

# **Social media and the New Product Development during COVID-19: An integrated model for SMEs**

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## **Abstract**

Despite Multinational Enterprises' growing interest in New Product Development (NPD), research into the use of social media in the NPD process in Small and Medium-sized Enterprises (SMEs) is lacking. In response, we propose and test an integrated model of the NPD process using social media. Data was collected from SMEs across industry sectors in India during the COVID-19 pandemic. This research applies structural equation modeling (SEM) to achieve a detailed understanding of the issue. The findings reveal that Integrated Social Media Interaction (ISMI) depends on Customer-Centric Focus (CCF), Customer Engagement Focus (CEF), and Customer Empathy Focus (CEmF). Based on the literature and our analytical research, it is revealed that the use of social media networks as a source of knowledge for NPD ventures is a systematic component of the NPD process for SMEs during the COVID-19 pandemic. To support their NPD initiatives, SMEs may depend on this hypothesized integrated model. The analysis concludes with SME managers' realistic and managerial guidance. This study provides useful insights for managers who wish to enhance NPD activities for SMEs through social media, and offers useful guidance to SMEs and innovation scholars, encouraging further research in this area.

**Keywords** – Social media; New product development; Customer empathy; Structural Equation Modeling; Small and medium-sized enterprises (SMEs)

## **Introduction**

New Product Development (NPD) is an important task for a company to keep it competitive (Ledwith & Dwyer, 2009; Tyagi & Sawhney, 2010; Violante & Vezzetti, 2017) NPD can be characterized as a procedure that begins with an idea generation and ends with commercialization of new end products. There is a strong linkage between NPD and performance of a firm, be it a large- or medium-size enterprise (Drechsler et al., 2013; Liu & Kop, 2015; Zhang et al., 2020). A firm's NPD activities help it develop new methods, tools, and techniques to reduce costs, shorten the product development process, and improve the quality of its existing items (Sanayei, 2016). Continuous engagement in NPD is the key to the success of a company in this competitive world (Bhuiyan, 2011; Chwastyk & Kołosowski, 2014; Drechsler et al., 2013; Ledwith & Dwyer, 2009; Lin et al., 2012; Shin et al., 2017; Wang et al., 2020) . As a result, developing new products has become a priority in any successful firm (Bhuiyan, 2011).

NPD is complex and unstructured compared to the manufacturing process, since it has iterative, evolutionary, cooperative, and uncertain characteristics (Ledwith & Dwyer, 2009). A systematic NPD framework can empower quick enhancements in fundamental innovations that enable firms to develop new products with better performance. Administrators need to address what they are attempting to accomplish. One key driver of the performance of the new product is its successful launch, which is also one of the costliest steps.

The advancement of innovative products requires organizations to solicit feedback from their stakeholders. Recent trends show that clients increasingly want to give their assessments of products via social media instead of rounding out reviews. The use of online social media does not automatically prompt improved execution in NPD. To accomplish that, organizations must build up a committed framework that joins social media to NPD and their corporate targets.

Most recently, the use of social media tools can potentially enhance new NPD outcomes (Liu & Kop, 2015). Social media has quickly become the most powerful and effective channel for product or service consumers to voice and exchange their opinions, owing to its accessibility and ease of use (Carr et al., 2015; Fernandes, Belo, & Castela, 2016; Lund et al., 2017; Rathore et al., 2016; Sandor et al., 2018; Zhan et al., 2020; Zhang & Chen, 2012). For example, Bashir et al., (2017) suggest a novel social media approach to provide possible leads for product development. A few strategic and tactical decision models attempt to drive NPD by identifying cutting-edge options and by analyzing the issues associated with NPD, in contrast to the traditional models. During the COVID-19 period, the key decision is to identify the various constructs related to NPD. This is then used to assess the role of predictive models in NPD during the pandemic.

NPD activity is evident in firms of all sizes – large as well as small and medium enterprises. However, it is somewhat paradoxical that most NPD literature is so heavily focused on the related activities of large multinational corporations or within developed economies. Bashir et al. (2017) examine the use of social media in new product development (NPD) processes in the fast-moving consumer goods (FMCG) sector of multinational corporations (MNCs) around the world. The literature within Small and Medium-sized Enterprises (SMEs) based in emerging and developing countries is limited (Abubakar et al., 2019). However, SMEs represent a major component of national economies all over the world. They are a major driver of employment and economic growth.

Moreover, innovation in SMEs exceeds the rates of the large multinational corporations (Abubakar et al., 2019). SMEs are often acknowledged to be an important source of growth and innovation in society (Arif Anjum, 2018; Juergensen et al., 2020). A limited number of studies have investigated social media use in logistics importation in a social context in SMEs (Lacoste, 2016).

A significant part of the literature on NPD spotlights on enormous global companies. SMEs in recent decades are also progressively utilizing social media to improve the NPD process, which motivates the topic of our research in an emerging country context. We further justify the importance of this research topic in the following two ways. First, SMEs have been strongly influenced by the economic and financial emergency during the recent COVID-19 lockdown, putting their survival in doubt. Conceivably, social media could speak for SMEs as a significant asset to re-orient their Technology-Centric focus, Product Feature-Centric Focus, and Customer-Centric Focus, and identify Customer Empathy Focus to improve the NPD. In this way, the examination of how social media is seen and presented by SMEs in their business and market procedures could reveal insight into potential methodologies and practices for NPD. Second, as noted, SMEs' trend toward social media to build up their business is yet constrained and fragmented. Thus, we propose to develop a framework of NPD for SMEs through social media during COVID-19. In particular, the study contends that the social media appropriation process in SMEs for NPD is an issue that can be analyzed from top to bottom.

This article proposes an integrated framework of NPD for SMEs through social media usage during COVID-19 that is responsive to the explicitness and tacitness of knowledge exchanged throughout the NPD process. The study also introduces a third, qualitative axis: "Customer Empathy Focus" in the NPD framework. Empathy is more than mere sympathy and can compassionately or sensitively consider and help others. When top management raises awareness and empathy (especially in the COVID-19 context), they can identify situations where empathy can make a difference for NPD, during COVID-19. Customer Empathy is the primary driving force for Integrated Social Media Interaction (ISMI) and today's

competitive world marketplace. Most specifically, it is affirmed to be crucial for the favorable outcome of NPD for SMEs. Therefore, there is a need to distinguish and better comprehend the developing limits of NPD for SMEs through social media research, and to measure patterns inside its subfields. These perceptions lead us to look at the ongoing patterns in NPD research. In particular, to fill the research gap, this paper aims to contextualize NPD for SMEs through social media to address the qualities of new measurements, "Customer Empathy Focus", and analyze the relationship between different constructs toward NPD.

This article attempts to shed some light on the practical issues and acceptability of an integrated framework of NPD for the SME sector. It provides a theoretically based classification of NPD metric integration methods and tools and selection criteria for SMEs to locate those most appropriate for their innovation purposes through social media. Overall, this study explores a prior research gap by clarifying why customer empathy focus and functional diversity (COVID-19 context) contribute to NPD by integrating social media interactions with SMEs.

The paper employs an illustrative construct-based hypothesized analysis using data from SMEs based in the Maharashtra region in India. Effectively using social media-based constructs creates client connections and enables new deals. The empirical analysis examines the role of various NPD constructs and the interdependency of constructs inside dyadic and social-media-based product development connections.

The contributions of this study are threefold. First, this study adds to a better comprehension of the role of social media in the NPD process. Second, the paper proposes an integrated framework that explains the impact of social media on NPD success during the COVID-19 period. Third, the study illustrates the value of Customer Empathy for SME groups focused on social media users for supporting NPD practices during the COVID-19 period.

The rest of this article is structured as follows. Section 2 provides the foundation for the role of social media in NPD during COVID-19. After investigating the fundamentals and applications of social media, the study develops the constructs of NPD, and a detailed review of existing investigations on SMEs and social media is introduced. Then the hypothesized model is discussed, and an essential framework is developed for analysis. Section 3 elaborates on the research methodology. Section 4 builds up the constructs and validates the derived hypothesis. Section 5 presents the main results and analysis. The last section discusses the study's significant managerial ramifications, limitations, and future research directions.

## **Literature Review and Hypothesis Development**

The study proposes and tests an integrated framework using social media for supporting NPD practices in SMEs. Few NPD studies (Bashir et al., 2017; Du et al., 2016; Deborah et al., 2017) have examined the usage of social media in operational contexts, such as consumer insights and governance framework, effective deployment and related problems, the influence of organizational media use on the success of client relationships of companies and, most importantly, the use of social media in SMEs social context such as the importance of SMEs in Socio-economic development (Abbasi et al., 2021). In this section, general definitions of social media and NPD are presented, the major topics of this promising research field are investigated, and the limitations of prior studies based on social media for NPD are discussed.

Scholars argue that social media is an excellent means for organizations to communicate with customers, to facilitate social communities, to foster stronger relationships with customers, and to identify new market opportunities. (Dawley, 2009; Eid et al., 2019; Fernandes et al., 2016) define social media as a group of Internet-based applications built on technological foundations of Web 2.0 that enable the creation and exchange of User Generated Content.

The use of social media platforms will theoretically boost NPD results (Choi et al., 2020). In recent times, the use of social media apps has been generally embraced. The process of embedding different social media in corporate sectors has greatly intensified in SMEs (Chen & Lin, 2019). The literature, however, provides minimal studies on the role of the usage of social media to encourage the practice of NPD in SMEs (Gloor et al., 2020). Therefore, the goal of this research is to resolve the gap and examine the use of social media to encourage NPD activities in SMEs. Our emphasis in this study is to investigate how social media can be used to gain information and expertise to help NPD mechanisms in SMEs (Wang et al., 2020).

