



Analyzing Australian SME Instagram Engagement via Web Scraping

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Abstract

Background: *Social media has grown into a prominent marketing and communication tool, and Instagram is a leader in this regard due to its distinctive supports for medial rich contents. Due to the challenges faced by Small-and-medium-enterprises (SMEs), they are suggested to embrace social media technology. Previous studies in Interactive value creation theory (IVF) indicated that SMEs-followers co-creation processes enable Instagram engagement. However, little is known of how to promote the value co-creation process via practical Instagram micro-practices that SMEs can employ regarding their constraints. This study is among the first to examine SMEs' practices for Instagram engagement via the process of value co-creation.*

Method: *We collected data regarding Instagram engagements of 10 Australian SMEs in eight months period using Instagram API. Qualitative analysis is conducted based on 2110 contents in a Poisson regression model. Content analysis and time-series visualizations are employed to investigate the uniqueness of several outliers in the dataset.*

Results: *Findings imply that SMEs should bank on @Tagging instead of #Hashtags to get more engagement as contents with @Tagging show higher levels of inclusiveness and trustworthiness. Also, customized postings for the loci-specific audience effectively encourage followers to participate in conversations, while commercial intensive posting style shows adverse effects due to its low level of credibility. Rich media contents would not necessarily reel in more engagement; the commitment and consistent postings amassed a considerable number of followers over time, leading to a higher engagement rate.*

Conclusions: *This study confirmed the benefits of data scraping in building business intelligence and validate the IVF framework as the theoretical background to investigate the effectiveness of Instagram micro-practices. IVF should be considered in designing social media practices to enable SMEs and followers' collaborations for business value generation. This study provides extra interpretations of the interrelationships between IVF, visual-rich contents, and social media engagement.*

Keywords: Instagram, Web Scraping, Australian SMEs, Engagement.

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Introduction

Small and medium enterprises (SMEs) have played a fundamental role in the global economic landscape as the major national income (GDP) contributors and the primary employment sources in many countries. Specifically, SMEs account for 90% of the total number of businesses worldwide while contributing 40% of GDP in emerging economies and employing 50% of the entire international workforce (World Bank, 2020). SMEs contribute up to 44% of Australia's GDP in the Australian economy and employ 68.3% of the Australian workforce (World Bank 2020, Australian Small Business & Family Enterprise Ombudsman, 2019). Moreover, the contributions of SMEs to technological innovation are also widely examined among many studies, for instance: SMEs are considered as foundations for innovation growth of global competitive advantages which is the primary factor allowing them to compete effectively with a larger corporation and to broaden customers' options with unique products and services (Cha et al., 2015; Li et al., 2018; Sukunesan et al., 2020). Despite SMEs significant contribution to the global economy, SMEs have long been suffering from a wide range of issues, for example, resource constraints, poor employees and management quality, the absence of self-efficiency perspective among management, and stagnant domestic markets (Selvarajah et al., 2019; Sukunesan et al., 2020). These constraints become heightened when SMEs engage in innovative R&D projects or invest in new technologies (Rammer et al., 2009; Walden et al., 2018). Moreover, due to the constraints, SMEs must understand the business values that these technologies bring and balance between costs and return on investment (ROI) of the innovative projects. However, to leapfrog and transform, SMEs will need to embrace emerging technology such as cloud computing, machine learning, AI (Artificial Intelligence), blockchain (Sukunesan et al., 2020). It is widely suggested that digital transformation is the means for SMEs' survival. At the same time, social media presents as a viable solution on this front at a lower upfront cost (Oztamur & Karakadilar, 2014).

Although the roles of digitalization in improving SMEs' productivity and performance have long been highlighted among scholars, studies into SMEs development through social media are still in the early stages. There is insufficient systematic training and guidelines on social media micro-practices, leaving many hidden potentials of the social media platforms unexploited (Bianchi et al., 2017; Echeverri & Skálén, 2011; Grochal-Brejdak & Szymura-Tyc, 2018; Louart & Martin, 2012). Further, SMEs are often social media-shy and oblivion to the benefits of social media due to the lack of skills and resources (Deloitte, 2019). However, the role of social media as an increasingly important business tool for internationalization (Blanchard, 2011; Kaplan & Haenlein, 2010; Sukunesan et al., 2020) has been evident. In particular, social media allow businesses to engage with customers effectively, build brand images, acquire value market customer insight. (Leung et al., 2013; Neiger et al., 2012). The role of digitalization, especially those via social media, becomes even more critical during extreme events. Considering the current COVID-19 crisis from the SMEs' point of view, the epidemic has caused severe disruptions not only on the capital supplies for the businesses but also on the downstream and upstream of the global supply chain. From the shutting down of factories in China to the prolonged lockdowns worldwide, businesses in various industries (e.g., hospitality, travel, retail) have been closed or forced to operate under strict national COVID-19 restrictions (Papadopoulos et al., 2020). However, it is suggested that the COVID-19 outbreak leads to a significant digital leap among customers and businesses. Industries (e.g., media, entertaining) with digital products and processes have been insulated from the COVID-19 crisis, with many customers have chosen to shop digitally due to various physical restrictions (Seetharaman, 2020). At the same time, industries with fewer digitalization levels, such as hospitality or restaurants/Cafes, witnessed significant losses forcing them to adopt other business models or operate digitally creatively (Seetharaman, 2020). Although the crisis alone is not the root cause of digitalization, it is the catalyst of digitalization among businesses and customers. A steady increase in digital adoption has been widely reported (Bouwman et al., 2019); hence SMEs must follow suit or risk being a laggard.

Among social media platforms, Instagram has such a tremendous uptake as it can leverage visual contents (Hu et al., 2014) and naturally align to key factors within international marketing dimensions (Sukunesan et al., 2020), especially brand communication and customer engagement. As a flagship photo-sharing social media platform, Instagram has evolved rapidly from its first launch in 2010 to an integral part of 800 million daily active users. It is suggested that the success of Instagram originates from its visually rich content that shapes the consumers' behaviours and requires companies to respond to such developments (Kaplan & Haenlein, 2010). Moreover, since customers' roles shift from non-creation to co-creation (or co-destruction) of business value (Hanna et al., 2011), the strategies and micro-practices to effectively communicate with their customers for the co-creation of value are vital. Instagram's visual appeal has significantly enabled itself as a platform of value exchange and becomes a critical component of many businesses marketing strategies (Kaplan & Haenlein, 2010; Kietzmann et al., 2011; Weinberg & Pehlivan, 2011). Although it is crucial to identify Instagram practices to maximize the value in the co-creation process between businesses and customers, there is still a lack of empirical study in this regard. In other words, although it is widely accepted that social media is an important marketing and communication tool (Leung et al., 2013; Kaplan & Haenlein, 2010; Kietzmann et al., 2011; Weinberg & Pehlivan, 2011) and business value is co-created with customers (Hanna et al., 2011), no study explored Instagram micro-practices to enable and promote such co-creation process. Therefore, this study exploits this gap in the literature and proposes the research question: 1) Which type of Instagram contents effectively drive Instagram engagement and encourage viewers to join the value co-creation process? 2) Which type of Instagram practices effectively drive Instagram engagement and encourage viewers to join the value co-creation process? Should businesses utilize Instagram as an online store or consider it a virtual customer environment (VCE)? As the process of value co-creation (co-destruction or no-creation) have been comprehensively conceptualized in IVF theory, this study also aims to enrich IVF theory as a theoretical background of Instagram engagement gaining and the VCE building process. More specifically, this study believes the business value co-creation process will manifest in the engagement between businesses and viewers. Additionally, the (business) value created from such interactions will benefit both businesses and their followers.

The IVF theory is presented in the core purposes of the information system (IS) artifact. The IS artifact contains three subsystems, namely: 1) Technological artifact, 2) Information artifact, 3) Social artifact (refer to Lee et al., (2015)); according to Vartiainen and Tuunanen (2016), three subsystems are connected in the way that value is co-created (and co-destroyed). In particular, the technology artifact relates to tools created by humans and employed to achieve a human purpose, while the information artifact refers to the process of data analysis, decreasing entropy, deriving meaning, and achieving viability. More importantly, in the context of the value co-creation process, the social artifact refers to the interactions and relationships among participants. From such interactions, individuals may achieve goals and purposes, solve problems, or form a community where individual develop a sense of belongingness and recognize his/her responsibility to the community and other participants. Van der Heijden (2004) conceptualizes the human purposes in conducting an IS project into the utility (productivity orientation) and hedonic (pleasure orientation). These purposes are related to value creation processes because, in both, participants aim for a type of utility (e.g., business value) or hedonic (e.g., entertainment). In other words, the value co-creation is not merely limited to design, and development of IS (utility) occurred between service providers and developer, but also extend to the experience (utility or hedonic) consumed by individual users. Value, therefore, is co-created either through productivity or pleasure related IS. Tuunanen et al. (2010) suggest that value co-creation occur from two sides, including 1) The IS offers value to its users and 2) The users hold values and goals that dictate their behaviour. These two issues can also be divided into factors (e.g., goals and value of the users, the context of IS uses) that either promote or engage the co-creation of value. In recent years, value co-creation has shifted the focus of IS research towards "services-dominant logic" that explore the value perceived, experienced and contributed by users (Tuunanen et al., 2010). However, it is also

worth mentioning that human purposes are not always constructive as the co-exist of value co-creation and value co-destruction is well recognized in IS research literature. According to Echeverri and Skålén (2011), value co-destruction is an opposing phenomenon of value co-creation. Therefore, providers must identify how (business) value is co-created with IS stakeholders since the providers cannot dictate this value creation process by themselves (Vargo & Lusch, 2004). It has been suggested that the IS, especially those developed and maintained with customers (e.g., social media platforms), is a platform for value co-creation (Grönroos, 2006). On the other hand, the value co-destruction process is considered a subsystem of the social artifact that reduces the hedonistic and utility value of such platforms. In a study focusing on the contradiction between two concepts, Vartiainen and Tuunanen (2016) propose that IS research need to embrace the concepts of value co-creation and co-destruction when studying user behaviours, IS artifacts, and the relationships between users and providers because, as stated by the co-author, IS artifact is inherently contradictory.

