How Large Information Technology Companies Use Twitter: Arrangement of Corporate Accounts and Characteristics of Tweets

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Abstract

Twitter is widely used by companies to reach various stakeholders, but how they use this social media platform is still unclear. To investigate how companies use Twitter, this study analyzes the content of the Twitter accounts of four large information technology companies, focusing on the arrangement of different Twitter accounts and on message characteristics (content, message elements, and communication strategies). The results show that companies used architectures of different Twitter accounts to serve various stakeholder groups. The companies' tweets covered diverse topics within the corporate, marketing, and technical communication domains. The tweets focused more on providing information and promoting action than on facilitating dialogue.

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Keywords

The transformation to Web 2.0 has significantly boosted the development of social networking sites (SNSs). More than 70% of Internet users use SNSs, and that percentage is only expected to grow (eMarketer, 2017). The increasing popularity of SNSs has transformed the way companies communicate with their stakeholders: Many companies have established corporate accounts on popular SNSs, such as Facebook, Twitter, LinkedIn, and Instagram, to get and stay in touch with relevant interest groups (Kaplan & Haenlein, 2010). Social media have become important elements of companies' internal and external communication strategies.

Culnan et al. (2010) argued that SNSs will only benefit organizations if they are carefully adopted and implemented, emphasizing the importance of a well-considered ("mindful") decision to align SNSs with other strategies and practices, a continuous attention to community building, and an absorptive capacity to listen to, learn from, and respond to stakeholders. Various types of insights could contribute to developing effective social media strategies: about the ways organizations are using SNSs, people's motives to visit and follow company SNSs, and the effects of accounts and posts on stakeholders. Because platforms differ in many respects, such insights might depend on the specific platform.

This article focuses on the way large information technology (IT) companies use Twitter. Having 321 million active users monthly, Twitter is one of the prominent social media platforms in business contexts (Culnan et al., 2010; Tao & Wilson, 2015). As a microblogging platform, Twitter enables users to post messages of up to 280 (originally 140) characters that can also contain links and pictures. Apart from actively contributing themselves, users can follow accounts, like messages, react to them, or share (retweet) them with others. Posts can be linked to larger discussions on the platform using hashtags (#) and to other Twitter accounts using public messages or mentions (@) (see Jones, 2014, for an account of how hashtags affect communication processes). Unlike Facebook, Twitter is an open community in which users can easily reach content provided by strangers. These characteristics make Twitter suitable for companies to disseminate information, build relationships, interact with stakeholders, and monitor public opinions.

We focused this study on large IT companies, which are forerunners in social media use, having higher adoption rates of SNSs than do other industries (Culnan et al., 2010; Veldeman et al., 2017). Investigating the adoption of SNSs from a technology acceptance perspective, Veldeman et al. (2017) found that large IT companies have higher expectations of SNSs' usefulness than do other types of companies—perhaps because of their familiarity with computer-mediated communication but also because their stakeholders are more active on social media. Among IT companies, we expected that large companies would show more sophisticated and elaborate usage of Twitter than would smaller companies. Xiong et al. (2018) found that company size affects the way companies adopt Twitter in their communication: Smaller companies with limited resources tend to use the platform less for marketing purposes and more for one-way communication. Xiong et al. (2019) came to similar conclusions.

Companies' Twitter use can be investigated in two ways: by analyzing the content of Twitter accounts or by interviewing or surveying professionals in organizations (cf. Iankova et al., 2019). In this article, we describe the design and results of a content analysis aimed at filling two gaps in the literature on how companies manage their Twitter accounts.

First, the way companies manage multiple Twitter accounts has not been systematically investigated. Various researchers suggest that companies strategically set up more than one Twitter account to effectively reach and engage different groups of stakeholders (Jansen et al., 2009; Jin & Huang, 2017; Li et al., 2013), but we know little about what companies actually do in this respect. The issue of multiple accounts is hardly acknowledged in research on the characteristics of companies' Twitter accounts. Therefore, in our study, we investigated how companies manage multiple Twitter accounts.

Second, we have no systematic and detailed knowledge about what companies specifically post on Twitter. Most of the available content-analytic research can be categorized in two types. The first type focuses on rather specific Twitter uses, such as the use of Twitter for communicating about corporate social responsibility (CSR; e.g., Araujo & Kollat, 2018; Gomez & Vargas-Preciado, 2016), customer services (Berry, 2018; Einwiller & Steilen, 2015; Page, 2014), public affairs (Gaither & Austin, 2016; Watts et al., 2019), or health promotions (Park et al., 2013). Other studies focus specifically on the presence of CEOs on Twitter (Capriotti & Ruesja, 2018; Yue et al., 2019). As a result, there is an emphasis on topics that are more or less prolific in some branches of the academic literature, but the

entire picture of Twitter use has never been sketched. The second type of research focuses mainly or exclusively on generic characteristics of Twitter posts, such as technicalities (e.g., tweet frequency, hashtags, retweets; Mamic & Arroyo Almaraz, 2013) and the use of engaging strategies (Lovejoy & Saxton, 2012; Rybalko & Seltzer, 2010; Watkins, 2017) or one-way versus two-way communication (Waters & Jamal, 2011). Only few studies provide coarse-grained indications of the actual content of organizational tweets (Swani et al., 2013; Tao & Wilson, 2015). Thus, in our study, we give a comprehensive overview of the way large IT companies use Twitter.