The theoretical framework suggested in this study draws on Technology Centric Focus, Product Feature Centric Focus, Product Usage Focus, Product Cost-Centric Focus, Customer Empathy Focus, Customer Engagement Focus, Integrated Social Media Interaction, and New Product Development. Figure 1 presents the conceptual framework of NPD for SMEs through social media developed in this research. Drawing on the relevant literature, the expected connections among the constructs are discussed, and hypotheses relating to these variables are developed. As shown in Figure 1, this study tests eight hypotheses regarding these concepts, which are developed below.

### *New Product Development (NPD)*

Social media assumes a significant role in a firm's NPD process (Liu & Kop, 2015). Managers ought to oversee social-media-based open innovation carefully to fully benefit the firm during the front end and back end of NPD (Du et al., 2016). Roberts and Pillar (2016) found that under half of the organizations utilize social media during the NPD process. For some organizations, utilizing social media for new item improvement does not help them achieve their aims. To produce upgrades, organizations ought to create methodologies that interface social media to their corporate targets. Carr et al. (2014) claim that social media data is helpful for advertisers as they can follow shoppers' reactions to promotion efforts, item execution, and adjustments in buyer sentiments toward a brand. Numerous organizations have additionally evolved consumer commitment programs through social media. In any case, the utility of social media learning in NPD appears indirect, or maybe elusive. This study presents a better approach to directing the inquiry to create customer and product development data. Hauser and Dahan (2017) explore the key factor in effectively dealing with NPD complexities in any association. For the NPD procedure, four components—clients, innovation, competitors, and suppliers—can be depicted to be progressively significant. NPD activities should be sensitive to the necessities of clients, and competitors, innovation, and suppliers.

Previous literature has examined various aspects related to NPD. For example, studies on NPDs have investigated Customer-Centric Focus, Customer Engagement Focus, etc. NPD includes many group-based errands that are of essential significance (Bashir et al, 2017). Past social media researchers have devoted significant attention to better understand NPD strategy (e.g., Bhuiyan, 2011; Hauser & Dahan, 2017; Goulding, 1983; Thrassou et al., 2012). NPD is a complicated and information-concentrated procedure where tasks are decayed into interweaved subtasks and circulated across specialists with heterogeneous skills (Bhuiyan, 2011). However, the presentation effects of utilizing social media in NPD exercises are ambiguous (Addas and Pinsonneault, 2016).

Despite the existing research, current literature on NPD for SMEs through social media during COVID-19 lacks several unexplored dimensions that have recently attracted research attention. Our extensive review of the extant literature has revealed various factors that have a positive effect on NPD during COVID-19. The proposed framework for NPD for SMEs through social media requires more validation for its adoption among social media marketers. Therefore, we have expanded our work into an empirical study to determine the effect of the social media model on NPD, centered on different identified constructs.

### *Technology Centric Focus (TCF)*

There is a recognition that technology-centric SMEs stimulate economic growth, and this has brought forth a scope of exploration on subjects related to innovation, including NPD and business performance (Jones et al., 2013). Du et al., (2016) proposed the predecessor of item advantage for a situation where SMEs have significant power, followed by technology vulnerability and asset vulnerability, and market vulnerability. Bhuiyan et al., (2004) proposed incorporating hierarchical capacity territories that impact new item's advancement in the NPD process. Bhuiyan (2011) and Shin et al., (2017) draw attention to the focal point of new item improvement on item design and execution. Study along these dimensions will focus on previously established SMEs-level technology-centric determinants and move beyond them by defining relevant customer-centric focus constructs that can forecast NPD. Such research will assist SMEs in better predicting NPD performance and creating an ecosystem that would promote a customer-centric focus in new product development processes. TCF constructs suggest that as tools are used to match a mission, they positively affect consumer-centric attention outcomes. When we analyzed marketers' expectations, we identified occasions where their use of a technology feature was helpful or not supportive in helping them achieve their NPD target.

The key four important characteristics of TCF are technological advancement (Healy et al., 2018), unique technology features (Aleixo & Tenera, 2009), better technology attributes (Sanayei, 2016), and automation (Cooper & Edgett, 2010). Customer-Centric Focus (CCF) for SMEs' NPD is greatly influenced by TCF features and organizational influences (customer service and corporate image). Technological advances thus influence customers' lives as markets are transforming and new consumers increasingly refer to emerging digital technology. As a result, the TCF construct contributes to the match between a task and a technology. TCF constructs could be used in various ways to understand the relationship between advancement, feature, attribute, and automation since their inception. Technology improvement and related issues are typically overlooked. Based on these arguments, we hypothesize that:

*H1: Technology Centric Focus (TCF) has a positive effect on Customer-Centric Focus (CCF) for SMEs' NPD*

*Product Feature-Centric Focus (PFF)*

An optimal new product commercialization strategy advances from a synchronized guide that presents the right product features at the right time, and at the right cost in the appropriate market segments. New product features related to quantitative attributes are simpler to determine than features purely driven by the perception and valence of consumers (Goswami & Tiwari, 2015). Rathore et al. (2016) show another methodology in getting valuable data about products and their highlights by utilizing social media. This

investigation contended that client-created content in social media is an additional and significant source of knowledge about the products. Owens and Davies (2000) argue that it is hard to settle on normal variables leading to new product success, yet it is conceivable to draw two key foci from the different investigations attempted: (1) new product success is profoundly situational and (2) no factor can be characterized for new product success.

Liu and KOP (2015) claim that social media offers a compelling and productive strategy for gathering data and information about clients' desires and encounters, although it does not consistently prompt NPD achievement. The examination shows that concealed client needs, a propelled assessment device, the gigantic measure of data, and an association's absorptive ability all challenge the use of social media. Drechsler et al. (2013) find that during the new item advancement process, advertising research leads to diminishing vulnerability and dangers by acquiring exact data on client needs and their thoughts regarding new products, information that can be used to shape the new product's features.

Companies must control their NPD project portfolio in order to deliver multiple product feature-centric focus effectively. The PFF definition describes a compilation of scoped product features and requirements that are formed as innovation progresses. If the PFF description has been narrowed down to the expected target, the technical departments become more involved in specifying the system layout. Furthermore, in a multi-product organization, product features and design components are interdependent, allowing scope changes in one model to be perpetuated to other latest progress, causing change events to occur across several ventures. The complexity of controlling the scale of an SME NPD portfolio increases exponentially in this setting, making it crucial for marketers to have the resources to rapidly achieve awareness of the Customer-Centric Focus (CCF) for SMEs. This construct suggests a product feature-oriented approach to creating CCF models. The function denotes the concept, architecture, implementation, and commercialization of a customer-centric focus model. The method formalizes the process of composing product functionality into descriptive CCF models. This leads to the following hypothesis:

*H2. Social media Product Feature Centric Focus (PFF) has a positive effect on Customer-Centric Focus (CCF) for SMEs' NPD*

### *Product Usage Focus (PUF)*

Over the last few decades, user-centered design (UCD) and user experience (UX) has been viewed as critical to the process of new product and service development. To achieve new product innovation, most organizations have concentrated heavily on a profound comprehension of product usage focus (Shin et al,

2017). Social networking sites, microblogs, content forums and community ventures, wikis, e-pages, and photo sharing sites are included in the social media product usage group. There is a lack of understanding of social media product use and potential benefits. Sakka and Ahammad (2020) looked at how social media product use impacts workers' ability to be brand ambassadors with stakeholders. Employee brand ambassadorship is also affected by social media product use (personal or work-related) in stakeholder networking and customer-centricity.

Despite being a critical aspect of customer behavior, product usage focus has received little attention in NPD studies. Both the conceptualization of product usage focus and the calculation of the construct were insufficient. In this construct, we hope to accomplish three goals. First, we will define core aspects of product usage focus that are applicable through NPD. Second, using two different methods: self-report questionnaire survey and discussion, we can establish accurate and valid measurements of product usage focus. Finally, we will explore our conceptualization and evaluation of product usage focus. Thus, the proposed conceptualization of product usage focus will provide not only informative use trends but also insights into the complexities of use changes over adoption level (Hajli, 2015), knowledge level at basic use (Bhuiyan, 2011), perceived ease of use (Bhuiyan, 2011), perceived usability (Hajli, 2015), and possibly product-market growth. In conclusion, the proposed conceptualization of product usage focus expands on established theoretical constructs and leads to a better understanding of NPD use, especially in the sense of Customer-Centric Focus (CCF) for SMEs' NPD. The above arguments lead to the following hypothesis:

*H3. Social media Product Usage Focus (PUF) has a positive effect on Customer-Centric Focus (CCF) for SMEs' NPD.*

#### *Product Cost-centric Focus (PCF)*

Empirical research has investigated the intervening impacts of improvement cost and item quality on the connection between advancement speed and task achievement for NPD. Managers are keen on speeding NPD with minimal cost and maximum product quality (Lin et al., 2012). Goulding (2004) investigates all types of business improvement that are not worried about providing existing items to existing markets. The basis for such activity may emerge out of unavoidable changes to the promoting condition, yet different factors frequently consolidate to give the impetus. Wouters et al. (2016) give an outline of research distributed in the advancement and activities of the executives writing on 15 techniques for cost management in NPD, and it correlates with a previous survey of management accounting.

Chwastyk and Kołosowskia (2013) propose strategies for evaluating the expense of the arranging, advancement, and operational exercises during NPD. This makes it conceivable to evaluate the cost-adequacy of the procedure to accomplish the proposed advantages and settle on successful choices. Tu and Xie (2010) investigate a Web-based cost estimation and streamlining framework, a subsystem of the Fast Item Advancement framework for stand-out creation. This study's product development cost variable is the sum of the expenses of item plan, creation, and coordination, which is the actual expense of an item. Some other potential expenses related to a product development cycle, such as overhead expenses, typically correspond to this primary product development cost: they are evaluated by increasing a steady rate to the product development cost.

