Web scraping Instagram Pre and During Covid-19: Examining customer engagement on Australian SMEs accounts

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Abstract

Instagram has gained the attention of hundreds of millions of users and evolved quickly into a critical customer engagement tool for businesses worldwide, more so during Covid-19. Impacts of Covid-19 have fundamentally changed the market, and therefore, this paper explores the relationship between Instagram practices and the engagement of 20 Australian SMEs (Small medium enterprises) pre and during Covid-19. This study aims to answer the following questions: (1) How should user-generated content (UGC) and call to act content (CTA) be included as Instagram posts? (2) How to use #Hashtags and @Tagging in Instagram posts to keep a campaign going? (3) How Instagram can be utilised to mitigate the effect of Covid-19? Findings revealed a statistically significant relationship between the number of UGCs to Instagram engagement, while CTA content performance recorded a mixed result. However, both UGCs and CTA positively affect the engagement when used to build a virtual community and engage with followers rather than redirecting customers to online selling locations. Also, diversity in @Tagging and #Hashtag uses are found to be effective drivers of engagement. The results imply that addressing the Covid-19 related concerns of followers while showing genuine brand social responsibility can be rewarded by extra engagement.

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

1   Introduction

The covid-19 outbreak has dramatically impacted Australian SMEs, and the damages are partly reported in recent government surveys. According to the Australian Bureau of Statistics (ABS) (2020), until June 2020, 70% of all surveyed businesses reported a decline in revenue compared to the same period of 2019, while SMEs were twice more likely to record a deficit in revenue comparing to large businesses. This is consistent with a large number of SMEs involved in heavily affected industries (e.g., hospitality, retailing, arts, and recreation). Many businesses are uncertain about the economy's future, which is a crucial factor forcing them to delay or cancel investment or hiring, leading to a spike in 10% unemployment in 2020. The pandemic damages can also be quantified through the stimulus package allocated to SMEs by the Australian Commonwealth Government. The Commonwealth renamed and doubled the unemployment benefit as JobSeeker Allowance (previously known as Newstart) to supply cash payments to workers (Prime Minister of Australia 2020). In addition, the SMEs loan

guarantee scheme was established as part of the 66 billion fiscal stimulus package that offers tax credits to support businesses' cash flow (Morrison & Frydenberg, 2020). While many suffered a tremendous loss, SMEs from industries with a high digitalisation level have been widely insulated from the crisis since the epidemic has caused severe disruptions in both the upstream and downstream supply chains forcing customers and businesses to embrace digital engagement (Seetharaman, 2020). There is a pressing need for SMEs to align their processes to keep pace with current digital acceleration and leapfrog to be competitive (Goldemberg, 2011).

Due to financial constraints, SMEs often require quick feedback on product performance before investing further, more so during Covid-19. As such, social media presents itself as a viable platform to test product acceptance and technology investment due to its low up-front cost and unlimited marketing potential. More specifically, social media has become an increasingly critical business tool for internationalisation (Sukunesan et al., 2020, Blanchard 2011, Kaplan & Haenlein, 2010), engaging with customers, building brand images, and collecting market and customers insight (Leung et al., 2013; Neiger et al., 2012). However, studies into SMEs' social media usage are still limited especially systematic analysis of micro-practices (Bianchi et al., 2017; Grochal-Brejdak & Szymura-Tyc, 2018; Louart & Martin, 2012). Also, many SMEs are social media ignorant and unclear about the benefits due to the lack of exposure, skills, and resources (Deloitte, 2019).

Among social media platforms, Instagram has a distinctive uptake with the exceptional ability to leverage the use of visual content and visual storytelling (Hu et al., 2014, Kaplan & Haenlein, 2010). As Internet users increasingly prefer images and visual content (Neher, 2013), Instagram visual content is a viable solution for businesses to "break through the clutter" (Miles, 2014) due to its capability to effectively build awareness, promote conversations, traffic, and generating interest in a highly visual offering. With a large number of active users, the platform has already surpassed its counterparts (Facebook and Twitter) in brand engagement (120 times and 58 times, respectively) as Instagram's advertising is reaching 849.3 million users, with every one in three of the most viewed stories are created by businesses (Hootsuite, 2019). This has enabled Instagram as a value exchange platform, making it an essential component of many businesses' marketing strategies (Kietzmann et al., 2011). Furthermore, since perspectives on customers' roles shift from non-creation to co-creation (or co-destruction) of value (Hanna et al., 2011), Instagram practices to effectively communicate with their customers for co-creation of value are vital. According to Phua et al. (2017), Instagram has a higher level of interaction, co-creation, and engagement than other platforms, making it the most frequently used platform by users to follow and engage with business profiles. The co-creation process from Instagram is based on the idea of sharing to prompt action (Miles, 2014). For example, engaging content shared by SMEs may prompt users to react quickly by endorsing the content or the company (e.g., like, comment, follow) or contributing to the community and the company (e.g., sharing their content to the community). Additionally, Instagram visual content are found to be more suitable for hedonic-related topics, while textual content-based platforms (e.g., Twitter, LinkedIn) may be appropriate for utilitarian posts containing more information (Virtanen et al., 2017). Instagram is more suitable for products and services advertisements, while Twitter and LinkedIn are often used for spreading political messages or professional networking.

To explore this further, it is vital to understudy customer engagement pre and during Covid-19 on Instagram. Nevertheless, solely exploring the optimal practices of Instagram features

(e.g., @Tagging, #Hashtag) is not sufficient for SMEs to improve their Instagram performance. Therefore, this article systematically analyses Instagram features' usage in two quintessential content, namely UGC and CTA. This study acquired data from a total of 10 Australian SMEs' Instagram profiles in addition to 10 SMEs that were contextually analysed by Sukunesan et al., (2020) to improve rigour and produce a more generalisable result. As many organisations have resorted to using data as a means by which they can build customer value position and monetisation (Balakrishnan et al., 2020), data scraping and analytical methods have emerged as critical tools to embrace and transform business models towards information-based and knowledge-based (Feldman & Sanger, 2007; Katsurai & Satoh, 2016; Arora et al., 2019). This study applies data scrapping methods and draws parallel to Haddad and Hornuf (2016) survey on Tweet sentiment analysis and Arora et al. (2019) survey on 1000 Indian social media influencers' influence index. In the following sections, the Interactive Value Formation (IVF) framework is shared as the theoretical lens before SME classification, and the business values of Instagram are discussed. Then, a review on UGC, CTA, and Covid-19 is also shared, followed by the methodology and results section. Finally, the conclusion and limitations of the study are shared by confirming the hypotheses that were presented.

2 Literature Review

2.1 Interactive value creation theoretical background

Customer participation and contribution (in terms of labour and resources) to creating business value have been one of the prominent research topics in marketing and management literature for the past four decades (Mustak et al., 2013). Noticeable changes in the marketplace have implied that businesses can and need to collaborate with the increasingly active customers whose participation has become an essential component of brand co-creation processes (Bagozzi & Dholakia 2006), product customisation/design (Dahlander & Magnusson, 2008) and innovation (Tether & Tajar, 2008). Over the past 40 years, the IVF theory has contradicted the proper understanding that conceptualises business value as embedded in the products and services and solely created by the providers (non-interactive value creation). The theory implies that value is mutually and simultaneously formed in the collaboration between providers and their customers (Vargo & Lusch, 2004; Prahalad & Ramaswamy, 2004; Ramirez, 1999). Therefore, both customers' and providers' roles are fundamental in the joint value creation activities since customers become active participants in the value creation processes. However, it is worth mentioning that IVF is both a creating and destructive process. Echeverri and Skålén (2011) argue that value is co-created and co-destroyed in the joint value creation activities between businesses and customers. Moreover, academic literature tends to overemphasise value co-creation by claiming that co-destruction only occurs in an exchange-based setting (Ramirez, 1999) or underestimating the impacts of value co-destruction as the "minor phenomenon" of value co-creation (Prahalad & Ramaswamy, 2004). Still, value co-destruction is considered as a significant feature of businesses and customers' collaboration which allows fluidity in business needs and ideas, among other studies (e.g., Plé & Rubén, 2010; Echeverri & Skålén, 2011). Makkonen and Olkkonen (2017) introduced the third dimension of IVF, where providers and customers are in a neutral position and "resource integration and the respective value-in-context could remain unrealised" (value no-creation) (Sthapit et al., 2018). Shortly, as noted by Sukunesan et al. (2020), IVF dynamically interchanges among three dimensions: 1) Value co-creation, 2) Value co-destruction, and 3) Value No-Creation. Three IVF dimensions are also seen in a

parallel concept called "Produsage" (Bruns, 2007), which revolves mainly around social media engagement and UGC. UGC is a diversified type of media content that social media users freely create. Harnessing UGCs allow business owners to build online communities with increased engagement alongside their business operations (Kaplan & Haenlein, 2010; Michaelidou et al., 2011), exemplifying IVF.

2.2 SMEs classification

To better explore SMEs' Instagram practices and customise training to improve their performance on the platform, SMEs classification is the first crucial step suggested in several prior studies (Cappel & Myerscough, 1996; Van Vliet & Pota, 2001; Spiller & Lohse, 1997). Classification will provide an understanding of practice variations on social media. By categorising SMEs into sub-groups, SMEs' characteristics can be thoroughly explored. Simultaneously, social media strategies can be designed for a specific business case to better use its resources while mitigating its limitations (Spiller & Lohse, 1997). Therefore, this paper applies Van Vliet and Pota's (2001) framework to classify SMEs based on their origin. Analysing SMEs' Instagram performances under their origin can enrich the data analysis process with previously undiscovered patterns. Particularly, Van Vliet and Pota (2001) group online retailers into five categories: 1) Internet startups, 2) Traditional retailers, 3) Catalogue retailers, 4) Retailers who both sell through store and catalogue, and 5) Manufacturers/Wholesalers.