To explore this further, this research employs data scraping methods to collect data from 10 Australian SMEs' Instagram profiles, which were examined manually in Sukunesan et al. (2020). In comparison with the previous study conducted by Sukunesan et al. (2020), where the authors analyze five Instagram marketing dimensions (brand awareness, culture awareness, communication, information, integration), this current study goes deeper into Instagram engagement (communication dimension). As Sukunesan et al. (2020) have delivered a comprehensive analysis on SMEs Instagram uses for internationalization, this study aims to generalize and compare the findings as SMEs engage with VCE that contain the majority of domestic followers. This study places exceptional attention on the potential of social media data scraping as a means of building market intelligence and deriving business competitiveness. In addition, as engagement can be directly derived from Instagram data, designing an approachable method to analyze Instagram practices based on engagement metric will be highly valuable for SMEs. Literature validating data scraping methods has been rising in recent years following data mining and machine learning trends (Arora et al., 2019; Feldman & Sanger, 2007; Katsurai & Satoh, 2016). For example, Haddad and Hornuf (2016) applied sentiment analysis on Twitter data to study Indonesian public satisfaction with telecommunication data. Anuja et al. (2019) used machine learning techniques to analyze the social media influence index for business endorsement with the data collected from 1000 Indian Facebook, Instagram, and Twitter influencers. With the support of data scraping and data analytic tools, many businesses nowadays enhance their business models with market intelligence enabling the organizations to work smarter, communicate more effectively, and make better decisions through the use of data (Larson & Chang, 2016). As such, we have employed data scraping techniques to examine Australian SME Instagram engagement practices.

The Interactive Value Formation framework as the theoretical lens and business value of social media is discussed alongside several hypotheses in the following sections. This is continued with the methodology, results, and discussion sections. Finally, the study's conclusion and limitations are shared by identifying specific areas of improvement for the 10 Australian SMEs.

Theoretical background

Interactive value formulation

Interactive value formation considers customers and businesses as co-producers or co-creators of value. Specifically, contrasted to the formal understanding that conceptualizes value as embedded in the product (non-interactive value creation), IVF believes that providers collaborate with their customers to create value in the products and services mutually (Prahalad & Ramaswamy, 2004; Ramirez, 1999; Vargo & Lusch, 2004). Consequently, the

roles of customers in the joint value creation processes are managerially important since customers become active participants in the value creation processes, and customers share the responsibility for the outcome and the added value (Maglio et al., 2009).

While IVF has been prevalent in marketing research (Sthapit & Bjork, 2018), it is essential to mention that it is a creating and destructive process (Echeverri & Skålén, 2011). Echeverri and Skålén (2011) claim that value is co-created and co-destroyed in integrating businesses and their customers. However, academic literature has often overemphasized co-creation by claiming that co-destruction only takes place in an exchange-based setting (Ramirez, 1999) or underestimated the effect of co-destruction as a "minor phenomenon" of co-creation (Prahalad & Ramaswamy, 2004). Chumpitaz Ca'ceres (2010) believes co-destruction is a significant business and customer interaction feature, allowing fluidity in business needs and ideas. The third dimension of IVF was introduced by Makkonen and Olkkonen (2017) as "no-creation" and in a neutral position, "resource integration and the respective value-in-context could remain unrealized (Sthapit & Bjork, 2018). In short, as noted by Sukunesan et al. (2020), IVF is a dynamic interchange between 3 dimensions: 1) Co-creation, 2) Co-destruction, and 3) No-Creation suited well for social media research. These dimensions can also be observed in a parallel concept called "Producership" (Bruns, 2007), which is built mainly around engagement and User Generated Content (UGC). UGC is characterized by diverse types of media content that social media users freely generate. Harnessing UGC allows business owners to operate online communities with increased engagement alongside their business operations (Kaplan & Haenlein, 2010; Michaelidou et al., 2011), exemplifying IVF.

Social media practices for engagement

Since businesses and especially SMEs, have been only able to access social media for the last decade, social media practices to gain business value are derived mainly from trial-and-error processes (Miles & Mangold, 2014), while optimal practices have not been thoroughly studied among existing literature (Chang et al., 2015). Among contemporary studies into SMEs social media utilization, Virtanen et al. (2017) point out the importance of SMEs' endorsement in gaining desirable reaction from potential customers. Since the chance of discovering an Instagram business profile is slim if potential customers have not been exposed to the company's products and brand images, the authors suggested businesses actively follow potential customers' profiles, like, and reply to their comments. Following is the most effective way to gain followers, while liking and commenting are more relevant for interacting and strengthening the relationship with current followers (Virtanen et al., 2017). To explain this phenomenon, the authors come close to IVF theory while suggesting that viewers tend to "react to endorsement by following back" and "noticed by others is a motivational factor" on social media. Furthermore, according to a more recent study conducted by Rietveld et al. (2020), posting Instagram content that is product-centric (informative appeals) are less effective in gaining engagement. The authors suggest practitioners should focus on positive emotional appeals (e.g., arousal and valence) to gain Instagram engagement. The findings imply that it is ineffective to use Instagram solely for product selling or advertisement purpose but have not comprehensively explained the mechanism that enables the high engagement of viewers with emotional appeals. Other studies also provide intriguing implications that may enrich the IVF theory; for example, Colliander and Marder (2018), the "amateur" and "credible" factors of a snapshot from Instagram users are more effective in engagement gaining than images with "studio aesthetic". Chang et al. (2015) suggest practitioners should encourage followers to share impressions and thoughts while the usefulness of the social media content effectively affects viewers behaviours. In short, although suggestions for social media practices have been provided in several studies, the results are scant. There has not been an underlining theory to explain and synthesis such social media practices.

Although Instagram's superior capabilities to promote rich media contents have been widely confirmed in previous studies (Hu et al., 2014; Rietveld et al.; 2020; Sukunesan et al., 2020),

the algorithm (Instagram algorithm implemented in early 2018) that enable such distinctive capabilities poses both considerable opportunities and challenges for SMEs in designing effective Instagram practices. The Instagram algorithm is a logical system based on big data and machine learning technologies that address real users' needs. More specifically, to maximize the time that Instagram users spent on the platform, the Instagram algorithm was designed to favour the most (potentially) engaging content and content creators (Agung & Darma, 2019; Hu et al., 2014; Li & Xie, 2020). The functions of the Instagram algorithm can be categorized in various points, for example, exposure and interaction, ban mechanism, interact, hashtag (refer to Agung & Darma, (2019)). Since the Instagram algorithm implemented, users' posts on the platforms have been monitored by the system before being seen by the audience/Instagram users. Moreover, only 20% audience (Instagram users who followed the profile) can see the content at launch, and this rate can be increased after the algorithm see how much engagement can be yielded by the post. In other words, the interactive posts have a higher opportunity to be exposed to a broader audience while contents that do not follow Instagram policies can be banned (or shadow banned where the Instagram algorithm does not highlight the contents on followers' news feed) from the platform (Agung & Darma, 2019). Furthermore, the new feeds of specific Instagram users are customized by the algorithm where 1) Users' interest, 2) Timeliness, 3) Users' relationship, 4) Frequency, 5) Following, and 6) Usage factors are taken into consideration to prioritize Instagram contents (Lua, 2021). For example, if an Instagram user shows a strong interest in a celebrity profile by following the profile and frequently like, comment and view the profiles' contents, the Instagram algorithm may prioritize the newest contents from the celebrity on the user's new feeds. Additionally, contents from different profiles will receive a ranking (a score) that arrange them in sequence in the users' new feeds. The Instagram algorithm is shaping consumers' behaviours and requires businesses to respond to such developments. As photos remain the central medium on the platform, businesses on Instagram need to create a distinctive brand value by engaging visual content to compete for customer attention and Instagram algorithm prioritization. In addition, merely gaining Instagram followers is not enough to broadcast Instagram contents entirely to the follower base; SMEs need to ensure a higher level of engagement and interactivity when posting on the platform. As only followers who frequently engage with the profile will see the contents, the concept of IVF becomes even more important in assuring the desired level of engagement gained from Instagram contents.

Literature review

Online retailer classification

Although many SMEs use Instagram as an online channel to distribute their products and engage with customers, their approaches to the platform are distinctive. For many SMEs, especially those manufacturing or wholesaling backgrounds, Instagram and social media is solely an online store where they intensively advertise their products and services. In contrast, other SMEs seem to (un)consciously realize the process of business value co-creation and IVF theory as they actively engage with Instagram followers and build a VCE among their products. For example, businesses have been found to take direct inputs from the social media community for innovative product development or perform customers services on social media platform (Piller et al., 2012). It is also suggested that Internet start-up SMEs have the advantage to exploit their background to succeed in the online market (Van Vliet & Pota, 2001). In other words, the skill set and operating model of SMEs with a specific background may enable them to realize and exploit the value co-creation process. As such, classifying SMEs into subgroups basing on their background will provide deeper information on their success or failure in benefiting from the process of value co-creation with Instagram followers.