The Product Cost-centric Focus (PCF) of an NPD initiative and the future benefit from a new product is typically used to pick innovative social media product ideas. Product cost-centric methods can also be divided into intuitive, analogical, parametric, and empirical. We consider the following parameters: social media strategy cost (Goulding, 1983), social media marketing cost (Wouters et al., 2016), social network advertisement cost (Chwastyk & Koosowski, 2014), and social media operating cost (Tu & Xie, 2003). How firms manage NPD costs when task uncertainty is high is a critical and largely unexplored problem. Previous literature indicates that target costing is an important cost control method used by companies during the NPD process. Setting and achieving a cost-centric focus (CCF) goal will result in considerable cost savings in sequential NPD processes. Relevant cost savings targets in the new NPD process would be less efficient in lowering component costs under concurrent NPD than sequential NPD. That is, consistent with the previous literature, the following hypothesis is proposed:

*H4. Social media Product Cost Centric Focus (PUF) has a positive effect on Customer-Centric Focus (CCF) for SMEs' NPD*

*Customer-Centric Focus (CCF)*

New products are still generally dependent on existing advancements, and the appearance of the current generation has not changed the linearity of the NPD process. Customer needs and knowledge have been portrayed as a new procedure because novelty emerges at each stage of NPD, based on responsiveness to customer feedback (Zhan, Tan, & Huo, 2019). Hidayanti et al. (2018) identify that establishing private associations with clients all together for an organization to get familiar with them is not a simple assignment. Building a positive interaction with clients necessitates a proper path for the company to understand the clients to support better. Chwastyka and Kołosowski (2014) observe that enterprises fundamentally execute gradual character developments, which are inconspicuous product changes. This technique for

advancement activities takes into account implementing actions with shorter periods and which are less budget-consuming. The innovation processes are simpler to design and execute.

Du et. al. (2016) clarify how customer-centricity can be estimated using seven measures of how regularly a firm attempts to identify client needs. Specifically, to catch the multifaceted idea of customer focus, the measures incorporate things that emphasize both the current and potential clients of a firm, and look at the firm's endeavors to comprehend these clients' explained, implied, and future needs. Lee et al. (2021) and Zhan et al. (2020) develop a framework for a consumer-centric focus on social media. Their cross-cultural study shows how culture influences consumers' commitment levels and activities on brand pages of social network sites, which extends the underlying motivations and engagement mechanisms in two different countries, China and the USA.

While social media interaction has helped shine a light on the importance of customer-centric focus, NPD can be characterized as an interdisciplinary process of innovation that places the needs and desires of the customer at the center of the NPD process. From a customer perspective, performance interoperability of NPD is very important. Researchers say there is a link between the CCF of social media and NPD. Depending on the CCF attributes customer is the first focus (Hidayanti et al., 2018), seeing the world through the customer's eyes (Du et al., 2016). Researching and identifying customers need (Chwastyk & Kołosowski, 2014), brand building relationship (Hidayanti et al., 2018) and customer retention (Jarvis et al., 2017) could be related to strategy, new product development and new markets, or Integrated Social Media Interaction (ISMI) for SMEs' NPD customer-centric creativity could be focused on the demands of consumers to create a new product or service that meets these needs and desires. Therefore, we have formulated the following hypothesis:

*H5: Social Media Customer-Centric Focus (CCF) has a positive effect on Integrated Social Media Interaction (ISMI) for SMEs' NPD*

*Customer Engagement Focus (CEF)*

Customer engagement is crucial in the NPD process, as it contributes to an organization's effort to develop customer-based products and services. Communication through social media can increase customer engagement, encouraging coordinated effort in co-creation, and permitting the organization to improve and develop new products based on clients' needs and desires (Hidayanti et al., 2018). Bolton (2011) examines a co-creation point of view of customer engagement that likewise offers new vital conversation starters for organizations regarding their associations with clients. Since customer engagement happens inside a

particular arrangement of situational conditions, the fitting parity of client and organization contributes to co-creation.

Gummerus et al. (2012) investigate customer engagement as a tool for capturing customers' comprehensive set of behavioral exercises toward a firm. The examination clarifies the impact of client commitment practices on perceived relationship benefits and relationship results. Customer engagement is described as a process that produces a relational value result that should be evaluated from both the buyer's and seller's perspectives. In today's corporate world, customer engagement focus is a new buzzword. It is a major driver of NPD by social media interaction. Over the last decade, customer engagement focus has emerged as a critical concern for NPD among corporate leaders worldwide. For the sense of NPD, customer engagement focus is perspective and multifaceted. We use Hollebeek et al. (2016)'s concept to define the spectrum of customer engagement focus and demonstrate how it can be used in the sense of Integrated Social Media Interaction (ISMI) for SMEs' NPD. The theoretical structure depicted in Fig. 1 broadens our view of customer engagement by describing enthusiasm (Bolton, 2011), insertion of attention (Candi & Hughes, 2017), absorption (Bolton, 2011), interaction (Roberts et al., 2017), perceived oneness (Gummerus et al., 2012). As a result, we hypothesize that an emphasis on consumer experience influences related outcomes. Via ISMI, the customer experience emphasis becomes a core competency for marketers to develop an effective NPD construct. This study thus expanded the conceptual connection between customer engagement and social media usage for SMEs' NPD process. Based on these arguments, the following hypothesis can be proposed:

*H6: Social Media Customer Engagement focus (CEF) has a positive effect on Integrated Social Media Interaction (ISMI) for SMEs' NPD*

#### *Customer Empathy Focus (CEmF)*

In the sales, marketing, and promotional literature, a social emotion, namely empathy, has been seen as critical to comprehend the idea of worker-client communications inside the business context. Further work can consolidate customer empathy and study its impact on administration collaborations, client relationship improvement, or co-production of administrations (Bahadur et al, 2018). During the COVID-19 pandemic, empathy, described as the desire to appreciate others' emotions or perspectives, was considered one of the essential traits of the NPD mechanism (Ngo et al., 2020). Despite the virtuous principle of empathy, product analysis has mixed results regarding the impact of employee empathy on business performance. Furthermore, as consumers are empathetic, the impact of employee empathy on customer-oriented action is greater. As a result, the current study focuses on empathy and the roles consumers play in shaping

customer loyalty, and the effects of Integrated Social Media Engagement (ISMI) on SMEs' new product development.

Empathy is a necessary component of normal social functioning, but there are few tools for evaluating human differences in this domain (Baron-Cohen & Wheelwright, 2004). Consumer empathy, or the ability to appreciate a customer's viewpoint and emotions, has traditionally been a cornerstone of NPD since the practice has stressed the importance of recognizing and placing oneself in the position of consumers since its inception (Pedersen, 2021). However, with a greater emphasis on reason, impartiality, and evidence, NPD may have become more empathy-deprived. This is tragic because the increasing objectification, differentiation, and subsequent distancing and polarization of the NPD sector emphasize a customer-empathetic approach to NPD proportionally necessary. By concentrating on a customer empathetic essence and fostering cross-fertilization, consumer empathy-based NPD tackles the increasing customer distancing and classification of the domain of NPD. The above discussion leads to the following hypothesis:

*H7: Social Media Customer Empathy Focus (CEmF) has a positive effect on Integrated Social Media Interaction (ISMI) for SMEs' NPD*

#### *Integrated Social Media Interaction (ISMI)*

The rise of social networking communications is accelerating, and it is anticipated that it will have major impacts on organizations. Consumers are rapidly adopting social media interactions in their day-to-day lives (Pan et al, 2019). Bashir et al. (2017) analyze the use of web-based social media in NPD forms. The study depends on a top-to-bottom investigation of multinational companies (MNCs) in the fast-moving consumer goods (FMCG) segment. To obtain a detailed understanding, the study uses a subjective methodology to collect and analyze the information. The authors recommend that social media be seen as a casual hotspot to increase comprehension of customers' inclinations, competitors' exercises, advertising patterns, and product feedback.

Social media interactions are described as consumer contact between businesses and consumers and between customers through company-managed social media networks. Recent literature has argued for the importance of social media experiences for NPD, proposing methodological mechanisms for managing NPD, developing indicators, and assessing the NPD capacity in the social media context. Even so, there is a need for a more in-depth understanding of the consequences of Integrated Social Media Interactions, especially one based on empirical evidence. We examine the relationship between social media interactions with CCF, CEF, and CEmF and NPD in three MIDCs exploratory studies involving data from 217

SMEs. The findings suggest that social media interactions aid NPD's upselling strategies. As a result, we eventually discover that consumers' ISMI with the NPD on social media are more beneficial.

Marketing, economics, corporate behavior, sociology, psychology, computer technology, and political science have all studied social media interaction from various disciplinary backgrounds (Ledbetter & Meisner, 2021). Through social media, NPD has received much interest in the last few years from both professionals and scholars, among other reasons, because of its possible effect on consumer behavior. However, comprehension of the construct is also in its infancy (Gómez et al., 2019). The above discussion leads to the following hypothesis:

*H8: Integrated Social Media Interaction (ISMI) has a positive effect on NPD for SMEs*

In summary, the classification from the literature shows that NPD for SMEs' integration methods offers promising new tools for filling information gaps in the most acute stages of design and testing and how the classification framework can be applied in practice (Hemetsberger and Godula, 2007). The purpose of our study is to build up a comprehensive framework and propositions showing the integration of Technology-Centric Focus (TCF), Product Feature-Centric Focus (PFF), Product Usage Focus (PUF), and Product Cost-Centric Focus (PCF) as a Customer-Centric Focus (CCF) strategy and the integration of CCF with both Customer Engagement Focus (CEF) and Customer Empathy Focus (CEmF) as an Integrated Social Media Interaction (ISMI) strategy (Figure 1). The literature review on the nine constructs of TCF, PFF, PUF, PCF, CCF, CEF, CEmF, and ISMI facilitates the development of the framework and our research propositions.