Since SMEs presented on Instagram often produce and distribute their products and engage with customers, the number of pure catalogues and retailers is limited. Therefore, it is suggested that the online retailers with catalogue retail origin, either as their 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 startup 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 startups, 2) Store-based retailers, and 3) Manufacturers & Wholesalers. More importantly, this study attempts to validate Val Vliet and Pota (2001), where the co-authors expect Internet startup SMEs to have the advantage of exploiting their background to succeed in the online market. Therefore, hypothesis 1 (H1) is designed as the following:

H1a: SMEs with an Internet Startup background have better Instagram practice leading to better engagement.

H1b: B2B SMEs will tend to shy away from engagement with individual customers and focus on Businesses leading to poorer engagement

2.3 The utilisation of social media among SMEs

The utilisation of social media provides numerous benefits to SMEs. Overall, social network platforms create remarkable opportunities for alternative information distribution and marketing channels (Sahay et al., 1998). Most importantly, perhaps the reason behind SMEs' social media utilisation is that promotion on social media is more cost-effective than traditional marketing channels, as social media is the most efficient form of information dissemination and customer interaction (Wang et al., 2012). Social media promotional campaigns are found to effectively encourage customer engagement and precisely target potential customers leading to revenue growth and long-term value creation by building a robust and loyal

customer community (Angel & Sexsmith 2011). For example, when viewers like a business post on Facebook, they spread promotional material to their social networks with ease that no traditional marketing channel can emulate (Lacho & Marinello, 2010). Many SMEs also use social media to redirect viewers to company websites, improving website visibility, brand recognition, and search engine rankings (Chua et al., 2009). For example, a successful social media presence has been found to increase search ranking on the Google search engine of companies' websites (Wood, 2009). Additionally, SMEs are also suggested to utilise social media platforms in the information gathering process (Chung & Buhalis, 2008). Social media platforms provide the opportunity for businesses to learn about their consumers more efficiently as social media data hold priceless information about (potential) customers (Parrott et al., 2010) (e.g., customers' sentiments toward the brands, the level of engagement of customers towards the company's activities or specific products/services, and customers' feedbacks, rating, and comments on the products/services).

However, despite the significant value that SMEs may gain from social media activities, simply establishing a profile on a popular platform does not assure that SMEs can attract customers to their profiles or groups (Culnan et al., 2010). Drawing on Facebook and Twitter data analysis, Paniagua and Sapena (2014) suggest that social media engagement only positively influences business value after a "critical mass of followers" is developed. Business value is not generated by social media platforms but from the interactions between SMEs and their followers (Milosavljevic & Cerf, 2008). Fostering a robust and loyal customer community allows businesses to gain business value from social media engagement and enhance business value in many other areas (e.g., brand images, customer services, products, and distribution). In other words, social media presence is not always directly linked to customers' immediate decision making or purchasing behaviour. Instead, businesses can only gain benefits from social media by fostering relationships with (potential) customers over time. Wang et al. (2012) propose that social media is a unique tool for businesses to actively create dialogue and stay involved with target market customers while encouraging peer communication (communication among followers) on social media platforms poses considerable influences on their attitudes and purchasing behaviours. Specifically, these loyal customers may contribute the social media content for SMEs' profiles, accept the company as an insider, accept new offerings, immunise negative information about the business and even serve as provocateurs for its products (Bhattacharya & Sen, 2003). The ability of social media to foster interactive dialogues provides a powerful way to engage with customers and build long-term relationships between the customers and the brand (Van Noort et al., 2012). However, SMEs have found forming interactive dialogues with customers to be 'problematic' as many SMEs are 'failing to gain a sufficient insight into the "true" nature of their customers' (Parrott et al., 2010) and to create a relevant and effective dialogue with followers in the contemporary era of social networks. Compared with traditional marketing campaigns where materials are professionally designed and distributed, social media customers can freely communicate (with the businesses and with other customers) about products and services (Mangold & Faulds 2009; Palka et al., 2009). Interactive communications require SMEs to consider when and how the business can involve in the conversation (Kietzmann et al., 2011) and how much they facilitate customer communication (Geho et al., 2010) and how they define their perspectives on the brand (Bernoff & Li, 2008).

2.4   Business value from Instagram key features

According to Hootsuite (2019), commercial Instagram profiles are visited by more than 200 million active users daily, in which 70% of users search for a specific brand, 80% of the users follow at least one business profile, and 60% search for the desired products/services on Instagram before buying. The Instagram engagement has become one of the main concerns for businesses on the platform where better presences are expected to acquire more followers allowing promotions, updates, and content to be more easily shared with potential customers (Ting et al., 2016). From a synthesis view, Leung et al. (2013) and Neiger et al. (2012) classify social media value to business into several major impacts, including promotion/brand awareness, product distribution, communication/engagement, management, information dissimilation, market research and brand performance indication apart from innovative business processes. However, social media's business value does not come from the platform itself but from the user community's specific usages enabled by the platform's network logic (Mukerji & Roy, 2019; Culnan et al., 2010). Network logics refers to a macro-level belief that shapes the cognition and decision-making process of a digital platform's users. It can be reduced into micro-level day-to-day practices that define users' activities, integrations, and strategies (Mukerji & Roy, 2019). According to Culnan et al. (2010), the business value of social media applications outpaces routine commerce activities (distributing content or driving sales) due to its enormous capability of customer community formation, known as virtual customer environments (VCEs). Instagram provides many VCEs augmented features for businesses to boost business value through branding, sales, customer service and support, and product development. While forming the customer community is not a new idea, Instagram VCEs augmented features allow the firm to build a loyal customer community much more effectively and efficiently (Culnan et al., 2010). For instance, a previous study conducted by Virtanen et al. (2017) confirmed that actively following Instagram users' accounts and replies to their comments significantly and positively affect Instagram engagement and the number of SMEs' business profile followers. Many other organisations, such as Lego, eBags, and others (see Li & Bernoff, 2011), have proved the benefit of solid VCEs.

At the time of this study, 6 Instagram features for engagement and VCEs are identified as 1) Instagram is a social network for images and videos sharing, 2) Users can follow (or get followed by) other users, including businesses and celebrities, for viewing/commenting their latest posts or communicating through private messages, 3) "Discover" feature to suggest the preferred   content and other accounts that are more likely to get the engagement from the users, 4) "Stories" feature for instant content sharing, 5) "IGTV" feature for the long-form video posting, 6) "Shopping" features to streamline online selling and payment process via Facebook pays (United States market exclusive) (Instagram, 2020).

2.5   User-generated content

Driven by rapid technological developments and changes in users' behaviours, UGC has become a phenomenon in intelligent web services (Naab & Sehl, 2017). As part of the UGC development, many platform operators have moved to the passive position where media content are created and freely distributed by the users. Therefore, the role of platform operators is to enable the content distribution process, customise and further develop shared content (Dahlberg, 2011; Bruns & Schmidt, 2011; O'Reilly, 2005). Considering the brand-related aspects of social media, UGC is applied by businesses to drive product awareness and to influence customers' purchase decisions (Blakley, 2013). Literature also refers to social media

UGC as "electronic word-of-mouth" (eWOM), where the users' message is more trustworthy than other sources of information with faster and greater reach to the global audiences (Hennig-Thurau et al., 2004). However, not many studies target the specific uses of Instagram UGC for business growth; thus, there has been no widely accepted definition for Instagram UGC. Based on the earlier review of Naab and Sehl (2017), we introduce three criteria for Instagram UGC as follows:

1) UGC holds a degree of personal contribution. Since users cannot directly post content on the page of SMEs' Instagram profiles, SMEs' Instagram profile needs to manually repost the content created by users on the company page.

2) Instagram UGC must be publicly shared.   content must be accessible to the public. content shared via email (or instant message) with editors are excluded.

3) Instagram UGC is created without professional skills and routines. Content created with design making and decision making in the hands of users is counted as Instagram UGC, while   content created by SMEs or with the collaboration of SMEs are excluded.

In the context of Instagram UGC, it is crucial to exclude the content created by the business either for product promotions or customer engagement. Since UGC is considered the trustworthy eWoM of the Internet that is freely communicated among users, content created by businesses (if detected by users) can be considered untrustworthy due to the potential commercial motivation. Therefore, social media users often filter out the content that appears to be too commercial intensive while engaging with trustworthy   content from sources with expertise (Yu et al., 2020; Ki and Kim, 2019). Additionally, social media users are subjected to the information saturation problem where a large amount of available information is distributed by businesses or influencers for their interests, preventing social media users from analysing relevant and applicable information to their needs (Pan & Fesenmaier, 2006). For example, in a study conducted on social media utilisation for tourism products, Lee and Gretzel (2014) suggested that when travellers are unfamiliar with destinations, suggestions from social media communities (especially those from well-known travellers) are found to be more influential to their decision-making than those from friends and relatives. In short, the lack of trustworthiness and credibility is the main factor in discarding   content created by SMEs from Instagram UGCs, while these factors allow UGC to influence Instagram engagement positively. Therefore, hypothesis 2 was proposed as follows:

H2: Higher UGC numbers will establish a stronger VCE, prompting a higher number of engagements.