Online retailer classification has long been perceived as a crucial step to better design and pursuit strategies for Internet-based marketing among many studies (Cappel & Myerscough,

1996; Hoffman et al., 1996; Spiller & Lohse, 2015; Van Vliet & Pota, 2001). Since social media has become a critical component of Internet-based marketing and retailing strategies, online retailer classification can support SMEs in understanding social media practice alternatives to reflect their ability and provide functional requirements for successful Internet-based marketing campaigns and E-commerce ventures. By categorizing SMEs into several sub-groups, SMEs' characteristics can be explored thoroughly, while social media strategies can be tailored for specific businesses to exploit the company's competitive advantages further while mitigating its limitations (Spiller & Lohse, 2015). To enhance the understanding of SMEs' Instagram performance, this paper adopts Van Vliet and Pota's (2001) framework as the foundation to classify SMEs based on their origin. This could provide in-depth insight into strategic and operational (dis)advantages, challenges, and limitations. Also, examining SMEs' Instagram performances under their origin can enrich the data analysis process. As such, Van Vliet and Pota (2001) classifies online retailers into five categories: 1) Internet start-up, 2) Traditional store-based retailers, 3) Catalog retailers, 4) Retailers who both sell through store and catalogue, and 5) Manufacturers/Wholesalers. As SMEs presented on Instagram often produce or distribute their products, the number of pure catalogues and store-based retailers is limited. Further, it is suggested that the online retailers with catalogue retail origin, either as its sole selling channel or in combination with store-based retail, have the most advantage and skill to build an effective online retail channel (Van Vliet & Pota, 2001). In other words, the skill set and operating model of the Internet start-up and catalogue selling SMEs share many similarities bar the selling medium (digital and paper-based). Therefore, this study focuses more on the differences in Instagram practices/performance among SMEs the origins of 1) Internet start-up, 2) Store-based retailer, and 3) Manufacturers and Wholesalers.

Business Values of Social Media

Literature on social media (Blanchard, 2011; Kaplan & Haenlein, 2010) has defined it as "a tool" that allows the creation and exchange of user-generated content and builds communities (McCann & Barlow, 2015). In addition, social media presents abilities to share information freely, which makes a noticeable improvement in consumers' knowledge and bargaining power (Kietzmann et al., 2011). Leung et al. (2013) classified social media usages for suppliers based on their functionalities, leading to five major impacts: promotion application, product distribution application, communication application, management application, and market research application. Similarly, Neiger et al. (2012) noted that social media impacts six categories: gaining market insight via customer communication, improving brand awareness, critical information dissimulation, broadening audience reach, improving public engagement and partnership with customers, indicating organizational performance. Other studies, such as Rodriguez et al. (2014), suggested that social media technologies have positive relationships with customer-orientated processes and social capital gathering processes, resulting in better organizational sales performance. While Ioanid et al. (2018) suggested that social media can smoothen the organizational transition to more innovative business processes by providing modern collaboration channels among SME representatives, customers, partner companies, suppliers, and academia representatives.

According to Culnan et al. (2010), social media business value does not come from the platform itself but the specific usages of social media platforms, as different social media platforms can be used for various purposes. The business value of social media applications goes far beyond everyday commerce activities (distributing content or driving sales) due to its ability of customer community formation, known as virtual customer environments (VCEs). VCEs generate business value through branding, sales, customer service and support, and product development. Although building customer communities are not a new idea, the characteristics of social media allow the firm to build a loyal customer community much more effectively and efficiently (Culnan et al., 2010). Many organizations such as Lego, eBags, and others (see Li & Bernoff, 2011) have demonstrated the benefit of solid VCEs.

The value created from the engagement between organizations and the customers exemplifies interactive value creation in which customers engage with the company regularly, co-creating content, and share ownership of content. This could be in the form of posting comments, adding an image, or commenting on an image or Instagram story. Regular content feed from organizations resonating with the community could see the relationship grow (Li & Bernoff, 2011). If the relationships thrive, customers consider themselves insiders and even serve as a "provocateur" for its products/services. It has been said that customer relationship is the most remarkable business value domain that can potentially be enhanced through the technologies (Blanchard, 2011). Such relationships breed loyal customers who are more willing to try the company's new offerings, resist negative information about the company (Bhattacharya & Sen, 2003), and forge a resilient VCE. From the aforementioned, we draw two hypotheses that warrant further investigation.

H1: Higher number of posting by SMEs will establish a stronger VCE prompting higher customer engagement

Key Features of Instagram for Engagement

Many businesses use Instagram to build a network with customers to fit their products and services into consumers' lifestyles and values (Sukunesan et al., 2020). According to Hootsuite and We are social (2019) statistics, 200 million Instagram users visit business profiles daily while 70% of users search for a brand, 80% of the users follow at least one brand, and 60% of the users learn about the products/services on Instagram before purchasing. Since the platform was launch in November 2010 and acquired by Facebook in 2012, it has attracted around 1 billion active monthly users and more than 500 million daily active users (Hootsuite, 2019) with more than 50 billion shared images and videos and more than 4.2 billion likes per day till the date of 25-1-2020. Although Instagram is four years younger than Twitter and seven years younger than Facebook, the platform has surpassed its counterparts in brand engagement (120 times and 58 times, respectively). In particular, Instagram's potential advertising reach is 849.3 million users, with one in three of the most viewed stories created by businesses (Hootsuite, 2019; Numilla, 2015). It has been suggested that companies with better presences and practices on Instagram are expected to attract more consumers following their profiles, making brand-related events, updates, and photos more easily shared (Ting et al., 2016). In recent years, the success of Instagram has made images, videos, and engagement rate the vital social currencies online (Rainie et al., 2012).

Drawing from the extant marketing literature, rich media content in advertisements significantly affects the cognition and behaviours of viewers (Bruce et al., 2017; Li & Xie, 2020; Pieters & Wedel, 2004). More specifically, the presence of images is found to capture a superior baseline of viewers' attention, while the quicker attentions gained, the more effective advertisements can achieve (Bruce et al., 2017). The positive effects of rich media content on traditional advertising medium effectiveness also hold true in the case of Instagram engagement as rich media contents are believed to allow the post to stand out, leading to more attention gained and a higher number of engagements (Li & Xie, 2020). This phenomenon is widely reported on Twitter contents (Li & Xie, 2020), Instagram contents (Li & Xie, 2020; Zailskaitė-Jakštė et al., 2017), Facebook contents (Tancharoenwong, 2018), Pinterest contents (Saxton & Ghosh, 2016) and many more. Furthermore, as explored in previous studies, the competition for creating engaging visual content on Instagram is much more intense than those on other social media platforms since Instagram is considered an image-sharing platform. Compared to Twitter, where most of the tweets only contain textual contents (Li & Xie, 2020), Instagram content designers need to put in extra effort to design engaging visual contents to compete with the overflow of images and videos from other sources (Kusumasondjaja, 2018). As the amount of engagement is the measure of Instagram endeavours success, it is important to investigate the determinants of Instagram engagement. Previous studies have been reported several factors such as colours, human faces, emotions

(Li & Xie, 2020), marketing appeals and landscape (Yu & Egger, 2021) that can influence Instagram engagement. Besides, several studies have also examined other determinants such as posting time, user-generated content (Yu & Egger, 2021), call to act contents, and influencer marketing (Arora et al., 2019). However, in the specific case of Australian SMEs, there is still a limited number of studies that validate the effect of SMEs' rich media contents on Instagram engagement. Since the resource constraint is a permanent issue plaguing SMEs, influencer marketing is out of reach for many SMEs, while professionally designed contents are rarely employed. Evidently, no SMEs involved in this study invested in influencers marketing during the considering time frame, while "informal" contents dominate contents deployed by SMEs (e.g., Internet memes, snapshots, screenshots, reshared contents) their low cost. Therefore, it is more practical and beneficial to SMEs to explore which type of rich media content (e.g., images, videos, and sidecars) can gain the highest amount of engagement and how to combine such contents with other Instagram functions (e.g., hashtags, taggings) to increase the level of media richness leading to a higher level of Instagram engagement. Therefore, this study aims to generalize the previous findings where Instagram rich media contents are believed to effectively affects Instagram engagement; this also leads to our hypothesis 2:

H2: Posting rich media content will attract more audience, thus leading to more engagement

Furthermore, social media is ideal for facilitating timely communication (Taylor & Perry, 2005) two-way conversations with audiences (Seltzer & Mitrook, 2007). Through VCE, users can extend their social networks to people they have never met in person and seek out regularly for their opinions about events, products, and services (Cheong & Morrison, 2008). Many studies regarding the gratifications on social media have focused on Twitter. For example, Liu et al. (2010) suggest that social gratification is the most decisive factor encouraging viewers to participate in the conversations on social media. In another study, Lee and Oh (2013) surveyed 309 Twitter users and proposed that self-expression, information seeking, socializing, and diversion are the main reasons people use social media. This finding is comparable with Greer and Ferguson (2011) study where arousal, information, social and companionship were identified as major social media gratifications. Additionally, Johnson and Yang (2009) proposed that social motives (e.g., recreation, entertainment, self-express, communicate) and information motives (e.g., breaking news, knowledge, receive advice and compassion) are driving the continuous adoption of social media. In short, information motives have been found as the gratification towards social media followed by other factors such as recreation and entertainment.

