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"SOCIAL MEDIA ACTIVITY IN B2B (AND MIXED BUSINESS MODELS) COMPANIES IN THE HIGH-TECH INDUSTRY & ACQUISITION ORIENTATION"

RELATORE:

CH.MO/A PROF./SSA ALEXANDER VINCENZO ANNA

LAUREANDO/A: HUEI-TSUEN HSU

MATRICOLA N. 2056364

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Firma dello studente

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Abstract

This study investigates whether social media activity affect the acquisition orientation (Cartwright, H. Liu, and Raddats 2021) or namely, the ability to acquire new clients and earn sales in the top high-tech, B2B/B2B2C companies listed in fortune 200. Financial data are collected using Compustat, a financial database, and social media activity data are separately merged into it using the social media data available for *fortune 200*. An OLS model is developed to analyze the impact of social media activity on total revenue, with robustness tests done by constructing a fixed-effects model. Contrary to popular expectations, an empirical result sheds light on the peculiarity that increasing social media activity does not have a positive effect on generating new revenues on non-traditional consumer markets and a context such that of a highly innovative industry. The findings prompt businesses and researchers alike to critically assess the conventional wisdom surrounding the impact of social media on strategic decision-making.

Table of Contents

List of Figures

List of Tables

Chapter 1

Introduction

THE STRATEGIC USE OF SOCIAL MEDIA for economic entities is a broad and interesting topic that has only emerged after the year 2011. Though, how this is done and if it has any effect has been under moderately few scrutiny by scholars, especially true for in the field of industrial marketing (non B2C, also called B2B marketing) (Lilien 2016), where social media is also widely adopted.

In the ever-evolving landscape of B2B/B2B2C high-technology companies, the interplay between social media activity and strategic orientations stands as a pivotal yet under-explored domain (Cartwright, H. Liu, and Raddats 2021). This thesis embarks on a comprehensive examination of the effect of social media activity on the acquisition orientation of such companies (Iankova et al. 2019), contributing to the nuanced understanding of contemporary industrial marketing dynamics. The study employs Ordinary Least Squares (OLS) regression analysis to probe the statistical significance of the relationship between social media activity and acquisition orientation. As the preliminary findings reveal a lack of statistical significance, this research provides a novel perspective within the current academic discourse and addresses a notable gap in the existing literature within industrial marketing management (Tiwary et al. 2021). The exploration of the intricate connections between social media dynamics and strategic orientations in the B2B2C high-tech sector is crucial for adapting to the rapidly changing technological landscape and optimizing decision-making processes.

To contextualize this study within the existing body of knowledge, a thorough review of relevant literature is conducted before proceeding with a quantitative analysis. This encompasses seminal papers and current theories in the field of industrial marketing management. The review highlights the lack of research specifically addressing the interrelation between social media engagement and acquisition orientation (proxied by revenue) in general (Sashi 2012), and even more so within the unique setting of mainly B2B/B2B2C high-technology companies (Brennan and Croft 2012). By scrutinizing the existing body of knowledge, this thesis aims to contribute both theoretically and empirically, shedding light on the intricate mechanisms that drive strategic decision-making in an era dominated by digital communication. Furthermore, this thesis delves into the distinctive char-

acteristics of the high-tech industry, acknowledging its fast-paced nature, technological dependencies, and the strategic imperatives that set it apart within the broader realm of B2C, B2B and B2B2C entities. This contextualization lays the foundation for the subsequent analysis, demonstrating the relevance the study in the current industrial marketing landscape.

Chapter 2

The Strategic Use of Social Media

2.1 The Umbrella Term of Social Media

SOCIAL MEDIA, an ubiquitious term, has been coined with much enthusiasm as one of the most revolutionary digital disruptions in the 21th century, where it first began as a tool for individuals to upload and share content. However, until today, the value of these digital platforms proved to be serviceable not only to the individual but also to organizations. The evolution of social media showed an upsurge in the number of users, with an increase from 2.73 billion people in 2017 to 4.89 billion people in 2023, according to Statista 2023. This number is expected to increase by roughly another billion in projection of the year 2027 (ibid.).

Fascinated by their reach and affordance, early researchers have referred to social media as social networks and social network services (Boyd and Ellison 2007). However, the term itself has narrowed down in scope over time. Hence, although it may seem apparent, a definition of social media is still necessary in order to make clear the context that underpins this work. Obar and Wildman (2015) synthesized definitions presented in literature and identified four recurrent features that are shared in social media services today:

1. Social media services are (currently) Web 2.0 Internet-based applications,
2. User-generated content is the lifeblood of social media,
3. Individuals and groups create user-specific profiles for a site or app designed and maintained by a social media service,
4. Social media services facilitate the development of social networks online by connecting a profile with those of other individuals and/or groups.

Having mentioned this, it is important to address the various terms that are associated with social media's evolution and history, which I shall address in chapter three under the theoretical review of core concepts. For the scope of this chapter, instead, relevant

definitions of social media should be first highlighted to start the study. In essence, from a broad impression of it to a more specific definition, social media is not only an umbrella term that describes the integration between technology and social interaction: but also (and more precisely), "[a tool] that leverages mobile and internet-based technologies to enable interactive platforms, fostering user engagement in content sharing, collaboration, discussion, and modification within both individual and community contexts." (Kietzmann et al. 2011), or similarly, "a cluster of online applications rooted in the principles and technological underpinnings of Web 2.0, facilitating the generation and sharing of content created by users." (Kaplan and Haenlein 2010).

The most well-known social media services with more than 100 million registered users to-date include but are not limited to: Twitter, Facebook, Linkedin, Instagram and Tumblr.

2.1.1 The tactical use of SM

Following the discussion on the appropriate definition of social media, it is immediately noticeable that social media is most often described an instrument. Indeed, the majority of existing research has centered around the operational utilization (or tactical uses) of social media platforms, namely, in delineating particular tools for strategy implementation (Cartwright, H. Liu, and Raddats 2021), instead, not many has directly attributed it to a certain strategic orientation.

Within the business and management literature, strategy and tactics is a recurrently used conceptual couplet (Mackay and Zundel 2017); tactics are short-term actions provided to achieve long-term strategic changes. To this end, tactics are a relief to a goal that needs immediate implementation, while strategy can be seen as a more formal, rational calculation of how reality can be organized and future steps may be arranged. (Langley, Giroux, and Cornut 2012)

Existing academic literature concerning the utilization of social media within business contexts has delineated numerous advantages, particularly emphasizing its role as a tactical tool for market intelligence gathering. This emphasis is placed on the interplay among networked users, focusing on interactions between networked partners, Enabled by personal self-expression and engagement with brands. (Cartwright, Davies, and Archer-Brown 2021).

Taking the most relevant example from the vast literature, Cartwright 2021 investigated the tactical usage of social media with twelve case studies, surveying upper and middle management employees who worked within marketing and/or sales departments. Her research revealed that organizations utilize social media as a "relatively blunt instrument, placing focus on generating [quick] shareable content" (ibid.). Through this process, the tactic is to disseminate attention-grabbing content to the largest possible target audience, with the goal in mind of being able to acquire interested recipients that follow the link to more direct engagement or sales channel.

However, it is important to note that since the term 'strategy' and 'tactics' are often used interchangeably. Present literature, when discussing the motives or consequently impacts for the usage of social media, often times fails to distinguish between the two. Nonetheless, it is important to separate the two terms in order to consolidate a better theory towards the potential benefits of social media. Indeed, Cartwright observed the fragmentation of current research in the organizational usage of social media and investigated in depth the strategic direction that social media usage solicits, where I shall address in the next section.

2.1.2 The strategic use of SM

Having previously mentioned, one might wonder, Why should organizations opt to utilize social media strategically instead of solely as a tactical instrument?(Cartwright, H. Liu, and Raddats 2021). The answer lies in the clearer view of better planning and better alternatives; having a strategic view enables the organization to control the environment by means of plans, scenarios and forecasts (Mackay and Zundel 2017). With high stakes in mind, it is simply unwise to approach the future in an improvident manner without having a long-term blueprint, even if strategies have to be constantly revised to adjust for unforeseen market circumstances or market disruptions.

The strategic use of social media can vary in degrees (adoption) and in effectiveness, depending on the type of business model or transaction model the business has, namely, either business-to-customer (B2C), business-to-business (B2B) or a hybrid model where both are present. Here, it is important to note that while research on the usage of social media in the B2C context is abundant, in the B2B context it is not so. This point shall be elaborated further in the next chapter, where the difference of social media in B2B and B2C context will be discussed in depth. Magno and Cassia (2020) emphasize "an urgent need to develop specific theories to explain the usage of social media in Business to Business (B2B) markets to acknowledge the unique features of industrial markets – in particular, their relational nature" (p. 438). Yet, despite the heartening calls, research regarding the strategic rather than tactical use of social media, particularly in the B2B setting, are still in an "embryonic stage" (Pardo, Pagani, and Savinien 2022).

In the academic world, researchers attempt to organize qualitative and quantitative evidence of social media activity in order to better formulate the effect of such a powerful resource; to understand its strategic orientations in relation to its apparent purpose. Needless to say, social media has largely contributed as an effective mechanism in the business environment for marketing (Saxena and Khanna 2013). Cartwright 2021, who developed theory on the strategic use of social media in the business-to-business environment, highlighted two distinct orientations in which companies aim to use social media: the former one on the acquisition of customers, and the latter one on the relationship management of customers.

Within the acquisition-oriented purpose, social media is often used as a 'Call to Ac-

tion' strategy; their activities include the cross-posting of highly similar content to raise awareness and encourage recipients to follow the content. Furthermore, to grab attention, mostly using nonspecific content. The benefit of such strategy means one can reach for a wider range of non-specific target audience and achieve a generalized connection. However, the downside of such action means that albeit quick generation, no specific channel strategy is utilized, and the content outreach could be uncertain and ineffective.

Another line of strategy within the acquisition-orientation is 'Thought Leadership'; their activities include relevant and timely content and oftentimes much more personalized, employee generated content that aims to target an audience that views the content with a 'preference' in mind. The content is highly valuable and engaging and can be said to influence the target audience much more easily (hence, thought leadership). However, this type of strategy could be time-consuming and difficult to continuously generate, since it aims to be of a higher quality. The outreach is still broad but is more engaging, including positive but also negative interactions.

In terms of relationship-oriented strategy, one observe 'Dissemination'; the activities of dissemination incorporate tailored (often informational) content that focuses on mass communication of a valuable information. This means that the target audience is key but is usually pre-existing, like specific-stakeholders and customers. The benefits of such strategy include higher engagement resulting in better communication and interaction, but lacks in dialogue potential and is time-consuming as well as restrictive.