We formulated two research questions: (a) How do large IT companies arrange their accounts on Twitter? and (b) How do large IT companies use Twitter? In answering the second question, we focus specifically on three aspects of tweets: content, message elements, and communication strategies.

Earlier Research

Kaplan and Haenlein (2010) defined social media as "a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0 and allow the creation and exchange of user-generated content" (p. 61). They distinguished between six types of social media, of which SNSs are the most widely used. SNSs are applications that enable users to construct a public or semipublic profile, display their connection with others, and build and maintain connections (Boyd & Ellison, 2007). They offer interesting options for nonprofit organizations (e.g., Guo & Saxton, 2014; Lovejoy & Saxton, 2012) and private companies (e.g., Rybalko & Seltzer, 2010; Vernuccio, 2014).

Although it is hard to establish the real-world effects of using Twitter, several studies hinted at ways in which Twitter might benefit companies. Majumdar and Bose (2019) investigated the relationship between Twitter adoption and firm value and found that implementing Twitter can have a positive impact on companies' market value. In an experimental study, Li et al. (2013) found a relationship between features of a company's Twitter account and its corporate reputation. Kim and Youm (2017) showed that company-initiated and customer-initiated tweets affect analyst stock recommendations. In the same realm, Prokofieva (2015) concluded that corporate tweets, even when they contain information already available elsewhere, affect investors by attracting their attention and reducing information asymmetry.

People's Motives to Follow Companies Online

Research on people's motives to start following companies on SNSs, to continue doing so, and to spread companies' messages points in various directions, starting from theoretical perspectives as diverse as uses and gratifications theory (Azar et al., 2016; Gao & Feng, 2016; Muntinga et al., 2011), social identity theory (Jin & Huang, 2017; Zhao et al., 2016), the value-based adoption model (Zhao et al., 2016), and the theory of planned behavior (Logan, 2014).

All these studies explored the (correlational) relationship between predicting variables and people's behavior or behavioral intentions with companies' SNSs. Based on the significant relationships found between predictors and behaviors or intentions, these studies suggest several factors that make people inclined to follow companies online.

The first five factors are motivators, or reasons why people might decide to follow companies online. A first factor is information (Azar et al., 2016; Gao & Feng, 2016; Jin & Huang, 2017; Logan, 2014; Muntinga et al., 2011; Taylor et al., 2011; Zhao et al., 2016). People connect to companies' SNSs to find information that could be useful to them about, for instance, brands, products, or services. Muntinga et al. (2011) distinguished four subfactors to this factor: surveillance (staying up-to-date), knowledge, prepurchase information, and inspiration (getting new ideas). A second factor is entertainment (Azar et al., 2016; Gao & Feng, 2016; Jin & Huang, 2017; Muntinga et al., 2011; Taylor et al., 2011). People use companies' SNSs to have a good time. Muntinga et al. (2011) mentioned the subfactors enjoyment, relaxation, and pastime. A third factor involves rewards (Azar et al., 2016; Muntinga et al., 2011). People are inclined to use companies' SNSs if they expect to get rewards from them (e.g., discounts, goodies, or sweepstakes). A fourth factor involves identification (Gao & Feng, 2016; Jin & Huang, 2017; Kim et al., 2014; Muntinga et al., 2011; Taylor et al., 2011). People connect with companies' SNSs when they feel a strong link between their personal identity and the brand, products, or services. Muntinga et al. (2011) further distinguished self-expression, self-presentation, and self-assurance as subfactors, and Gao and Feng (2016) distinguished self-expression and impression management as subfactors. A fifth factor is connectedness (Azar et al., 2016; Gao & Feng, 2016; Jin & Huang, 2017; Kim et al., 2014; Muntinga et al., 2011; Zhao et al., 2016). People use companies' SNSs as opportunities to interact with the company (responsiveness) or other followers.

In addition, the studies identify two factors that might make people reluctant to follow companies online. The first is the conglomerate of trust, reliability, privacy, and invasiveness (Azar et al., 2016; Kim et al., 2014; Taylor et al., 2011; Zhao et al., 2016). People might refrain from using companies' SNSs when they doubt their trustworthiness or reliability or fear privacy violations. The second is ease of use (Logan, 2014). People might decide not to follow companies online when they think doing so will be difficult.

People's motives might differ between different types of SNSs (Logan, 2014). On Twitter, for example, people tend to follow companies to satisfy their need for information whereas on Facebook they tend to follow companies to hear about others' experiences. So the content companies post on their Twitter accounts is quite important (Verhoeven et al., 2012).

Corporate Use of Twitter

With the rise of Twitter, many researchers started to investigate how organizations incorporate this SNS into their communication strategy. In their studies, three main themes emerged: content of Twitter accounts, message elements (mainly technicalities such as the use of hashtags, videos, and images), and communication strategies (mainly the conglomerate of interactivity, two-way communication, and community building). A central underlying conclusion appears to be that companies do not fully benefit from the affordances of Twitter, so the professionalism of strategically setting up and managing corporate Twitter accounts can be much improved. Here is an overview of the research on each theme.

Content of corporate Twitter accounts. Instead of sketching an overall view of how Twitter is used, researchers predominantly focused on specific communication domains. Sometimes they offered new and surprising insights. Einwiller and Steilen (2015), for instance, drew attention to the changing nature of handling complaints, which in Twitter are visible to the public, partly replacing the private negotiations of the past. Schneiker et al. (2019) observed that controversial organizations use Twitter's informality and low threshold of disseminating information to distract from their business and come across as normal citizens. But most researchers used the Twitter environment to contribute to broader and more traditional discussions in the literature.

