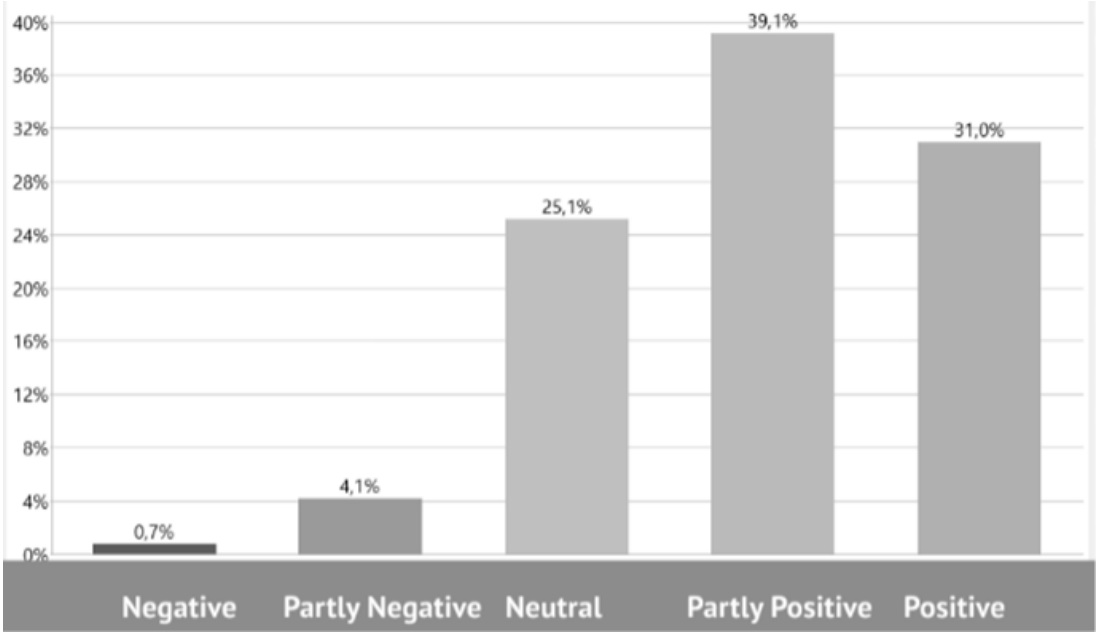
Figure-5. Number of Followers



According to Figure-4 and Figure-5, it can be said that the companies whose products are for individual customers use Twitter more efficiently than the other companies as seen from many followers, and tweets, and they use Twitter to reach individual customers, and they use official communication channels for corporate customers.

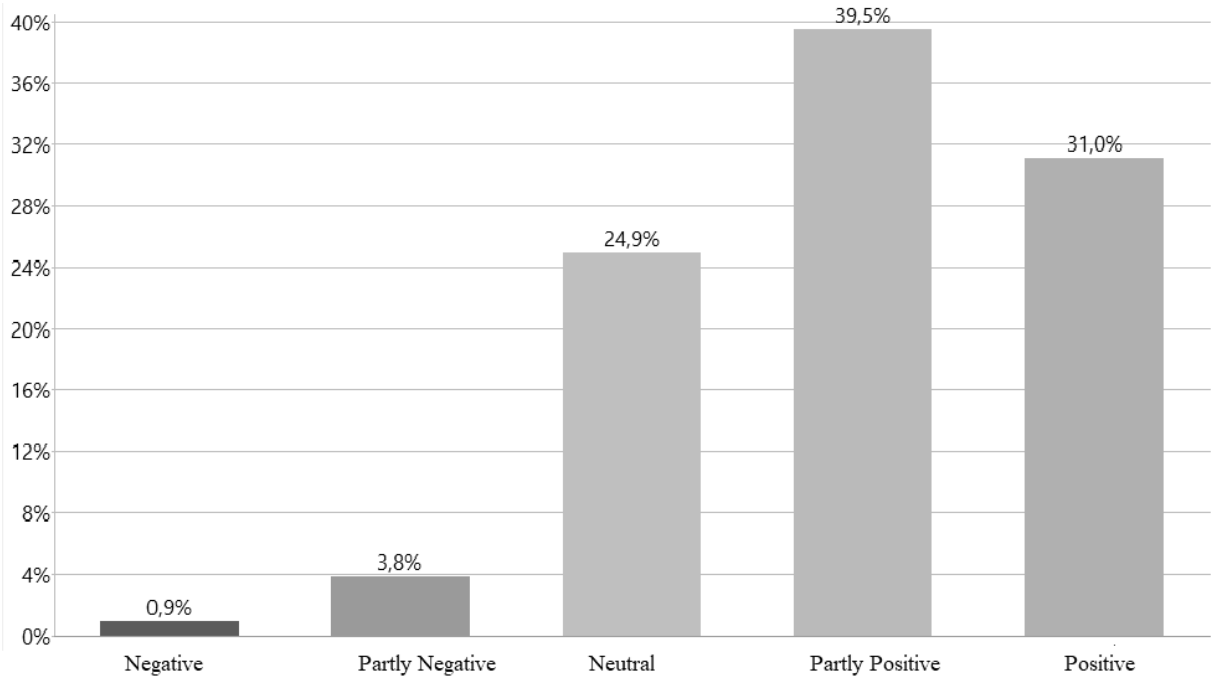
Sentiment analysis is used to analyze the emotions of tweets. As known, sentiment analysis analyses public opinions, viewpoints, attitudes, emotions, and evaluations (Kaurav, et al., 2021: 19). Sentiment analysis is widely preferred in analyzing people's views and feedback on brands, and services (Ainin et al., 2020). Figure-5 signifies the chart of tweets posted by companies.