Lastly, within the relational-orientation purpose one has the 'Co-creation' strategy, where activities comprise of well defined and targeted content as well as the monitoring and responding to online activities. This means the target-audience is well-defined and relates naturally to their industry. The profit of such strategy evidences in strong online relationships and high level of engagement between existing connections. Nonetheless, this process is prone to trail-and-error, with long content generation time and require very consistent maintenance (Cartwright, Davies, and Archer-Brown 2021).

2.2 SM usage in the corporate environment

2.2.1 SM in SMEs

As previously mentioned, the strategic use of social media differs with the type of business model, namely, B2C, B2B or a hybrid of both. While this is an important parameter in social media research today, it is nonetheless not the only parameter discussed in depth. On this account, the strategic use of social media is also widely discussed in the context of the dimension of business corporations. Here, especially in small and medium sized enterprises. Henceforth, one can ask, why are researchers invigorated to study the effects of social media in the context of small and medium sized enterprises?

One of the starting reasons, is that, small and medium sized enterprises (SMEs) are crucial to the economy of all countries (Fathian, Akhavan, and Hoorali 2008). Due to

Strategy	Activities	Target Audience	Benefits	Challenges
Call to Action *Centralised and acquisition-orientated*	• Cross-post highly similar content • Raise awareness and encourage recipients to follow the content • Attention grabbing, but potentially nonspecific content	• Wide range of non-specific target audience (e.g., connection of the wider public)	• Reach of a wider audience • Ability to generate content quickly (e.g., by re-posting relevant and timely content)	• No specific channel strategy (e.g., social media are used in parallel) • Uncertainty about target audiences • Low quality of content that is not engaging
Dissemination Strategy *Centralised and relationship oriented*	• Tailored (often informational) content • Some focus on mass-communication to target broad audiences • Development of valuable content	• Key but usually pre-existing audiences (e.g., specific key stakeholders and customers)	• Higher engagement with existing target audiences • Known target audience resulting in better communication and engagement	• Lack of dialogue amongst existing relationship partners • Restrictions within the market • Difficulty in choosing the correct platform for very specific audiences
Thought Leadership Strategy *Decentralised and acquisition-orientated*	• Employees generate thought leadership content • Relevant and timely content • Personalised content	• Audience targeted based on their preferred content	• Content highly valuable and engaging • High levels of engagement on social media	• Time-consuming creation of thought leadership content • Difficultly to continuously generate thought leadership content • Engaging broad audiences increases risk in negative comments
Co-creation Strategy *Decentralised and relationship-orientated*	• Well defined and targeted content • Monitoring and responding to online activities	• Well-defined audience that relates naturally to their industry	• Strong online relationships due to well-defined audiences • High levels of engagement between existing connections	• Trial and error process • Long period of time to develop beneficial content • Relationships usually very complex that require consistent nurturing

Figure 2.1: Exposition of B2B strategy (Cartwright, Davies, and Archer-Brown 2021)

their flexibility, ability to generate revenue, and potential for innovation, they make up the majority of businesses and are critical to the majority of world economies (Bahaddad, AlGhamdi, and Houghton 2012). They are essential in expanding the production base, assisting large manufacturing companies, and supplying local, national, and international job prospects. It is acknowledged that SMEs represent "the life blood of modern economics" (ibid.). Though, it has been difficult for them to survive and grow. This is because they are limited in resources, whether human, organizational or financial (Wardati and ER 2019). Literature also stressed their struggle in seeking information thus affecting their Enterprise Resource Planning adoption, due to the more of the listed reasons below, according to Buonanno et al. (2005):

- lack of (or substantially less sophisticated) information system management (Ramdani, Kawalek, and Lorenzo 2009)
- frequent concentration of information-gathering responsibilities into one or two individuals, rather than the specialization of scanning activities among top executives
- lower levels of resource available for information-gathering; and
- quantity and quality of available environmental information

Even more than the aforementioned reason, SMEs also differ from large companies, from other points of view. Most of the time important business decisions are concerted not by top management executives, but by one or two individuals, in other words non-experts of management (ibid.). Therefore, SMEs struggle in terms of changing market dynamics, globalisation, technological disruption, decreasing product lifecycle, and increased competition (Abed, Dwivedi, and Williams 2015). That is to say, in order to overcome these

challenges, SMEs need to be able to grasp opportunities to be able to operate more stably in all areas of operation including production, finance, human resource management, and marketing.

That being said, social media is a particularly great tool for SMEs as it provides them numerous opportunities, according to Derham, Cragg, and Morrish (2011), adopting social media SMEs such as:

- low cost
- low level of TI skills required to use it
- low barriers to participation

In addition, by adopting social media, SMEs can, according to Gligorijevic and Leong (2011):

- build brand communities
- advertise their products and services
- target various market segments/niches (Dwivedi et al. 2021)

Overall, social media is an simple and low-cost way to: connect with potential consumers; hear what they have to say; build large company networks; manage reputations; foster client trust and loyalty (Abed, Dwivedi, and Williams 2015); and obtain marketing intelligence (Chua, Deans, Parker, et al. 2009). Nowadays, a lot of SMEs think that they "must" engage with social media (Durkin, McGowan, and McKeown 2013).

For example, Eid, Abdelmoety, and Agag (2020) discovered that business-to-business (B2B) exporting SMEs in the UK heavily rely on social media (SM) to improve the quality and quantity of their global business contacts, gain a better understanding of market competition and customer perceptions, and build brand awareness. Although this mounting evidence is encouraging, there is still room for B2B SMEs to embrace SM at a faster rate for improved performance. For example, according to the 2021 annual report on European SMEs (Müller, Buliga, and Voigt 2021), when it comes to incorporating digital technologies like SM into their operations, European SMEs considerably lag behind larger companies. The modest size of SMEs, however, may allow them to be generally adaptable, nimble, and quick to apply client insights (Eggers et al. 2017). Indeed, the strategic utilization of social media, a vital component of market-sensing prowess, strengthens the ability to connect with customers. Interestingly, while the use of social media does impact brand management proficiency, its suggested effects on customer relationship management aptitude and marketing performance only manifest through the intermediary role of brand management proficiency. (Cao and Weerawardena 2023). Anyhow, the strategic use of social media in the context of SMEs (and, espcially in the framework of B2B) is yet fully articulated, calling for direction in future research (ibid.).

2.2.2 SM in LEs

Opinions diverge when it comes to whether large firms are better at deploying social media to their advantage; while Eggers et al. (2017) say that a few studies exist that point to a differentiation between large firms and SMEs on social media adoption and related performance impacts, other scholars observe that the size of the organization has no impact on social media maturity. For example, one of the result demonstrated is that social media deployment presented problems comparable to those faced by smaller organizations, despite the fact that larger organizations have more resources, (Cartwright, Davies, and Archer-Brown 2021).

Because of this, present research calls for a more clarified view with regards to the difference between how large firms and small firms utilize social media and the impact of the performance. Regardless of the nature of the firm, i.e. B2B or B2C, the majority of firms use social media as a marketing tool, and this particular observation will be addressed more in detail in the next chapter. An interesting study by Fabian Eggers, who is the professor of marketing at Menlo College, pointed out the indicative differences between large firms and small firms' strategic usage of social media:

- When it comes to achieving marketing objectives, large firms tend to use social media more actively than SMEs, though non-user SMEs do express their plan to employ social media
- Overall, it is evident that large firms are likely to use every social media under consideration; while SMEs often use only one social media e.g. Facebook
- large firms tend to be more active on social media than SMEs

Moreover, industry also appears to be a key contingency in the context of social network usage:

- For large firms, a B2B focus creates a positive effect between social network usage and firm growth, in the manufacturing industry
- For smaller firms, a [B2C] service focus creates a positive effect between social network usage and customer closeness

At a initial glance, it appears clear that the absent connection between the effect of social networks and the expansion of small and medium enterprises (SMEs) is attributable to a scarcity of time, expertise, and financial resources, while large firms, due to their ability to stay active on social media, is more capable to use social media to achieve their strategic goals. This is especially true for large firms in the manufacturing industry: the author suggests that there is a direct positive effect between social media usage and large, B2B firms. This effect is also observed in a few other studies, for example, in Järvinen et al. (2012).

Though, it is for sure not so simple. Digging deeper, the same study finds that the missing direct link between SMEs and social media usage and firm growth depends on a factor named "entrepreneurial resources", which is a factor that describes innovativeness, risk-taking and proactiveness. Only when an SME commits to use social media in a way that parallels its effort to its determination to succeed can the firm grow in response to its social media usage (Eggers et al. 2017).

Chapter 3

Social Media Marketing

3.1 Definition and Review of Core Concepts

3.1.1 Social Media Marketing

MARKETING continuously evolves, with diverse initiatives aimed at enhancing its efficiency and effectiveness in engaging both direct and indirect customers. This field plays a crucial role in every industry (Pardo, Ivens, and K. Wilson 2013).

In recent times, digital platforms, notably social media (SM), have afforded enterprises the chance to collaboratively generate value for themselves and their diverse stakeholders via customer engagement, idea exchange, networking, and other means. (Tiwary et al. 2021). In academic research, many scholars try to understand how firms use this tool to effectively influence marketing strategies, as marketing proved to be the main beneficiary of strategic social-media usage. The strategic use of social media has consequently been under watch by many stakeholders as the most potent tool for consumer marketing and industrial marketing alike.

As such, social media marketing has been defined as the The use of social media tools, platforms, and software to generate, convey, distribute, and trade offerings that hold significance for an organization's stakeholders (Tuten and Mintu-Wimsatt 2018) & (Cartwright, H. Liu, and Raddats 2021).

Social media marketing has become an essential aspect of modern business marketing, allowing companies to create and sustain connections with clients, boost brand recognition, and generate revenue. Additionally, it provides an opportunity to acquire valuable customer insights, which can inform the development of marketing plans and decision-making processes. As the importance of social media continues to grow, it will remain a fundamental element of many businesses' marketing strategies.

This section will look more specifically into how social media has evolved in marketing by taking a deep dive on the terms that emerged due to this new phenomenon, while highlighting some examples in literature to illustrate relevant findings about social media marketing.

3.1.2 Electronic Word-of-Mouth

In the digital age, where connectivity and information-sharing are ubiquitous, Electronic Word of Mouth (eWOM) has emerged as a pivotal component of marketing strategies. eWOM is a digital counterpart to traditional word-of-mouth (WOM) communication, but it unfolds in the vast landscape of the internet and is inherently tied to the phenomenon of social media marketing. This sub-section explores the significance of eWOM and its intricate relationship with the realm of social media marketing.

Electronic Word of Mouth (eWOM) refers to the sharing of opinions, recommendations, and experiences related to products or services through digital channels. These channels can encompass social media platforms, online review websites, forums, blogs, and other digital spaces where consumers interact and exchange information. Using the most cited definition, eWOM can be described as any favorable or unfavorable expression conveyed by potential, current, or past customers regarding a product or company, disseminated to a broad audience and various entities through the internet (Li et al. 2017) & (Siqueira Jr et al. 2019). This term has sprung off from conventional word-of-mouth communication.