So far, considerable attention has been paid to the use of Twitter for CSR communication. Araujo and Kollat (2018) reported the importance of CSR

communication on Twitter, finding high levels of endorsement (likes) and diffusion (retweets) for CSR messages and even such (halo) effects for the Twitter account as a whole. Gaither and Austin (2016) examined people's reactions to different CSR types, finding that people are critical about company tweets highlighting positive initiatives in areas for which the company's products or production processes are known to make negative contributions. Gomez and Vargas-Preciado (2016) and Tao and Wilson (2015) drew attention to the low proportion of CSR-related tweets on corporate accounts. And Suárez-Rico et al. (2018) conducted a study that attempted to explain the amount of attention paid to CSR in corporate tweets. Their study had two significant findings: Companies operating in sensitive industries and companies whose CEOs have shorter tenures post more tweets about CSR. These studies all developed and used various ad hoc categorizations of CSR tweets.

Other researchers tried to make sense of the content of Twitter accounts from different perspectives. Einwiller and Steilen (2015) focused on the handling of complaints and used a rather specific categorization of possible strategies companies use in deliberating customer complaints, concluding that the strategies that customers find more satisfying are used less often. Likewise, Page (2014) and Berry (2018) characterized typical elements of corporate apologies in reaction to customer complaints. Xiong et al. (2019) investigated the financial reporting of companies on Twitter, differentiating between various types of financial information, and warned that the use of Twitter for opportunistic financial disclosures is on the rise. Park et al. (2013) analyzed health-related messages on Twitter, focusing on guidelines for effective health messages, showing that health organizations predominantly focus on simple language use but often do not comply with other guidelines (e.g., making important things stand out). Yue et al. (2019) investigated CEO tweets, using a coding scheme focusing on leadership, with a lot of emphasis on CEOs' personal life and vision. They found many differences between CEOs of Fortune 200 companies and those of top start-up companies. And Watts et al. (2019) studied the Twitter accounts of tobacco companies from a public affairs perspective, mainly highlighting how these firms try to influence government policy and use CSR to bolster their reputation.

But comprehensive analyses of the content of company tweets are lacking. Swani et al. (2013) and Tao and Wilson (2015) offered starting points with sets of rudimentary, nonexhaustive main categories. In our study, we tried to fill in this gap in the literature by analyzing how the domains of corporate, marketing, and technical communication are represented in the

tweets of large IT companies. In corporate communication, Twitter can be used to build and maintain relationships with stakeholders (Shin et al., 2015) and to promote the company's image or reputation (Vernuccio, 2014). In marketing communication, Twitter can be used to attract consumer attention (Kwon & Sung, 2011) and promote word of mouth communication between consumers (Jansen et al., 2009). Kaplan (2012) proposed that firms use mobile SNSs for marketing research and sale promotions, and Taylor et al. (2011) highlighted the effectiveness of SNS advertising. And in technical communication, technology companies can use Twitter to provide user support (see Lam & Hannah, 2016, for an overview of how Twitter is used for technical support). Regarding the prevalence of the domains, Verhoeven et al. (2012) found that organizations' social media strategies are largely controlled by their public relations department, followed by their marketing and customer service departments. As a result, the corporate communication perspective might dominate the marketing and technical communication perspective.

Message elements. Several studies focused on message elements used on corporate Twitter accounts. Specifically, they analyzed the use of hashtags (#), public messages (@), hyperlinks, and visuals. In addition, Page (2014) drew attention to the use of emoticons. Guillory and Sundar (2014) assumed that links and video content contribute to the functional interactivity of tweets. Araujo and Kollat (2018) showed that the presence of links, hashtags, and images or videos indeed corresponds to more likes and retweets. Content analyses, all conducted more than 5 years ago, suggest that the inclusion of such elements cannot be taken for granted, with relatively high percentages for hyperlinks (60–68%) and hashtags (30–55%) and lower percentages for public mentions (16–18%), pictures (3–14%), and videos (2–9%; Lovejoy et al., 2012; Mamic & Arroyo Almaraz, 2013; Swani et al., 2013). In our study, we tried to update these findings in the specific context of large IT companies.

Communication strategies. A major discussion in the literature about companies' communication strategies for using Twitter involves the conglomerate of interactivity, two-way communication, and community building. The literature generally agrees that it would be wasteful to limit the use of Twitter to just broadcasting messages, and several studies confirmed the usefulness for interactivity, two-way communication, and community building, suggesting that its main function is engaging and involving people (Guillory & Sundar, 2014; Li et al., 2013; Saffer et al., 2013; Saxton & Waters, 2014; Watkins, 2017).

But some studies have more nuanced findings. Araujo and Kollat (2018) did not find different effects for the strategies of engaging people versus broadcasting messages, and Saxton and Waters (2014) found that despite a preference for dialogical messages, people are more likely to share one-way messages with others. Many content analyses found that companies do not optimally use the dialogical possibilities of Twitter on their accounts (Capriotti & Ruesja, 2018; Gomez & Vargas-Preciado, 2016; Lovejoy & Saxton, 2012; Rybalko & Seltzer, 2010; Shin et al., 2015; Waters & Jamal, 2011; Yue et al., 2019). Lovejoy and Saxton (2012), for instance, analyzed 100 nonprofit organizations' tweets and identified three communicative functions: information, community, and action. The information function involves tweets that merely inform people about the organization or its products and services, the community function involves tweets that interact with people to build an online community, and the action function involves tweets that encourage and mobilize people to act for or on behalf of the organization. In this study, we explore whether the dominance of one-way asymmetrical communication also applies to the Twitter accounts of large IT companies, using as our framework Lovejoy and Saxton's three communicative functions of information, community, and action.