2.6 Call to act content

CTA is a traditional advertising and copywriting technique to pursue customers doing something (White & Woods, 1997; Applegate, 2005). Since the early days of digital marketing, many authors have mentioned CTA as a suitable solution for businesses in encouraging customers to learn more about the products and the brands (Bendinger et al., 2009) to gain more traffic for an Internet location (Ghose & Dou, 1998; Edwards & La Ferle, 2000) and to change consumers' behaviours with desirable offers and rewards (White & Woods, 1997). By integrating CTA into Internet marketing campaigns, it is suggested that businesses can maximise the utility of the online location for the brand's competitive positioning within a broader audience. CTA can improve several marketing functions, such as building a brand's

image, providing product information, reaching a new market, and developing customer relationships and customer services (Parsons & Lepkowska-White, 2010). Since consumers are not merely passive receivers of advertising messages and are increasingly involved in the value creation process (Mustak et al., 2013), CTAs have long been used to encourage viewers to participate in the value creation process. In the context of social media, CTA has been widely used to gain more digital engagement (Scheinbaum, 2016). As technology has posed an enormous potential of transforming previous social configurations, social media platforms also expand conventional CTA's capability with new functions such as @Tagging (where followers can be directly tagged and referred to in the post). Such developments have provided implications for better CTA practices in social media marketing campaigns. Although CTA still contains its traditional marketing functions, social media engagement stimulation (number of likes, comments, and shares) becomes a critical quantitative metric to justify CTA effectiveness.

According to De Vries, (2012), CTA is a "medium-level interactive brand post" that can increase the popularity of social media content. The authors suggest that increasing the level of social media content interactivity is an alternative way to enhance the salience of such content. The level of Instagram content interactivity characterises two-way communication between SMEs and their followers and between customers themselves; put differently, it characterises Instagram users' dialogue (many-to-many communication). Since social media users are becoming increasingly active, many-to-many communication is highly preferred and trusted as users often turn to social media to engage with peers, create, consume and distribute content (Schultz & Peltier 2013; Hanna et al., 2011). As the motivation behind Instagram content posting is to gain viewers' reactions, we expect that higher degrees of interactivity will generate more engagement by enabling such communications among users. However, previous studies report inconclusive findings (e.g., insignificant effect (De Vries et al., 2012), positive effects (Liu & Shrum, 2002)) regarding interactivity on advertisement effectiveness and social media engagement gaining. In the context of SMEs' Instagram engagement, we propose H3 as follows:

H3: Higher number of CTA content results in higher engagement when used for VCEs building than for product advertising.

2.7   The effect of Covid-19 on Australian SMEs

As we are in the middle of the Covid-19 outbreak, it is too soon to quantify the long-term effects of the pandemic on businesses, primarily in the cases of Australian SMEs (Cassells & Duncan, 2020). At the time of writing, adverse fiscal impacts could be seen across many layers of society despite the Australian government's introduction of small business grants (Morrison & Frydenberg, 2020) and schemes like JobSeeker (Morrison et al., 2020) and Jobkeeper (Morrison & Frydenberg, 2020). This has dynamic consequences resulting in dramatic changes in how businesses and consumers behave. From the SMEs' point of view, the outbreak has forced many businesses to close with severe disruption in capital flow and retaining the quality of services in a time of uncertainty, and now the imminent recession is much more complicated than usual (Tarki et al., 2020). Traditional retailers face numerous short-term challenges that worsen their pre-existing issues. New challenges relating to employee/customers' health and safety, travel restrictions, supply chain and cash flow disruption, and the sudden disruption in consumer demand, sales, and marketing (Ivanov, 2020; Seetharaman, 2020) have propped up.

Many businesses, especially those in traditional retail, tourism, and hospitality require fundamental business model changes with a shift towards online operation (Donthu & Gustafsson, 2020) as Covid-19 is forcing customers to shop digitally due to physical restrictions (Seetharaman, 2020). Along with physical restrictions, the "scarcity effect" (Hamilton et al., 2019) has also dramatically affected price elasticities and stockpiling habits, while traditional deterrents such as queuing and perceived crowding are now widely accepted. Many retailers are diffusing messages about the availability of commodities, limiting the number of items per consumer and implementing new online services and delivery. Similarly, online retailers introduced the virtual queue and notifying option to limit the number of customers to be handled simultaneously. This can be witnessed among many Australian online retailers across several industries, from computer hardware retailers (Scroptec) to online grocery stores (Woolworths; Coles) on items such as central processing unit (CPU), graphic processor unit (GPU), food or toilet paper (Scroptec, 2020; Woolworths, 2020; Coles, 2020). These restrictions and disruptions have led to several consumer behaviour changes: 1) Providers switching (product availability/special reasons). 2) Brand loyalty enhancement (reward for supporting customers in their hard times) 3) New products/services discovery (Pantano et al., 2020). As such, we introduce H4 as following:

H4: Assuring customers about business availability via Instagram with Covid-19 related topics during the outbreak encourages customers to remain loyal and engaged.

3 Methodology

In this section, the methods to collect and process data from 20 Australian SMEs' Instagram profiles are clarified, followed by the justification of our chosen statistical methods. Our approach contains four main steps: 1) SMEs classification and input seeds preparation, 2) Data scraping, 3) Data pre-processing, 4) Time series visualisation and Poisson regression model (refer to Figure 1)
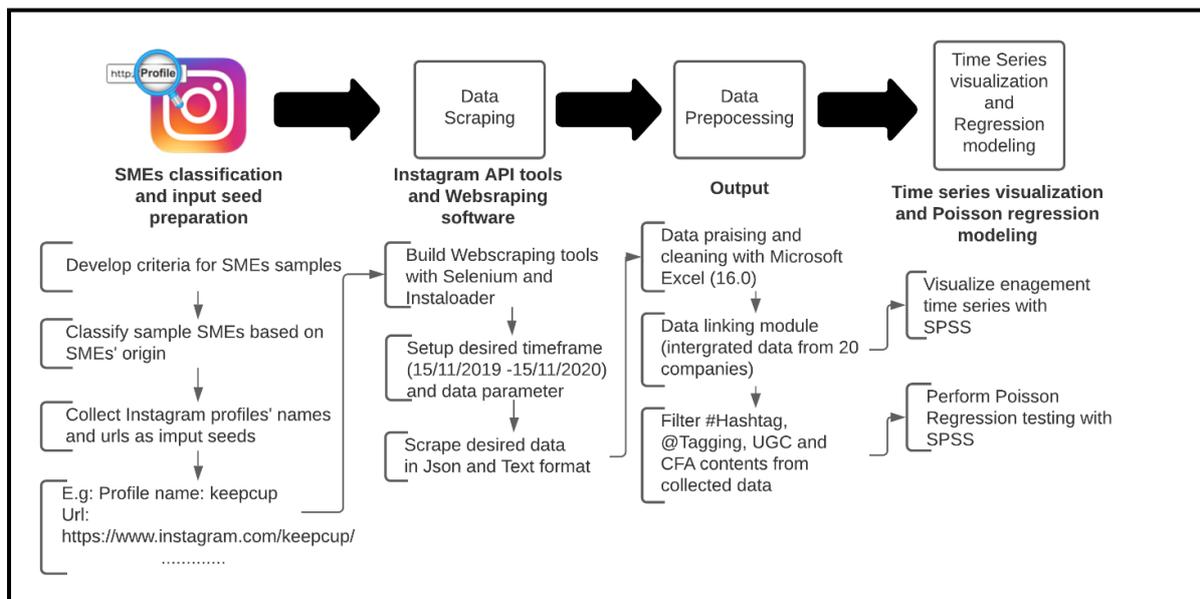

Figure 1. Modified Research Model

3.1 SMEs selection and classification

The fast-changing nature of social media and lack of accountability permit the creation and abandonment of accounts seamlessly; thus, selecting a representative sample is one of the most challenging aspects of analysing Instagram accounts. Since this study is interested in SMEs with Van Vliet and Pota (2001) classification, samples' origin was also considered in the selection process to avoid any bias in the data analysis phase. This research employs data scraping methods to collect data from the 20 Australian SMEs' Instagram profiles, 10 of which were previously examined in Sukunesan et al. (2020). Although Sukunesan et al. (2020) analysed five marketing dimensions of SMEs' Instagram utilisation (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 of SMEs Instagram uses with a content analysis method, this study aims to generalise and quantify the previous findings throughout the Covid-19 crisis. This study places exceptional attention on the potential of social media data scraping as a means of building market intelligence and deriving business competitiveness. To choose ten additional SMEs for data analysis, a set of inclusion criteria for samples are provided as follows eventuating to SMEs listed in Table 1: 1) SMEs are Australian based, 2) SMEs are active on Instagram from (15/11/2019 to 15/11/2020), 3) SMEs are listed in Victoria state government business arm (Business.vic.gov.au). While the criteria for SME selection were based on the previous of Sukunesan et al., (2020), the timeframe for data scrapping is a year. The chosen time frame for data collection entirely covered the ongoing Covid-19 epidemic milestones in the context of Australian SMEs, including 1) Covid-19 was first reported in Wuhan, Hubei Province, China on 31/9/2019 (Zu et al., 2020), 2) the first Australian laboratory-confirmed Covid-19 patients were diagnosed in Melbourne 25/1/2020 (Fotheringham et al., 2021), 3) Victoria state lockdowns (16/3/2020 to 16/9/2020) (Costantino & Raina MacIntyre, 2021).