Interestingly, the gratification towards social media significantly increases in time of crisis (e.g., COVID-19, Australian bush fire) as viewers perceived social media to be more credible than mass media in such situation (Procopio & Procopio, 2007). In such events, users often seek an unfiltered, unique, and timely line of communication from social media (Bucher, 2002; Procopio & Procopio, 2007). Therefore, social media is also be used for emotional support and recovery from crises (Choi & Lin, 2009; Stephens & Malone, 2009). Since social media users are often hungry for the latest (trending) information or expected value (in terms of entertainment, self-expression, or emotional support), this study suggests that posting content customized for specific users' needs will result in a higher level of engagement. In the case of Instagram, Nummala (2015) proposed that English is often used on Instagram to form hashtags or descriptions for optimizing visibility and attracting multilingual followers. However, depending on the characteristics of the business and the market, the usage of multi-languages in providing profile information, image description, and hashtags can be crucial. Localized content presentation and interaction, which could be easily facilitated via social media, is crucial in building customer relationships. Additionally, according to Sukunesan et al. (2020), businesses can gain desirable engagement from their followers by fitting their social media contents into viewers' lifestyle and shared value. Therefore, hypothesis 3 is proposed as following:

H3: Postings with contents suited to loci specific audience could lead to higher engagement

There are six primary features offered by Instagram: 1) Instagram operates as a social network for sharing images and videos; it allows users to upload videos and images on their profiles. 2) Anyone can create their account to follow or get followed by other users, businesses, and celebrities for their latest shared content and communicate with them via private message. 3) Instagram provides a "discover" feature based on specific users' profile to suggest the contents or Instagram accounts that are most likely to get the users' engagement. 4) Instagram provides the "stories" feature that allows users to instantly share their moments as an image or short video (up to 15 seconds) and pin the story on a prominent place in the user platform. 5) Instagram provides the "IGTV" feature that allows users to watch the long-form video (up to 1 hour) from their favourite creator. 6) Instagram provides "shopping" features to connect users with their favourite business and allow them to shop on Instagram with Facebook pay (currently only available in the US market) (Instagram 2020). Nummila (2015) and Sukunesan et al. (2020) noted that Instagram features have the potential to exert strong influences on all five international marketing dimensions: 1) Brand Awareness, 2) Information, 3) Culture awareness, 4) Communication/Engagement, and 5) Integrations. However, in this study, we are concerned with only the Communication/Engagement dimension. Building from the connection between business value and engagement, four hypotheses are drawn for this study. These hypotheses will be tested against the data collected from the 10 Australian SMEs.

The conceptual framework for the determinants of Instagram engagement is presented in Figure 1. We argue that rich media content, posting rate, and customized content for loci specific viewers are related to Instagram engagement (i.e., the number of likes). In the next section, we employed the Poisson regression model to validate hypothesis 2, where posting types (e.g., videos, images) and textual attachment (@Tagging and #Hashtag) effects on Instagram engagement were quantified. To examine Hypothesis 1 and 3, the content analysis method was employed with the aids from time series visualization. Although the nature of the data does not allow us to confirm hypothesis 1 and 3 statistically, this study attempted to explore the phenomenon to provide implications for future research.

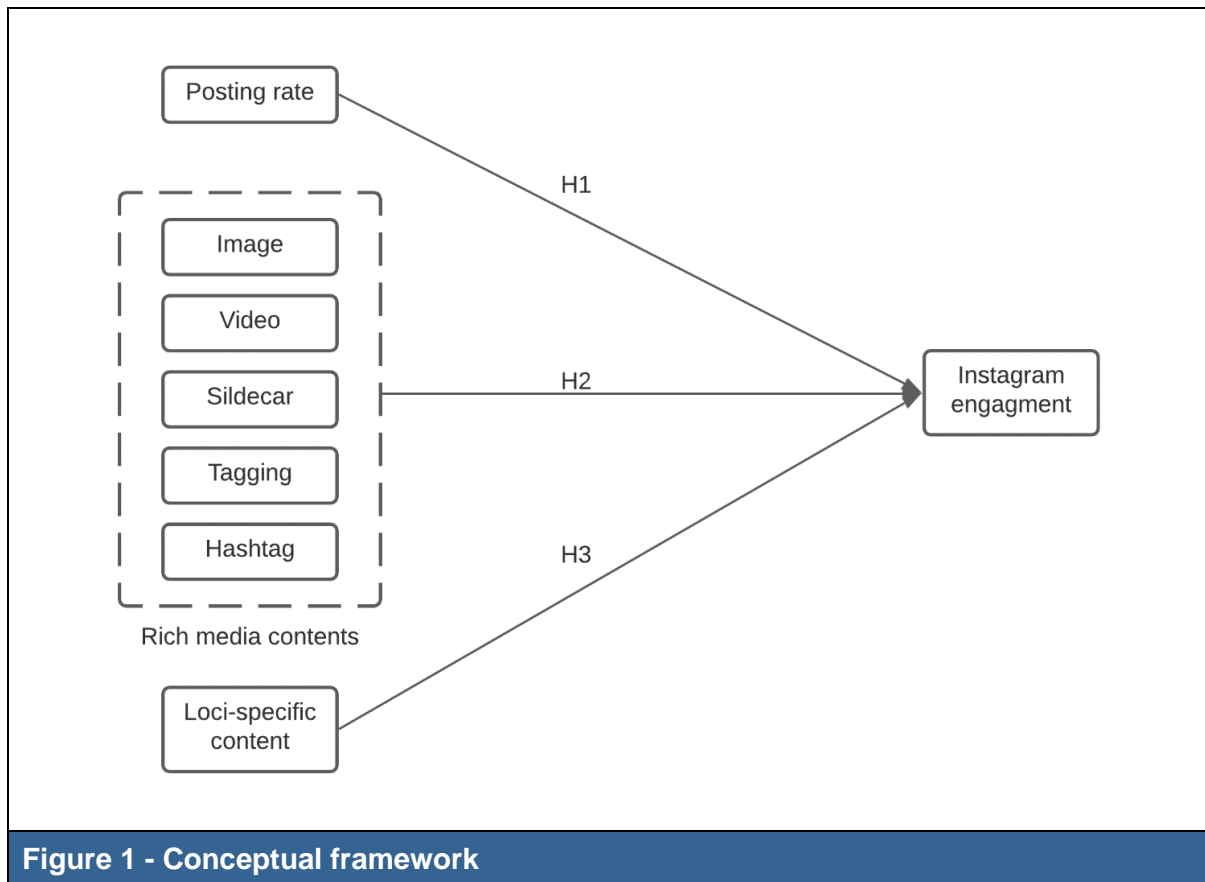


Figure 1 - Conceptual framework

Methodology

SMEs selections and classifications

This study uses a quantitative approach to explore the relationship between Instagram brand communication practices of 10 SMEs and the companies' posts' engagement rate. Due to the fast growth and change of the Internet and social media trend where Instagram accounts keep appearing and being abandoned rapidly, drawing samples is one of the most challenging aspects of SMEs' Instagram analysis. Therefore, this study applied the sampling techniques where samples are chosen based on related criteria for the research purpose and Van Vliet and Pota's (2001) online retailer classification framework where samples are grouped according to their origins. Specifically, a set of criteria for samples is predefined in the previous study of Sukunesan et al. (2020), considering their origins for SMEs classification (refer to Table 1).

- SMEs are Australian based (Sukunesan et al., 2020)
- SMEs are active on Instagram from (1/1/2020 to 31/8/2020)

Table 1 - SMEs classification and description		
SMEs brand	Classification	Description
KeepCups	Manufacturers/ Wholesalers	KeepCups was born in 2009 in Melbourne, Australia, on the idea of an Australian coffee shop owner who perceived the pressing problem of disposable, non-recyclable, and polyethylene cups. The founder identified the business opportunity to design and produce their reusable barista standard reusable cup and promote customers' behaviour change.
Frank Body	Internet Start-up	Frank Body was born in 2013 based on the idea of an Australian coffee shop owner who was looking for the uses of leftover coffee grounds. The company believes the ingredient can exfoliate human skins and develop several product lines based on coffee grounds. The business grew from \$5000 capital to a multi-million-dollar brand via aggressive social media and word-of-mouth marketing. Although the company has distributed its skincare products via several third-party distributors, Instagram and online retail portals remain its primary marketing/ selling channel.
Lonely Kid Club	Internet Start-up	Lonely Kid Club was born in 2011 as an independent slow fashion brand. They provide custom-made, personalized clothing from ethically produced garments from a Sydney-based flagship store. The company sells via Lonelykidsclub.com while promoting their community/safe space called Lonely Kids Club via private Facebook and Instagram. Although the company distributes its products through Sydney based store, the origin of the company is an internet start-up since they were initially selling and marketing their T-shirt via the online shop and social media
Pressed Juices	Traditional Store-based Retailer	Pressed juices offer cold-pressed juice, smoothies, and flavoured waters with frozen fruit soft-serve. The company distribute its products via several stores and food trucks in Melbourne Australia
Bisonte Australia	Traditional Store-based Retailer	Bisonte Australia was found in 1980 as handcrafted leather jackets and ethos for wearable producer and designer. The company opened its retail store in 1993 in Chapel Street Melbourne Australia
Liarthelabel	Manufacture/ Wholesalers	Liarthelabel was founded in 2013 as an ethical accessory, swimwear, activewear, and bralette designer and producer in Gold Coast, Byron Bay, Australia
Vegethreads	Traditional Store-based retailers	Vegethreads offers locally made clothes using organic, eco-friendly materials. The company distributes their products via a flagship store in 246 High Street, Northcote Australia and promote ethical clothing community via Facebook and Instagram
Thankyouaus	Internet Start-up	Thankyouaus brands themselves as a movement that contributes their profit to tackle poverty in the world. They offer sustainable and ethical skincare products solely via their website and promote their campaign via Facebook, Instagram, and Twitter
Loving Earth	Manufacturers/ Wholesalers	Loving Earth is and high-quality chocolate and cacao manufacture. They brand themselves as an ethically driven company that provides healthy and sustainable products from cacao ingredients grown and attained from the indigenous Ashaninka community (Peru). In addition, they promote environmental protections and indigenous collaboration activities and engage with their customers and followers via social media.