Method

We used content analysis to answer our two research questions. We analyzed a corpus of tweets from large IT companies using a coding scheme based on current research (deductive approach) complemented with bottom-up insights that emerged when analyzing the individual tweets (inductive approach; cf. Potter & Levine-Donnerstein, 1999). Because we wanted to get a detailed view on the companies' Twitter activities, including their management of different Twitter accounts, we used a limited sample of four large IT companies. To ensure the reliability of our findings, we included an intercoder reliability assessment in our procedure.

Corpus

To focus on large IT companies' use of Twitter, we selected four companies from the top 10 of the Fortune 500 technology and telecommunications companies, excluding companies without an account (Apple), online stores (Amazon), and social media companies (Facebook). To be able to analyze the companies' arrangement of different accounts, we selected companies

Table 1. Overview of the Corpus of Accounts and Tweets.

Company	Number of Accounts	Number of Verified Accounts	Number of Tweets in Week 1	Number of Tweets in Week 2	Total Number of Tweets
IBM	38	16 (42%)	1651 (31%)	1315 (25%)	2966 (56%)
Microsoft	39	38 (97%)	636 (12%)	773 (15%)	1409 (27%)
HP	18	14 (78%)	212 (4%)	323 (6%)	535 (10%)
Intel	13	13 (100%)	221 (4%)	146 (3%)	367 (7%)
Total	108	81 (75%)	2720 (52%)	2557 (48%)	5277 (100%)

that had at least 10 accounts. This process resulted in the following companies: Hewlett-Packard (HP), IBM, Intel, and Microsoft.

Using the company names as search terms, we gathered all the Twitter accounts of these four companies and then filtered the results using the Account/People tab to ensure that only company-owned accounts were included in the sample. Some accounts were verified as official accounts, but others were not. When an unverified account systematically posted the company's official information and presented a link to the company's official Web site on its profile page, we labeled it as an "unverified official account" and included it in the sample. To keep variations of different regions and cultures from being a factor, we only used accounts targeting international followers, excluding accounts for specific countries (e.g., Microsoft India or Microsoft UK).

Many tweets contained links to materials outside the Twitter platform (e.g., a report about current technology developments and future trends, an e-book about the company's products and services, or a webinar discussing new features of the latest software version). Because these links might clarify the tweet content, we followed each link, read its material, and included its content in the analysis. We collected data over two weeks: The first week was from January 10–16, 2018, and the second week was from April 18–24, 2018. We included all tweets posted during these two weeks, which resulted in a total of 5,277 tweets (see Table 1 for an overview).

Coding Scheme

To analyze all the tweets, we constructed a coding scheme with three main categories based on and adapted from previous research. Each tweet was analyzed concerning its content, message elements, and communication strategy. We did an open-coding process of one week's tweets from our

sample companies in order to check the suitability of previous codes and complete the coding scheme with emerging categories. The tweets we used for developing our coding scheme were not part of the actual tweets we analyzed in the main research.

For the content of the tweets, we started by distinguishing between corporate, marketing, and technical communication but discovered that we also needed to account for combinations of those domains. For each main category, then, we defined potential subcategories based on the literature but also inductively defined subcategories based on our analysis of the tweets.

For the message elements of the tweets, we focused on any deviation from plain text. As a result, we coded the following features: navigation hyperlinks, hashtags (#), public messages (@), visuals (e.g., photos, videos, and infographics), and emojis.

And for the communication strategies of the tweets, we used the framework developed by Lovejoy and Saxton (2012). Earlier research (e.g., Guo & Saxton, 2014) confirmed this framework's usefulness for understanding the extent to which companies use Twitter to engage with relevant interest groups. The framework consists of three main categories—information, action, and community—and 11 subcategories. We used the subcategories as a starting point but inductively created new subcategories when needed.

Coding Procedures and Intercoder Reliability

Two coders independently coded a random sample of 150 tweets. These 150 tweets were selected from the sample companies but were not part of the actual tweets that we analyzed in this study. We selected at least three sample tweets from each subcategory to ensure both coders checked all subcategories. Using the codebook, they coded each tweet for its content, message elements, and communication strategy. Some tweets appeared to provide more than one type of content. For instance, some tweets had a combination of corporate and technical content. In such cases, the coders double coded or triple coded them. After two rounds of coding, the intercoder reliability was 0.95 for the main content categories, 0.88 for the subcategories, 0.92 for the message elements, and 0.87 for the communication strategies.

Results

We will first describe the results regarding the companies' arrangement of different Twitter accounts. After that, we will present the results on the

message level, focusing on content, message elements, and communication strategies, respectively.

Corporate Accounts on Twitter

All four companies used multiple accounts to shape their presence on Twitter. Compared to Intel and HP (13 and 18 accounts, respectively), IBM and Microsoft (38 and 39 accounts, respectively) had many different accounts. The differences are not attributable to the number of main categories per company but rather appear to reflect the number of accounts per main category. Table 2 gives an overview of all the different Twitter accounts that we found in our analysis.