SMEs brand	Classification	Description
KeepCups https://au.keepcup.com	Internet Startup	KeepCups was born in 2009 in Melbourne by a local coffee shop owner who found the business opportunity in designing and producing their reusable barista standard cup.
Frank Body https://frankbody.com	Internet Startup	Frank Body was born in 2013 by an Australian coffee shop owner who used leftover coffee grounds to exfoliate human skins. The business is growing from $5000 capital to a multi-million-dollar brand via aggressive social media and word of mouth marketing.
Lonely Kid Club https://lonelykidsclub.com	Internet Startup	Lonely Kid Club was born in 2011 as an independent slow fashion brand. The company sells its products via its website and promotes its community via private social media groups
Pressed Juices https://pressedjuices.com.au	Traditional Store-based Retailer	Pressed juices offer cold-pressed juice, smoothies, and flavoured waters with frozen fruit soft-serve

		via several stores and food trucks in Melbourne.
Bisonte Australia http://bisonte.com.au	Traditional Store-based Retailer	Bisonte Australia was born in 1980 as a handcrafted leather jacket and ethos producer and designer. The company sells via a retail store in Chapel Street Melbourne.
Liar the Label https://liarthelabel.com.au/shop	Manufacture/ Wholesalers	Liar, the label, was born in 2013 as an accessory, swimwear, activewear designer, and producer in Gold Coast.
Vegethreads https://vegethreads.com	Traditional retailer	Vegethreads offers locally made clothes using eco-friendly materials via their flagship store at 246 High Street, Northcote.
Thankyouaus https://thankyou.co	Internet Startup	Thankyouaus brands itself as a social movement where profit is contributed to tackling poverty in the world. They offer sustainable and ethical skincare products via their website and promote their activities on social media profiles
Loving Earth https://lovingearth.net	Manufacturers/ Wholesalers	Loving Earth is a high-quality chocolate/cacao manufacturer that offers healthy and sustainable products
HLSK https://hlsk.com.au	Manufacturers/ Wholesalers	HLSK was born in 2013 as a handcrafted jewellery designer and producer by an experienced Jeweller (Hannah Stewart). The brand saw tremendous growth from the garage-based workshop to a 300 square meter factory in Melbourne and a flagship store in Armadale.
Tulloch Wine https://tullochwines.com	Manufacturers/ Wholesalers	Tulloch Wine was found in 1838 by a Scottish Australian (James Tulloch) as viticulture and winemaking.
Crazy Plant People https://crazyplantpeople.com	Traditional retailer	Crazy plant people are a New South Wales-based company that offers in-house plants and accessories. The company distributes its product via its store and website and builds a community via social media profiles
Big Winery Tour https://bigwinerytours.com.au	Manufacturers/ Wholesalers	Big Winery Tours was born in 2016 by Beau Heme. The company offers winery tours in Yarra Valley, Melbourne.
Ugg Direct https://uggdirect.com.au/	Traditional retailer	Ugg Direct is Australian footwear and online accessory retailer. The company distributes its product via its website and a flagship store in South Wharf, Victoria.
Beanbagrus https://beanbagsrus.com.au	Manufacturers/ Wholesalers	Beanbagrus is a Queensland-based bean bag manufacturer. The

		company produces several product lines from cushion beans and distributes its product via its website.
Solar Calculator https://solarcalculator.com.au	Internet Startup	Solar Calculator offers solar power advice. The company connects customers with accredited solar installers and provides consultants for several solar solutions via their website.
Drinking Style Vinstrip https://drinkinstyle.com.au/shop	Manufacturers/ Wholesalers	Drinking style Vinstrip is the wholesaler of the Italian brand Vinstrip. The company offers Italian-made Wine/Bottle Carrier and handbags from eco-friendly materials.
Alfresco Blinds Co https://alfrescoblindsco.com.au	Manufacturers/ Wholesalers	Alfresco Blinds Co was founded in 2008 by Chris Peroukaneas, and the company is a high-quality supplier and installer of (in)outdoor blinds.
Mister Moose Shop https://etsy.com/au/shop/mistermooseshop	Traditional retailer	Mister Moose Shop offers family portraits, Australiana prints, and Washi tape from a Sydney-based store and Esty.com – an E-commercial platform.
Soflossy Official https://soflossy.com.au	Traditional retailer	Soflossy Official offers handmade, gluten-free, vegan-friendly cotton candy via their website.

Table 1. SMEs description

3.2 Data collection

Following the outcome of the Cambridge Analytica debacle, both Facebook and Instagram rigorously limited access to their users' data through Facebook Application Programming Interfaces (API). The restrictions hamper the ability to explore and examine the social phenomenon through the platforms and preserve access for those whose policies may facilitate the outrage itself (Bruns, 2019). Along these lines, to gather meaningful data for the study, this paper developed a hybrid data scraping method that uses both current Instagram APIs and an alternative web-scraping program to collect the desired data. The data collection phase incorporates various steps that were designed to collect applicable data instances for the study. The data collection phase began with the preparation of 20 targeted SMEs' Instagram profiles, including profile URL and profile names that serve as input seeds for data scraping purposes. Twelve months of data from 15/11/2019 to 15/11/2020 was 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 web scraping program was written in Python - an increasingly popular application for machine learning and A.I. (Artificial Intelligence). Employing a similar approach to Arora et al. (2019), the Instagram API (Application Programming Interfaces) was called to collect raw data in JSON format. The data held SMEs' profile insights, including the number of followers, the type of post, the number of likes and comments for each post and the content (both images, videos, and texts).

No	SMEs' Instagram profile	Followers	Image	Side-car	Vi-deo	Com-ment	@Tag-ging	#Hash-tag	UGC	CTA
1	Keepcup	181,000	300	32	31	3308	309	848	236	23
2	Frank Body	789,000	549	47	70	20,544	476	132	261	198
3	HLSK	240,000	172	9	11	4,011	9	43	0	27
4	Loving_earth	342,000	257	43	24	31,802	352	255	164	49
5	Thankyouaus	97,500	84	43	25	4,865	128	297	20	56
6	Lonelykidclub69	16,400	575	50	5	3,537	95	3	211	77
7	Liarthelable	6,027	79	0	0	31	28	789	0	1
8	Pressedjuices	77,300	50	10	16	816	37	34	9	7
9	Bisonet_australia	1,027	15	1	1	21	0	53	0	0
10	Vegethreads	36,000	515	26	0	1,624	116	225	35	17
11	Tullochs Wine	3,930	68	4	77	453	21	1,142	0	23
12	Big winery tour	721	20	10	6	93	21	141	0	0
13	Soflossy Official	3,116	159	15	5	1,368	47	389	0	3
14	Mister Moose Shop	1,422	101	2	25	1,054	68	528	0	10
15	Uggdirect	2,627	133	71	9	2,650	10	227	0	148
16	Beanbagsrus	1,376	70	0	3	67	0	900	0	0
17	Crazy Plant People	169,000	1,573	0	0	10,789	3,136	2	1,573	1,573
18	Alfresco Blinds Co	6,313	53	100	25	193	30	0	0	16
19	Solar Calculator	186	48	0	0	70	0	4	0	23
20	Drinking Style Vinstrip	1,771	186	13	10	185	192	5,298	0	31
	Total	1,976,716	5,007	476	343	87,481	5,075	11,310	2,512	2,282

Table 2. Description of 20 Australian SMEs and the total amount of data scraped from various Instagram features

3.3 Data pre-processing

JSON files are parsed in the pre-processing data phase to acquire meaningful variables for analytics and regression modelling processes. The parsed JSON contains the number of likes and comments of each post, the text/images/video content of each post, the text content of comments, and the date/time of each post. Excel (16.0) was used to parse and systematise the JSON data and the different companies' text format data into spreadsheets.

Variable	Description
Engagement rate	The total number of likes yielded from each Instagram post of the profile.
[Type=Graph Image]	Instagram post in Image format.
[Type=Graph Sidecar]	Instagram post in Sidecar format (post with more than one image)
[Type=Graph Video]	Instagram post in Video format.
Comments	The number of comments.
#Hashtag	The number of #Hashtags.
@Tagging	The number of @Taggings.
Date Time	Date and time of each Instagram post.
UGC	User-generated content Instagram post.
CTA	Call to act content post.

Table 3. Variables to measure engagement

The Date Time of each post is used as a unique identifier for the data set. This study adopted several measurements from Arora et al., 2019, including the Engagement rate and Posting Rate. Other variables such as comment, type of post, date and time, CTA and UGC were generated from the collected data (refer to table 3).

3.4 Poisson Regression

Since traditional regression techniques are best suited when dependent variables are continuous, they would not fit in the context of Instagram engagement analysis, where the counted likes were used as the respondent variable. In contrast, Poisson regression, which belongs to a statistical family known as the generalised linear model (GLiM) (see Dobson, 2002; Fahrmeir & Tutz, 2001; Fox, 2008; McCullagh & Nelder, 1989), are more suited for more suited to model count data. GLiM statistical family is designed to model datasets with binary, ordered categorical, count, and time to failure (or success) dependent variables (Coxe et al., 2009). Since count data is Poisson distributed - the discrete distribution depicts the occurrence of (individually countable) outcomes that takes on a probability value only for non-negative integers, making it an excellent choice to model count variables such as the count of Instagram likes and comments (Coxe et al., 2009). As such, Poisson Regression models can produce more precise results in analysing Instagram scrapped metadata, where the dependent variable is the count of likes received in the considered timeframe.

The count of like was used as the respondent variable to represent Instagram engagement because liking is the lowest form of engagement on Instagram. The number of like represents an acknowledgment of Instagram users about Instagram content, regardless of the meaning behind such actions. Typical liking incidents require users to view Instagram content and, if applicable, then click the like button. The like action requires only a simple tap from users, which is virtually effortless, instantaneous, and reflexive (Swani et al., 2017). More importantly, liking can be considered a donating action that is driven by user-brand relationships rather than self-presentation. In other words, when users like Instagram content, they are more likely to advocate for the content creators than self-expression.

