Value Creation with Big Data in Marketing: An Empirical Evidence on SMEs

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ABSTRACT

Manuscript type: Research paper

Research aims: This study investigates the impact of big data marketing on the ability of SMEs to create value through the relationship quality.

Design/Methodology/Approach: Data were collected from 150 SMEs in West Java. Structural Equation Modelling (SEM) was employed to test the research model.

Research findings: The results of the study indicated that big data use for marketing purposes had a positive impact on value creation and relationship quality. Surprisingly, this study demonstrated insubstantial evidence to associate relationship quality with value creation. The effect of relationship quality as a mediator between big data use and value creation was also not significant.

Theoretical contribution/Originality: This study extends on existing literature by providing empirical evidence showing the importance of big data in stimulating value creation and relationship quality in the Indonesian culinary industry.

Practitioner/Policy implication: The outcome of this research suggests SMEs to quickly adapt to the dynamic business environment by investing in big data, as it has the potential for high business

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value. The use of big data can also facilitate SMEs to better manage their relationships with customers. The ability of small businesses to use data is a crucial factor in creating new development for business continuity, accompanied by establishing relationships based on data.
Research limitation/Implications: To increase the generalisability of this study, future research needs to consider collecting data from different types of populations and countries.

Keywords: Big Data Marketing, Relationship Quality, Value Creation, SME, Culinary
JEL Classification: M12

1. Introduction

Small and medium enterprises (SMEs) contribute significantly towards Indonesia's economy. Since they are scattered widely throughout rural areas, they create substantial employment opportunities for local people. While many large organisations had to close their operations during the global financial crisis, SMEs were able to survive as they did not rely on imported materials and banking services (Ridwan Maksum et al., 2020). As of 2018, SMEs accounted for forty per cent of the country's GDP (Purwantini & Anisa, 2018). The number of SMEs in the country had reached 58.97 million (Indonesia Central Bureau of Statistics, 2018), showing an extensive development of the sector. Yet, in order to survive and compete under the fierce competition, there is a need to engage in value creation through product, process and system innovations (Rashidirad & Salimian, 2020). Value creation is imperative for a business's competitiveness as it is argued to have a significant impact on customer loyalty and growing market share. SMEs are documented to be closely related to value creation as they are more mobilised in innovations as compared to their larger counterparts.

Advanced technologies, such as big data, undoubtedly creates new opportunities for value creation. Previous studies have emphasised the opportunities created by big data (Saggi & Jain, 2018; Cao et al., 2021; Jabbar et al., 2020). It serves as a powerful tool to handle the large amounts of information available in SMEs (Bharadwaj & Noble, 2015; Demil & Lecocq, 2015). In marketing specifically, big data can be used to reach new market segments, obtain in-depth knowledge on their customer perception regarding quality of products and services, as well as enhance accuracy of sales and demand forecasting (Kumar et al., 2020; Pantano et al., 2020). Big data can also be potentially used by marketers

to track purchasing patterns and trending topics in the marketplace, which can eventually facilitate firms to offer more personalised services (Rust & Huang, 2014). Hence, the usage of big data creates an environment where speed of innovation process can be accelerated.

Despite the hype associated with big data marketing, SMEs may face uncertainties as they seek to understand how values can be captured from such technological investments (De Luca et al., 2021). While big data promises added value creation in various business operations, including marketing, and has been identified as the next big thing in innovation, several scholars (Matthias et al., 2017; Akter et al., 2016; Rubin & Lukoianova, 2013) have expressed concerns on the actual impact of technology on firms, particularly SMEs. According to the International Data Corporation (2016), worldwide revenues of big data and business analytics are expected to grow by more than 50 per cent over the five-year forecast period, showing that firms are making extensive investments in this technology. However, if the management teams do not develop new perspectives and innovative capabilities through big data, these investments could ruin them. In Australia for instance, Masige (2020) and Dekimpe et al. (2020) reported that many retailers were struggling to create value through big data marketing. While several studies have focused on the adoption and use of big data (Kwon et al., 2014; Raguseo, 2018; Sun et al., 2018), practitioners and academic researchers have highlighted the imperative need to go one step further by looking at how big data can be a valuable resource for firms to attain competitive advantages (Abbasi et al., 2016; Côrte-Real et al., 2017). Any investment in advanced technologies could be a wasted investment if the importance of competitive strategies to derive value is neglected.

Many authors have also discussed the importance of relationship quality towards value creation (Boulding et al., 2005; Rafiq et al., 2013). For example, an increase in relationship quality can encourage customers to get involved and engage with products and services. These positive interactions with customers could promote relationship stability and eventually lead to value creation (Tajvidi et al., 2021). In today's environment, good relations with customers are important to enable firms to respond to rapid market changes. While the impact of relationship quality in value creation is acknowledged in the literature, the synergistic relationship between big data and relationship quality in the context of SMEs is relatively new and barely studied.