HLSK	Manufacturers/ Wholesalers	HLSK was born in 2013 as a handcrafted jewellery design and producer by an experienced Jeweler (Hannah Stewart) in Melbourne. The brand witnessed tremendous growth from the garage-based workshop to a 300 square meters factory in Melbourne and a flagship store in Armadale. The brand gains momentum from appearing at Paris and New York Fashion weeks and on several fashion publications. In addition, the brand engages with customers via social media, and they also acquire several celebrities as followers on their account.
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Although customers' engagement on Instagram can be quantified in several ways, we use two primary aspects of Instagram's posts to represent the customers' engagement: likes and comments. While the number of likes describes how the companies' followers enjoy the content, the number of comments signals the level of discussion among the companies and their followers on the platform (Bakhshi et al., 2014). This section describes our methods to collect and process data from Instagram's profiles of the companies, followed by clarifying our statistical methods and analysis process. The methodology contains three main phases, including data collection, data processing, and regression model testing presented in Figure 2:

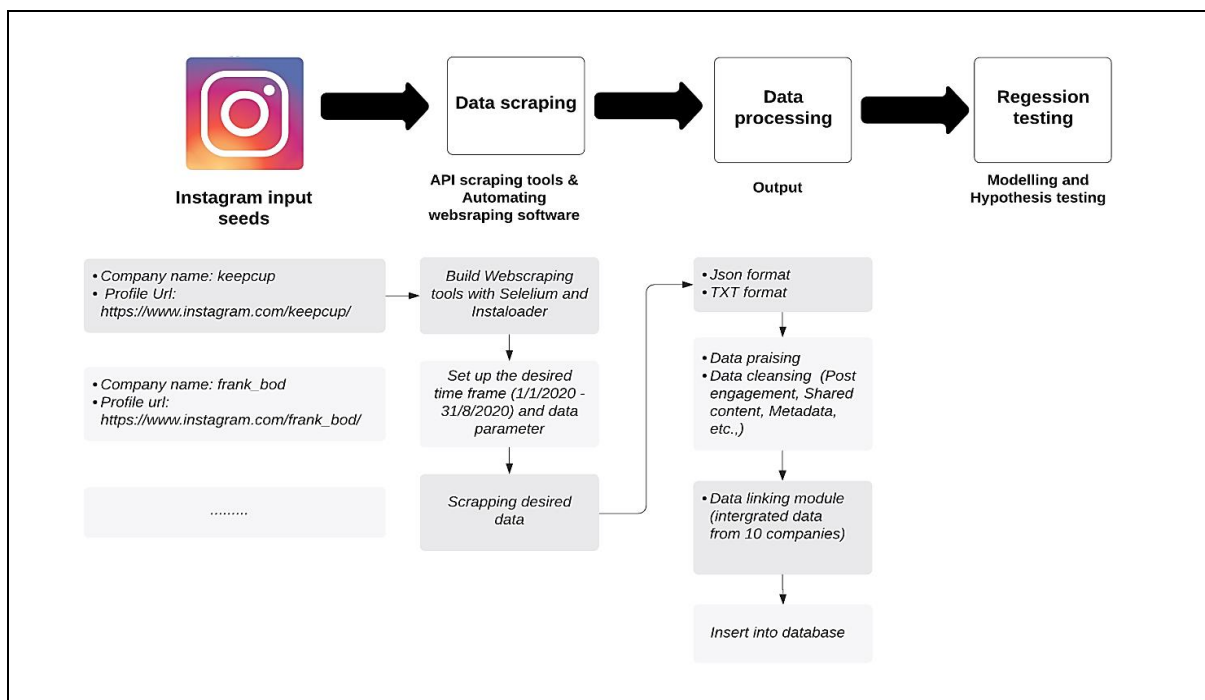


Figure 2 - Research Approach

Data collection

In the aftermath of the Cambridge Analytica scandal, Facebook, as the parent company of Instagram, has severely restricted access to its platforms' data via Instagram Application Programming Interfaces (APIs). The limitation hampers the ability to study and investigate social phenomena through Instagram and preserve the platform for those whose policies might play a role in facilitating the scandal itself. Furthermore, alternative data access provided by Facebook, such as the social science One initiative, presents an insufficient replacement for fully functional APIs, since many authors claim that the social media "data philanthropy" initiatives only demonstrate the corporation "social responsibility". Still, they are failed to provide appropriate frameworks for data accesses (Bruns, 2019). Therefore, to effectively collect sufficient and meaningful data for the study, this paper deploys the combination of two

approaches that use both current Instagram APIs and an alternative Instagram scrapping program to collect the desired data.

The data collection process included multiple connected steps that were designed to obtain relevant data instances for the study. Firstly, the data collection process identified and prepared targeted companies that served as input seeds to the Instagram platform for data scraping purposes. This study selected 10 SMEs based on Sukunesan et al. (2020); more specifically, the companies' Instagram ID and URL were used for information extraction from Instagram. Eight months of data from 1/1/2020 to 31/8/2020 were extracted from each site. Table 2 presents a brief description of the SMEs and the total amount of data scraped across different Instagram features. The custom web scraping application was written in Python, an increasingly popular application for machine learning and AI. Employing a similar approach to Arora et al. (2019), the Instagram API (Application Programming Interfaces) was used to collect raw data in JSON format, which included" SMEs' profile insights including the number of followers, the type of post, and the number of users who were reached by each post.

Table 2 - Description of 10 Australian SMEs and the total amount of data scraped from various Instagram features								
No	SMEs' Instagram profile	No. Followers	No. Image	No. Sidecar	No. Video	No. Comment	No. @Tagging	No. #Hashtag
1	Keepcup https://au.keepcup.com	181,000	196	14	23	2,569	217	512
2	Frank_bod https://www.frankbody.com	789,000	384	35	45	22,317	325	89
3	Hlsk https://hlsk.com.au	240,000	119	5	7	2,669	4	43
4	Loving_earth https://lovingearth.net	342,000	168	29	16	5,864	213	180
5	Thankyouaus https://thankyou.co	97,500	50	24	7	1,222	68	207
6	Lonelykidsclub69 https://lonelykidsclub.com	16,400	415	38	4	2,574	74	0
7	Liarthelable https://liarthelabel.com.au	6,027	79	0	0	31	28	789
8	Pressedjuices https://www.pressedjuices.com.au	77,300	50	10	16	816	37	34
9	Bisonet_australia http://www.bisonte.com.au	1,027	15	1	1	21	0	53
10	Vegethreads https://www.vegethreads.com	36,000	341	18	0	862	91	137

Data processing

The data processing phase focuses on data parsing layers in which JSON files are parsed to generate meaningful variables for data analytics and Poisson regression modelling processes. The parsed JSON data includes overall followers for each company profile, the number of comments and likes of each post, the text content of the company's posts, and comments for each post. Finally, the different companies' parsed JSON data and the Text format data are systematized in an Excel (version 16.0) spreadsheet. The predefined seeds are used as a unique identifier for the data set. To further analyze SMEs' communication dimension, this study adopted several measurements from Arora et al. (2019), including the Engagement rate and Posting Rate. In addition, other variables (Comment, Type of post, Date, and Time) were also included. The variables are summarised in Table 3.

Table 3 - Variables	
Variable	Description
Engagement rate (ER)	The number of like yielded from each Instagram post of the SMEs profile
[Type=GraphImage]	The Instagram posts in Image format
[Type=GraphSidecar]	The Instagram posts in Sidecar format (Sidecar format includes more than one image included in the given post)
[Type=GraphVideo]	The Instagram posts in Video format
Comments	The number of comments in each Instagram post of the SME's profile
N_#	The number of #Hashtag in each Instagram posts of the SME's profile
N_@	The number of @Tagging in each Instagram posts of the SME's profile
Date&Time	The date and time of each Instagram posts
Posting Rate (PR)	The number of each SME's divide by the time duration (in days)

Poisson Regression

Due to the characteristic of the collected data, this study chose to employ a Poisson regression model. Poisson regression was selected to model the data because the dependent variable (i.e., number of likes) was measured as count data. Traditional regression techniques assume the dependent variable is continuous and would not be appropriate in this context. Poisson regression presents the log of the count expectation as a factor of the independent variables. The results of Poisson regression are the incident-rate ratio (IRR) which is computed as e^{β} , where β is the Poisson regression coefficient. When the independent variables increase by 1 unit, the dependent variables are expected to change by β , while other variables in the model remain constant. In short, for each model, the companies' posts belong to one of the independent categories (e.g., image, video) have an incidence rate for the dependent variables (e.g., the number of likes and comments) equal to IRR multiplies that of those in other categories. Therefore, we included the variable listed in Table 3 as independent variables and the engagement rate as dependent variables to build the models. Also, the final models only consider the variables that have a significant association with each dependent variable.

Results and Discussion

Poisson regression result

The study considered attributes of brand communication as predictors (posts' type, the number of @Tagging, and the number of #Hashtag and number of comments) of Instagram engagement (measure in the number of like). The results for 10 SMEs are reported in Table

4. Image-type posts, the number of comments, and the number of @Tagging were all positively associated with the chances of gaining more engagement from customers. In contrast, the number of #Hashtag surprisingly has a negative relationship with the engagement rate. At the same time, the video-typed posts and sidecar posts seem to not associate with the engagement in either way. More specifically, for every extra @Tagging included in a post, 1.12 times (95% CI, 1.12 to 1.13) more likes were recorded, while every extra #Hashtag lowers the chances of engagement by about 7%. This phenomenon can be explained by the "Credibility" concept where "Trustworthy" social media posts from source with well-known "Expertise" are more effective in gaining social media engagement (Ki & Kim, 2019). By @Tagging an account to social media posts, SMEs provided a channel for their viewers to validate their posts' contents and information. The tagged accounts, especially those well-known among the VCE, play as the validator for such contents and use their reputation to ensure the validity of such contents. On the other hand, viewers can trace back to the accounts via the link embedded in @Tagging to learn about or follow their favourite influencers and content creators. The IVF theory also manifests in this practice, allowing business profiles to yield more engagement and gain trust from their followers. At the same time, followers can access validated information or expand their contents and social network by following other followers, influencers, or content creators.