Although the count of comments is also a potential respondent variable representing Instagram engagement, comments differ from likes in that they require many steps, including understanding the Instagram content (and perhaps previous comments), clicking the comment section, generating the appropriate responses, and then posting the responses. Therefore, commenting requires more cognitive resources and effort and contains a higher level of self-expression than liking (Labrecque et al., 2020). Interestingly, commenting represents a two-way interaction between the commenters and receivers, while many Instagram users use comments for exposure and self-promotion. Compared to previous studies, we posit that comment heavily drives the user's relationship with a brand and Instagram engagement. In other words, the higher number of comments allows Instagram to go viral, leading to a higher number of likes. As SMEs can influence the number of comments (e.g., by tagging, commenting, replying and deleting comments), it is not a representation of Instagram engagement but an Instagram micro-practice, as suggested by (Virtanen et al., 2017). Therefore, comments are not a respondent variable but a dependent variable that SMEs can control or influence to gain Instagram engagement.

Poisson regression presents the incident-rate-ratio (IRR) computed as $e\beta$, where β is the Poisson regression co-efficient. If the independent variable increases by a unit, the dependent variables are expected to change by β, and other variables remain constant. In other words, in

each model, the companies' posts may belong to several independent categories (e.g., image, video, UGC, CTA). Having an incidence rate ratio for the dependent variable equal to IRR multiplies by a changing unit of the independent variables. The statistical method employed in this paper is comparable to Labrecque et al., (2020). In particular, the usage of Poisson regression models revealed the differences across social media engagement activities such as likes, comments, and shares for linguistic characteristics (pronoun usage across five pronoun types). However, instead of analysing the linguistic characteristics of Instagram posts, we are more interested in investigating specific Instagram practices that SMEs can apply to improve Instagram engagement.

4 Results

4.1 User-generated content

Overall, the results indicate that UGC has a positive relationship with the chances of getting more engagement (ranging from 1.02 (β = 0.02, p < 0.001) to 4.21 (β = 1.44, p < 0.001) times). The result also confirms H2: A higher number of UGC will establish a stronger VCE, prompting a higher number of engagements (refer to Table 4). More specifically, SMEs with strong VCEs such as Lonelykidclub69, Frank Body, Loving_earth, and Crazy Plant People have a higher chance of getting 1 unit of engagement from a UGC posted due to their consistent uses of UGC (ranging from 33% to 100% of total posted content). By contrast, SMEs with a lower UGC posting rate (Vegethread) record a negative Instagram engagement gain (eβ = 0.72 β = -0.23, p < 0.001) from UGCs, while SMEs that did not use UGCs in their Instagram posts (Alfresco Blinds Co, HLSK) witnessed significantly weaker VCEs leading to a smaller number of followers and engagement in the considered timeframe. The results confirm previous studies in determining UGC as an effective tool that drives social media contents' popularity (Chevalier & Mayzlin, 2006; Tan et al., 2014) or visual content (Li & Xie 2020). Social media users highly prefer UGC to interact with each other since the messages conveyed by UGC are more trustworthy than other sources of information (Hennig-Thurau et al., 2004). In other words, Instagram users, especially those who are researching specific products/services before purchasing, prefer to trust and engage with peer users rather than businesses and other entities on the platform, as information from peer users are more reliable and trustworthy than those from businesses or influencers. As such, as the eWoM of the Internet, UGC can be deployed by businesses to build product awareness and to positively affect customers' purchase decisions (Blakley, 2013; Leung et al., 2013; Burgess et al., 2018; Coxe et al., 2009).

The exception to this pattern occurs in the case of Thankyouaus – an Internet startup SME. While 13% of Thankyouaus posts are UGC, the company still shows an inferior performance in UGC categories (every extra UGC lowers the chances of getting more engagement by 58% (β = -0.86, p < 0.001). As the positive relationship between UGCs and VCEs building has been described in prior studies (Sukunesan et al., 2020), we found it more informative for SMEs to explore practices of the exceptional cases where the lack of UGCs or the misuses of UGCs leads to poor engagement performance and/or inflicting the development of SMEs' VCE. More specifically, we find the UGCs used by 2 SMEs (Thankyouaus and Vegethreads) are indistinguishable from other types of posting and entirely about their products to promote and redirect followers to selling sites. Vegethreads and Thankyouaus's UGCs share similar messages, colour tone, and sentiment to other companies' posts. The lack of transparency, diversity, product-centric posting style and framed UGCs used by the two companies have discouraged customers from engaging with the companies and the Instagram community.

Unsurprisingly, this finding has been addressed in the previous study of Yu and Egger (2021), where Instagram users often filter out Instagram images that appear too commercial. As users prefer to collect genuine information from peers instead of advertisements, the findings hold practical implications for SMEs that UGC is a more suitable tool for VCE building and Instagram engagement gaining than advertising or redirecting followers to online selling locations. Furthermore, businesses should not target short term sale growth by using UGC solely for advertising and selling because this type of practice may discourage followers' involvement and prevent the VCE from forming, ensuring the modest business value gained from Instagram initiatives in the long run. Moreover, in the specific use of UGC, the content created by the "Trustworthy" source with well know "Expertise" to the VCE can gain more discussion. The findings provide practical implications for businesses in choosing the preferred UGC for Instagram reposts and maintaining the consistent UGC posting rate for a higher level of Instagram engagement.

SME	UGC ratio	Classification	β	S.E.	Wald	eβ	p
Keepcup	65%	Internet Start-up	0.16	0	1682.09	1.17	0
Frank Body	40%	Internet Start-up	0.1	0	3809.4	1.11	0
Loving_earth	50%	Manufacturer	0.02	0.01	56.71	1.02	0
Thankyouaus	13%	Internet Start-up	-0.86	0.01	5316.42	0.42	0
Lonelykidclub69	33%	Internet Start-up	0.27	0.01	2631.75	1.32	0
Pressedjuices	12%	Traditional retailer	0.24	0.02	179.8	1.27	0
Vegethreads	6%	Traditional retailer	-0.23	0.02	226.78	0.79	0
Crazy Plant People	100%	Traditional retailer	1.44	0.08	351.21	4.21	0

Table 4. UGC practice among 20 SMEs

4.2 Call to act content

Initial analysis of the CTA variable surprisingly shows a mixed relationship between CTA content and engagement gain among 18 SMEs that used CTA in the considered timeframe. Specifically, seven companies show adverse effects on engagement from CTA uses (from 26% to 10% decrease in chances of engagement). On the other hand, six companies record positive impacts from CTA posts (from 7.4% to 421% increase in engagement), while five companies record insignificant results. However, by looking deeper into the CTA practices of 18 companies, a posting pattern concerning their origins can be identified. Specifically, internet startup SMEs (e.g., Loneltkidclub69) and retailer SMEs (e.g., UggDirect) are found to use CTA often to redirect customers to their online shop location, especially in the event of promotions or exclusive offers (refer to figure 2). This contrasts with manufacturing SMEs, where CTA is employed to ask customers to look at the products presented in the posted image. This style of using CTA has resulted in negative or insignificant chances of engagement gaining for most SMEs in all three origin categories. As discussed above, the selective attention of Instagram users often filters out commercial intensive Instagram content (Yu & Egger 2021). Since Instagram users prefer to collect genuine information from peers instead of advertisements, the findings hold practical implications for SMEs to use CTA as another tool for VCE building and Instagram engagement rather than to advertise or redirect followers to online selling locations. In other words, Instagram CTA should not be directly used to gain more traffic for an Internet location, as suggested by Ghose and Dou (1998) and Edwards and La Ferle (2000). Instead, by using CTA to engage with viewers and foster strong VCE among the brand and its products/services, SMEs can more effectively gain traffic to online locations when the trust

(with followers) is built, and followers become loyal to the brands. On the other hand, SMEs will gain little rewards by intensively advertising via CTA and continuously redirecting viewers to unfamiliar online destinations.

However, we also found a remarkable exception to this pattern occurring in the case of Crazy Plant People – a retailer SMEs. The significant 421% increase in engagement gaining of Crazy Plant People's CTA content is created with a uniform approach. All Crazy Plant People's posts were images taken and submitted by the customers that contain the customers and their purchased products. The company also encourages customers to submit their moment in every post's caption in one predefined template. This unique type of Instagram practice has led to exceptional CTA performance since Crazy Plant People's practices have successfully created an inclusive virtual community of like-minded people who love the products and encourage them to show their love for the product with the rewards of potential likes and comments from other community members.
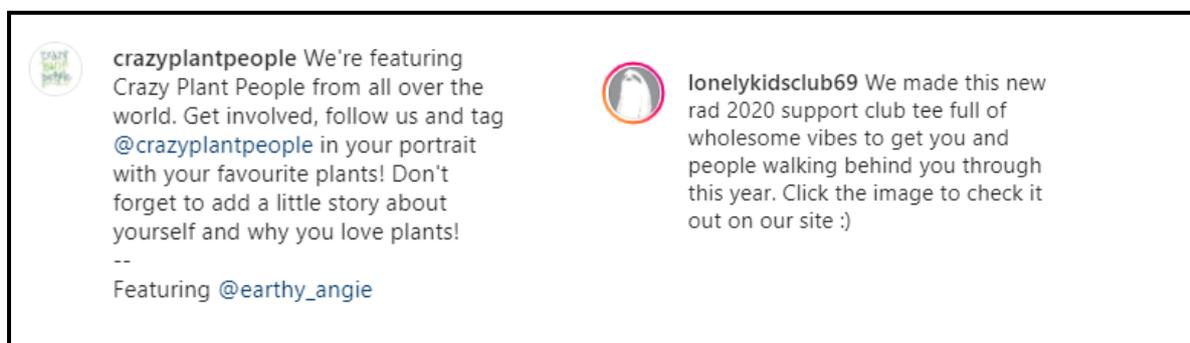

Figure 2. CTA practices of Crazy Plant People (left) and Lonelykidclub69 (right)