Conventional offline word-of-mouth communication has been empirically demonstrated to wield significant influence over consumers' purchasing decisions, as underscored in studies such as Richins and Root-Shaffer (1988). The advent of the Internet has markedly expanded consumers' avenues for accessing impartial product information from their peers and has facilitated the opportunity for consumers to express their own consumption-related recommendations through the medium of eWOM.

The relationship between eWOM and social media marketing is symbiotic and mutually reinforcing. Social media platforms provide a fertile ground for eWOM to flourish, and social media marketing directly benefits and strategizes on eWOM. However, their effectiveness varies greatly depending on the narrative, forum and communal orientations. Indeed, a study suggests that when marketing messages are shared among a community, it doesn't just make them more effective, but rather the messages themselves are modified as they become entrenched within the community. (Kozinets et al. 2010)

3.1.3 Web 2.0

"Web 2.0" has been a popular topic in recent years. However, it is not a technical term, but more of a collective concept that characterizes the technical features and social behaviors of well-known Web 2.0 sites. This term gained popularity during the initial talk of the first Web 2.0 conference, where Tim O'Reilly and John Battelle defined the themes of Web 2.0. They both recognized the Web's transformation into a platform with software that exceeds the limitations of a single device, and with data as a significant driving force.

The term "Web 2.0" represents a significant shift in the way the internet is used and experienced. It has transformed the digital landscape, reshaping how individuals, busi-

nesses, and organizations interact online.

According to Constantinides and Fountain (2008), Web 2.0 can be characterized as a set of online applications that are open-source, interactive, and user-controlled. These applications serve to enhance users' participation in both business and social processes, thereby expanding their experiences, knowledge, and market influence. Web 2.0 tools facilitate the creation of informal user networks that enable the efficient flow of ideas and knowledge. This is achieved through the facilitation of streamlined processes for generating, disseminating, sharing, and editing or refining of informational content.

Therefore, it can be said that Web 2.0 is the evolution of the World Wide Web; from a static and one-way communication medium to a dynamic, interactive, and user-centric platform, eased and pushed by the advent of social media and takes part as an environment for eWOM as discussed above.

The emergence of Web 2.0 technologies and the growing prevalence of social media have ushered in a form of communication that is both more immediate and interactive. This enables users to readily exchange and consume information on the internet (Akrimi and Khemakhem 2012).

Ammirato et al. (2019) identified that Web 2.0 and social media present many opportunities to enhance B2B innovation in small and medium enterprises (SMEs), as they face various challenges due to limited resources. This will be discussed in depth in the last section of this chapter.

Enterprise 2.0

Enterprise 2.0, a concept rooted in the principles of Web 2.0, represents a paradigm shift in the way organizations approach internal communication and collaboration. It embodies a departure from traditional hierarchical structures and embraces a more open, participatory, and digitally-enabled approach to work.

The term "Enterprise 2.0" was first coined in the mid-2000s, signifying a transformational shift within enterprises driven by the adoption of Web 2.0 technologies. These technologies, characterized by user-generated content, social networking, and collaboration tools, found their way into the corporate realm, challenging traditional top-down communication models. This evolution marked the beginning of a new era in organizational communication and collaboration.

"The corporate world caught on that social media was not just for consumers; the term Enterprise 2.0 emerged to take Web 2.0 inside the enterprise, and the phrase social media expanded to include both", summarized by the Harvard Business Review (Bradley and McDonald 2011), in other words, when new technologies and applications find their way into the business domain, they are often referred to as Enterprise 2.0 (Matuszak 2007).

Social Networking 2.0

Unlike traditional social networking, social networking has been refined too following the advent of Web 2.0 and Enterprise 2.0. The idea of social networking has existed for a long time, predating the Internet and even widespread communication. Humans have always been social beings, with our capacity to collaborate in communities and generate collective benefits being among our most valuable qualities. In its simplest form, a social network comprises a minimum of three entities engaged in communication and exchanging information.

In the present era of digital media, social networking pertains to individuals utilizing the Internet and web-based applications to interact in ways that were previously unfeasible. This shift in the uses and potential of the internet is primarily due to a change in the collective cultural perspective, and to major events like COVID-19, which accelerates the need for a virtual mode of socializing.

Besides, the current Web is also significantly more advanced from the Web of ten years ago. This continuous change and innovation provides a more conductive environment for social networking, and instills progressive transformation to even electronic social networking. To distinguish it from traditional social networking and earlier forms of web-based Social Networking, this study will use the term Social Networking 2.0 to refer to the combination of electronic social networking and Web 2.0 technologies (Van Zyl 2009).

Social Networking 2.0 applications are expected to handle the digital representation of people's connections or relationships by giving them access to viewable profiles and automatic updates of address books. Additionally, these applications should assist in recognizing and transforming possible connections into either weak or strong relationships by offering "introduction services" and enabling users to showcase their skills, knowledge, and experience in a searchable format. The elements that should be present to meet these standards can be concisely outlined as follows:

- The application has to to create a digital representation of one's personal connections and relationships
- The application has to assist in identifying potential connections (M. S. Granovetter 1973)
- The application has to facilitate the transformation of possible connections into both weak and strong ties (M. Granovetter 1983)

Therefore, Social Networking 2.0 refers to websites or apps that aid in maintaining personal relationships, identifying potential connections, and transforming those possibilities into both strong and weak ties, through the use of emerging Web 2.0 technologies (Van Zyl 2009).

3.2 Industrial marketing vs. Consumer marketing

Consumer marketing, otherwise known as Business-to-Consumer (B2C) marketing, is a branch of marketing that focuses on promoting and selling products and services directly to individual consumers or households. It is the type of marketing most people are familiar with, as it involves businesses targeting everyday consumers as their primary audience. When most people think about social media marketing in the B2C domain, what is associated is often the concept of "social media influencers", eWOM, mass media advertising and vice versa. Several elements characterized consumer marketing, including:

- a broad and diverse audience;
- products with a personal or consumption focus;
- shorter sales cycle;
- focus on e-commerce or retail

Despite the appearance of being more straightforward, consumer marketing is a dynamic and highly competitive field that requires businesses to stay attuned to consumer trends and preferences. Success in consumer marketing often hinges on the ability to understand the consumer mindset, the need to create compelling brand experiences, and the adaptation to changing market dynamics (Iankova et al. 2019). As such, academic investigations into social media that concentrate on its efficacy in the realm of business-to-consumer interactions, predominantly revolve around scenarios where the use of social media has been shown to enhance brand recognition, foster customer loyalty, stimulate engagement, and ultimately drive sales (Swani, Brown, and George R. Milne 2014). Many more literature example can be used to substantiate these points, where they will be thoroughly reviewed in the subsection.

Certainly, the difference in business models, whether it's B2C (Business-to-Consumer) or B2B (Business-to-Business), necessitates distinct marketing and social media strategies due to the contrasting nature of their target audiences, transaction dynamics, and relationship-building approaches.

Industrial marketing, indeed, is a specialized branch of marketing that primarily deals with the exchange of goods and services between businesses, often in a B2B context. In B2B transactions, the buying and selling entities are typically businesses, government agencies, or institutions rather than individual end consumers. Thus, the industrial marketing strategy and consequently social media utilization is characterized by the firm's unique nature: involving,

- complex products;
- long buying cycles;
- the establishment of enduring relationships between suppliers and customers.

Furthermore, Industrial marketing places a strong emphasis on the creation and delivery of value. Suppliers in industrial markets must offer products and services that provide clear advantages and fulfill specific business needs, often requiring customization to meet the diverse requirements of their business customers.

Therefore, even though the contemporary and widely explored subject of social media integration within corporate settings is gaining significant attention in academia, research in the field of social media remains constrained and predominantly fixated on the consumer aspect, particularly in a business-to-consumer (B2C) context (Michaelidou, N. T. Siamagka, and Christodoulides 2011).

While there are anecdotal accounts underscoring the significance of social media for B2B enterprises, the interest and adoption of social media within B2B organizations has been notably sluggish when contrasted with their B2C counterparts (Neuhaus, Millemann, and Nijssen 2022). In both theoretical and practical research domains, the body of knowledge is rather disjointed, with empirical investigations reliant on individual cases that are frequently reported in a non-systematic and less analytically rigorous manner (Jussila, Kärkkäinen, and Aramo-Immonen 2014).

This section aims to provide a comprehensive understanding of industrial marketing and its difference from consumer marketing, its key concepts, theories, and practices with regards to social media marketing.

3.2.1 SMM in the B2C Context

Social media marketing in the B2C context is matured and quite saturated. The sheer volume of social media marketing in the B2C context can be demonstrated by the sheer volume of research published on its benefits. Indeed, a systematic literature review, that attempted to bridge the gap between B2C and B2B opinion leadership and thought leadership in social media marketing, reported that the output of relevant search strings on the aforementioned topic resulted in only six articles on B2B study compared to forty-one articles on B2C study (Neuhaus, Millemann, and Nijssen 2022).

Widely accepted is the notion that firms can use social media marketing as part of their general business strategy, and that social media adoption does generate significant benefits (Dwivedi et al. 2021). Research on strategic social media usage by B2C firms can generally be divided into different viewpoints: 1) from the organization's perspective, for example, discussing social media marketing as a factor relating to sales, return of investment and more firm key-performance-indicators; and 2) from the consumer's perspective, for example, its relevancy on eWOM, brand awareness and perception, its effect on customer behavior and its effect on advertising and so on.

Another separate category also focuses on social media marketing's increasing adoption and challenges in adoption depending on the business dimension, business model, and industry type. Of course, a small segment of research also dedicate entirely to the comparison of B2B and B2C social media marketing, as well as across more obscured

mixed-business model, whether it be a hybrid of B2B or B2C, or B2B2C (Iankova et al. 2019). Based on related effects, according to Alalwan et al. (2017), the general themes that emerged from current research are as following:

- social media and advertising;
- social media and eWOM;
- social media and customer relationship management (CRM);
- social media and brand;
- social media and customer behavior and perception;
- adoption of social media

In the B2C market, as a summary, almost all reported significant influences of social media adoption to each of the themes. Since this study would like to discover more on social media marketing in the B2B context, we will now turn our attention to the elaboration of social media marketing in the B2B context.

3.2.2 SMM in the B2B Context

As highlighted before, research on social media within the business-to-business (B2B) context has received comparatively limited focus in contrast to the extensive research dedicated to business-to-consumer (B2C) social media studies (Michaelidou, N. T. Siamagka, and Christodoulides 2011).