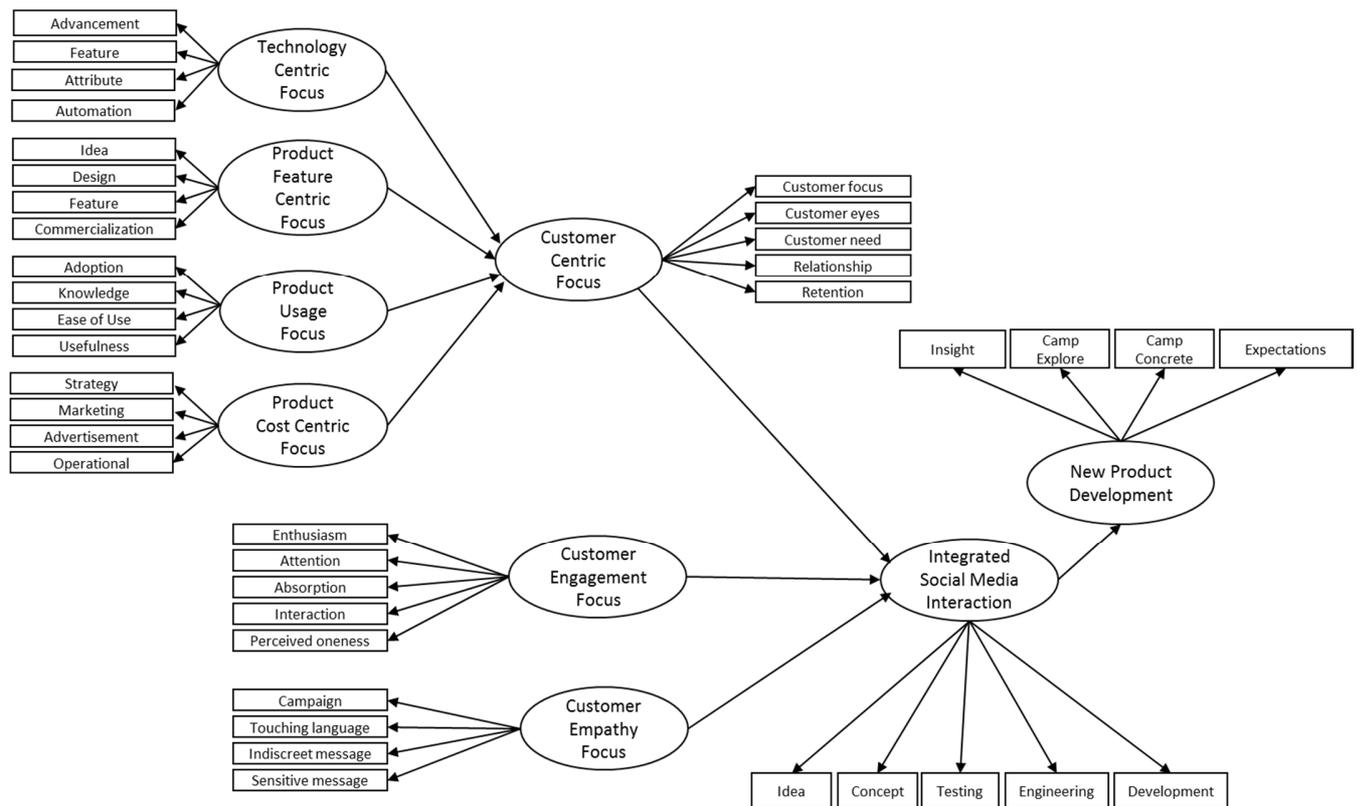


Figure 1: A conceptual framework of social media driven NPD for SMEs

An integrated conceptual framework for NPD for SMEs through social media is constructed (Figure 1) based on the prior conceptualization of CCF, CEF, CEmF, and ISM. In total, nine (9) propositions with 39 variables are developed for the integrated conceptual framework. An experimental assessment of the model will explain further the relations among the factors and afterward validate the created model and recommendations. The examination gives professionals a systemic framework with suggestions for dynamics regarding NPD for SMEs, enhancing both the SMEs' and customers' value by offering valuable implications for the NPD of SMEs through social media.

The examination starts with an itemized audit of the NPD framework, based on which constructs are created from the detailed survey and discussion with SMEs' social media experts. Next, we get the hypothesis from the constructs and represent it through a graphical chart. Then, we investigate the outcome with the assistance of CFA and SEM strategy through SPSS 23 and AMOS programming. The exploration sums up the ramifications of all-out NPD for SMEs through social networking by considering the COVID-19 situation. Specifically, this paper differentiates from prior literature with the objectives (i) to offer new experiences in NPD for SMEs through social media during COVID-19; (ii) to increase a more profound

comprehension of Integrated Social Media Interaction (ISMI) and NPD during COVID-19, and (iii) to decide the effect of customer empathy and analyze their relationship with the help of SEM during COVID-19 for SMEs NPD.

## **Research Method**

In order to understand the use of social media as a possible source of information and knowledge for NPD in SMEs, this research uses a quantitative research methodology for collecting and interpreting data, yielding meaningful insights into the NPD field. There are many reasons for selecting these SMEs to perform this experiment. First, the researchers had access to a data sample of the SMEs and these companies were huge in number. Second, NPD initiatives were assumed to include these companies extensively. Third, social media platforms are used extensively by these companies. The process and methods adopted to collect and analyse the data are discussed, in turn, below.

This research adopted qualitative & quantitative methods to consider the effect of social media on NPD during COVID-19. The research process is arranged in five phases, as seen in Figure 2.

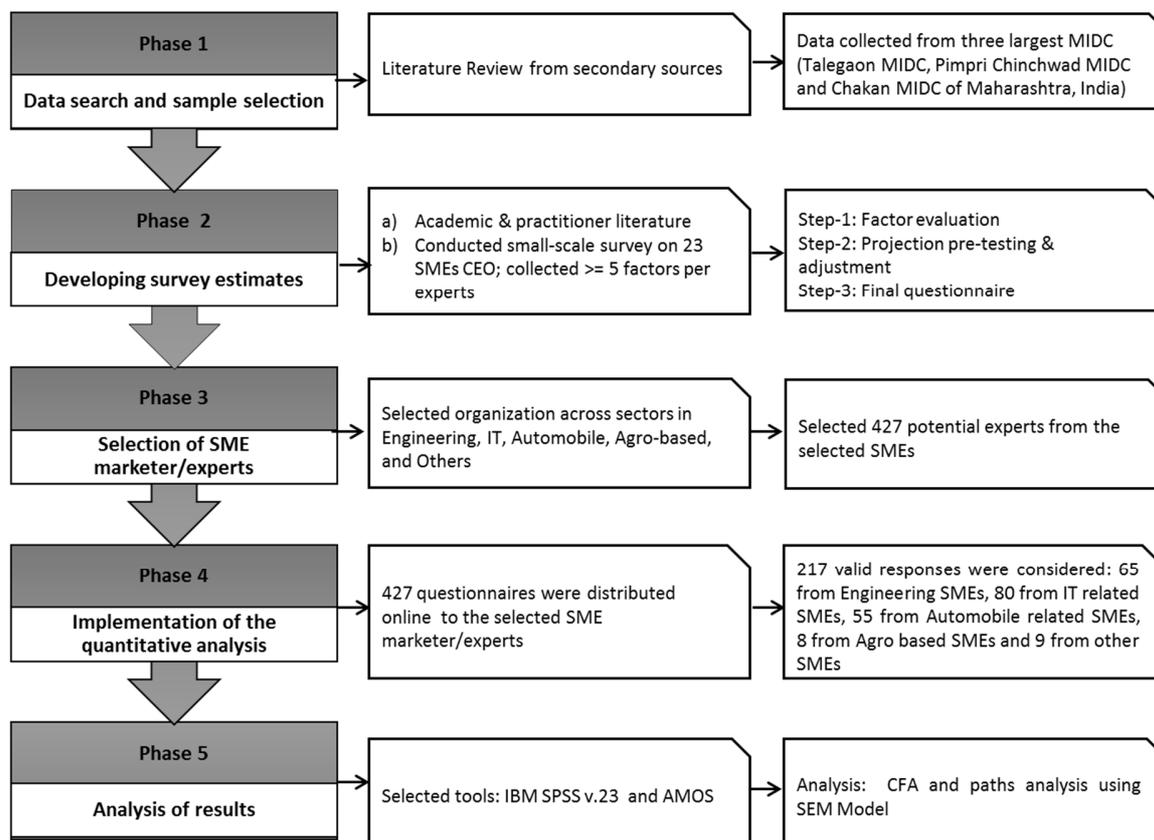


Figure 2: An outline of the research process

Screening of significant factors related to Social Media and NPD during COVID-19 was carried out. A small-scale survey was performed between SME experts and academics to identify additional considerations and review the evaluation process to make sure that all-important issues were addressed. Experts were approached via email and invited to share (at least) four keys that came to their attention as they considered the future of Social Media and NPD during COVID-19. Finally, the questionnaire was pre-tested by four scholars and six SME experts with considerable conceptual and/or subject-specific experience in this area, who checked it for precision, consistency, rationality, and theoretical suitability to confirm that the results would be reliable.