Although at first sight, we might assume that the large number of different Twitter accounts per company would obscure stakeholders' view of which accounts to follow, the majority of the accounts (68%) focused on either specific products (49%) or stakeholders (19%), both of which reflect a strong, easily recognized focus on the needs of self-identifiable stakeholder groups. The remaining accounts largely followed conventions in the way that organizations present themselves to the outside world, focusing on, for instance, job seekers, journalists, people with interests in public affairs, or people interested in social and environmental issues. As such, our findings underline the assumption that having an architecture of different Twitter accounts helps companies to optimally connect with a diversity of stakeholders (Jansen et al., 2009; Jin & Huang, 2017; Li et al., 2013). Corporate communication and technical communication are better represented in the various accounts than is marketing communication.

Content of Corporate Tweets

As Table 3 shows, three main categories, two combinations of main categories, and 18 subtypes of content emerged from the coding process. The most frequent main category was corporate communication (35%), followed by technical communication (30%) and marketing communication (19%). The remaining tweets (16%) involved combinations of main categories.

Within corporate communication, we distinguished eight subcategories. The most frequent subcategory was community relations (9%), which involved building relationships with stakeholders by sending greetings, offering entertaining items (e.g., quizzes and games), and promoting community activities (e.g., inviting people for an in-person gaming activity in

Table 2. Overview of Different Twitter Accounts Used by the Four Companies.

Type of account	Example	Total	HP	IBM	Intel	Microsoft
Service and products	IBM Storage, Microsoft Excel	51 (47%)	3 (17%)	21 (55%)	8 (62%)	19 (49%)
Stakeholders	HP Developers, Microsoft Partner	20 (19%)	3 (17%)	7 (18%)	1 (8%)	9 (23%)
News	IBM News Room, HPE News	7 (6%)	3 (17%)	2 (5%)	1 (8%)	1 (3%)
Region and policy	Microsoft Europe, IBM Policy	6 (6%)	0 (0%)	1 (3%)	1 (8%)	4 (10%)
CSR	HP Sustainability, IBM Accessibility	5 (5%)	2 (11%)	1 (3%)	0 (0%)	2 (5%)
Main	IBM, Microsoft	5 (5%)	2 (11%)	1 (3%)	1 (8%)	1 (3%)
Human resources	Jobs at Intel, HP Careers	4 (4%)	2 (11%)	1 (3%)	1 (8%)	0 (0%)
User support	Microsoft Support, HP Support	4 (4%)	1 (6%)	2 (5%)	0 (0%)	1 (3%)
Lab and research	IBM Research, Microsoft Research	3 (3%)	1 (6%)	1 (3%)	0 (0%)	1 (3%)
Technical documentation	IBM Redbooks, docs.microsoft.com	2 (2%)	0 (0%)	1 (3%)	0 (0%)	1 (3%)
Event	HPE Discover	1 (1%)	1 (6%)	0 (0%)	0 (0%)	0 (0%)
Total		108 (102%)	18 (102%)	38 (101%)	13 (102%)	39 (102%)

Note. Percentages total more than 100% due to rounding.

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Table 3. Content of Company Tweets.

Content Category	Examples	Frequency (Percentage)
Corporate communication		1827 (35%)
• Community relations	"Engage in a hands-on robotics experience at STEM Saturdays. Walk-in, FREE activity at your nearest @MicrosoftStore on any Saturday in April. @Hacking_STEM @MicrosoftEDU #STEM https://bit.ly/2Ji1Wzl"	473 (9%)
• Corporate social responsibility	"Today we celebrate Dr. Martin Luther King Jr.'s legacy and honor his enduring message of equality, opportunity, and service to others with a day of service. Proud of all our employees who are giving back and making a difference in their communities."	352 (7%)
• Research and development	"At our booth at #CES2018 we are demonstrating #VR powered by Intel that allows viewers to experience the thrill of downhill skiing, ice skating, or snowboarding as if they were actually there. #PyeongChang2018"	310 (6%)
• Business insights	"Will G-Commerce Disrupt Gift Delivery? (via @forbes) http://ibm.co/2EscmJX#Watson Commerce"	250 (5%)
• Partner relations	"IBM and shipping giant Maersk have formed a new #blockchain company for tracking international cargo https://www.bloomberg.com/news/articles/2018-01-16/ibm-maersk-form-new-blockchain-company-for-international-cargo . . . via @business"	176 (3%)

Table 3. (continued)

Content Category	Examples	Frequency (Percentage)
• Human resources	"@HPE we are bringing together the brightest minds to create breakthrough technology solutions that advance the way people live and work 🤳 Join our Sales Graduate Rotational Program & take UR career to the next level ☞ http://hpe.to/6011 DbM67"	122 (2%)
• Corporate achievements	"We're honored to be recognized on @Forbes' list of World's Most Reputable Companies for the 10th year running. We dedicate ourselves to that same commitment to excellence for the next 10!"	83 (2%)
• Government relations	"We joined more than 115 businesses urging Congressional leadership to act now and pass a #DACA fix by Jan 19. Here are some of @IBM's #Dreamers telling their own stories:"	62 (1%)
Technical communication		1604 (30%)
• Information on specialized topics	"9 great articles you might have missed about data management"	962 (18%)
• User instructions	"Easy steps to change Microsoft Edge home page: http://msft. social/C6Od2n"	478 (9%)
• Updates and feedback	"#AppService and Functions hosted apps can now update TLS versions! Find out more"	164 (3%)
Marketing communication		1009 (19%)
• Commercial advertising	"Take every moment an adventure! Hold on to those great memories with the HP ENVY Photo printer and Instant Ink. #ReinventMemories http://hp.tl/ 6008DKWmm"	507 (10%)