Though B2B enterprises operate in markets characterized by more stringent product requirements, complex transactions, negotiation intricacies, and organizational structures than the consumer market, they are still progressively embracing social media (SM) to meet various business goals. The growing significance of social media for B2B entities adds an element of complexity and intrigue, making it an appealing area for both researchers and practitioners (Manzanaro, Valor, and Paredes-Gázquez 2018).

Studies such as that of Moore indicate B2B sales professionals commonly employ specialized media channels tailored for professionals (e.g. Linkedin), whereas B2C counterparts prefer platforms designed for the general public (e.g. Facebook) when engaging in direct interactions with customers.

So what role does SM play in the B2B context? Several roles are posited by research so far:

1. **Acquisition-orientation** (Cartwright, Davies, and Archer-Brown 2021) and (Iankova et al. 2019): a strategic approach to acquire new customers, leads, or clients to their first interaction with the firm (Sashi 2012). This strategy, in terms of social media, involves leveraging social media marketing efforts to expand the customer base

and attract new potential buyers, subscribers, or followers. Our study considers any social media related activity that is designed to attract potential clients into the first sales as acquisition oriented. Intuitively, in the B2C context- this could mean paying for advertisement on social media platform (Stephen and Galak 2012), or paying for an influencer to market one's products (Barry and Gironda 2019). In the B2B context instead, this could mean publishing technical papers on social media platforms, or creating opinion pieces that could influence technological trends (see "thought-leadership" in the next chapter) (Magno and Cassia 2020). However, since focus in social media literature has mainly been consumer oriented, it is still largely "unclear to what extent these techniques are echoed by B2B firms" (Iankova et al. 2019). For example, Iankova et al. 2019 (which is the main literature that this study is based on conceptually), indicate that the utilization of social media in business-to-business (B2B) contexts differs from approaches seen in business-to-consumer (B2C), hybrid, and business-to-business-to-consumer (B2B2C) models (ibid.). Specifically, B2B organizational members view social media as less effective overall as a communication and marketing channel; additionally, they consider it to be less significant for fostering relationship-oriented interactions compared to other business models (ibid.). Our thesis attempts to verify, using a regression analysis, if this statement rings true or not; to shed some more light on this topic.

2. **Relationship orientation** (Moore, Hopkins, and Raymond 2013): a strategic approach to build and nurture long-term relationships with its audience. Unlike acquisition-oriented strategies, which primarily focus on attracting new customers, relationship orientation prioritizes engagement, interaction, and customer retention. Generally, it can also be defined as any interaction beyond the initial transaction between the buyer and the seller.

   Some studies such as that of Moore, Hopkins, and Raymond (ibid.) indicate that B2B practitioners exhibit a greater inclination toward employing relationship-oriented social media strategy compared to their B2C counterparts, specifically in tasks related to prospecting, addressing objections, and following-up sales.

As example, under the category of acquisition orientation, one primary effect is sales-augmentation (Agnihotri et al. 2016) several studies cite the positive relationship between social media activity and usage and the increase of sales; (Itani, Agnihotri, and Dingus 2017). Recall chapter one's section "strategic use of social media", where I also iterated this concept.

3.3 Challenges of the usage of SM in the B2B context

Needless to say, Unlocking the complete capabilities of social media within the B2B domain poses distinctive challenges that differ from the consumer-focused arena of business-

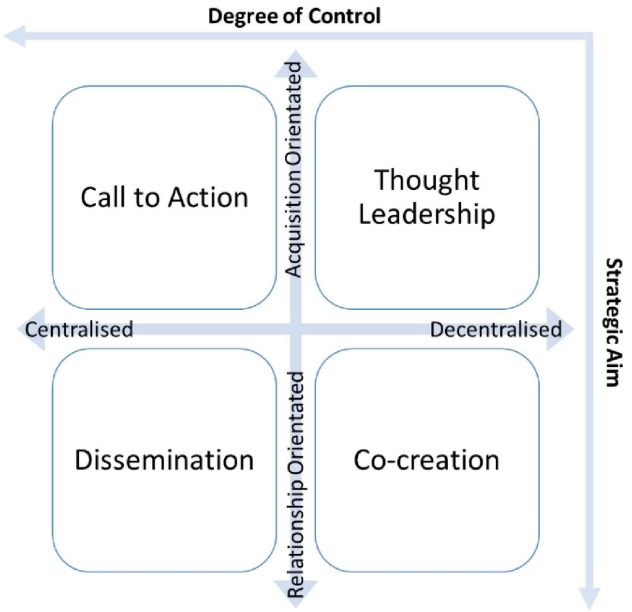

Figure 3.1: Diverging strategic aim of SM marketing (Cartwright, Davies, and Archer-Brown 2021)

to-consumer (B2C) marketing.

Before 2016, it is unclear if decision-makers in B2B firms are using social media to serve strategic business purposes. For example, "in the US and European technology industry, 55% of decision-makers engage in SM for non-business purposes, while only 29% use SM for business purposes" (Ngai, Tao, and Moon 2015).

However, despite the evident presence of social media in the strategies of B2B marketers, scholarly research indicates that B2B marketers are trailing behind their B2C counterparts in terms of both utilization and the depth of sophistication when it comes to social media (Bruhn, Schnebelen, and Schäfer 2014). These findings have been supported in a B2B study on social media. Marx (2013) summarised the findings by saying: “Amazingly, many B2B marketers still don’t get social media”. Director of the study, Christine Moorman, attributes this to B2B marketers having an inappropriate tactical perspective regarding social media, noting that “the biggest challenge is that many (B2B) companies see social media as a cute promotional activity when it can be a strategic marketing activity”. As a result, "B2B companies pay a price for the lack of integration. A 2011 global survey of senior B2B and B2C managers found a significantly high correlation between financial performance and social media integration, says Steven Van Belleghem, author of The Conversation Company, and former managing director of InSites Consulting, which fielded the survey" (ibid.).

The function of social media platforms differs between B2C and B2B contexts. In B2C, 77 percent of companies have gained customers through Facebook, whereas in B2B, the figure stands at a lower 43 percent, as reported by Miller (2012). Several factors contribute to these variations (Habibi et al. 2015).

- Larger number of decision-makers;

- Slower decision-making cycle;
- High-value exchange;
- More direct and intense customer relationships;
- More functional, rational or utilitarian decision-making criteria;
- More complex products;
- Customers are more knowledgeable;
- Differences in B2B marketing communication promotional tools and messages.

Indeed, it is only until recently that B2B firms are beginning to increase adoption of social media, taking advantage of the attention by going online.

As a reaction to the COVID-19 pandemic and increasing globalization, sales and marketing teams underwent a profound shift in their approach to engaging potential business clients. They transitioned from traditional methods such as roadshows, trade shows, and in-person events to the digital realm, actively seeking innovative means to exert influence. Consequently, in an ever-increasing need for digitization, firms has increased the adoption of social media.

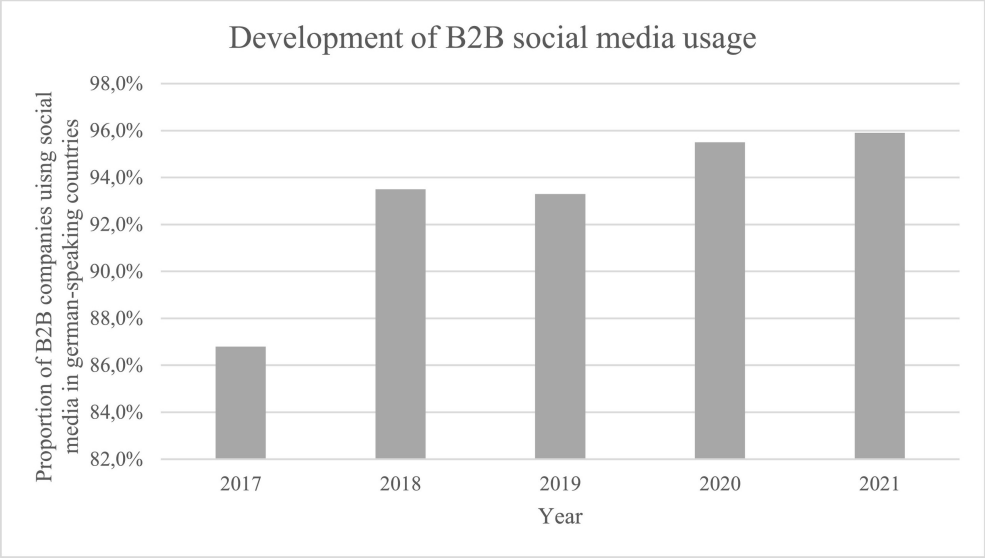

Figure 3.2: Development of B2B social media usage (Arbeitskreis Social Media B2B, 2021 & (Neuhaus, Millemann, and Nijssen 2022)
)

The influence of B2B marketing characteristics on the integration of social media reveals disparities between B2C and B2B marketing regarding customer behavior and target audience focus. This leads to variations in both traditional and digital marketing communication methods. For instance, B2B enterprises place a higher emphasis on informative formats such as blogging and webinars, while consumer-oriented businesses are more

inclined to experiment with advanced digital formats like interactive content and online tools, with a preference for infographics (Habibi et al. 2015). Consequently, although there has been considerable focus on the strategic utilization of social media (SM) to improve business outcomes, its precise implementation within the realm of business-to-business (B2B) operations is still largely uncharted and complex to comprehend (N.-T. Siamagka et al. 2015).

Today, extensive research indicates that the primary obstacle encountered by B2B firms concerning social media revolves around a widespread deficiency in understanding how to adeptly employ these platforms as a strategic resource and how to seamlessly integrate such a resource into a comprehensive marketing strategy (X. Liu 2020).

All systematic literature reviews of current state of strategic B2B social media marketing agrees on the idea that there is significant and mostly untapped opportunities for optimizing the utilization of social media in strategic B2B marketing (Cartwright, H. Liu, and Raddats 2021); (Salo 2017); (Pascucci, Ancillai, and Cardinali 2018); (Kaplan and Haenlein 2010). Especially, in a summary by a study called "the current state of B2B marketing", which holds true till today, it is highlighted that "to advance B2B practice, marketing's biggest challenges are company-wide challenges" (Wiersema 2013). In other words, the biggest challenge for B2B marketing is that marketing as a central function needs to align more with the rest of the functions of the company to be able to truly harness the power of B2B marketing. In other words, B2B social media would have a limited influence only on the tactical level (focusing on marketing, but not market-focused)- it needs to be made strategic and whole and trickled down to the whole organization, and paying constant attention to sales' close relationship to the customer, if it were to truly create value for all stakeholders.

Chapter 4

The High Tech Industry

4.1 The landscape of high-tech industry

THE high-tech industry, abbreviated as the "highly-intensive technology industry," in simple terms denotes an economic sector primarily dedicated to advancing and manufacturing state-of-the-art technologies and products. These innovations frequently feature high levels of originality and complexity, setting them apart from traditional industry offerings. The high-tech industry spans a diverse array of subfields, such as electronics, software, telecommunications, biotechnology, aerospace, and other areas.