The efficacy of the survey results relies heavily on the right choice of interviewees. To maintain a high degree of variability and reduce the cognitive bias of the various participants, the SME marketer/expert panel was systematically selected based on this feature. Heterogeneity was accomplished by experts from different SME fields such as Engineering, IT, Automobile, Agro-based and other categories; and through the addition of trained experts from academia & SME marketers /experts. As a result, 217 possible experts from 172 SMEs with expertise in the research field of SMEs were required to participate in the forum. To

ensure that only experts are represented in the credible jury, participants with legitimate expert knowledge of SMEs were selected. Participants were adequately briefed about the research context before the interview and were ensured of the confidentiality of their information. The Mann–Whitney U-Test was also used to screen for possible non-response bias. No substantial variations ( $p < 0.05$ ) and no non-response bias could be detected when comparing the differences in response to all 23 predictions.

The questionnaire survey method was used in this research, allowing panelists to provide quantitative evaluations quickly. Prior appointments have been made to maximize the response time. 427 questionnaires were distributed electronically to selected experts. Besides, respondents were granted the right to add qualitative justifications for their quantitative figures. Quantitative and qualitative assessments (written justifications by other professionals) soon after their initial assessment, summarizing the experts' estimates involved. After discarding unfinished answers, 217 valid responses were accepted.

This study employs Structural Equation Modeling (SEM) using AMOS version 23 software to examine the research model and hypotheses. It is capable of handling simultaneity, where the conceptual network of relationships provides meaning to embedded measures. The SEM helps to test the relationships between the constructs (e.g. Customer-Centric Focus, Customer Engagement Focus, Customer Empathy Focus, and Integrated Social Media Interaction strategy), and determines the predictive power of the model, following a two-stage process as prescribed by Anderson and Gerbing (1988). Moreover, the SEM combines a dual focus on prediction concerning the structural relationships among constructs with the measurement of latent, observed indicators (Venai, Midgley, and Devinney 2005). Our structural model assessment will offer an analysis of the path coefficients (direct and indirect effects between latent variables), the goodness of the fit of the entire model, and the boot-strapped scores (Tubadji and Nijkamp 2015). The unit of analysis in this study was a SME.

## **Research Setting**

The objective of the article is to measure the above mentioned constructs of SMEs based in India. There are three reasons for researching such a setting. First, the Indian economy is characterized by a large proportion of SMEs. Second, Indian SMEs are characterized by a high proportion of original innovators. Third, Indian SMEs account for around 70% of the total employment. The methodology applied in this study is descriptive, intending to implement in the field of NPD. The study is considered as action-oriented research, in terms of intention. The questionnaire is deterministic or regular and was configured according to a 5-point Likert scale. It was crafted after studying relevant NPD references and consulting with academicians and SMEs' social media marketers.

### *Data Collection Process*

A random sample of 334 firms was drawn out of 427 selected SMEs, based in Maharashtra, India from three MIDCs (Maharashtra Industrial Development Corporation) locations in Maharashtra from March 2020 to June 2020. The product development managers/marketers of SME were surveyed and 229 firms responded, giving a response rate of 68.56%. Out of 229 questionnaires collected, 217 were found valid and used for data analysis. Initial contacts were made to welcome them to participate in the meetings, which focused on respondents of the organizations taken from one online SME group comprised of 427 individuals. We reached the product development managers/marketers by e-mail/Whatsapp with a survey hyperlink requesting their participation in our study and followed them up as needed via telephone calls. The questionnaire was published via the group portal, and they were requested to use a survey hyperlink to complete the survey. Besides, data on the thematic analysis was collected using interviews with the online focus group via Zoom software, with samples cutting through users, technicians, and experts from Pune, the Industrial Hub of India. This study undertook a thematic analysis by using the NVivo Pro 11 software for deductive coding. The key finding from the research is that there was a functional relationship between customer empathy and NPD of SMEs via Integrated Social Media Interaction. The exploration study utilized a descriptive and inferential design. We then utilized multiple/multivariate regression analysis to determine the connections between the independent variables and the dependent variable.

The research is designed based on a standardized questionnaire form, which is used via an online survey to develop a framework for NPD for SMEs through social media during COVID-19. The online survey collected data from 334 accessible responses obtained from active SME marketer networks in Maharashtra, India. The research guided the analyses over four months in 2020 to gain multiple perspectives on NPD. Table 2 provides descriptive statistics of the study's demographics. The SME people's segment profiles were evaluated utilizing six review variables: age, gender/sexual orientation, education, designation, type of SMEs, and type of operations. Utilizing a blended technique approach, this research mainly focuses on creating a new construct during COVID-19, which has been named the "Customer Empathy Focus" construct. In conclusion, the investigation contextualizes the conventional obstructions of SMEs' social media marketers to accommodate the COVID-19 context better. The study also points the way for future research on multinational corporations' (MNC) NPD.

In-depth interviewing is a powerful methodology for acquiring insight into the phenomena of interest, since respondents offer intensive relevant data not gained by a structured questionnaire. The study led to different query searches by utilizing the pursuit highlight of N-Vivo (QSR International). The query searches were principally used to discover interesting patterns, associations, and abnormal data from the subjective literary

substance. The study used word clouds given by N-Vivo 11 to understand some key topics in the information. Word clouds are an apparatus to visually depict and decipher the discoveries: the more regular the word use, the bolder the color and the bigger the size. Investigation of word-cloud-utilized crude information through N-Vivo 11 (Figure 3) outlines what SMEs marketers and other executive members referenced cNPDerning the the NPDNPD framework for SMEs through social media COVID-19. After content examination, we utilized QSR's N-Vivo 11 software to explore composed meeting transcripts. At the later stage, these words were utilized to develop the constructs for model framing and quantitative data analysis.



Figure 3: A cloud-based thematic analysis of Constructs using Nvivo

We conducted online group conversations and online in-depth, open-ended personal written interviews between March 27th and June 17th, 2020 with 27 SMEs' social media marketers in Maharashtra, India. Interviews were variously recorded, audio-taped and transcribed. To adopt a premeditated thematic analysis, transcripts of interviews and significant comments have been coded to illustrate and describe appropriate use of social media. To understand the impact of social media on NPD systems and challenges related to the use of social media in SMEs, first, to inspect the related excerpts, we formulated a descriptive coding procedure, and coded based on descriptive occurrences. To get an overall impression of the information, a Word Frequency Query was utilized to recognize the most frequently-used words overall records. This methodology gave an indication of which codes ought to be used. The Coding Stripes Investigation helped in the examination's applied advancement by contrasting hubs (empathy, engagement),

and by outwardly delineating how they identified with each other. This empowered a quest for crossing codes to recognize content coded to more than one node; proposing associations between COVID-19 ideas. For instance, the most generally referenced node is engagement, which incorporated every positive notice of NPD in all the records. The Coding Stripes Examination empowered 'focus' node to be delineated close by the node with which it most frequently co-occurred.

The study utilized covariance-based SEM with AMOS version 23 software package. In the first place, the study tried for normal technique bias and afterward played out a CFA to assess the goodness of fit indices and validity and reliability measures. From that point, to test the research hypotheses, the study analyzed the structural model. The reasonableness of data for SEM was a significant consideration. To assess latent model's appropriateness, Hair et al. (2016) propose a two-advance procedure with CFA and SEM. As the recommended methodological approach for estimating mediating models (Hair et al., 2016), SEM can examine the direct, indirect, and total effects of proposed relationships.

### *Measurements*

No earlier approved scales were accessible to quantify different hindrances or protections toward NPDs (Talwar et al, 2020). Therefore, we adjusted the NPD scales used by earlier researchers to the NPD setting by alluding to scale improvement's psychometric procedure. Subsequently, a multi-technique approach, as suggested by (Lezhnina & Kismihók, 2020), was utilized, which incorporated a literature review, open-access articles, expert opinion, pilot study, and cross-sectional overview. A subjective assessment was necessary, as the current examination is the first experimental examination concerning NPD metrics for SMEs through social media during COVID-19.

A rigorous review of the extant literature was undertaken to develop the observed items of all the latent variables in order to address the relationship between Technology Centric Focus, Product Feature Centric Focus, Product Usage Focus, Product Cost-centric Focus, Customer Empathy Focus, Customer-Centric Focus, Customer Engagement Focus, New Product Development, and the mediating effect of Integrated Social Media Interaction on this linkage. Measurement of the research constructs involved the employment of multi-item reflective scales (Bollen & Lennox, 1991). The use of multi-item measures enhances confidence so that the measurement of the research construct will be consistent (Churchill, 1979). Each construct in the overview was estimated by a minimum of four factors drawn from the earlier studies. The descriptions of the constructs are shown in Table 1. Every factor in the poll was estimated by a five-point Likert scale including strongly agree (5), agree (4), neutral (3), disagree (2), and strongly disagree (1).