Also, while every extra Image-type post yields a significant 1.1 (95% CI, 1.1 to 1.11) times more engagement, both Sidecar-type posts and the number of additional comments is almost not associated with engagement in either way (1.01 times of getting more engagement). This finding has practical implications on how and what should SMEs post on their Instagram site. While #Hashtags are essential for searching content, SMEs should bank on @Tagging instead to get more engagement and add Image-type posts instead of video or multi-images (sidecar-type). Furthermore, the number of Video-type posts among 10 SMEs was insufficient for Poisson regression, indicating that video is not the preferred method by the companies to communicate with their followers. Besides, all calculations are statistically significant ($p < .001$) except for Sidecar-type posts estimation. Therefore, the above analysis does not support Hypothesis 2, which lauds rich media content for more engagement. This finding is counterintuitive at first, as videos are deemed to have a higher level of richness than images. However, this finding is in line with previous findings of Cvijikj and Michahelles (2013) that content with a higher level of vividness (videos) to be perceived as less attractive compared to content with a lower level of vividness (images). According to the authors, interactivity has a greater effect on Facebook engagement, causing contents with a higher level of vividness (video) to be perceived as less attractive. In Instagram case, the platform is widely deemed a social media for image sharing (Sukunesan et al., 2020). Therefore, the platform is not optimal for video content for posting. Visibly Instagram provides the "IGTV" function dedicated to long-form videos (Instagram 2020), while the "Stories" function is frequently used for featuring short-form video. Such functions have diluted the potential engagement gained from formally posted videos. Moreover, Instagram users are subjected to information saturation issues (Kusumasondjaja, 2018); by consuming hundreds or thousands of contents a day, the immediate consumption of contents may also discourage Instagram users from viewing and engaging with posting contents in video and sidecar form.

To further examine and compare the Instagram practices of each SME, we conducted individual testing. Specifically, SMEs with internet start-up origin (Frank_bod, Lonelykidclub69, Thankyouaus) posts a broader range of Instagram contents (e.g., UGC, call-for-action content, internet memes, SMEs' activities). At the same time, SMEs from traditional stored-based and manufactures origin (HLSK, KeepCup, Bisonet_australia) mainly posts about their products/services and promotion events. Since the pattern of Instagram performance towards the engagement rate of each SME is comparable to the overall results, the study particularly focuses on the SME with the best and the worst Instagram practices across six categories. More specifically, the effectiveness of Lonelykidsclub69's of image-type and sidecar-type posts are significantly higher than other companies, with every extra image-type increase the

chance of gaining like by 2.13 (95% CI, 1.94 to 2.34) times. At the same time, every extra sidecar-type posted by Lonelykidsclub69 yields 1.93 (95% CI, 1.76 to 2.13) times more likes. Further, while the number of comments in all 10 SMEs' posts is positively associated with the engagement rate, every extra comment Pressedjuices's post yields the largest 1.16 (95% CI, 1.05 to 1.29) times more engagement showing the superior level of communication among the company and its followers. Also, the effectiveness of Frank_bod's #Hashtags is the highest among all, with every extra #Hashtag yields 1.06 (95%, 1.05 to 1.06) times more engagement for the posts, while the effectiveness of the number of @Tagging in HLSK's posts is the highest among 10 SMEs with every extra @Tagging gain 1.38 (95%, 1.36 to 1.41) times more likes for HLSK's posts.

The results confirm Van Vliet and Pota's (2001) views where manufacturers and traditional store-based SMEs solely consider online selling an alternative cost-saving selling channel for their physical stores/distribution chains while internet start-up SMEs pay more attention to building customer base via Instagram engagement. Specifically, Internet-based SMEs are more successful in building a community among their products/services with more engaging content that are fit into their followers' lifestyle/hobbies/personalities leading to more followers and a higher engagement rate. Also, the engaging content of Internet start-ups often provokes their followers to @Tagging their friends into the companies' posts that potentially expand the community with more like-minded people and more potential customers. On the other hand, manufacturers and store-based SMEs (except for Pressedjuices) tend to focus more on promoting their own products/services rather than engage and create a conversation with their customers leading to a much lower number of followers and engagement rate. The practice of store-based and wholesalers/manufacturers SMEs set themselves up as an online store (HLSK, KeepCup, Pressedjuices) where customers can research products/services before buying. On the other hand, Internet-start-up SMEs create a community where customers can find like-minded people (Frank_bod, Lonelykidclub69) or join a social movement (Thankyouaus) (refer to Figure 3).

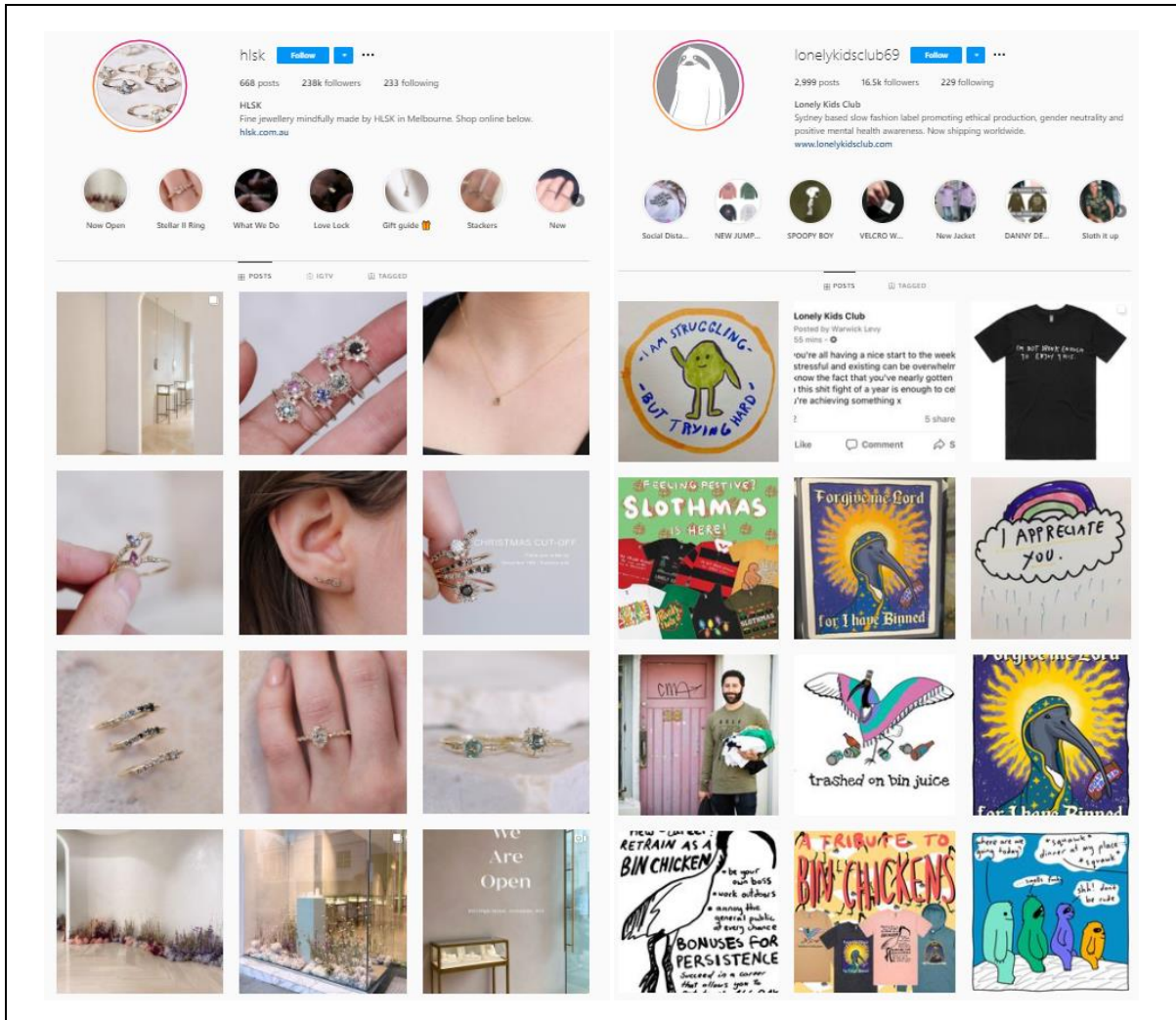


Figure 3 - The profiles of Lonelykidclub69 and HLSK

The results have reflected the superior performance of Internet start-up SMEs and provided insights into the differences in the Instagram approach of Internet start-ups and store-based wholesalers/manufacturers. Based on the origin of SMEs, this study suggests that store-based retailers, wholesalers, manufacturers SMEs need to focus more on building customers' community as their Instagram practices are in the infant stage. Also, Internet start-up SMEs need to supply clear, legitimate, and sufficient information about their products/services to improve their Instagram performance. Also, Internet-start-up SMEs have an enormous potential to move out from price-leadership strategies (Van Vliet & Pota, 2001) with the unique, co-created value from their Instagram community. They can achieve more enjoyable pricing strategies by supplying niche products targeting their followers' needs and promoted by their followers. Instagram is also a solution for Internet start-up SMEs to mitigate their weakness in customer services by communicating directly with customers and allowing the community members to support each other. Table 5 summarises the analysis of Instagram on well-performing and poor-performing SMEs.