Categorizations used for "high technology" almost universally rely on two primary factors. The first factor pertains to the quantity of technology professionals within an industry, including scientists, engineers, and similar roles. The second factor relates to the extent of research and development (R&D) investments (Walcott 2000). High technology classification is determined by the ratio of technology professionals to the total workforce and the ratio of R&D expenditures concerning the firm's size, measured by metrics like sales, profits, or value-added, says in (Hetrick 1996). The precise threshold for the ratio that designates an industry as high tech is a subject of ongoing debate. One definition, utilized by the Organization of European Community Development (OECD 1995) and the U.S. National Science Foundation (NSF 1998), classifies occupations based on their technology intensity, which is computed by comparing an industry's R&D expenditures and/or the number of technical personnel employed with the overall value of an industry's shipments.

The high-tech industry's landscape exhibits several prominent characteristics, which differentiates the high-tech industry from other industries:

- Swift Technological Progress: High-tech sectors lead in technological innovation, as companies continually strive to develop and market cutting-edge products and solutions.

- Global Competitive Environment: The high-tech industry operates on a global scale, experiencing fierce competition from established players and startups world-

wide.

- Substantial Research and Development (R&D) Investment: High-tech firms allocate significant resources to research and development, driving the creation of pioneering technologies.

- Emphasis on Intellectual Property Protection: Intellectual property, encompassing patents and copyrights, assumes a vital role in safeguarding the innovations and products of high-tech companies.

- Short Product Lifecycles: Many high-tech products have brief lifespans due to the rapid pace of technological evolution, necessitating ongoing product development and enhancements.

- Complex Ecosystems: The high-tech sector relies on intricate supply chains and partnerships, with companies collaborating with suppliers, manufacturers, and service providers to deliver comprehensive solutions.

- Regulatory Frameworks: High-tech industries are subject to governmental regulations concerning safety, intellectual property, export controls, and other facets.

- Focus on Cybersecurity: Cybersecurity is of paramount importance in the high-tech industry, given the sensitive data and technologies involved, prompting companies to invest in robust security measures.

- Market Diversification: The high-tech industry caters to both consumer and business markets, creating distinct market segments with unique needs and characteristics.

- Influence of Startups and Innovation Hubs: High-tech innovation is frequently driven by startups and innovation hubs in tech-centric regions like Silicon Valley, fostering an entrepreneurial and disruptive culture.

- High Capital Investment: Developing and scaling high-tech products often demands substantial investments in infrastructure, research, and manufacturing.

- Environmental Responsibility: Sustainability and environmental concerns have gained prominence in the high-tech industry, focusing on energy efficiency, responsible sourcing, and waste reduction.

  One of the greatest characteristic that is of interest in the scope of this research, is whether these particularities affect how high-tech companies uses social media strategically, and whether social media has a major impact on the success of this industry, since it is characteristically specific both in its position in the supply chain (more B2B) and in nature (above listed), and their selling behavior depends greatly on specifications and technical knowledge, instead on their general exposure to the

masses (additionally, the general public will rarely see and not to mention, understand the products). Because of this, high-tech marketing is often directed at specific customer end, though reputation does play an important role when it comes to B2B selling. It is therefore interesting to see if social media plays a pivotal role in this setting.

Indeed, as De Ruyter, Moorman, and Lemmink (2001) points out, in terms of marketing (in this case often B2B or B2B2C) the high-tech industry faces many demanding challenges from its complex nature, which creates uncertainty in supply and demand side and contribute to perceive risks. Suppliers of high-tech products often encounter technological skepticism from buyers, leading to delays or postponements in their product purchases (Shanklin and Ryans 1987).

Moreover, it has been consistently shown that, beyond the high-tech product itself, the expertise of the salesperson and the quality of after-sales support and service, as well as effective communication, are vital elements for achieving success as a supplier in high-technology markets. Extensive contract negotiations and the need for ongoing maintenance create a context of frequent interactions between individual buyers and sellers, emphasizing the significance of communication and collaboration. This situation is often described as the "multi-headed customer and seller" phenomenon (Abratt 1986).

4.2 High-Tech Industrial marketing

The impact of IT advancements on the management of inter-organizational relationships has been a long-standing area of interest (D. T. Wilson and Vlosky 1998). However, many scholars noted, that the influence of IT on acquisitions and relationships, has not received sufficient attention. On this theme, De Ruyter, Moorman, and Lemmink (2001) emphasized the complexity of relationships in high-technology markets. Suppliers face paramount challenges, such as buyer skepticism toward new technologies and the constant risk of obsolescence due to ongoing technological developments. Nevertheless, in high-technology markets, it is common to encounter relatively high buyer switching costs and substantial buyer commitment to a specific vendor's technology (D. T. Wilson and Vlosky 1998).

According to De Ruyter, Moorman, and Lemmink (2001), both buyers and sellers perceive high-technology markets as high-risk environments, underscoring the pivotal role of trust and commitment in supplier-customer relationships. Consequently, the active management of supplier-customer relationships is particularly crucial in high-technology markets. This management aims to ensure a continuous flow of information and the establishment of trust and commitment between suppliers and customers.

Social media marketing, as aforementioned, plays a crucial role to strategically facilitate relationships between buyer and seller in the high-tech context (Brennan and

Croft 2012). Likewise, by proving their competence through publishing innovative, often academic and educational content, they establish themselves as "thought leaders" (Cartwright, Davies, and Archer-Brown 2021) (see section "B2B social media marketing" in chapter 2); the expert reputation (and state-of-the-art products) in turn encourages potential buyers to engage in the first transaction with the firm, facilitating also acquisition orientation, though, how much of an effect social media marketing has on both strategic directions is still vague and calls for more attention. This is not only due to the special nature of the high-tech industry, as illustrated above, but also because marketing in high-tech industrial context strives, as a new paradigm, to "drive the market" with its innovation instead of being "market-driven" (Hills and Sarin 2003).

4.2.1 Case Study: Brennan and Croft 2012

In their research published in 2012 titled "The use of social media in B2B marketing and branding: An exploratory study" (Brennan and Croft 2012), Brennan and Croft undertook a comprehensive investigation into the utilization of social media tools by business-to-business (B2B) marketers, a domain often overshadowed by the predominant focus on consumer marketing in contemporary discourse. Despite the widespread integration of social media in consumer-centric strategies, there was a noticeable dearth of empirical evidence regarding the extent of its adoption in B2B marketing practices. The researchers addressed this gap through a semi-structured content analysis of social media materials disseminated by ten large B2B businesses operating in the high-technology sector. By employing content analysis and text-mining techniques, the study sought to profile the use of social media in B2B marketing and providing insights into the strategies of major players in the high-tech industry.

The findings revealed a nuanced landscape wherein large B2B technology companies demonstrated extensive engagement with various mainstream social media channels. However, the study emphasized that the adoption of these tools was not universal among such companies. Remarkably, the study highlighted a disparity in the pace of adoption, with U.S.-based firms emerging as frontrunners in incorporating social media into their B2B marketing practices. The study not only presented a quantitative assessment of the prevalence of social media use but also delved into the qualitative aspects of its application. The identified B2B social media pioneers were observed strategically positioning themselves as 'thought leaders,' assuming market-driving roles, and cultivating relationships with diverse stakeholder groups. These insights contributed significantly to understanding the evolving landscape of B2B digital marketing and underscored the potential of social media in shaping the strategic orientation of large B2B technology companies.

Overall, Brennan and Croft's study shed light on the evolving landscape of B2B digital marketing, specifically within the high-technology sector. In the rapidly evolving landscape of the technology sector, major companies have effectively utilized social media tools to establish their brands as authoritative voices. In this dynamic environment,

industry leaders like Cisco, Oracle, and Intel strategically aim to demonstrate their role as market drivers. Beyond merely providing the essential components such as hardware, connectivity, and software that fuel the social media revolution, these companies actively embrace innovative business models centered around mass collaboration—a trend predominantly observed in the business-to-consumer sphere.

Chapter 5

Empirical Analysis

5.1 Empirical Analysis

5.1.1 Research hypothesis, sample, variable description and summary statistics

THE increasing prevalence of social media platforms has revolutionized the way that businesses interact with their customers, leading to new opportunities for engagement and revenue growth. High-tech companies, as mentioned in previous chapters, have been at the forefront of the revolution of this marketing strategy to boost their bottom line, with cutting-edge and innovation being their speciality. However, despite the growing importance of social media in the business world, there is still a lack of empirical research examining the impact of social media on acquisition orientation for high-tech B2B/B2B2C companies. In this chapter, we aim to fill this gap by conducting an empirical analysis of the effect of social media on revenue in high-tech companies, providing unique insights into the role of social media in driving business success in this dynamic and rapidly-changing industry.

As aforementioned in chapter 2, acquisition orientation is defined as a strategic approach to acquire new customers, leads, or clients. This strategy involves leveraging social media marketing efforts to expand the customer base and attract new potential buyers, subscribers, or followers (Cartwright, Davies, and Archer-Brown 2021). Even though the strict definition of acquisition orientation defined as the obtainment of new clients is not able to be observed directly via publicly available data, we can definitely observe the figure it is being translated into- revenue, and through this, attempt to verify whether social media activity is indeed producing positive effects on the success of large, B2B/B2B2C high-tech companies. Here, we generally assume that inclining revenues include revenues gained from newly acquired customers.

The resulting hypothesis is therefore constructed as such:

H1: Social media activity has a positive effect on the acquisition orientation (proxied by sales revenue) of high-tech, B2B/B2B2C companies

Seemingly straightforward, this hypothesis indeed triggers some peculiarities as the nature of high-tech company renders it complicated to predict positive results (Shanklin and Ryans 1987). One would, from one side, indeed expect the hypothesis to be verified since social media activity does seem to be generally useful as part of the selling, promotion, and reputation building of the brand (Vukanovic 2012), which is especially true for small and medium enterprises (Cao and Weerawardena 2023). However, to determine the *degree* in which social media activity has on acquisition orientation, from the other side one could also foresee the complication within. For example, it depends on how well posts are written for targeting a specific audience (Swani, George R Milne, et al. 2017), and how well-suited a platform serves for doing so (whether the site is Twitter, Facebook, Instragram or Linkedin etc.) (Swani, Brown, and George R. Milne 2014), how much resources the company has dedicated for doing so (here we assume they generally have full-resources at hand as only large companies are within the samples) (Müller, Buliga, and Voigt 2021), and how much visibility the company has or has not to the general public depending on *which* company it is, its history, and what products it sells (e.g. Apple, Tesla in comparison to Jabil), and ultimately, whether they are B2B, B2B2C or B2C (Iankova et al. 2019). These factors all contribute differently to the effect of social media activity on revenues and therefore to the outcome of this research, one can only assume what is able to be assumed and leave the rest to the benefit-of-the-doubt.