Figure-6. Sentiment Analysis of Tweets, Retweets, and Replies



The chart highlights that a big number of tweets decoded "partly positive" and "positive" emotions. The rate of "negative" and "partly negative" tweets is quite low according to neutral, and positive tweets.

Figure-7. Sentiment Analysis of Tweets



It can be said that the result of semantic analysis of only tweets and tweets, replies, and retweets are quite close to each other.

4. RESULTS

This paper focuses on evaluating how the world's most innovative companies express themselves on social media, especially on Twitter. Innovation is sometimes accomplished by improving an existing idea, concept, or product. However, what's interesting is being able to think beyond what's already available and come up with a whole new concept. To achieve this goal, an organizational culture that attaches importance to cooperation with customers and employees, teamwork, values, culture, feedback, and communication is required. The reason why innovation attracts so much attention today is that the pace of change is increasing day by day. In an ever-changing global environment, strategic advantage can only come from being leaders of change rather than watchers, and innovation is the only way firms can become leaders of change. Looking at the companies covered in the research, it can be said that these companies are the world's leading companies in terms of financial size.

According to findings, it can be said that most tweets have positive emotions. This clue says that there is a positive correlation between companies and their followers. As seen from the word clouds "new" and "learn" are the keywords of innovation for these companies. They also include the most components of innovation and give importance especially the meaning of these words inside and outside the company, and consider the innovation ecosystem as a whole.

It can be said that the most innovative companies do not look at innovation from a single perspective; used Twitter as a means of expressing themselves; give importance to social media and also replies and see innovation as a part of organizational culture beyond just seeing it as an output and consider innovation from a holistic perspective.

But the accounts and websites companies that are from Pasicifc rim are not in English. IT can be guessed that their target audience is the Pasicifc rim region, and they prefer to sell especially individual innovations for local. In addition, it is seen that the word “pandemic” takes place in the word clouds. In this direction, it can be said that extraordinary situations such as the pandemic, which humanity has been struggling with since 2019, have triggered the emergence of innovations.

It is considered that this study, which is carried out on how businesses that want to take their place in the innovation world, share their "what" with the whole world and their stakeholders, whose innovation studies they follow, will be beneficial for the managers of companies trying to be innovative and academicians working in the field on innovation. The point to be underlined, to feel innovation is not only a destination, it is a process. In addition, especially SMEs need to be prepared for the technologies that will come with Web 4.0, and against turbulence, this will change the stakeholder expectations that will change and communication styles.

As it is known, the value of innovation and its adoption by the masses is proportional to the degree of the contribution it provides to its stakeholders. Therefore, the innovations developed to be the most innovative company in the world must have high material and moral added values. For this reason, the study is important in terms of determining what kind of content the World's Most Innovative Companies create on Twitter for their employees and customers, their perspectives on their stakeholders, what topics they care about, and the degree of interaction with their followers. The study is also significant in terms of revealing the common characteristics of the companies in question, apart from being innovative. The inclusion of only Twitter shares in the analysis can be considered as a limitation of this research. Even so, it has not been found such a study in the international literature about companies and innovation. This increases the importance of the study. The data obtained from this study are especially valuable for businesses, and public/private organizations. Therefore, the results obtained from these studies should be taken into account not only by academicians but also by businesses.

Social media data is a very important tool for businesses to express their thoughts, suggestions, and opinions about the business at the moment, and to analyze and understand their expectations and needs for the future. Social media accounts of more companies can be examined in future studies. In addition, the contents of different social media companies on different social media platforms should be examined. Therefore, the number of studies that are collecting data from social media should be increased.

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