Table 1: Development of Constructs

<b>Constructs</b>	<b>Variable</b>	<b>Item sources &amp; year</b>
1. <b>TCF</b> (Technology Centric Focus)	Technical advancement	(Healy et al., 2018)
	Unique technology feature	(Aleixo & Tenera, 2009)
	Better technology attribute	(Sanayei, 2016)
	Automation	(Cooper & Edgett, 2010)
2. <b>PFF</b> (Product Feature Centric Focus)	Idea generation	(Rathore et al., 2016)
	Product design	(Owens & Davies, 2001)
	Product feature	(Rathore et al., 2016)
	Commercialization of product	(Owens & Davis, 2000; 2001)
3. <b>PUF</b> (Product Usage Focus)	Adoption level	(Hajli, 2015)
	Knowledge level at specific usage	(Bhuiyan, 2011)
	Perceived ease of use	(Bhuiyan, 2011)
	Perceived usefulness	(Hajli, 2015)
4. <b>PCF</b> (Product Cost Centric Focus)	Social media strategy cost	(Goulding, 1983)
	Social media marketing cost	(Wouters et al., 2016)
	Advertisement cost on social networks	(Chwastyk & Kofosowski, 2014)
	Social media operational cost	(Tu & Xie, 2003)
5. <b>CCF</b> (Customer Centric Focus)	Customer is the first focus	(Hidayanti et al., 2018)
	Seeing the world through the customer's eyes	(Du et al., 2016)
	Researching and identifying customers need	(Chwastyk & Kofosowski, 2014)
	Brand building relationship	(Hidayanti et al., 2018)
	Customer retention	(Jarvis et al., 2017)
6. <b>CEF</b> (Customer Engagement Focus)	Enthusiasm	(Bolton, 2011)
	Insertion of attention	(Roberts et al., 2017)
	Absorption	(Bolton, 2011)
	Interaction	(Roberts et al., 2017)
	Perceived oneness	(Gummerus et al., 2012)

7. <b>CEmF</b> (Customer Empathy Focus)	Campaign	(Elavarasan & Pugazhendhi, 2020) and Primary Source*
	Touching language	(Vellingiri et al., 2020)
	Indiscreet message	(Ali & Alharbi, 2020)
	Sensitive message	(Paital, Das, & Parida, 2020)
8. <b>ISMI</b> (Integrated Social Media Interaction)	Identification of opportunity and idea	(Bashir et al., 2017)
	Product concept development	(Martini et al., 2013)
	Product concept testing	(Bashir et al., 2017)
	Product design and engineering	(Martini et al., 2013)
	Prototype development and testing	(Part, 2010)
9. <b>NPD</b> (New Product Development)	Customer insight	(Roberts & Piller, 2016)
	Camp Explore – how organizations search for NPD	(Roberts & Piller, 2016; Carr et al., 2015; Liu & Kop, 2015)
	Camp Concrete – how customers involve in NPD	(Roberts & Piller, 2016; Du et al., 2016)
	Customer expectations of launching new products	(Hauser et al., 2017)

Primary Source\* refers an opinion from social media marketers for NPD

## Data Analysis and Results

Structural equation modeling (SEM) helps to evaluate the reliability and validity of the measurement model (Ringle et al, 2005). It evaluates the measurement and structural models concurrently, simultaneously running factor analysis to assess the convergent and discriminant validity, and hypothesis testing (Gefen et al, 2000). Data were analyzed and interpreted in a two-stage process, as prescribed by Anderson and Gerbing (1998). The units of analysis in this study were SMEs based in India. The analysis was designed as a structure equation model using survey data on 172 SMEs, covering information on various measures on Customer-Centric Focus strategy, Customer Engagement Focus, Customer Empathy Focus, Integrated Social Media Interaction strategy, and NPD.

Table 2 illustrates the demographic information of the respondents in the survey along the profile for the SMEs under study. Most respondents were university-educated (51%), male (78%) and in the 31+ age group (59%). Operational executives and departmental managers accounted for 32% and 42% of the responses respectively. The responses came from various industries, with the most responses collected from

IT-related firms (37%) and the automobile components industry (25.4%). Among the SMEs, 65.5% were involved in business-to-business operations, while the remaining 34.5% were involved in business-to-consumer operations.

Table 2: Demographic data analysis

Demographic Parameters	Industrial Areas (MIDCs)	Pimpri Chinchwad MIDC	Chakan MIDC	Talegaon MIDC	Total with Percentage
Total Samples		N <sub>1</sub> =56	N <sub>2</sub> =44	N <sub>3</sub> =117	N=217
Sex	Male	49	32	87	168 (77.42%)
	Female	07	12	30	49 (22.58%)
Age	20 or Under	00	01	02	03 (1.38%)
	21-30	21	19	45	85 (39.17%)
	31-40	33	21	49	103(47.47%)
	40-above	02	03	21	26 (11.98%)
Education	School level	00	00	00	00 (0.00%)
	Graduate	25	20	65	110 (50.69%)
	Professional	27	23	50	100 (46.08%)
	Others	04	01	02	07 (3.23%)
Designation	Executive	14	23	33	70 (32.26%)
	Manager	24	13	55	92 (42.40%)
	CEO	07	04	12	23(10.60%)
	Owner	11	04	17	32(14.74%)
Type of SMEs	Engineering	10	08	47	65 (29.95%)
	IT	25	21	34	80 (36.87%)
	Automobile*	15	10	30	55 (25.35%)
	Agro based	04	01	03	08 (03.69%)
	Others	02	04	03	09 (4.14%)
Type of operation	B to B**	40	32	70	142 (65.44%)
	B to C***	16	12	47	75(34.56%)

\* automobile components industry; \*\* business-to-business; \*\*\* business-to-consumer

### *Assessment of the Measurement Model*

Using the two-pronged approach developed by Anderson and Gerbing (1998), an assessment model was generated before the conceptual model was evaluated. The prediction model was tested as a CFA method

using AMOS, with a maximum likelihood estimation approximation for each corresponding latent variable. Then, a structural equation analysis in AMOS 23 evaluated the presumed ties in the measured analysis. SEM is an observable method for the evaluation of dynamic theories with multiple linking variables. Estimating SEM structures involves describing a significant number of equations. The system provides an equation for each 'reaction' or 'endogenous' component. It can be seen as a blend of analyses of the factor, regression, and analysis of the path. SEM is a combination of components and multiple-regression analysis. The SEM can be partitioned into two sections. The model of measurement is the part of the model which relates measured variables to latent variables. The measuring model is the model component that relates calculated variables to latent variables. The structural model is the component of latent variables reflecting relationships.

SEM was chosen as the end objective of this experiment, as this technique opens up a large array of possible outcomes. The dataset's skewness and kurtosis estimation occurred separately within the stipulated ranges between  $\pm 3$  and  $\pm 10$  (R.B Kline, 2011), which indicates that knowledge was normally disseminated. The analysis revealed that the Kaiser-Meyer-Olkin Sampling Adequacy (KMO) estimate was 0.915, which defined a high-shared shift and a relatively small disparity in individuality (Kaiser and Cerny, 1979). Bartlett's sphericity test (testing that the matrix of correlation has an identity matrix) firmly approved the sufficiency of the test size (Chi-square = 9913.991, df = 741), confirming the reasonableness of EFA for this information (Cooper & Schindler, 1998). Cronbach's alpha  $\alpha > 0.7$  (Nunnally & Bernstein, 1994) was satisfactory for all of the 9 constructs (Table 3) showing internal consistency.

Table 3: Reliability analysis of the Constructs

<b>Constructs</b>	<b>Cronbach's Coefficient <math>\alpha</math></b>
TCF (4 items)	0.910
PFF (4 items)	0.952
PUF (4 items)	0.957
PCF (4 items)	0.937
CEmF (4 items)	0.920
CCF (5 items)	0.971
CEF (5 items)	0.951
ISMI (5 items)	0.970
NPD (4 items)	0.901

### *Measurement model Validity*

The measurement model of this examination has an adequate number of substantial indicators for each construct. To demonstrate this, we first conducted a confirmatory factor analysis (CFA), in which various tests of construct validity and reliability were performed. In assessing CFA, the base number of items for each construct needs to be at least three, and all evaluated standard loadings must be higher than 0.70 (Hair, Anderson, Black, & Barry, 2016). The factor loading of every item was exceptionally significant ( $p < 0.001$ ), and the estimations of loadings lay between 0.7 and 0.95. The reliability of each item was confirmed by factor loadings, which were above 0.70 for all items (Hair et al., 2010). As can be seen in Table 4, CR was over the suggested limit of 0.70 (Nunnally, 1978). We utilized the average variance extracted (AVE) as a rule for convergent validity with cutoff of 0.5, following the proposals of Fornell and Larcker (1981). Moreover, the Composite Reliability (CR) of each construct was more than 0.70.

Table 4: Convergent Validity

<b>Items</b>	<b>Factor Loading</b>	<b>Constructs</b>	<b>AVE</b>	<b>CR</b>
TCF 1	0.840	Technology Centric focus ( <b>TCF</b> )	0.708	0.829
TCF 2	0.869			
TCF 3	0.858			
TCF 4	0.824			
PFF 1	0.886	Product Feature Centric Focus ( <b>PFF</b> )	0.834	0.953
PFF 2	0.949			
PFF 3	0.906			
PFF 4	0.911			
PUF 1	0.922	Product Usage Focus ( <b>PUF</b> )	0.846	0.957
PUF 2	0.923			
PUF 3	0.909			
PUF 4	0.926			
PCF 1	0.872	Product Cost-centric Focus ( <b>PCF</b> )	0.790	0.938
PCF 2	0.888			
PCF 3	0.909			
PCF 4	0.885			
CEmF 1	0.799	Customer Empathy Focus ( <b>CEmF</b> )	0.745	0.921
CEmF 2	0.860			
CEmF 3	0.892			

CEmF 4	0.897			
CCF 1	0.907	Customer Centric Focus (CCF)	0.871	0.971
CCF 2	0.95			
CCF 3	0.934			
CCF 4	0.943			
CCF 5	0.933			
CEF 1	0.857	Customer Engagement Focus (CEF)	0.793	0.950
CEF 2	0.856			
CEF 3	0.919			
CEF 4	0.904			
CEF 5	0.915			
ISMI1	0.899	Integrated Social Media Interaction (ISMI)	0.865	0.970
ISMI 2	0.94			
ISMI 3	0.939			
ISMI 4	0.925			
ISMI 5	0.947			
NPD 1	0.763	New Product Development (NPD)	0.698	0.902
NPD 2	0.845			
NPD 3	0.878			
NPD 4	0.852			

### *An Integrated NPD Model for SMEs*

As depicted in Figure 4, the suggested integrated NPD model for SMEs stresses the presence of an Integrated Social Media Interaction (ISMI) where CCF, CEF and CEmF play key roles. It is suggested that the ISMI mechanism cannot be isolated from TCF, PFF, PUF and PCF. The framework places the role of ISMI in such a way that it links the two main players in the newly-formed framework of CCF, CEF, CEmF & NPD. An integrated description of the core components of the NPD processes within an enterprise derives from the recent literature and the analytical work of the various SMEs. During the COVID-19 pandemic, interviewees in the observational study's design context established few integral social media components in the NPD framework. While poor links and the significant noise of misleading or even false information influence social media, our results show that research requires "customer empathy" during the COVID-19 pandemic to help decision-makers better appreciate the meaning and consequences of their NPD. Our results indicate that, during the COVID-19 pandemic, there has been a beneficial impact of social media on the NPD phase. Our findings have significant implications for policymakers and stakeholders interested in

the analysis of NPD-related behavioral patterns for SMEs during the COVID-19 pandemic via social media. The paper concludes that the 'hybridization' social media solution to NPD for SMEs, shown by the system, provides some organizational potential.