Sample description

Our social media activity is derived from a list of *Fortune 200 companies* and merged with financial data retrieved from the Compustat database. Compustat is a financial database provided by Standard and Poor's that provides a wide-ranging collection of market and corporate data for numerous companies across the globe, which goes back to as far as 1950. Financial market professionals, investors, and academics find Compustat a valuable tool for obtaining intelligence in their respective fields.

Using Compustat, we manually filtered and selected those companies beginning with the 2 digit SIC code: 36, mainly, the *electronics and electronics equipment industry* for the interest of this study. In retrospect we have included not only pure B2B companies in the sample (which was the original intent of the research) but also mixed model or B2C companies due to the concern of not having enough data pool. In the process of doing so, we have included, in the ratio of eight to two, companies of mixed business model such as B2B2C or straightforwardly B2C. The resulting selection is a group of 10 companies with data on social media activity (8 being more traditionally B2B in business model, with 2 being mixed or B2C), spanning from the year 2011 to 2020, which was the time when businesses started to adopt social media with more frequent activity. Panel data, also referred to as longitudinal or cross-sectional time series data, integrates aspects of both time

series and cross-sectional data by following multiple entities or individuals across different time points, is used in this research. Essentially, panel data comprises observations on a group of subjects at various time intervals. This distinctive structure enables researchers to investigate individual and time-specific effects, offering a more comprehensive understanding of the underlying dynamics of economic phenomena. Econometric models that leverage panel data allow for the exploration of cross-sectional variations and temporal patterns, contributing valuable insights into the intricacies of economic relationships and behaviors. The adaptability of panel data makes it an indispensable tool in empirical research, facilitating more robust and nuanced analyses compared to conventional cross-sectional or time series data alone. This allowed us to have a more comprehensive picture of trends and relationships among variables, ultimately making this analysis fuller completer and more insightful.

Another reason why we track social media activity through a long period of time is because social media activity adoption of firms increase with time and its impact on revenue might be lagged, so a longer window of observation is more insightful. In this research, the data is adopted for different high-tech companies across the year 2011 to the year 2020 to see how things change across different firms and, within the same firm, across different years.

The selected 10 companies, where each company has 2 sets of social media activity data- on 1) Facebook and 2) Twitter, are:

1. **Apple**: is a technology company that designs and manufactures consumer electronics, computer software, and online services. They are widely known for products like the iPhone, iPad, Mac computers, and software such as iOS and macOS.

2. **Tesla**: is an electric vehicle and clean energy company. They design and manufacture electric cars, energy storage solutions, and solar products. Tesla is also involved in developing autonomous driving technology.

3. **Qualcomm**: is a semiconductor and telecommunications equipment company. They design and market wireless telecommunications products and services. Qualcomm is a major player in the development of mobile communication technologies.

4. **Jabil**: is a manufacturing solutions provider that offers design, engineering, and manufacturing services for electronics and technology companies. They provide a range of services from product design to distribution.

5. **Broadcomm**: is a global technology company that designs, develops, and supplies a broad range of semiconductor and infrastructure software solutions. Their products are used in data centers, networking, and various electronic devices.

6. **Intel**: is a semiconductor manufacturing company that designs and manufactures microprocessors for the global market. They are a major player in the computer hardware industry.

7. **Advanced Micro Devices**: AMD is a semiconductor company that designs and manufactures microprocessors, graphics processors, and related technologies for computers and gaming consoles.

8. **Texas Instruments**: is a global semiconductor design and manufacturing company. They produce a wide range of analog and embedded processing products, including micro-controllers and digital signal processors.

9. **Whirlpool**: is a multinational manufacturer of home appliances. They produce a variety of products, including washing machines, refrigerators, ovens, and other household appliances.

10. **Eaton**: is a power management company that provides energy-efficient solutions for electrical, hydraulic, and mechanical power. They offer a wide range of products for various industries, including aerospace, automotive, and electrical systems.

Looking at the selected companies for the setting of this study, which are particularly high-tech and B2B/B2B2C companies, we proceeded to analyze some key financial figures, in particular, revenue, total assets, teturn on Assets, total equity, and research & development expenses:

- Revenue: the maxmimum amonut of revenue is 275 billion dollars, with the minimum amount being 4 billion dollars

- Total Assets: maximum value is 375 billion dollars, with the minimum being 3 billion dollars

- Return on Assets: maximum value is at 0.5% and minimum value is -0.019%

- EBITDA: maximum value is at 81 billion and minimum value is at negative 59 million

- EBIT: maximum value is at 71 billion and minimum value is at negative 130 million

- Total Equity: maximum value is at 126 billion and minimum value is at negative 9 billion

- R&D expenses: maximum value is at 375 billion and minimum value is at 3 billion

It is also important to note that, some supplementary data is retrieved with manual searching in the peer analysis function on the EIKON database, selection is based on the companies presented above (companies filtered in fortune 200's companies with SIC codes beginning with 36).

Variable description

The relevant variables considered in this dataset encompass 2 major classes, the former class is the dependent variable, while the latter class is the independent variable, the independent variable is the variable or set of variables that are hypothesized to have an impact on the dependent variable. Often denoted as Y, the dependent variable is the outcome or response variable that we seek to understand or predict based on the variation in one or more independent variables. The dependent variable represents the phenomenon under investigation, and its changes are influenced by the values of the independent variable. The others are control variables, which are additional factors that are included in the model to account for potential confounding influences or variations that might affect the relationship between the independent and dependent variables. Panel data, which involves observations on multiple entities over multiple time periods, is particularly susceptible to various unobserved heterogeneities and time-varying factors that may impact the estimated relationships. Control variables help mitigate these issues and enhance the precision and accuracy of the regression results.

In the previously mentioned order, the independent variables are:

- Posts per day: is the average of the posts the company has published per day during the year
- Overall tweets: is the average number of overall tweets that the company has published in that year

The dependent variable is:

- Revenue: as the name suggests, it represents the total amount of income or sales generated by a company through its primary business activities. Also usually scaled by total assets or sales growth, defined as (revenye - lag_revenue)/(revenue).

Finally, the control variables are:

- ROA: return on asset (ROA), is a crucial financial metric that provides insights into a company's efficiency in generating profits from its assets. Calculated by dividing net income by average total assets, ROA measures the effectiveness of a company in utilizing its assets to generate earnings.
- R&D expenses: research and Development (R&D) expenses are a significant financial statement figure that reflects the investment a company makes in innovation and technological advancements. Found in the income statement, R&D expenses encompass the costs associated with the development of new products, processes, or services. These expenses typically include expenditures on salaries and benefits for research personnel, costs of materials and equipment, as well as overhead expenses related to research facilities. This figure is especially crucial to the high-tech

industry as it is a measure that impacts how innovative or cutting-edge are the company, that ultimately gives them a competitive advantage. Usually scaled by total assets.

- Total assets: total Assets is a fundamental financial statement figure that represents the sum of all the economic resources owned or controlled by a company. This figure is prominently featured on the balance sheet, one of the key financial statements.

- Natural log total assets: we take the natural log of total assets, to address issues related to the distributional properties of the data. When the dependent variable exhibits a skewed or non-constant variance, taking the logarithm helps stabilize the variance and approximate a more normal distribution, as well as approximate the linearity of the data.

- Total equity: a key figure in financial statements, represents the residual interest in the assets of a company after deducting its liabilities. It is a critical indicator of a firm's net worth and shareholder value. Comprising common stock, retained earnings, additional paid-in capital, and other equity components, total equity reflects the ownership stake that shareholders have in the company.

- Leverage: defined as total debt to total equity, is a key metric that assesses the proportion of a company's debt in relation to its equity, measuring the extent of financial leverage used to fund its activities.

- Year: this variable is delineated from the panel data setting which indicates the year to which the social media activity refers to, although with gaps (since there could be missing data for certain years) e.g. 2015. For every firm there should be 10 rows corresponding to the 10 years.

After we have described our main variables, let us first take a look at the correlation table (Table 5.1):

The table presents a correlation matrix with significance in brackets for a set of variables, including:

- Total revenue

- Total assets

- Return on assets

- Ebitda

- Ebit

- Total shareholder's equity

Variables	Total revenue	Total assets	ROA	EBITDA	EBIT	Total shareholder's equity	R&D Expenses	Posts per day
Total revenue	1.000							
Total assets	0.980	1.000						
	(0.000)							
ROA	0.382	0.381	1.000					
	(0.000)	(0.000)						
EBITDA	0.982	0.982	0.481	1.000				
	(0.000)	(0.000)	(0.000)					
EBIT	0.987	0.975	0.477	0.995	1.000			
	(0.000)	(0.000)	(0.000)	(0.000)				
Total shareholder's equity	0.874	0.917	0.532	0.936	0.919	1.000		
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)			
R&D expenses	0.702	0.785	0.341	0.761	0.707	0.756	1.000	
	(0.000)	(0.000)	(0.002)	(0.000)	(0.000)	(0.000)		
Posts per day	-0.140	-0.063	-0.010	-0.087	-0.132	0.001	0.259	1.000
	(0.202)	(0.564)	(0.929)	(0.430)	(0.229)	(0.996)	(0.017)	

Table 5.1: Pairwise correlation indexes

- Research and development expense:
- Posts per day

Each cell in the matrix displays the Pearson correlation coefficient between the corresponding pair of variables. The diagonal elements show the perfect correlation (1.000) of each variable with itself. The off-diagonal elements represent the correlations between different pairs of variables. Significance are included in parentheses, denoting the level of statistical significance. For instance, the correlation between revenue and total assets is highly significant ($p < 0.001$). The negative correlation coefficient between postsperday and revenue suggests a potential inverse relationship, though it is not statistically significant. Overall, the table provides a comprehensive overview of the interrelationships between the variables, allowing for an in-depth analysis of their associations and statistical significance.

From this table, it is quite noticeable already the interrelationship between the variables, although to draw a proper conclusion, a regression analysis would be needed, that being said we proceed to look at our regression model in the next section.