Compared to Crazy Plant People's, other high-performance companies (Lonelykidclub69, Keepcup) seldom use CTA in their post. Also, when used, content is used to redirect customers to their online shop (refer to figure 2). According to the results, this approach of CTA usage adversely impacts Instagram engagement. For example, Lonelykidclub69 performs poorly in the CTA category (every CTA post of the company yields only a 0.88 chance of getting more engagement) despite its superior performance in other Instagram features' uses. In other words, CTA tends to be an ineffective tool for product advertising/selling, but it is effective in building VCEs around the company's product/services. Also, SMEs should consider the rewards for customers when they follow the CTA content to ensure posts' effectiveness. The reward should be substantive to set precedence, ensuring repeat behaviour. Customers' rewards (for participating in CTA) can be in the form of exclusive products/services discounts or monetary prizes for those who closely follow and participate in the company activities (refer to Figure 3 a). Additionally, for customers who consistently show their love for the products/services, companies can also share their profiles by the @Tagging function (with owner consensus) to reward them with engagement from the VCE. By directing the engagement from the VCE to specific customers, SMEs can increase the customers' sense of belonging to the community and encourage other members to follow the desired behaviours of such customers (refer to Figure 3 b). Alternatively, SMEs can reward customers with desired behaviours by promoting such behaviours in Instagram posts. These practices also direct positive engagement to the customers and encourage others to follow of behaviours of rewarded customers (refer to Figure 3 c). Moreover, SMEs can even use customer input in product design and development and rewards them with a monetary prize or profit cut for

every sold product (refer to Figure 3 d). This practice allows SMEs to collect new ideas that are likely preferred by customers in products/services development and enhances the capability of a value co-creation process that benefits both the SMEs and the community. As the financial constraint is SMEs' weakness, Instagram practices that maximise customers' contributed value is significant for SMEs' viability.
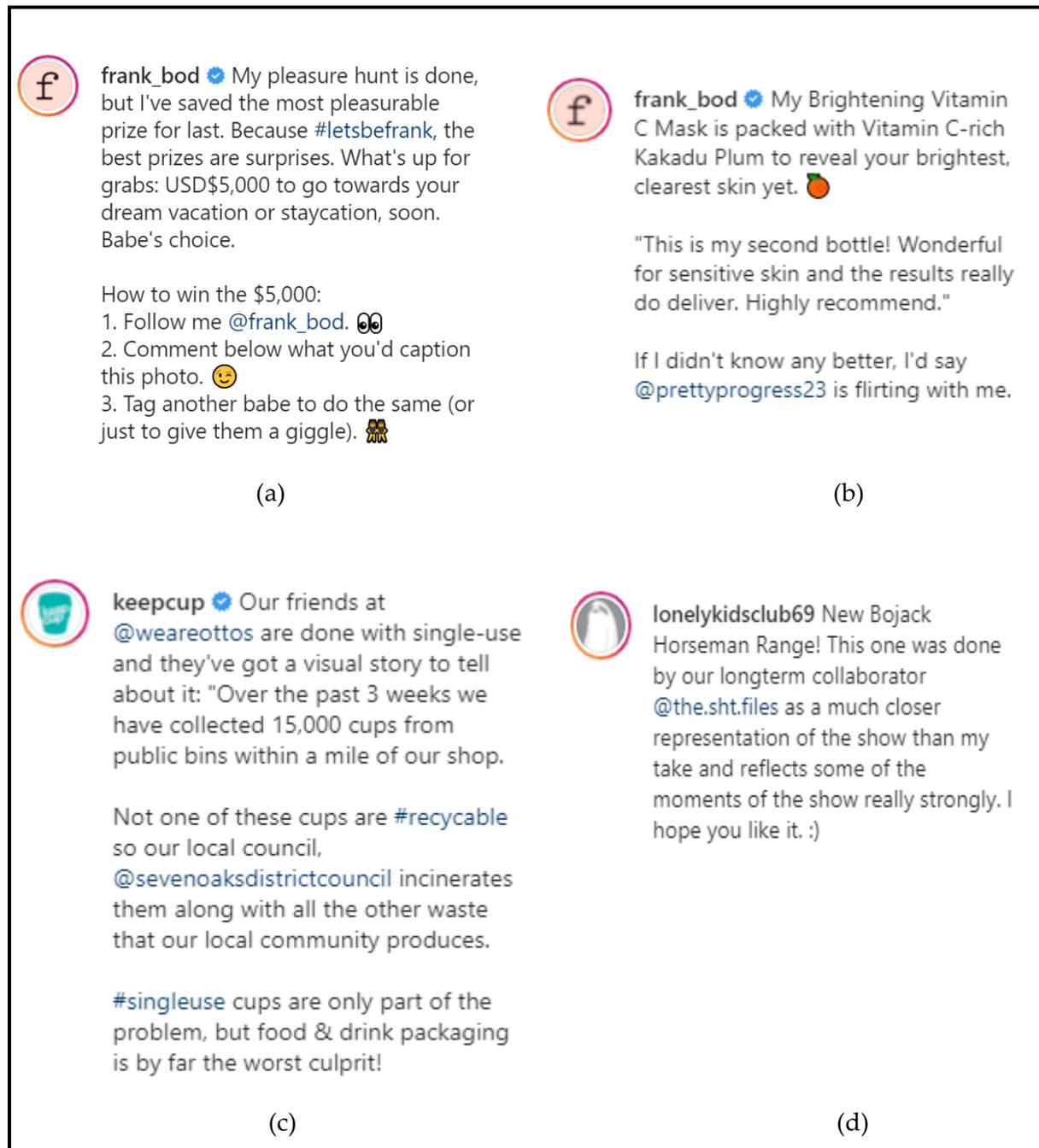

Figure 3. Examples of SMEs rewards for followers' participation in CTA

Although Poisson regression produces many significant results, we still found an interesting pattern in weaker predictors, especially in CTA content among manufacturers SMEs (refer to table 5). The use of CTA among manufacturer SMEs neither increase nor decrease the chance of getting more engagement. This finding reinforces H1a and H1b in consideration of CTA content usage. Manufacturers (B2B) are hesitant to use CTA in their daily posts (in the cases

of HLSK and Alfresco Blinds Co) or lack of needed marketing/selling skills to effectively use CTA   content to yield consistent results (in the cases of Liarthelabel and Loving Earth).

SME	Classification	β	S.E.	Wald	eβ	p
HLSK	Manufactures	0	0	1.08	0.996	0.3
Loving Earth	Manufactures	0	0	0.01	1	0.92
Liarthelabel	Manufacture	-0.11	0.26	0.18	0.9	0.67
Ugg Direct	Traditional retailer	-0.04	0.04	0.99	0.96	0.32
Alfresco Blinds Co	Manufactures	0.04	0.04	1.13	1.04	0.29

Table 5. SMEs with insignificant results from using CTA

4.3   The best and worst-performing SMEs

This section categorised the results from 20 companies into the best and worst-performing groups based on SMEs' eβ (refer to table 6).

	SMEs	Classification	Variable	Wald	eβ	p
Best performing	Solar Calculator	Internet Start-up	Comments	2.85	1.46	0.09
	Ugg Direct	Traditional retailer	@Tagging	96.1	2.12	0
	Lonelykidclub69	Internet Start-up	#Hashtags	568.98	1.93	0
	Lonelykidclub69	Internet Start-up	Image	313.87	2.14	0
	Alfresco Blinds Co	Manufacturers	Slide	547.49	2.68	0
	Crazy Plant People	Traditional retailer	CTA	351.21	4.21	0
	Crazy Plant People	Traditional retailer	UGC	351.21	4.21	0
Worst performing	Loving Earth	Manufactures	Comments	31471.47	1	0
	Crazy Plant People	Traditional retailer	@Tagging	4362.93	0.72	0
	Crazy Plant People	Traditional retailer	#Hashtag	286.86	0.83	0
	Beanbagrus	Manufacturer	Image	19.83	0.63	0
	Bisonte_Australia	Traditional retailer	Slide	61.55	1.08	0
	Soflossy Official	Traditional retailer	CTA	12.31	0.74	0
	Thankyouaus	Internet Start-up	UGC	5316.42	0.42	0

Table 6. The best and worst-performing across all parameter's comparison

Overall, Internet startup SMEs posted more diverse   content on Instagram (e.g., UGC, CTA, memes), while SMEs with traditional retail and manufacturing origins mostly post about their products and services. This diversity in posting among Internet startup SMEs led to superior performances where Internet startup SMEs' uses of @Tagging and #Hashtag show much stronger positive relationships to engagement than others. The remarkable exception to this pattern occurs in the Crazy Plant People case, where the company applies only 1 type of content for every post. Although Crazy Plant People's unique practice results in a high number of UGC, CTA content, the lack of creativity in applying other Instagram features is obvious. The company's performances in @Tagging and #Hashtag is the poorest among 20 SMEs where every extra @Tagging and #Hashtag only yield 0.72 (β = -0.33, p < 0.001) and 0.83 (β = -0.18, p < 0.001) chances of getting 1 engagement unit. Nonetheless, Crazy Plant People's posting style has successfully encouraged customers to show their support for the brands resulting in the best performing in the CTA and UGC category (every CTA and UGC post by the company gained 4.21 (β = 1.44, p < 0.001) times more chance of getting more engagement. Crazy Plant People's practice has shown a considerable potential of UGC and CTA in building an effective

VCE. The results have confirmed H2 and H3, where a higher number of UGC and CTA will establish a stronger VCE prompting a higher number of engagements.