Table 3. (continued)

Content Category	Examples	Frequency (Percentage)
• Successful business cases	"Real stories of service providers who are transforming their business and disrupting the market with #IBMAnalytics: http://bit.ly/2Ac5nmO"	286 (5%)
• Product launch	"Check out these 5 new product launches from @HP! http://hp.tl/6015DwunL#KeepReinventing"	86 (2%)
• Sales promotions	"Try #IBM #MaaS360 free for 30 days and breed customer confidence in your #security offering. Exploit the cognitive power of #Watson to prevent attacks on your clients' devices before they can have an effect. http://bit.ly/2sJfH6v"	71 (1%)
• Word of mouth	"@anandtech says Intel #Optane SSD 900P is so reliable it's 'almost taken all the fun out of testing a #SSD.' http://intel.ly/2ERCM95"	59 (1%)
Corporate, technical, and marketing communication		512 (10%)
• Business insights, commercial advertising, info on specialized topics	"Learn how an #IBM partnership can leverage the latest #cognitive technology to solve complex #business problems http://bit.ly/2tVpZQI"	
Corporate and technical communication		325 (6%)
• Business insights, communication about technical or specialized topics	"AI is driving digital transformation and is fast becoming a staple of modern marketing organizations: http://ibm.co/2HoW4UW#WatsonMarketing"	

their local store). The second subcategory was corporate social responsibility (7%), which mostly involved activities that go beyond the companies' self-interest: for instance, removing barriers for disabled people, providing

support for social equality and diversity, or protecting the environment. The third subcategory was research and development (6%), in which companies showcased their latest products and technologies or published research findings from their labs. The fourth category was business insights (5%), in which companies shared business-related knowledge, such as how to improve customer loyalty or create brand awareness. The fifth category, partner relations (3%), covered tweets about companies' alliances and collaborations with other parties (e.g., joining other companies to establish a new company or introducing partners in manufacturing). The sixth subcategory, human resources (2%), focused on the companies as employers, providing information about recruitment and corporate working environments and sharing employees' career experience. The seventh subcategory, corporate achievements (2%), announced noteworthy achievements, such as being recognized as most reputable company or getting a high score on relevant rankings. The last subcategory, government relations (1%), involved the companies' public affairs efforts, informing people and influencing lawmakers about legislation and public policy (e.g., safe transportation policies concerning driverless cars, fair immigration processes, or clear operational guidelines for drones).

Within technical communication, we distinguished three subcategories. The most frequent subcategory was information on specialized topics (18%), which focused on technological developments and their implications (e.g., describing how artificial intelligence [AI] and mixed reality will shape the future of learning or how self-driving vehicles can make life easier, providing demos for new products and applications, and sharing programming knowledge for developers). The second subcategory involved user instructions (9%), in which tweets provided step-by-step procedural and operational information on, for instance, how to install and get started with a product. The third subcategory, updates and feedback (3%), used the platform's interactivity and timeliness to solicit users' feedback on products or manuals or to notify them about software updates and fixes.

Within marketing communication, we distinguished five subcategories. The most frequent subcategory was commercial advertising (10%), which involved persuading followers to purchase certain products or services. The second subcategory, successful business cases (5%), included customer stories of how the company's products helped them to achieve their goals. The third subcategory, product launches (2%), announced new products in the market. The fourth subcategory, sales promotions (1%), contained short-term incentives (e.g., coupons, discounts, or free trials) to encourage purchases. The last subcategory, word-of-mouth (1%), included recommendations about

companies' products and service from satisfied customers or professional agents (e.g., a computer magazine praising the speed and performance of a laptop or customers stating that certain products are easy to use).

We found two combinations of main categories. The first was a combination of corporate, technical, and marketing communication (10%), in which companies shared business and management strategies, talked about the latest technologies, and simultaneously promoted their associated products and service. Such content was usually linked to an external article, report, or study giving more detailed descriptions. For example, one of the companies first introduced the importance of brand awareness, then gave a detailed analysis of how brand awareness can be improved through applying the Internet of Things (IoT), and ended by promoting its IoT-related service.

The second combination, corporate and technical communication (6%), resembled the previous one in that it connected technical and business knowledge, but the tweets in this combined category did not explicitly attempt to promote the companies' products. For instance, a company connected background information about AI with an explanation of how AI will change the marketing landscape of organizations. Tweets in this category, then, did not address specific products but focused more on the industry as a whole.

Message Elements

For our analysis of the message elements in company tweets, we used a subsample of the total number of tweets. In many cases, the IT companies reused or passed on information from other accounts without adding any new elements to their retweets. These retweets functioned as recommendations of the original author's information, including content and communication strategies, but did not add any new message elements; therefore, we only included original tweets posted by the companies themselves in our analysis, which amounted to 4,068 tweets (77%). Table 4 gives an overview of the message elements found in this subsample of tweets.

Most tweets included navigational hyperlinks (88%), hashtags (87%), and visuals (84%). Public messages (26%) and emojis (9%) were considerably less prevalent. Within the visuals, infographics and photos were most often used; other types of visual elements were much less popular.