Summary Statistics

Variable	Mean	(Std. Dev.)	Min.	Max.	N
Total revenue	43177.17	(65726.68)	4272	274515	85
ROA	0.19	(0.11)	-0.02	0.5	84
R&D Expenses	3780.1	(4586.97)	25.03	18752	85
Total assets	58599.72	(90628.81)	3321	375319	85
Natural log TA	10.07	(1.33)	8.10	12.84	85
Total shareholder's equity	26246.8	(36907.35)	187	134047	85
Leverage	0.63	(0.21)	0.21	0.97	84
Operating cash flow	12169.92	(21011.87)	-338	81266	85
Market to book	9.26	(14.71)	0	116.95	85
ROA volatility	0	(0)	0	0	85
Posts per day	1.27	(1.72)	0	6.8	85
Overall tweets	6155.62	(4142.54)	1	15839	52
Tweets excluding retweets	391.91	(551.03)	0	2346	85

Table 5.2: Summary statistics

The provided table displays summary statistics for various financial and operational variables across a dataset. The variables cover a range of financial indicators, such as revenue (revt) in thousands, return on assets (roa), research and development expenses (xrd) in thousands, total assets (at) in thousands, natural logarithm of total assets (ln_at),

total shareholders' equity (seq) in thousands, leverage (lev), operating cash flow (oancf), market-to-book ratio (Markettobook), return on assets volatility (ROAvolatility), daily posts on social media (postsperday), overall tweets (overaltweets_n), and tweets excluding retweets (tweetsexcludingretweets_n). The statistics include measures such as the mean, standard deviation, minimum, maximum, and the number of observations (N) for each variable. These summary statistics provide a comprehensive snapshot of the central tendency and variability within the dataset, offering valuable insights into the distribution and characteristics of the financial and social media-related metrics under consideration.

5.1.2 Regression model and settings

To test our first hypothesis, we examine the association between social media activity initiated by the high-tech company and the revenue generated by the company. Hence, we run the following OLS model:

$$Revenue_{it} = \alpha + \beta_1 Social\ media\ activity_{i,t-1} + \beta_2 \sum Controls_{i,t} + e_i$$

where:

- α is the constant to be estimated
- β is the coefficients to be estimated
- i denotes each company
- t denotes each year
- e is the error term

Here, the dependent variable is *revenue* and the independent variables measure *social media activity*. More specifically, we use *Posts per day* (i.e., the average number of Facebook post per day or the average number of tweets posted per day) and *tweets excluding retweets* (i.e., total amount of tweets in a year excluding the number of retweets). The full set of controls are in line with previous literature and their detailed description is as follows:

- Total assets: refer to the sum of all the assets, both current and non-current, that a company or entity owns and uses in its business operations. We use natural log to keep the variable constant throughout the study and avoid non-linearity, since its behavior is often times non-linear.
- Leverage: defined as total debt to total equity, is a key metric that assesses the proportion of a company's debt in relation to its equity, measuring the extent of financial leverage used to fund its activities.
- ROA: return on assets defined as net income over average total assets.

- ROA volatility: is defined as the standard deviation of ROA, where it is manually calculated initially via the supplementary data collected from EIKON for better understanding and simplicity and to have more observations. Alternatively, we can also use the Compustat variable "sd_roa3" which is the 3 year rolling standard deviation of ROA to measure the stability of ROA over the course of our analysis.
- Market to book: measures a company's market capitalization relative to its book value of equity.
- Operating cash flow: refers to the net cash flow generated by operational activities, excluding cash flow stemming from extraordinary items and discontinued operations.
- R&D: since our setting is related to high-tech companies, this measure is certainly needed as it is closely related to tech companies' innovation, value proposition and success.

5.1.3 Empirical Results

Twitter Data

Before proceeding to the fixed effect model, we initially performed a simple Ordinary least Squares (OLS) regression to explore the relationship between the variables of interest and social media activity measures with only Twitter data. The model included the control variables as described above. The empirical results are presented below. The results shall be divided into two sections, one with only Twitter data and one with only Facebook data to explore the difference and effect of each modelling using different social media platforms.

The table reports our main regression results for Hypothesis 1 (see previous section). Here, we regressed social media activity with variables displaying the most observations 1) ln_postsperday 2) tweetsexcludingretweets on total revenue 'revt' and natural log of revenue 'ln_sale'. Furthermore, we have added the variable "year" as a control variable to partially account for the effect of time in the first simple OLS model. In Column 1, we use Posts per day as the measure of twitter activity initiated by the high-tech companies and did not find a positive and significant association, thus suggesting that the companies' social media activity does not have a beneficial impact on its ability to acquire additional revenue. The coefficient of interest is equal to -0.0184 if we look at column 3 where both independent and dependent variables are log-transformed. The result appear to have no significance. We scaled posts per day using natural log plus one since the coefficients initially were too small.

However, we did find a positive and significant association between the total asset and the companies' total revenue as well as most of the fundamental financial measures, such as leverage and operating cash flow. In column 2, we use Tweets-excluding-retweets as our main variable of interest and, interestingly, we also did not find a significance. In column 3, we scaled the revenue using natural log to see how the coefficients would behave, to see that apart from social media activity based on posts per day, almost all other control variables have significant effect on total revenue, with R-square nearing 1.

The regression result is shown below:

VARIABLES	(1) Sales	(2) Sales	(3) ln_sales	(4) ln_sales
Posts per day	-3,931		-0.0184	
	(2,690)		(0.0490)	
TA	2,001	930.2	0.672***	0.663***
	(3,069)	(2,984)	(0.0559)	(0.0536)
R&D	-1.311**	-1.381**	-1.73e-05	-1.91e-05
	(0.601)	(0.642)	(1.09e-05)	(1.15e-05)
Lev	13,371	11,768	1.018***	0.995***
	(11,569)	(11,796)	(0.211)	(0.212)
Operating CF	3.298***	3.387***	1.20e-05***	1.29e-05***
	(0.187)	(0.180)	(3.40e-06)	(3.24e-06)
Market to book	141.7	114.4	0.00125	0.00114
	(121.2)	(121.7)	(0.00221)	(0.00219)
ROA	-69,988***	-71,541***	0.335	0.299
	(22,641)	(23,254)	(0.412)	(0.418)
Sd_roa3	-73,610*	-75,429*	-3.503***	-3.498***
	(38,517)	(39,166)	(0.701)	(0.704)
Year	649.8	514.2	-0.0236	-0.0238
	(799.6)	(814.9)	(0.0146)	(0.0146)
Tweets excluding retweets		-2.377		3.69e-06
		(2.938)		(5.28e-05)
Constant	-1.312e+06	-1.028e+06	50.26*	50.73*
	(1.606e+06)	(1.635e+06)	(29.24)	(29.39)
Observations	60	60	60	60
R-squared	0.984	0.984	0.976	0.976

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 5.3: OLS Regression results of Twitter without fixed effects

Next, even though we have already established that regular OLS regression gave no significant results, for the sake of robustness, we shall still proceed with incorporating longitudinal and cross-sectional fixed effects into the analysis. By employing this model, we ensure that our analysis will be robust and will incorporate the time and individual fixed effects present in our dataset, improving the reliability of our results. The mathematical model of the regression remains unchanged except the presence of new variables estimating the fixed effect, as shown below:

$$Revenue_{it} = \alpha + \beta_1 Social\ media\ activity_{i,t-1} + \beta_2 \sum Controls_{i,t} + c_i + \gamma_t + e_i$$

where, just like before:

- $alpha$ is the constant to be estimated
- $beta$ is the coefficients to be estimated
- i denotes each company
- t denotes each year
- c represents time-invariant individual-specific effects (fixed effects)
- y represents represents the time fixed effect for time t
- e is the error term

Below is the regression result table:

VARIABLES	(1) Sales	(2) Sales	(3) ln_sales	(4) ln_sales
Posts per day	-75.91		0.0352	
	(1,111)		(0.0219)	
TA	6,226	6,126	0.419***	0.431***
	(3,969)	(3,995)	(0.0908)	(0.0926)
R&D	4.841***	4.843***	1.57e-05*	1.43e-05
	(0.401)	(0.417)	(6.82e-06)	(8.10e-06)
Lev	7,238	7,040	-0.162	-0.152
	(6,883)	(6,929)	(0.125)	(0.130)
Operating CF	1.130***	1.135***	5.03e-06**	5.11e-06**
	(0.254)	(0.270)	(1.86e-06)	(1.95e-06)
Market to book	-2.744	-3.347	0.00103***	0.00126***
	(30.15)	(29.46)	(0.000256)	(0.000297)
ROA	-17,770	-17,648	0.768***	0.760***
	(14,614)	(14,463)	(0.144)	(0.151)
Sd_roa3	-45,159	-44,823	0.0823	0.112
	(27,237)	(27,659)	(0.385)	(0.412)
Tweets excluding retweets		0.0482		2.94e-05
		(1.115)		(2.28e-05)
Constant	-49,065	-48,069	5.615***	5.490***
	(40,611)	(41,008)	(0.933)	(0.944)
Observations	60	60	60	60
R-squared	0.961	0.961	0.904	0.902
Number of companyname	9	9	9	9

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 5.4: OLS Regression results of Twitter with fixed effects

In the second analysis, We see a reverse in the sign of research and development expense, having a significant positive effect on revenue. Furthermore, our main social media activity measure natural log of 'posts per day' remain insignificant across both total revenue in column 1 and the natural log of total revenue in column 3, though the sign had reversed in the latter case. We also see that the control variable ROA volatility or "sd_roa3" had lost significance as well as leverage "lev" compared to the simple OLS regression without fixed effects. All in all this doubly confirmed the fact that in this study, social media activity seems *not* to have a benefit in increase total revenue (also called acquisition orientation in our study) for B2B/B2B2C high-technology firms within the Fortune 200.

Facebook Data

Due to the different characteristics of different social media platform, it is worthy separating the analysis. In this section we will look at Facebook data only and explore its effect on the regression modelling. From the same analysis using Facebook, here, we use only one social media measure, namely 'posts per day' to estimate its effect on revenue. The regression table can be seen below:

	(1)	(2)
VARIABLES	Sales	ln_sales
Posts per day	-5,793	0.288**
	(9,329)	(0.119)
TA	1,103	0.635***
	(3,505)	(0.0449)
R&D	-1.454**	-2.18e-05**
	(0.672)	(8.60e-06)
Lev	8,856	0.566***
	(14,274)	(0.183)
Operating CF	3.397***	1.70e-05***
	(0.206)	(2.64e-06)
Market to book	114.2	0.00168
	(135.3)	(0.00173)
Roa	-79,712***	0.374
	(26,201)	(0.335)
Sd_roa3	-69,596	-1.610**
	(50,792)	(0.650)
Year	712.4	-0.0207
	(1,016)	(0.0130)
Constant	-1.426e+06	44.66*
	(2.044e+06)	(26.16)
Observations	52	52
R-squared	0.983	0.988

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 5.5: OLS Regression results of Facebook without fixed effects

Looking at the preliminary OLS regression, we are suprised to see that the log-transformed "posts per day" do have a positive effect on the log transformed total revenue based on Facebook data. This can be shown in column 2. Meanwhile, we can still observe that almost every other control variables have a significant positive effect on total revenue, apart from market to book "mtb" and year.