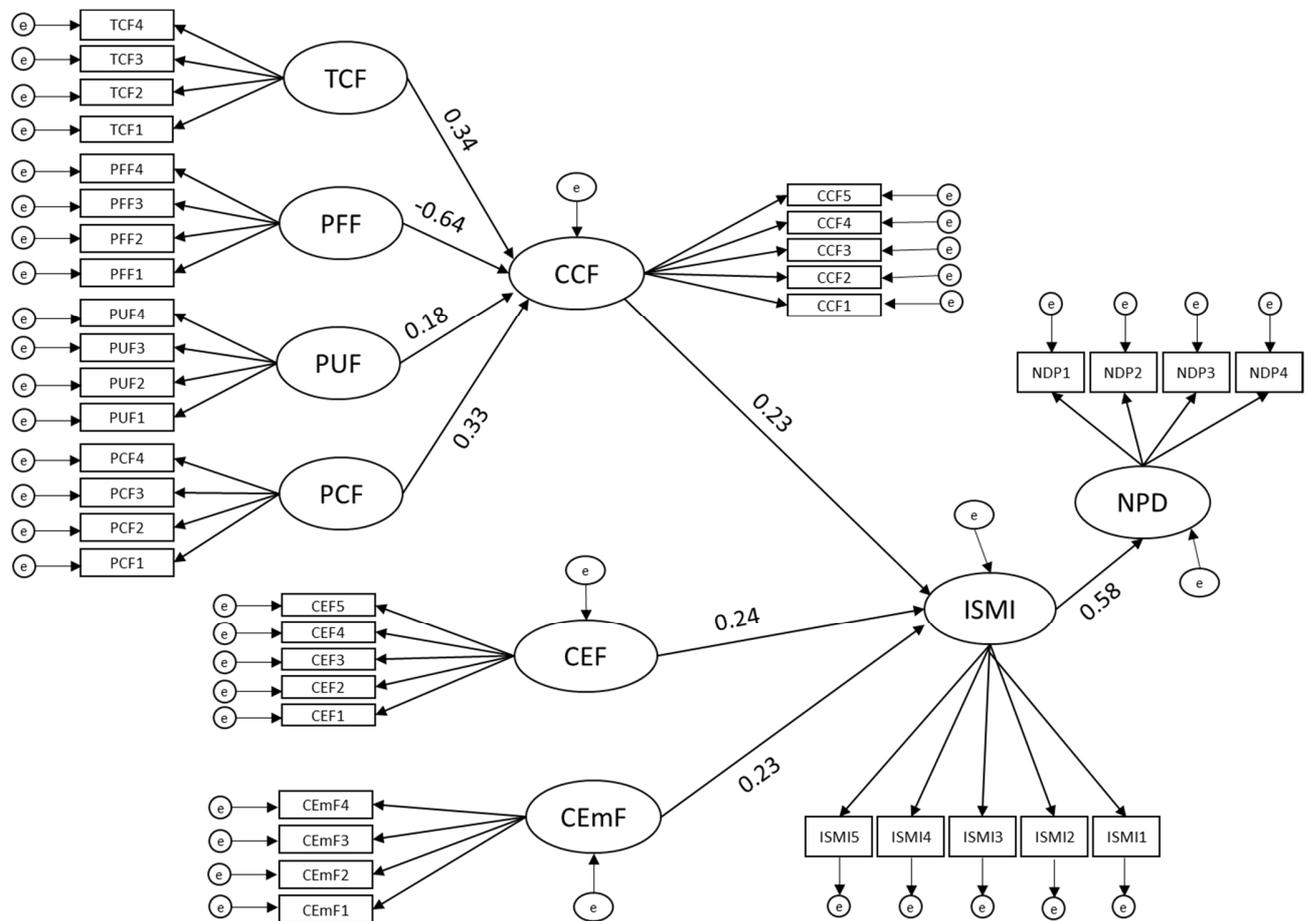


Figure 4: An integrated NPD model showing the relationship between Constructs

The model was first tested to check the connections between the various parameters. The modeling of this study's structural equation was based upon covariance. The findings of the structural model path analysis in this research are shown in Figure . The structural model findings are shown in Table . The detailed study bolsters the hypothesis that Integrated Social Media Interaction is more influential on NPD. Similarly, Customer Technology Centric Focus, Product Feature Centric Focus, Product Usage Focus, and Product Cost-centric Focus have a positive and significant relationship with Customer-Centric focus. Customer-Centric Focus, Customer Engagement Focus, and Customer Empathy Focus have a significant relationship with Integrated Social Media Interaction. The after-effects of this examination are strong (for performance as the result) and offer a fascinating insight into the relations between social media and NPD activity.

### *Evaluating the goodness-of-fit criteria*

We used the guidelines for model fit recommended by Hair et al., 2010, using several fit indices (i.e.,  $\chi^2/df$ , CFI and RMSEA) to avoid redundancy. Model fit was evaluated using the maximum likelihood (ML) method. All the related records were within acceptable ranges, including Chi-square to degrees of freedom ( $\chi^2/df = 1.728$ ), root mean square error of approximation (RMSEA = 0.058), comparative fit index (CFI = 0.951), Tucker-Lewis index (TLI = 0.945), incremental fit index (IFI = 0.951) and normed fit index (NFI = 0.891). This attribute shows a reasonable model fit to the generated dataset (Hu & Bentler, 1999; Hair et al., 2016).

Table 5 illustrates goodness-of-fit indices of Structural Model Testing (SME) using AMOS. Comparative fit index (CFI) yielded a decent match average of 0.920 by reaching the recommendation rating. While the goodness-of-fit index (GFI) at 0.740 was slightly less than the specified limit of 0.90, the root mean square error of approximation (RMSEA) was 0.073, showing accuracy of the details and a nearby good fit. CMIN / DFI's calculated estimate was 2.142, which indicates a strong nearby model fit. The values of AGFI (0.705), RMSEA (0.073), TLI (0.914), CFI (0.920), IFI (0.921), PNFI (0.799), and PGFI (0.653) state that the model suggested was objectively quite similar to model performance, as the corresponding values of such parameters were marginally below or quite near to the prescribed value range for a suitable match.

Table 5: Goodness-of-Fit Indices of Structural Model Testing using AMOS

Good-of-fit Index Statistics	Abbreviation	Recommended range of values for a good fit	Resultant Value
<b>Absolute Fit Measure</b>			
Chi-square test	$\chi^2$	$p > 0.05$ (Marsh & Hocevar, 1985)	1474.034
Degree of Freedom	df	$df > 0$ (Bentler, 1990)	688
Chi-square/Degree of Freedom	$\chi^2/df$	$\chi^2/df < 3$ (Marsh & Hocevar, 1985)	2.142
Goodness of Fit Index	GFI	$GFI \geq 0.90$ (Chau, n.d.)	0.740
Adjusted Good-of-Fit Index	AGFI	$AGFI \geq 0.90$ (Chau, n.d.)	0.705
Root Mean Square Error of Approximation	RMSEA	$RMSEA < 0.08$ (Byrne, 2013)	0.073
<b>Increment Fit Measure</b>			
Tucker Lewis Index	TLI	$TLI \geq 0.95$ (Kline, 2016)	0.914
Normed Fit Index	NFI	$NFI \geq 0.95$ (Hu & Bentler, 1999)	0.861
Comparative Fit Index	CFI	$CFI \geq 0.90$ (Segars & Grover, 1993)	0.920

Relative Fit Index	RFI	RFI >0.90 ( <i>Hu &amp; Bentler, 1999</i> )	0.850
incremental fit index	IFI	IFI >0.90 ( <i>Hooper et al., 2008</i> )	0.921
<b>Parsimonious Fit Measure</b>			
Parsimonious Normed Fit Index	PNFI	PNFI > 0.50 ( <i>Hooper et al., 2008</i> )	0.799
Parsimonious Good-of-fit Index	PGFI	PGFI > 0.50 ( <i>Hooper et al., 2008</i> )	0.653

### *Path Analysis*

The procedure allowed us to investigate the relationship between key factors influencing the Integrated Social Media Interaction. This investigation applied SEM to test eight hypotheses to analyze the impacts of the TCF, PFF, PUF, PCF, CEmF, CCF, CEF, ISIM, and NPD.

Hypothesis 1 predicts that social media Technology Centric Focus (TCF) has a positive effect on Customer-Centric Focus (CCF) for SMEs' NPD. The standardized coefficients ( $\beta$ ) of social media Technology Centric Focus and Customer-Centric Focus are 0.344, and the t-value is 3.699,  $p < 0.01$ , indicating statistical insignificance. The findings support this hypothesis.

Hypothesis 2 proposes social media Product Feature Centric Focus (PFF) has a positive effect on Customer-Centric Focus (CCF) for SMEs' NPD. The standardized coefficients of Social media Product Feature Centric Focus and Customer-Centric Focus are -0.638, t-value = -1.941, p-value > 0.01, indicating statistical insignificance. Hence, hypothesis 2 is rejected.