Communication Strategies

Table 5 lists the frequency of the communication strategies used in the 5,277 tweets in our sample. The broadcasting of information, merely

Table 4. Message Elements in Company Tweets.

Message Element	Frequency
Navigation hyperlinks	3600 (88%)
Hashtags (#)	3530 (87%)
Visuals	3409 (84%)
Infographics	1489 (37%)
Photos	1075 (26%)
Graphics	285 (7%)
Live streaming video	186 (5%)
GIFs	173 (4%)
Videos	111 (3%)
Screenshots	85 (2%)
Memes	5 (0%)
Public messages (@)	1043 (26%)
Emojis	353 (9%)

Note. Only original tweets of the companies are included here ($n = 4{,}068$ tweets).

informing the public about internal and external activities and developments, was the most prevalent communication strategy in the IT companies' tweets (53%). But a considerable number of tweets (40%) were action oriented. The most common action involved promoting events, followed by selling products or services, providing instructions, offering downloads or updates, and calling for feedback (by commenting or filling out a survey). The least prevalent communication strategy focused on community (7%). These tweets, which were aimed at facilitating a dialogue with followers and creating and maintaining an online community, often solicited responses and sometimes responded to public messages.

Discussion

This study has explored the way that large IT companies use Twitter by analyzing the Twitter accounts and tweets of four large IT companies. Our first main finding is that the IT companies managed large numbers of different Twitter accounts in an apparently meaningful way, confirming the practicality of the advice given by Jansen et al. (2009), Jin and Huang (2017), and Li et al. (2013) that companies should strategically arrange an architecture of different Twitter accounts to optimally reach their various stakeholders. All four companies differentiated between Twitter accounts in a way that largely focused on stakeholders.

Table 5. Communication Strategies in Company Tweets.

Communication Strategy	Example	Frequency
Information	"IBM Releases Tools to Outsmart Machine Learning https://www.esecurityplanet. com/news/ibm-releases-tools-to-trick-machine-learning-at-rsa-conference. html"	2792 (53%)
Action		2093 (40%)
Promoting events	"Are you a developer? Hone your craft with Clint Byrum at #indexconf, Feb. 20-22, 2018 in San Francisco: http://spr.ly/ 6010Dz10K"	768 (15%)
Selling products or services	"Embrace the #MaaS360 Unified Endpoint Management platform and see why it's great news for service providers. http:// bit.ly/2eNyeli"	655 (12%)
Providing instructions	"http://msft.social/2PwmoE - See how to use #VSTS to build your assets in source control & automate deployment to one or many environments."	509 (10%)
Offering downloads or updates	"Yes, you CAN take it with you! Download the new IBM Verse mobile app for Android: http://spr.ly/6013DKPttoriOS: http://spr.ly/6014DKPtQ"	149 (3%)
Calling for feedback	"Are you a #WatsonSupplyChain user? Click the link and tell us what you think! http://ibm.co/2EbAwIm"	12 (0%)
Community		392 (7%)
Response solicitation	"When it comes to building an amazing #gaming rig – what do you think is the most important thing to include?"	352 (7%)
Responding to public messages	"@ UserID Sweet. We will most definitely be there for that."	40 (1%)

Note: N = 5,277.

We discerned three complementary directions of stakeholder orientation. The first type of account focused on specific products instead of on the company behind them. Users and potential users of these products can easily recognize the relevance of these specific accounts, in which technical and marketing communication perspectives might merge. The second type

of account explicitly focused on certain stakeholder groups, such as developers or partners. These accounts offered diverse content that was particularly relevant to these stakeholder groups. The account names help stakeholders to find them, but most likely these stakeholders also have other ties with the company that motivate them to use the Twitter account as a channel. In these accounts, companies provide information that might be relevant for these stakeholder groups, describing it from their perspectives. The third type of account used organizational conventions for presenting the company to the outside world (e.g., human resources and news). These conventions are not only predictable; they are also connected to certain types of stakeholders. By using these conventions, the four companies enabled people to select the right Twitter accounts to follow. Having a clear architecture of Twitter accounts, then, is a good starting point for companies in developing their content strategy.

Our second main finding involves the content of the combined Twitter accounts. To our knowledge, this is the first study to sketch a comprehensive picture of the types of content companies post on Twitter. We found that the traditional domains of corporate, marketing, and technical communication formed a good overall framework for analyzing the content of the Twitter accounts. All three domains appeared to be relevant, with some interesting crossovers between the domains.

Twitter erases boundaries between the traditional communication domains. Corporate communication on Twitter becomes less isolated and more closely related to companies' daily activities (Argenti, 2006). Within corporate communication, internal and external communication processes become more integrated. Still, the nature of the Twitter content within the corporate communication domain does not seem to differ substantially from that in traditional channels. Technical communication is broadening as a discipline, still providing all sorts of user support but also making sense of technological developments and explaining them to stakeholders. On Twitter, boundaries between technical and marketing communication become less clear as user support and sense making are now a prominent part of the product story. This insight might provide new fuel for the added-value discussions within technical communication (cf. Mead, 1998; Redish, 1995). For marketing communication, Twitter provides opportunities to further explore indirect marketing strategies. Chen et al. (2017) and Wall and Spinuzzi (2018) found that companies provide nonmarketing content to establish trust, expertise, and thought leadership, which in the long run might affect purchasing decisions. As such, the marketing strategy becomes more integrated.