In consideration of posting types, image is the preferred posting type; sidecar recorded fewer uses while an insignificant number of videos were used. The usage of image and sidecar showed a strong positive relationship with engagement, while video uses recorded insignificant results. However, in the Beanbagrus case, any extra images gained only 0.63 engagement ($\beta = -0.18$, $p < 0.001$) while none of the sidecar/video posts and @Tagging are used in the considered timeframe making 3 out of 7 parameters results insignificant. Further, the company uses Instagram solely as a digital product showroom where all company post only contains the company's brand name and product description (refer to figure 4). This Instagram practice disregards followers' involvement and prevents the customer base/community from forming, resulting in poor Instagram performance. This type of practice is also common among manufacturer (B2B) SMEs and some traditional retailers leading to comparable results and reinforcing H1b: B2B SMEs tend to shy away from individual customers' engagement and focus more on businesses.
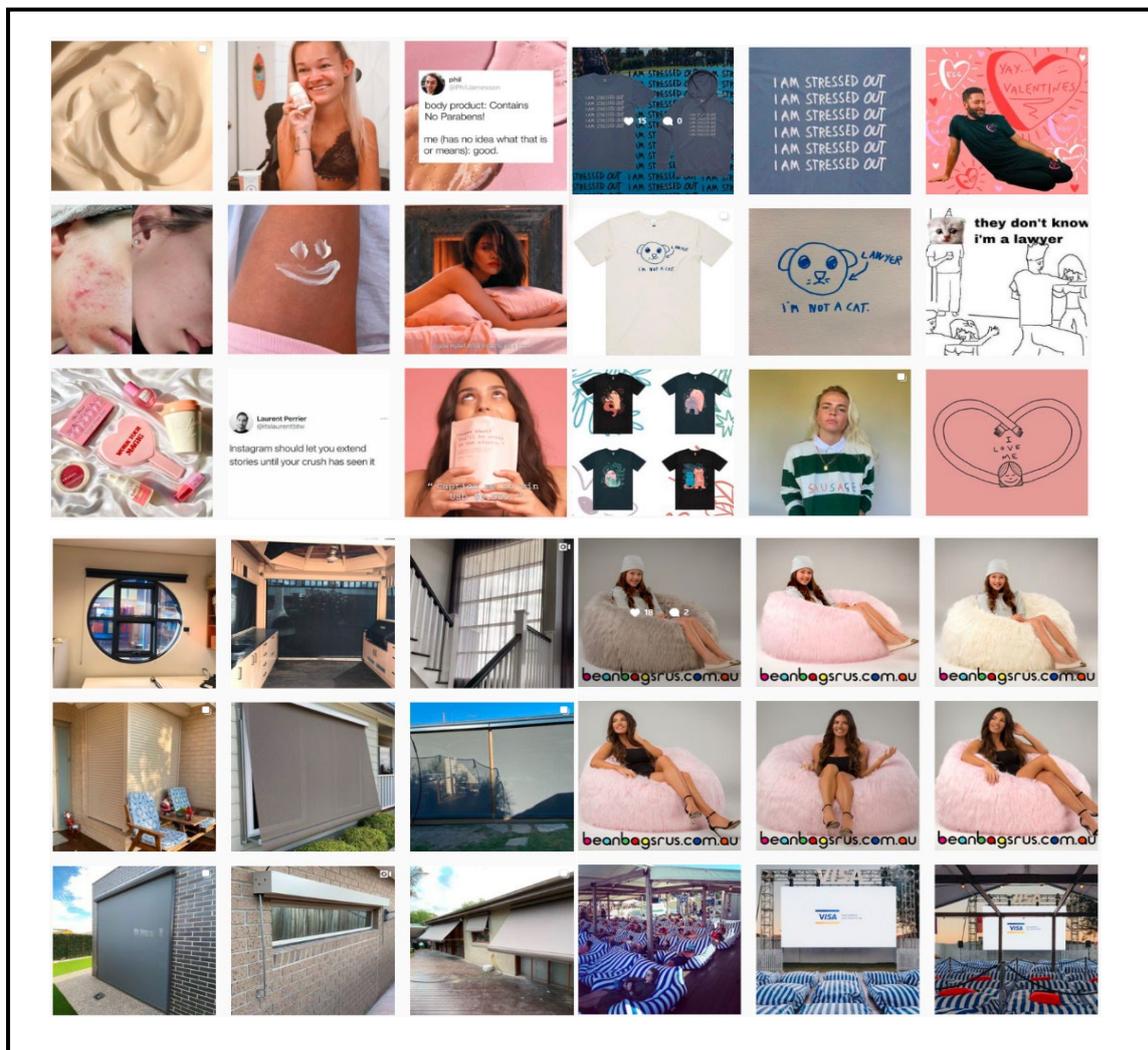

Figure 4. Frank Body, Lonelykidclub69, Alfresco Blinds Co, Beanbagrus's Instagram practices (from left to right, top to down)

The results also support H1a and H1b that manufacturers and traditional retailer SMEs (except for Crazy Plant People) are believed to use online stores as an alternative cost-saving selling channel for the physical stores/distribution chains. At the same time, internet startup companies focus more on building customer bases via online engagement. Internet-based SMEs often consider their Instagram customer base and followers as a community; thus, the posted content is more engaging, relating to their followers' lifestyle/hobbies leading to more followers and higher engagement. Internet startups' content encourages their followers to expand the community with more like-minded people; by @Tagging feature where followers' friends can be tagged in companies' posts by the followers, in contrast to manufacturers and store-based SMEs, which tend to focus on their products rather than engage with the customers. In short, store-based and wholesalers/manufacturers SMEs use Instagram as an online store that allows customers to research products/services before purchasing. Simultaneously, Internet startup SMEs promote a community where customers and followers find like-minded people (Frank Body and Lonelykidcub69) or join a social movement (Thankyouaus).

Crazy Plant People's UGC and CTA usage results also shed light on how Instagram features and practices may maximise the IVF from their customers/followers. Our findings support both hypotheses (H2 and H3) and suggest that UGC and CTA practices' consistency is an essential driver of /followers' participation in VCE. In particular, while the usage of CTA and UGC by Crazy Plant People has successfully encouraged customers to participate in the company's marketing efforts. Lonelykidclub69 has converted many UGC into their products' designs to address followers' needs while rewarding their participation in the value formulation process. The Instagram practices of these SMEs create an inclusive VCE where customers/followers get rewarded for their involvement and convert UGCs from participants into value for both the communities and businesses. The superior engagement gained by the company with VCE building orientation is unsavoury compared to SMEs with commercially intensive posts, as pointed out by Hanna et al., (2011). Consumers expect and even relish their role as active participants in brand-consumer interactions, while commercially intensive and unsolicited marketing is increasingly considered both annoying and intrusive by the customers (Schultz & Peltier 2013). In other words, the role of IVF is significant in SMEs' cases with relevant VCE building practices, and other SMEs receive extremely limited to no co-created value with the followers/customers. In some cases, unsolicited UGC practices result in a co-destruction effect on Instagram engagement and the business value.

4.4 Covid-19 adaptation and direction to move forward

When examining the Instagram practices of 20 SMEs, we found only 5 SMEs (Keepcup, Frank Body, Lonelykidclub69, Thankyouaus, and Tullochwine) that launched the Covid-19 related content during the considered timeframe. Unsurprisingly, the SMEs that quickly react to the current situation tend to have superior Instagram practices across seven parameters (Frank Body, Lonelykidclub69, and Tullochwine) or focus on building VCE through UGC and CTA (Thankyouaus; Lonelykidclub69 and Frank body). Moreover, among 5 SMEs, four companies are Internet startups, while only one company has a manufacture/wholesaler origin. This phenomenon reinforces H1a and H1b and suggests that Internet startup SMEs tend to react faster to changes and better capture the community's sentiment than SMEs from the traditional retailer and manufacturer/wholesaler backgrounds. Therefore, they are more active on the platform, which results in higher engagement gain. Among Covid-19 posts by 5 SMEs, we detected two main messages: 1) Messages that address the community's frustration and 2)