The result is unexpected as the number of observations we have for the data in Facebook is lower than the number of observations we have for the data in Twitter (85 vs 74). Thus, one can say that Twitter data does better in modelling only due to its bigger pool of observations. Here, it is worthy to note that the general purpose and audience of each social media platform differs in terms of content sharing, user connections, format, and audience engagement. Facebook is characterized by its comprehensive content sharing capabilities, allowing users to post longer text, images, videos, and more. The platform emphasizes personal connections, where users connect with friends, family, and acquaintances through friend requests, making it more difficult for a private user to see posts that is not followed or requested (though to the contrary it is also true that Facebook does have a good advertising function). Privacy settings on Facebook are robust, giving users control over who can view their posts and other profile information. With a broad and diverse user base, Facebook is often used for sharing personal updates and life events. On the other hand, Twitter is renowned for its brevity, limiting tweets to 280 characters. The platform revolves around following accounts of interest, with mutual consent not required; therefore, it is a popular hub for real-time updates, news, and short-form content. Hashtags play a significant role on Twitter, categorizing and discovering content. The platforms also differ in their feed algorithms, with Facebook using an algorithmic feed and Twitter initially having a chronological feed.

As aforementioned, for the sake of robustness, we anyhow conduct a fixed effect panel regression.

The result is outlined below:

VARIABLES	(1) Sales	(2) ln_sales
Posts per day	3,592	-0.0405
	(2,618)	(0.0266)
TA	2,948	0.322***
	(4,158)	(0.0367)
R&D	5.124***	2.41e-05***
	(0.246)	(3.63e-06)
Lev	3,621	-0.300***
	(6,216)	(0.0386)
Operating CF	1.261***	5.85e-06***
	(0.0868)	(1.60e-06)
Market to book	-1.543	0.00111***
	(35.25)	(0.000182)
ROA	-11,919	0.856***
	(12,759)	(0.0912)
Sd_roa3	-32,645	0.467**
	(27,160)	(0.190)
Constant	-20,080	6.541***
	(41,939)	(0.358)
Observations	52	52
R-squared	0.971	0.969
Number of companyname	8	8

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 5.6: OLS Regression results of Facebook with fixed effects

In the second analysis, we can confirm the insignificance of the results of Facebook social media activity on revenue. We see a reverse in the sign of research and development expense, having a significant positive effect on revenue, as well as the natural log of total assets, operating cash flow as well as market-to-book ratio and ROA-volatility in the case of the second column where we log-transformed both independent and dependent variables. It is important to note that observations has decreased using Facebook as mentioned before from 84 to 74. All in all this, for the second time, highlighted the fact that in this study, social media activity seems *not* to have a benefit in increase total revenue (also called acquisition orientation in our study) for B2B/B2B2C high-technology firms within the Fortune 200.

5.1.4 Robustness Tests

Looking the regression result, we aim to establish a link between high-technology firms' revenue and social media activity. Nonetheless, it is fair to doubt that the inference might be confounded by a reverse causality concern, or in other words, that it could be more profitable firms invest more in social media activity (i.e. higher levels of revenue causes higher levels of social media activity). Based on anecdotal evidence or current literature in industrial marketing, the size of the organization has no impact on social media maturity (Eggers et al. 2017). Furthermore, it seems like social media deployment presented problems comparable to those faced by smaller organizations, despite the fact that larger organizations have more resources (Cartwright, Davies, and Archer-Brown 2021), as mentioned in the second chapter.

Empirically speaking, we could still address this to make sure the data is consistent with the literature. This is done by lagging the social media variables by one year forward to see the impact of revenue on social media activity. Hence, we implement the following simple OLS regression, which is the inverse of our hypothesis one (H1) as outlined earlier in the chapter.

$$Social\ media\ activity_{i,t+1} = \alpha + \beta_1 Revenue_{i,t-1} + \beta_2 \sum Controls_{i,t} + e_i$$

If increased revenue gained by the high-tech firms lead to increased activity on social media platforms, then there should be a positive and significant correlation between revenue and social media activity. However, if the posts on social media are driven by the firms' intrinsic motivation and willingness to share information regardless of the revenue, then revenue would not be significantly correlated to social media activity. The result are as follows:

In table 5.7 and 5.8 we report the results of OLS regressions to test for reverse causality where the main independent variable is the revenue, and the main dependent variable is social media activity lagged forward. We find that the revenue does not predict any

VARIABLES	(1) Posts per day
Sales	1.424
	(0.870)
TA	-0.486
	(0.606)
R&D	0.000***
	(0.000)
Operating CF	-0.000***
	(0.000)
Market to book	-0.004
	(0.011)
ROA	1.262
	(1.943)
Sd_roa3	2.428
	(5.436)
Year	-0.068
	(0.082)
Constant	128.613
	(165.435)
Observations	39
R-squared	0.694

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 5.7: OLS Regression Result for Reverse Causality (Twitter)

VARIABLES	(1) Posts per day
Sales	0.549
	(0.625)
TA	-0.305
	(0.412)
R&D	0.000***
	(0.000)
Operating CF	-0.000***
	(0.000)
Market to book	-0.010
	(0.006)
ROA	-4.271***
	(1.312)
Sd_roa3	3.543
	(3.381)
Year	0.015
	(0.054)
Constant	-32.383
	(109.802)
Observations	32
R-squared	0.882

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 5.8: OLS Regression Result for Reverse Causality (Facebook)

abnormal social media activity one year later, meaning that more profitable firms are not on average more likely to increase their social media posts and contents compared with firms that have lower profitability. This is generally consistent with literature and anecdotal evidence as larger firms, compared to smaller firms, do not exhibit more social media maturity (Eggers et al. 2017).

5.1.5 Discussion

Looking at the result of the regression, we hereby attempt to discuss the insignificance of the result. The likely attribution may be to the small pool of observation mainly due to the limited data availability, since our only source of social media activity data came from a dataset which includes only companies within the Fortune 200. Since the p-value is close to being less than 0.05 at times, it could be likely that we simply cannot reject the null hypothesis because of faulty and otherwise limited data sample.

Another potential problem comes from the possibility that high-tech industrial marketing uses other platforms of social media where we do not have data on hand, for example, Linkedin. As literature suggests, tech companies try to become opinion leaders and drive the market (Brennan and Croft 2012), more than being market driven, hence, B2B2C/B2C companies that manufacture electronics (like those in our sample pool, except Tesla and Apple, where we know are B2C companies) may prefer to use more reputable or formal sources of social media (or non-social media, such as professional journals) to market their innovative products. It could even be that they do not leverage social media as a marketing resource at all since their target audience isn't the end-consumer but other electronic companies that are further up or down the value chain. They could simply be utilizing social media for other purposes, such as but not limited to, building general reputation, hiring talents, or raising general awareness and vice versa. It could be quite possible, that social media may not be the main strategy in their attempt to drive revenue but trade shows or customer visits. Hence, this could account for the insignificance in the regression.

Another possible explanation to the result could be the specificity of social media strategies employed by our B2B/B2B2C high-tech companies. Different companies may implement social media campaigns with varying degrees of effectiveness, and a generalized approach might not capture these nuances. For example, Tesla and Apple are both B2C companies that are notoriously able to market themselves via social media, stirring lasting interest of consumers, however, it is unclear how other B2B companies were able to post and write about their products when the client, as opposed to being interested in the brand's visual or creative impact, is more interested in the technical aspects of the products, supply security, ease-of-use in design, efficiency and et cetera.

That being said, we can also note the heterogeneity of B2B Companies. This means that B2B companies in the high-tech sector can be highly diverse. The impact of social media may vary significantly across different types of high-tech B2B companies. If the

sample includes a broad range of companies, the overall effect might be obscured. However, it is also true that we have adopted a model incorporating entity-specific (company) fixed effects; by including fixed effects for each high-tech B2B company in the panel, we control for un-observable characteristics that are constant over time but vary across companies. This helps to account for the individuality of each company, such as its brand reputation, management quality, or business model. The fixed effects are represented by dummy variables for each company. Other ways of making the model more robust could be introducing random effects: where we assume that the individual effects are random, meaning they are uncorrelated with the independent variables. Though, the robustness could work towards declining level of significance found in the model.

Another possible explanation could be multicollinearity between variables. High multicollinearity among independent variables can lead to unstable estimates and inflated standard errors. If there are other correlated factors influencing revenues in high-tech B2B companies, it might diminish the statistical significance of the social media activity variable. This has been tested in our correlation matrix. Furthermore, we have also tested the likelihood of the confounding factor of reverse causality.

In essence, the insufficient sample size could be a prime suspect that lead to the incapability of detecting a statistically significant effect. Larger samples increase the statistical power of the analysis and improve the chances of identifying true relationships, which is the general direction of improvement in this study. Otherwise, it could be wise to consider a more qualitative methodology for this study, such as in-depth case study to determine the effect of the social media activity on total revenue in this special context.

Chapter 6

Conclusions

IN CONCLUSION, this thesis has delved into the intricate relationship between social media activity and the acquisition orientation (ability to generate new revenue, as defined by Cartwright, Davies, and Archer-Brown (2021)) of B2B2C high-technology companies. Firstly, by extensively reviewing existing literature on qualitative analysis related to how social media is strategically used in industrial marketing, the study attempts to articulate that social media is mainly used by economic entities in either curating customer relationships (relationship orientation) or, at the same time, augmenting revenue (acquisition orientation). Secondly, by employing an Ordinary Least Squares (OLS) regression analysis, the study sought to discern whether the intensity of social media activity had a statistically significant impact on these companies' total revenue over the period of 2011-2020. However, the findings revealed an insignificance in the relationship, indicating that, within the context of the sampled B2B2C high-tech firms, the level of social media activity did not exhibit a discernible influence on their ability to acquire additional revenue. While the lack of statistical significance may not align with initial expectations, this outcome contributes valuable insights to the existing literature and underscores the need for a nuanced understanding of the complexities surrounding social media dynamics in the B2B/B2B2C high-tech sector. The inconclusive results invite further exploration into the intricacies of how B2B2C, large high-technology companies navigate their strategic orientations in the era of pervasive digital communication.

This study holds significance in the broader landscape of business strategy and technology management. As the digital realm becomes an integral part of B2B2C transactions in the high-tech sector, understanding the dynamics of social media's influence on acquisition orientation has practical implications for industry practitioners, policymakers, and researchers. The findings prompt businesses to critically assess the conventional wisdom surrounding the impact of social media on strategic decision-making. Furthermore, the study underscores the importance of context-specific analyses, recognizing that the B2B2C high-tech landscape is multifaceted, influenced by factors beyond social media engagement alone. Future research endeavors in this domain may benefit from exploring alternative methodologies, examining specific sub-sectors within high-tech B2B2C, or

investigating complementary factors that could modulate the relationship between social media activity and strategic orientations in a rapidly evolving technological landscape.

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