Our third main finding, which involves message elements in tweets, is that the use of navigational hyperlinks, hashtags, and visuals was more common in the tweets of large IT companies than previous studies have suggested (Lovejoy et al., 2012; Mamic & Arroyo Almaraz, 2013; Swani et al., 2013). To what extent this usage has evolved over time or can be attributed to the specific type of organization in our research is unclear. Visuals were used not only to draw people's attention but also to convey information. But the variation of visuals used was rather limited: Most were infographics or photos. Public messages and emojis were still relatively scarce. The scarcity of emojis might indicate that the use of emojis is considered to be less appropriate in formal communication (Danesi, 2016).

Our fourth main finding is that, as earlier literature suggests, one-way information sharing is the main communication strategy that companies used on Twitter (Capriotti & Ruesja, 2018; Gomez & Vargas-Preciado, 2016; Lovejoy & Saxton, 2012; Rybalko & Seltzer, 2010; Shin et al., 2015; Waters & Jamal, 2011; Yue et al., 2019). Compared to the nonprofit organizations in Lovejoy and Saxton's (2012) study, the IT companies included more tweets with a call to action but fewer tweets contributing to community building. Given the earlier research highlighting the advantages of interactivity, two-way communication, and community building (Guillory & Sundar, 2014; Li et al., 2013; Saffer et al., 2013; Saxton & Waters, 2014; Watkins, 2017), our finding suggests an area in which IT companies might improve. On the other hand, research on people's motives to visit or follow company SNSs indicates that obtaining information is one of the key motives (Azar et al., 2016; Gao & Feng, 2016; Jin & Huang, 2017; Logan, 2014; Muntinga et al., 2011; Taylor et al., 2011; Zhao et al., 2016). Further research is needed in order to gain more detailed and nuanced insights into the possibilities of community building in various company contexts and the pros and cons of a focus on interactivity and engagement.

Limitations and Suggestions for Future Research

Several limitations must be taken into account when interpreting our findings. First, our findings are based on only four large IT companies. In designing our study, we prioritized depth over breadth because we wanted to address both the arrangements of accounts and the characteristics of tweets. Furthermore, we drew a purposive sample of the largest companies, so we cannot be sure that our findings would also apply to much smaller companies or could be generalized beyond IT companies. At the least, our

findings regarding technical communication would not apply to several other types of companies. Future research should investigate the extent to which our findings can be generalized to other IT companies and can apply to other types of organizations. Our coding scheme could be a starting point for such future research.

Second, our findings provide a general overview of the content within the various domains but do not describe the tweets' content in great detail. Future research could further explore what the content in each domain looks like, either by qualitative analysis or by a more detailed system of categories and subcategories. In addition, future research might further explore the relationship between content categories and message elements or communication strategies in order to determine if certain types of content lead to richer messages or more interactivity.

Third, our analyses focused only on the characteristics of the content that the IT companies provided. We did not include the reactions of stakeholders, in terms of likes, comments, and retweets, to the various types of content. Future research could investigate whether certain types of content, message elements, or communication strategies lead to higher appreciation, more engagement, or more retweets.

Fourth, our findings are based only on our content analysis of accounts and tweets. We did not include the objectives, motives, and perspectives of the companies involved in our study. Future research could combine the results of content analysis with in-depth interviews with company representatives who are responsible for the various Twitter accounts.

And fifth, our research focused implicitly on Western contexts. Future research could compare our findings to those in other cultures, such as in China, not only because of the cultural differences but also because the microblog infrastructure (Weibo) is entirely different from that in Western countries (Twitter).

Practical Implications

Our findings lead to several practical implications for organizations that have or aspire to a presence on Twitter or other SNSs. The first implication is that it is important to invest in a good architecture of organizational accounts. Our analysis showed that having many different accounts does not have to be a problem as long as they can be clearly recognized by the various stakeholder groups. The principles used by the four IT companies— that is, to have accounts that focus on products, that explicitly address

certain stakeholder groups, and that follow traditional conventions—appear to be effective.

The second implication involves the content of organizational Twitter accounts. Organizations should carefully weigh the relevance of corporate, technical, and marketing communication on their Twitter accounts, looking for more integrative approaches and removing strict boundaries between the traditional domains, which can strengthen each other. Within the domain of technical communication, sense making and storytelling about technological developments and their future implications appear to be important on Twitter. Within the domain of marketing communication, the development of indirect, long-term marketing strategies might be relevant.

The third implication involves the use of message elements. Plain tweets appear to be rare nowadays, so it seems relevant to add useful hyperlinks to more information as well as hashtags (#) and public mentions (@) for their embedding in the overall Twitter context. Visual content appears to be important as well, either to draw people's attention or as an alternative and attractive way of conveying information. Our research showed that when considering visual elements, IT companies often used the same types of visuals (infographics and photos). Organizations, then, might consider a broader spectrum of visuals. In any case, creative graphic design experts should form part of an organization's social media team.

The fourth and last implication involves interactivity and community building. Instead of blindly following general advice that organizations should always aim for interactivity and community building on Twitter, companies might identify and focus on specific interactive and community opportunities. Not all stakeholders on all Twitter accounts will have a preference for interactive participation and community building. Genuine interest, reciprocity, and long-term commitment are important requirements for realizing interactive Twitter accounts and building on a community.

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