Table 4 - Engagement across 10 Australian SMEs (*reference category was GraphVideo)										
Parameter	β	Std. Error	95% Wald Confidence Interval		Hypothesis Test			e^β	95% Wald Confidence Interval for e^β	
			Lower	Upper	Wald Chi-Square	df	Sig.		Lower	Upper
(Intercept)	6.89	0.01	6.89	6.89	6416558.48	1	< .001	985.91	980.67	991.19
GraphImage	0.11	0.01	0.09	0.11	1380.66	1	< .001	1.1	1.11	1.11
GraphSidecar	0.01	0.01	0.01	0.01	4.24	1	0.04	1.01	1.01	1.01
Comments	0.01	0.01	0.01	0.01	1187000.71	1	0	1.01	1.01	1.01
N_#	-0.07	0.01	-0.07	-0.07	31378.07	1	0	0.93	0.93	0.93
N_@	0.12	0.01	0.12	0.12	65056.94	1	0	1.12	1.12	1.13

Table 5 - Engagement across Well-performing and Poor-performing Australian												
	Parameter	Instagram profile	β	Std. Error	95% Wald Confidence Interval		Hypothesis Test			e^β	95% Wald Confidence Interval e^β	
					Lower	Upper	Wald Chi-Square	df	Sig.		Lower	Upper
Well-Performing	GraphImage	Lonelykidclue69	0.75	0.01	0.66	0.85	250.41	1	0	2.13	1.94	2.34
	GraphSidecar	Lonelykidclub69	0.66	0.05	0.56	0.75	183.21	1	0	1.93	1.76	2.13
	Comments	Pressedjuices	0.15	0.05	0.05	0.25	8.19	1	0.01	1.16	1.05	1.29
	N_#	Frank_bod	0.06	0.01	0.05	0.06	844.21	1	0	1.06	1.05	1.06
	N_@	HLSK	0.32	0.01	0.31	0.34	1296.77	1	0	1.38	1.36	1.41
Poor-Performing	GraphImage	Bisonet_australia	0.06	0.19	-0.31	0.42	0.1	1	0.75	1.06	0.74	1.53
	GraphSidecar	Bisonet_australia	-0.51	0.47	-1.44	0.42	1.15	1	0.28	0.6	0.24	1.52
	Comments	Loving_earth	0.01	0.01	0.01	0.01	29481.48	1	0	1.01	1.01	1.01
	N_#	Vegethreads	-0.13	0.01	-0.14	-0.12	759.04	1	0	0.87	0.87	0.89
	N_@	Vegethreads	-0.44	0.01	-0.46	-0.42	2450.89	1	0	0.63	0.63	0.65

Posts over time

Regardless of the posts' contents of the SMEs, the time series results show a clear correlation of the posts' frequency towards the engagement rates. The company (frank-bod) that has the highest number of posts (461 posts) over eight months duration records the highest level of engagement, and the highest number of followers (789,000) refer to Table 2. At the opposite end, Bisonet_australia only launched 17 contents during the same period, unsurprisingly records the lowest level of engagement and the number of followers (1,027). These results echo similar studies examining the business value of social media (Li & Bernoff, 2011; Ting et al., 2016) that allude SMEs committed to building a strong VCE will post more often; this, in turn, will lead to higher engagement. Our analysis indicates that higher platform commitment leads to a stronger VCE, and higher customer engagement recorded on SMEs profiles, confirming Hypothesis 1. This trend presents in 9 models where more active companies (KeepCup - 0.96 posts/day, Frank_bod - 1.92 posts/day, Lonelykidclub69 - 1.89 posts/day, Loving_earth (0.88 posts/days, HLSK - 0.54 posts/day) yield significantly more likes and followers than the inactive ones (Bisonet_australia 0.07 posts/day, Pressedjuices - 0.31 posts/day). The only exception is recorded in the case of Vegethread since the company has a relatively high post frequency (1.49 posts/day) yet still yields an insignificant number of likes on each post. The reason behind this phenomenon can lay in the company's poor Instagram practices since the company has the poorest uses of @Tagging and #Hashtag (refer to Table 5 and Figure 5).

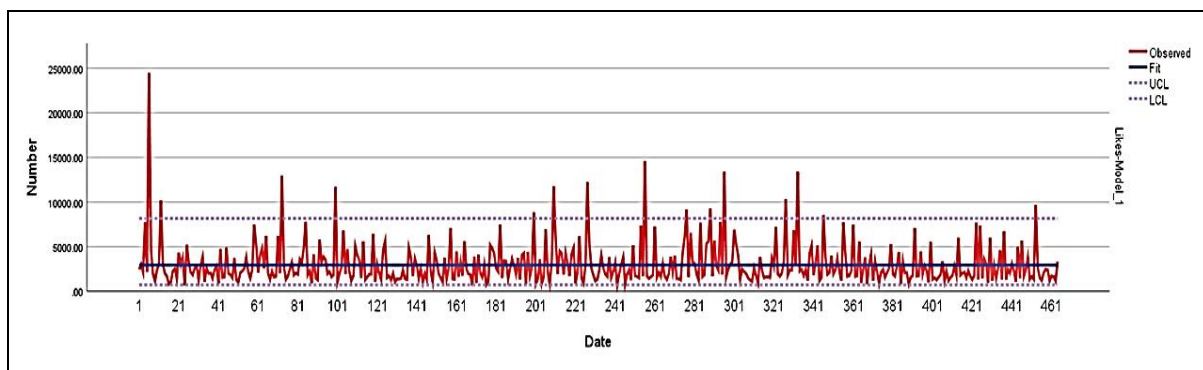
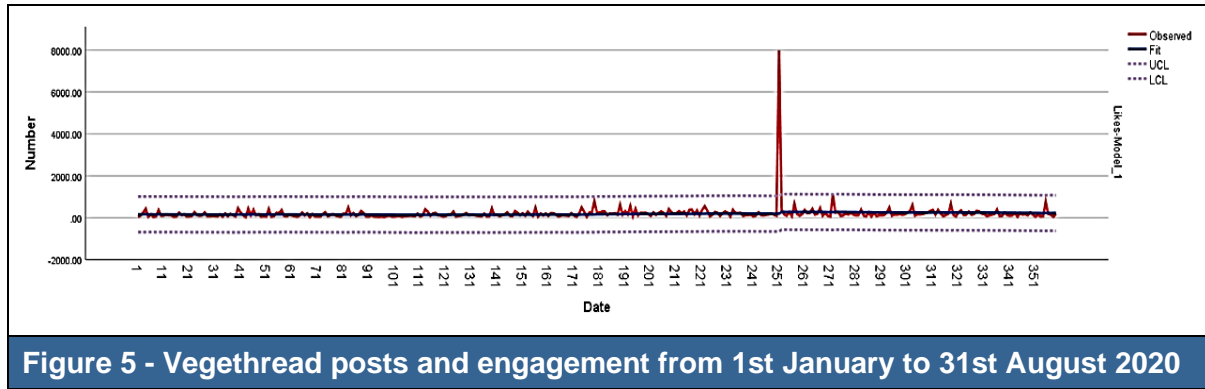
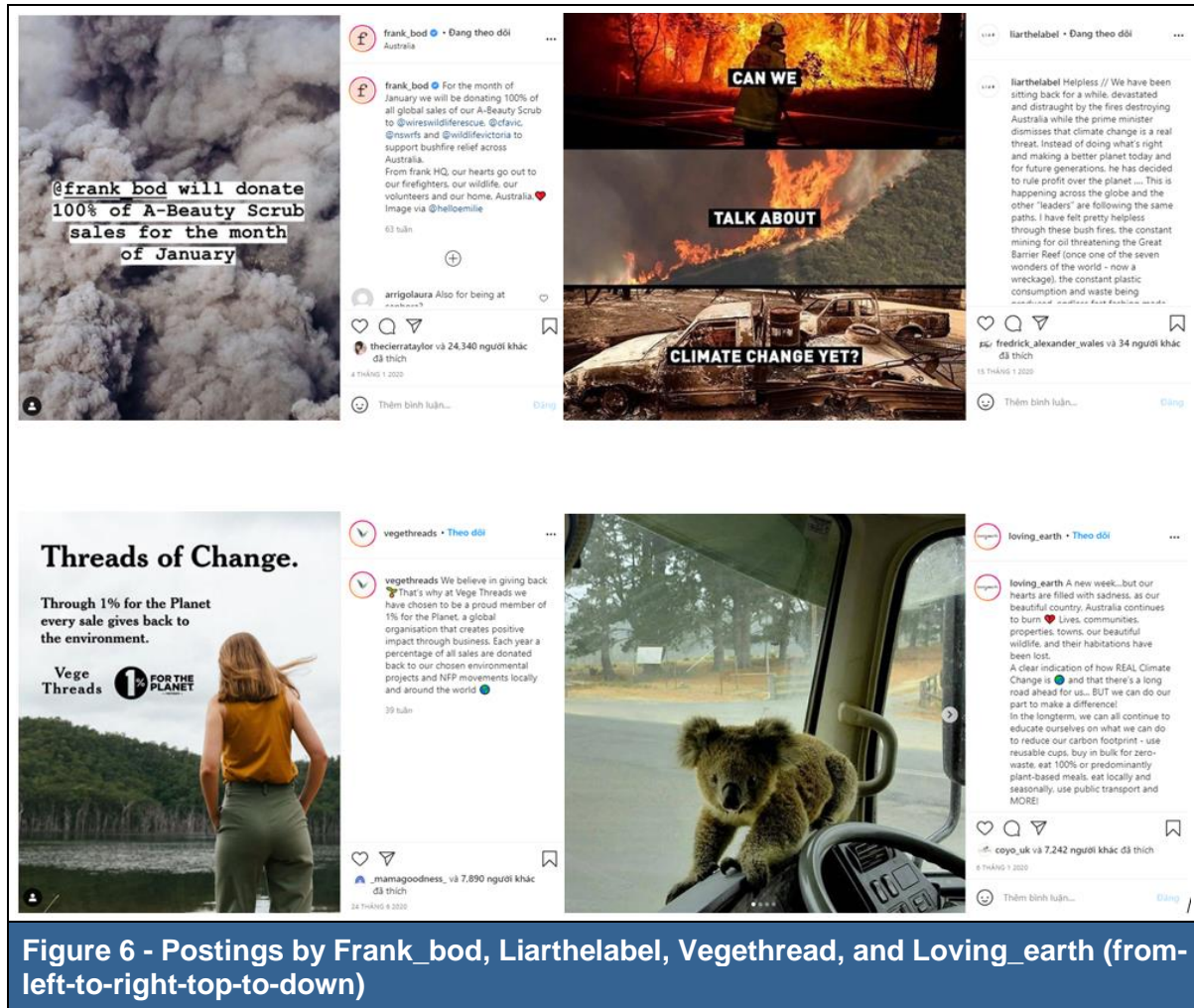