Hypothesis 3 suggests a significant positive relationship between Product Usage Focus and Customer-Centric Focus (CCF) for SMEs' NPD. The standardized coefficients of Product Usage Focus and Customer-Centric Focus (CCF) for SMEs' NPD are 0.176, t-value = 0.533, p-value > 0.01, indicating statistical insignificance. The findings do not support this hypothesis.

Hypothesis 4 proposes that Product Cost-Centric Focus has a positive and significant relationship with Customer-Centric Focus. The standardized coefficients of Product Cost-Centric Focus and Customer-Centric Focus are 0.331, t-value = 3.783, p-value < 0.01, indicating statistical significance. Thus, hypothesis 4 is accepted.

Hypothesis 5 suggests that there is a significant positive relationship between Customer-Centric Focus and Integrated Social Media Interaction. The standardized coefficients of Customer-Centric Focus and Integrated Social Media Interaction are 0.237, t-value = 3.585, p-value < 0.01, indicating statistical significance. Thus, Hypothesis 5 is fully supported.

Hypothesis 6 predicts that Customer Engagement Focus has a positive and significant relationship with Integrated Social Media Interaction. The standardized coefficients of Customer Engagement Focus and Integrated Social Media Interaction are 0.230, t-value = 3.529, p-value < 0.01, indicating statistical significance. Thus, the findings do support this hypothesis.

Hypothesis 7 suggests that there is a significant positive relationship between Customer Empathy Focus and Integrated Social Media Interaction. The standardized coefficients of Customer Empathy Focus and Integrated Social Media Interaction are 0.233, t-value = 3.448, p-value < 0.01, indicating statistical significance. Thus, Hypothesis 5 is accepted.

Hypothesis 8 predicts that Integrated Social Media Interaction has a positive and significant relationship with New Product Development. The standardized coefficients of Integrated Social Media Interaction and New Product Development are 0.582, t-value = 8.143, p-value < 0.01. The results indicate that ISMI was positively related to NPD. Hence, Hypothesis 8 is fully supported.

Since the standard of measurement model was adequate, we checked the structural one. The effects of the path analysis were calculated from model fit indices and the value of the regression coefficients. Table 6 presents the relationship between TCF, PFF, PUF, PCF, CEmF, CCF, CEF, ISMI, and NPD.

Table 6: Structural Model Results

Hypothesis	Structural Equations	Coefficients ( $\beta$ )	t-value	p-value	Result
H1	TCF $\longrightarrow$ CCF	0.344	3.699	***	Supported
H2	PFF $\longrightarrow$ CCF	-0.638	-1.941	0.052	Rejected
H3	PUF $\longrightarrow$ CCF	0.176	0.533	0.594	Rejected
H4	PCF $\longrightarrow$ CCF	0.331	3.783	***	Supported
H5	CCF $\longrightarrow$ ISMI	0.237	3.585	***	Supported
H6	CEF $\longrightarrow$ ISMI	0.230	3.529	***	Supported
H7	CEmF $\longrightarrow$ ISMI	0.233	3.448	***	Supported
H8	ISMI $\longrightarrow$ NPD	0.582	8.143	***	Supported

Notes: \*\*\* Significance level: p < 0.01

## Discussion and Implications

The purpose of this study was to shed some light into the pragmatic issues and acceptability of an integrated framework of NDP from the interactions with social media in SMEs sector. The paper introduces a new NPD conceptual model for SMEs to promote, perform and thrive in a competitive market during the COVID-19 pandemic via social media. This paradigm should be used to objectively analyze the context and result of SME internationalization as a theoretical prism. It was revealed that previous businesses' main barriers to NPD include: lack of funding, inadequate intelligence, difficulty selecting reputable collaborators and vendors, lack of bargaining power, insufficient expertise, lack of industry awareness, limited foreign experience, lack of government support, and insufficient demand for small business products.

Structural equation modeling (SEM) is utilized to test our proposed framework and hypotheses. Our findings show that SMEs' NPD depends on Integrated Social Media Interaction (ISMI). Subsequently, ISMI relies upon Customer-Centric Focus, Customer Engagement Focus, and Customer Empathy Focus. Customer-Centric Focus depends upon Technology Centric Focus, Product Feature Centric Focus, Product Usage Focus, and Product Cost-Centric Focus respectively. These constructs were studied for each phase of the NPD procedure and brought together in a framework of NPD for SMEs. The newly-developed "Customer Empathy" construct in this study can be of immense use to SMEs for NPD initiatives to ensure clutter-free differentiation with their NPD process.

Social media helps SMEs engage clients during the COVID-19 pandemic in a comparatively inexpensive manner and at high productivity levels for NPD. The findings show that the NPD phase of SMEs during the COVID-19 pandemic can be clarified only partly by the presence of SME stakeholders on the board and the social media behavior of the members of the SME's board. Our frameworks partly affirm the advantage of inviting owners/CEOs of SMEs to share in NPD's practices. Inviting social media marketers with the right contacts, particularly those with good social media links, appears to positively influence social media in the NPD process. The research was influenced by many social media marketing models, including the 7-P model, the innovation-oriented internationalization model, the Uppsala Model, the Network Approach Model, the Born Global Model, the Resource Based View model etc., and investigated various aspects of consumer intent for social media.

### *Theoretical Implications*

The findings of this study validate the proposed model and contribute to theory and practice. The paper extends the literature by contributing to the theoretical development of a conceptual model for explaining

the relationships among the constructs. It is the first to introduce additional constructs such as Customer Empathy (CEmF) and Integrated Social Media Interaction (ISMI).

This study made several significant theoretical contributions. The findings concentrate primarily on the possible advantages of social media in SMEs' NPD framework during the COVID-19 pandemic. Though NPD studies have explored many avenues, this study has primarily emphasized three areas. The first is developing an integrated model for SMEs for NPD process using social media during the COVID-19 pandemic. The second is the expansion of the literature by contributing to the theoretical design of a conceptual model to clarify the connection between the constructs. The third aspect is the study of Consumer Empathy Focus (CEmF) and its consequences for managerially-related decisions across empirical models. A special emphasis has been placed on exploring the effects of Customer Empathy on NPD and corporate performance.

To our knowledge, this is the first study to empirically apply the social media innovation-oriented internationalization paradigm to NPD for SMEs. The research contributes to the limited literature on the contemporary prevalence of NPD for SMEs via social media. The analysis contextualizes the generic obstacles of innovation-oriented internationalization via social media to help accommodate the NPD for SMEs.

### *Practical implications*

The findings have several implications for researchers, policymakers,, and stakeholders in understanding NPD-related behavioral trends for SMEs via social media during the COVID-19 pandemic. The intellectual structure and detailed NPD literature framework developed in the present study provide practitioners with useful perspectives to better understand the effect of SME activities in increasing organizational environments. It provides realistic alternatives during the COVID-19 pandemic to SMEs seeking to achieve NPD via social media. During the COVID-19 pandemic, SMEs need "customer empathy" and helpful mechanisms to help decision-makers better understand the context and implications of their NPD.

The model gives helpful advice to NPD SME administrators. In the social media context, improved awareness of the factors associated with intrinsic motivation will activate NPD for SMEs. This may also inspire people to continue associating themselves with the underlying SMEs. Thirdly, the present study results illustrate the value of Customer Empathy for SME groups focused on social media users. Finally, our suggested system offers a 360-degree view of the aspects to be handled before releasing every new product for SMEs via social media, from the managerial viewpoint. The research gives some perspectives into the diverse forms of customer interactions of an NPD and the consequences for marketers to create and

promote powerful and favorable NPD-Social Media partnerships. The key policy consequences of our research are the steady improvement of the NPD for SMEs during the COVID-19 pandemic via social media, which certainly raises the competitive potential.

## **Conclusion**

During the COVID-19 pandemic, SMEs' use of social media for purposes of correspondence and connectivity acquired considerable prominence. Social networking groups have been seen to be influential in fostering market reputation. The framework for SMEs NPD through social media during COVID-19 has by and large been seen as an unusual example: costly to construct, but once produced completely profitable. Past research shows that Consumer-Centric Focus and Customer Engagement Focus through the Integrated Social Media Interaction approach is the leading trigger of NPD. However, Customer Empathy has not yet been observed in the sense of COVID-19 scenarios. This study is the first effort to address the gap in creating a "Customer Empathy" construct for the theoretical model and empirically test it among SMEs' social media new product marketers. A few conclusions are drawn through a progression of statistical investigations dependent on a review of 217 specialists in the SME sector.

Besides, regardless of the restrictions sketched out, this study reaches out to earlier research by contributing new important insights into the "social media applications for NPD" literature. The study offers observational help for a few hypothetical recommendations progressed in the paper. The findings also provide valuable managerial implications for global new product marketers and correspondence experts. The results recommend that "customer empathy" was progressively active for NPD for SMEs through online social media during the COVID-19 pandemic. The conceptual framework and experimental approval offer valuable data for future studies. This study measures the direct effects of Integrated Social Media Interaction on NPD performance; future research could consider incorporating control variables such as the number of new products, type of new products, or the target destination of new products. In future collective investigations, multi-criteria decision techniques such as analytic hierarchy process (AHP), analytic network process (ANP), a technique for order performance by similarity to ideal solution (TOPSIS), fuzzy sets, and the mix of these strategies for critical thinking, might be applied to examine NPD modeling purposes. Future research can utilize qualitative investigations (analysis by NVivo®) to study how often the term COVID-19 is available in references to NPD related papers. In conclusion, this research contributes significantly to theories and practices by drawing attention to the reasons for adopting new metrics such as "Customer Empathy Focus". It offers noteworthy contributions to the NPD process in the COVID-19 context.

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