Messages that show the social responsibility of the business in tackling the epidemic. In particular, SMEs with strong VCE (Lonelykidclub69 and Frank Body) often apply the 1st type of Covid-19 message, while Tullochwine and Keepcup prefer to use the 2nd type of message (refer to Figure 5). Further, while the 1st message type comes in the form of UGC, the 2nd type was solely designed and posted by the SMEs. Although there is not enough evidence to conclude which approach is more effective than the other, all Covid-19-related posts by 5 SMEs in the period record a spike in engagement rate.
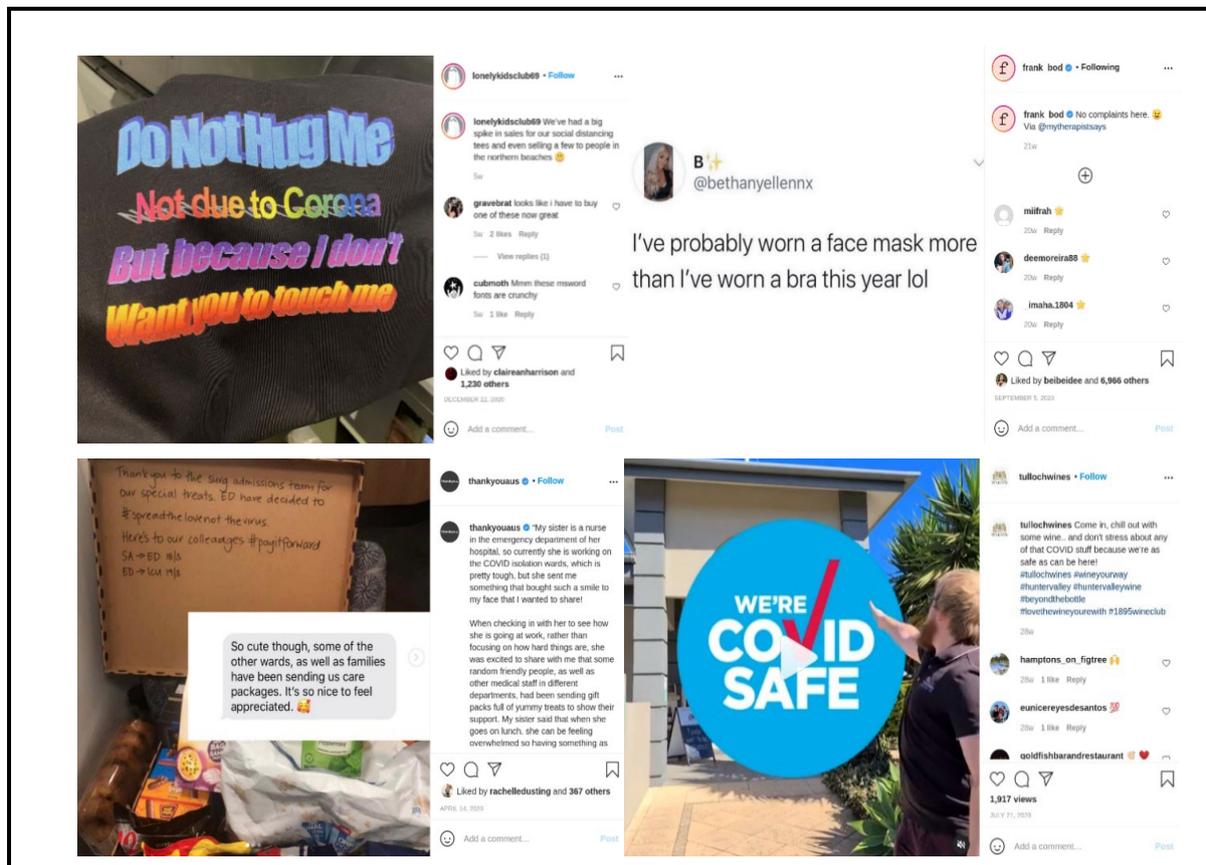
Figure 5. Covid-19 related Instagram messages posted by Lonelykidclub69, Frank Body, Thankyouaus, and Tullochwine (from left to right up to down)

The high engagement return of Covid-19 related posts has also confirmed the view of He and Harris (2020) that the outbreak offers excellent opportunities for businesses to engage with their corporate social responsibility strategies and agenda actively. This also supports H4 that by assuring customers about business availability and addressing their anxiety through Instagram Covid-19 related posts during the outbreak, SMEs can gain unprecedented numbers of loyal customers and Instagram engagement. Since the tragedies of Covid-19 do not limit sickness or death, the ubiquity of such threats leads to uncertainty among customers. As people become more suspicious and less susceptible, gestures to show the brand's social responsibility or address customers' concerns can be more meaningful and long-lasting than those implemented in "normal" times (He & Harris, 2020). Further, social unrest caused by physical lockdown can also lead to a spike in demand for specific products. Therefore, businesses must maintain an e-commerce platform so that their products can continue to be sold and delivered directly to customers while assuring the products' availability to meet unexpected demand (Sharma et al., 2020). Furthermore, since Instagram is a widely preferred

online destination for many customers to research the product before purchasing (Hootsuite, 2019), actively present on the platform is also critical for SMEs during the outbreak and the optimisation of the E-commerce business functions.

Moreover, continuously engaging with customers on both physical and digital outlets will reassure them that they are being cared for and manage the supply chain constraints caused by volatile demand. Other measures such as panic buying control by restricting purchase quantity per customer, implementing protection plans for customers and employees, and contributing to public health are also suggested in early studies and can be implemented and augmented via Instagram engagement. Besides, Instagram enables SMEs to engage with customers and provides management applications and business/market intelligence gathering applications (Leung et al., 2013; Neiger et al., 2012). As Pantano et al. (2020) suggested, to minimise current and future business impacts of the Covid-19 epidemic, retailers should identify and execute controllable activities with more understanding of how their stakeholders operate and how their customers behave during the pandemic. Therefore, we suggest that SMEs combine the market survey with CTA content and analyse Instagram data analytics tools provided by Instagram or third parties to re-evaluate the business model and build a contingency plan to manage inevitable supply chain disruption and volatile customers' demand.

5   Conclusion and Implication

This study aimed to explore how UGCs, CTAs and Instagram micro-practices contribute to Instagram engagement via the process of co-creation. By analysing 5826 Instagram content posted by 20 Australian SMEs throughout one year, this study also confirms the ability to employ data analysis in extracting business intelligence and examining four proposed hypotheses. This study has also provided a procedure to measure SMEs' Instagram micro-practices effectiveness in terms of engagement via data scraping. Drawing from the data analysis process, the findings present several practical implications for better Instagram practices. Specifically, while UGC offers a positive influence in driving Instagram engagement among SMEs, there is a mixed picture in the case of CTA. By analysing the best/worst performing SMEs across seven parameters, CTA and UGC were more suitable tools to build VCE than redirect them to SMEs' online stores. At the same time, UGC and CTA are significantly more effective in yielding engagement when used in diverse forms (e.g., Internet memes, customers' snapshots, message snapshots) with diverse @Tagging and #Hashtag. The results also imply the importance of content customisation for followers' loci and relevant context of 'tribal' language or culture to gain attraction. These phenomena can be explained with the concept of "trustworthy" and "expertise" in Instagram practices. More specifically, as Instagram users are suffering from saturated and illegitimate information from countless businesses and influencers, they often filter out commercial intensive Instagram content (Yu & Egger, 2021) or information from untrustworthy sources (Ki & Kim, 2019). In other words, the uses of UGC and CTA can only positively affect Instagram engagement, and VCE builds with trustworthy messages, especially those from sources with well-known expertise. Besides the trustworthiness of Instagram UGC and CTA, the consistency in posting rate also plays a crucial role in driving Instagram engagement.

This study also supplies a brief overview of how 20 Australian SMEs use Instagram platforms to manage and gain competitive advantages from the Covid-19 outbreak. The study confirms Van Vliet and Pota's (2001) previous findings, where SMEs with an internet startup

background react more quickly and effectively to the sentiment and trends on the Internet than those from manufacturers. More specifically, while all manufacturer SMEs retain a similar posting style during the outbreak, internet startup SMEs have successfully addressed the anxiety of their followers and presented their social responsibility. This explains several peaks in engagement rate during the ongoing epidemic for Internet startup UGC and CTA, while the engagement rate for manufacturer SMEs' content remains insignificant engagement. The consistency of the posting rate during the Covid-19 epidemic is also a vital factor noted by Sharma et al. (2020). By assuring the availability of its products/services via consistent posting rates, SMEs address the anxiety of their followers and prepare for spikes in demands for specific products. It is also worth noting that if they survive, the Australian SMEs will emerge in a vastly different "normality" compared to the pre-Covid-19-era (He & Harris, 2020. The business model's fundamental changes are needed to cope with consumer behaviours and accelerate the digitalisation process.

6   Limitations and Suggestions for Future Research

First, consumers have been increasingly active participants in brand-consumer interactions and business value creation on social media platforms (Hanna et al., 2011). Future studies should dive deeper into consumer engagement (Dessart et al., 2015) by deploying more complex experimental apparatus (e.g., measuring the number of clicking, the amount of traffic to online location via Instagram links, post-viewing time, and buying behaviours) and more objectively denoting consumer engagement variables, beyond cross-section data collected from the platform (e.g., conducting interviews, retrospective self-report). Since the viability of many SMEs in today's rapidly transforming business environment heavily depends on successful engagement for meaningful partnerships, the engagement of customers and SMEs social media profiles is one of the most crucial aspects of business-consumer relationship quality and business value creation (e.g., in term of sale, products/services development) (Kaplan & Haenlein, 2010; Michaelidou et al., 2011). However, the study only focused on one in four marking dimensions (Engagement) proposed by Sukunesan et al. (2020); this provides opportunities for further studies to examine all four additional marketing dimensions (Brand awareness, Information, Integrations, and Culture awareness). Second, while many SMEs present on more than one platform, this study has solely considered SMEs' Instagram performance. Since one social media platform can be more suitable for a specific type of product or SMEs from one industry than others (Yu et al., 2021), biases can be introduced into regression models when we justify SMEs' engagement solely on Instagram practices. Additionally, the follower base of SMEs' business profiles is distinctive (e.g., SMEs offer cosmetic products (Frank Body), or women's swimwear (Liarthelable) may have follower bases dominated by women). To amplify external validity and managerial implications, future study needs to address the role of potentially interesting follower base characteristics to design customised social media strategies that different SMEs can pursue in consideration of their unique follower bases. As this study only analysed the Instagram   content of 20 SMEs, by no mean the results are generalised for the population of Australian SMEs. Future studies can address this limitation with a larger sample size with representatives from different industries. Thirdly, as the data collected step only relied on Instagram metadata, this study has not thoroughly analysed the Instagram visual and audio   content. Since engagement is also heavily influenced by the contexts and properties of Instagram   content (Yu et al., 2021), many important independent variables (e.g., colour distributions, objects, texts, human face

expression) are left unexplored. Nonetheless, machine learning solutions can be introduced in future studies to collect uncovered parameters from posting   content. Fourth, at the time of writing, the Covid-19 epidemic is continuing to spread around the globe. This study has not been able to thoroughly quantify the damage caused by the outbreak on Australian SMEs and the reaction and perception of SMEs during different phases of Covid-19 and different Covid-19 related restrictions (e.g., lockdown, re-opening, face-mask requirements, physical distancing). Future studies need to comprehensively quantify and qualify the damages caused by the Covid-19 outbreak to SMEs, changes in consumer behaviours, and the effectiveness of SMEs' reactions to the pandemic to shed light on Instagram's best practices in the time of crisis.

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