Figure 4 - Frank_Bod posts and engagement from 1st January to 31st August 2020

Although there is no clear seasonal pattern or linear trend detected from 10 models, the results give an idea of the prevalent influence of the first ten days of January on the engagement rate since it is visible that most of the companies record a peak in engagement in this period. More specifically, Frank_bod records 24445 likes for its 4th January post, HLSK records 11727 likes for its 5th January post, Loving_earth records 7296 likes for its 6th January post lonelykidsclub69 records 984 and 966 likes for its 2nd and 6th January posts, respectively. The only exceptional outlier again occurs in the case of Vegethread (refer to Figure 5), as they reached 7978 in their 24th June post. The outlier in Vegethread Instagram engagement time series is an interesting phenomenon since it gains around eight times more likes than the 2nd most liked post (1099 likes) on 7th July.



Next, we examined the three most prominent outliers from the data sample: 1) Vegethread's 24th June post, 2) Frank_bod's 4th January post, 3) Loving_earth's 6th January post. Interestingly, all three examining posts share a comparable message that describes the company's social responsibility and promotes the company's commitment to tackle pressing social issues. While Vegethread announced their membership of "1% for the planet" project (donating 1% of every sale to give back to the environment), Frank_bod and Loving_earth addressed the Australia bush fire incidents; in particularly, Frank_bod promised a 100% donation of global sale from A-Bauty Scrub product to support bushfire relief across Australia. By fitting their message into the customers' lifestyle, three companies raised a considerable level of empathy, attention, and engagement from their audiences and created a peak engagement rate in 8 months period. The communication successes of these posts confirm the vital role of the corporation's responsibility as a "differentiating factor", which allows businesses to satisfy different types of stakeholders' needs and differentiate themselves within their target markets (Drumwright, 1994). Moreover, by 29/12/2019, the devastating 2019-2020 Australia bushfire had burnt the largest area that has ever recorded (1939 Black Friday fires) (Collin et al., 2020), undoubtedly creating an opportunity for the companies to address this pressing problem and attract a remarkable engagement rate from Australian followers in the companies' posts. The study shows that following popular trends and addressing pressing social issues may result in a better engagement rate.



The investigation into the three prominent outliers also highlights an essential aspect of Instagram practices for internationalization: localization. These posts exemplify a deep understanding of local community and market information since the cultural context is crucial for businesses entering foreign markets (Hermeking, 2005; Selvarajah et al., 2019; Sinkovics et al., 2007). The reception received for these posts affirms Hypothesis 4. In this case, Australian consumers have long been confirmed as individuals with commitments to environmental concerns (Palmer et al., 1999). Additionally, the devastating Australian 2019-2020 bush fire disaster has significant impacts on many Australian daily lives (Collin et al., 2020), raising an elevated level of social empathy, environmental awareness, and a need for self-contribution to relieve. The analysis results show the communication effectiveness of an Instagram practice, where businesses speak in "local language," address local problems and show their commitments to local issues. The successful practice of the three companies confirms the international marketing strategy point of view that businesses cannot standardize Instagram practices for every presented market (one-size-fits-all approach). In contrast, companies need to tailor social media practices to accommodate local markets' differences (Berthon et al., 2012). Furthermore, the commitment of the businesses is also essential; in fact, the companies that have higher posting frequency records significantly higher engagement than other players implicating the consistency of posts and being 'heard' is also crucial for Instagram success for internationalization.

Theoretical contribution

The findings enrich the current knowledge of IVF theory for gaining user engagement on Instagram. Although conventional wisdom has long suggested that rich media contents help social media posts go viral, this study offers a more nuanced explanation of how businesses and Instagram followers make this happen in a co-creation process. The findings confirm that posting images helps an Instagram post receive more likes than videos and sidecars. This can be explained by the fast-consuming behaviours (of social media contents) among Instagram users and the image-centric design of the Instagram platform. As Instagram contents are often viewed briefly by users, the messages embedded in Instagram contents need to be concise and catchy to motivate viewers to react (e.g., like and comment) and contribute to the value co-creation process. However, the relationship between Instagram images and engagement is more complicated than their mere presence. The level of image trustworthiness, especially those from sources with well-known expertise, positively influences user engagement. This study finds that sharing and tagging contents created by "Trustworthy" Instagram users (with "Expertise") and calling Instagram followers to embark on a shared activity are associated with higher engagement. The commitment and consistency of businesses shown in the posting rate also positively affect Instagram engagement. Since the rewards gained by followers (from the co-creation process) in an inactive Instagram group is not comparable with those from an active group (in term of likes, comments or promotions), Instagram users only prefer to participate in the VCE around active SMEs profiles. A consistent posting rate is also essential in generating business value from the value co-creation process.

More importantly, businesses that actively encourage Instagram users to participate as co-producers in value creation result in a higher level of engagement, while using Instagram solely for product selling is ineffective in gaining user engagement. For example, posting up-to-date content that addresses the concerns or the hunger for new information of followers effectively gains engagement. In fact, in the time of crisis (e.g., Australia bush fire), Instagram contents that successfully present genuine social responsibility of the SMEs and relieve Australian customers' anxiety records a peak in engagement rate. This phenomenon also expands with the concept of localization. Designing an Instagram posting for the loci-specific audience is crucial to effectively encourage followers to participate in the business value co-creation process. From the users' point of view, by collaborating with the business in this value creation process, Instagram users are also rewarded by the business and the follower community (in terms of timely information, engagement, offers, promotions). In other words, businesses' value to customers and followers does not solely embed into the products and services themselves but also in the inclusiveness and interaction of the company's Instagram VCE. However, it is also worth mentioning that IVF is both a co-creation and co-destruction process (or a non-creation process). In other words, undesired interactions among the VCE community, such as negative reviews or the lack of credibility of information sources, may afflict Instagram engagement, brand images, and product sale. For example, some negative reviews from unsatisfied followers may negatively affect the overall engagement of the profile.

Practical contribution

This study also provides managerial implications for social media practitioners. First, since most contemporary social analysis and listening tools only report the number of likes, comments, and brand mentions while ignoring the context of Instagram contents, this study provides a solution for companies to analyze the effectiveness of #Hashtag @Tagging, image, video and sidecar posts. Secondly, this study provides insights for content creators to design engaging posts by answering what characteristics can maximize content effectiveness on Instagram. For instance, even with photos taken from mobile phone cameras or content reshared from other sources, content creators should consider the needs of viewers, the current trending information, the trustworthiness and expertise of the sources to maximize Instagram engagement. This implication is also critical for businesses to enter foreign markets.

By timely following the information trends and addressing the needs and concerns of followers in the foreign market, businesses can gain higher Instagram engagement. Businesses also need to study their viewers' lifestyle to customize Instagram narratives for a higher Instagram engagement rate. Practitioners should also show more commitment to the VCE by consistently posting to maintain the conversation with followers. Lastly, businesses, especially those with manufacturing and retailing backgrounds, should recognize the benefit of the value co-creation process (IVF theory) and build a strong VCE around their products. As solely utilizing Instagram as an online store result in a poor engagement rate, actively listening and responding to Instagram followers will allow businesses to address their needs more effectively, resulting in a higher engagement rate.

Conclusion and Further research

The study supplies a mechanism to measure engagement on Instagram using web scraping techniques. All ten SMEs were featured in an earlier study conducted by Sukunesan et al. (2020), focusing on internationalization. Three hypotheses were presented and examined against data eight months of Instagram data. The findings had practical implications by suggesting how and what should SMEs post to increase the chance of gaining Instagram engagement. More specifically, @Tagging eventuated as the forerunner than #Hashtags in drawing engagement, while a single image was a better engagement driver than videos. Commitment and consistency also had a profound influence on customer engagement outcomes. Finally, the results also pointed to the customization of content on Instagram. Posts that treat the audience according to their loci specific and showing the relevance context by exhibiting 'tribal' language or culture gained more significant attraction. This study also confirmed the benefits of data scraping as means to build business intelligence. Despite these promising findings, the study had several limitations. A longer duration of data could have yielded a more precise outcome as only eight months of data was collected. In addition, the study did not incorporate other social media platforms. Since many SMEs use more than one social media platform, justifying their engagement solely on Instagram practices can be biased towards specific characteristics of Instagram users (e.g., genders, age, races) or industries. For example, body care SMEs may have more advantages and motivations to invest in Instagram engagement than SMEs from the fishing industry. However, the authors concede that this can be considered in the future, where engagement across multi-platforms is evaluated. Further, the study only focused on 1 in 5 international market dimensions proposed by Sukunesan et al. (2020); this leaves room for further examination into other dimensions such as Brand awareness, Information, Integrations, and Culture awareness.

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