In this sense, this study investigates the impact of big data on value creation and relationship quality of SMEs. It also extends one

step further by looking at the possibility of relationship quality as a mediator between the big data marketing and value creation. The study expands on the previous literature by examining the interaction between the three elements within the context of SMEs. While big data has long been utilised by large firms to enhance competitiveness, the adoption of such technology should not be understated. Companies are expected to take advantage of big data for them to be able to upgrade their status and become more innovative. In this study, we focused on the culinary industry, as this sector appears to contribute to 41 per cent of SMEs establishment and forms 6 to 9 per cent of the creative industry (Hidayat & Asmara, 2017). This sector is an important industry for Indonesia, as it has the potential to provide employment opportunities for local people and is strongly associated with tourism development.

The rest of this paper is organised as follows. Section 2 highlights the underpinning theory and conceptual development of this study, while Section 3 explains the methodology employed. The analysis is presented and discussed in Sections 4 and 5. Section 6 concludes the paper by discussing the implications of this study.

2. Literature Review, Theoretical Framework and Hypotheses Development

2.1 Big Data Marketing

Big data can either be in the form of structured data (e.g., customer relationship management) or unstructured data, generated from social media communication technologies and platforms (e.g., Facebook, Twitter) (Lansley & Longley, 2016). Big data is commonly represented by datasets that are very high in velocity, volume and variety (George et al., 2016; Watson, 2014). Various researchers have suggested big data as "the new oil", as it offers opportunities for firms across industrial sectors to obtain insights into customers and operations, thus enhancing their marketing, decision-making and new product development. According to Suoniemi et al. (2020), the principal of big data marketing is to exploit the technical advantages, and connect as well as understand the actual needs of consumers, so as an accurate psychological intervention or marketing strategies can be carried out to influence purchase behaviour. The use of big data marketing enables firms to extract previously unknown, yet potentially valuable knowledge related to customers, competitors and the broader environment, which consequently will help them in sensing market threats and opportunities better. Through

big data marketing, firms can instantly gain consumers' feedback, track changes in their behaviours and communicate the information to the team responsible for product development. Similarly, firms can acquire information on their competitors' key product attributes and pricing policies allowing them to optimise their pricing decisions (Xu et al., 2016). According to Erevelles et al. (2016), *Ford Motors* uses big data marketing to overcome challenges from its competitors, like *Hyundai*, *Skoda* and *Tata*. The car manufacturer uses primary consumer data gained from sensors and remote application management software to understand drivers' needs, which are translated into product innovation and design. This approach helps the firm to establish strong customer relationships and strengthen the value-added capability of marketing.

2.2 *Indonesia's Culinary Industry and Potential of Big Data Marketing*

The culinary industry in Indonesia has undergone significant changes that were mostly driven by increasing public standards and a new generation of consumers (Mehra et al., 2018). The trend of food consumption behaviour has changed with more than 50 per cent of consumers opting to dine out, take away or order online (Rekarti & Doktoralina, 2017). The changing patterns of consumer behaviours have created an imperative need for culinary businesses to innovate through information technology (IT) in order to remain competitive. Furthermore, IT usage in the sector has led to over 80 per cent increases in income generation and employment opportunities.

The growth of IT use in culinary services in Indonesia is preceded by food delivery services such as *Foodpanda* and *GoFood*. These serve as third-party logistics providers for more than 30,000 restaurants (Sudiwijaya & Ambardi, 2021). In line with this development, there are also intermediary information providers such as *Zomato* and *Makan Mana* which connect culinary lovers and businesses. The information providers serve as online platforms for people to review numerous restaurants, foods, and online search engines. The growth of such technologies has grown to 78 per cent and become the highest in the world. Besides these applications, the use of social media such as Instagram has also become popular in Indonesia's culinary industry. Pictures related to culinary services are ranked as the top three most downloaded photographs on Instagram (Hu et al., 2014). This is not surprising considering the tremendous growth of food bloggers/influencers who specialise in discussing content on dining experiences and products (Bell et al.,

2017). It was reported that the number of Instagram photos with the hashtag "food" increased tremendously from 800,000 to 250 million, between 2013 to 2018. The habits of posting food photos taken while dining out has attracted not only the general public, but also offers large amounts of customer behaviours to both the communication and advertising firms. Through social media, dining out in restaurants has become a channel for self-expression, communication and advertising. In this way, social media appears to be the most desirable means to learn and share experiences in relation to product consumption. Using social media, the culinary businesses can also track their consumers' behaviours, preferences, and tastes (Ruiz-Molina et al., 2014). Through comments and likes, user involvement in culinary product discussion, as well as testimonials and recommendations from the community members of the pages created, businesses can identify customer needs and better respond to rapid market changes. Thus, it is not surprising that the culinary industry has strongly promoted the posting of food photos through social media platforms by creating highly recognisable usernames and hashtags. Some also directly reach out to their patrons and reward them for their food photo-posting behaviours.

The growth of social media usage in the culinary industry has led to the massive collection of structured and/or unstructured data (Dwityas et al., 2020). Such data is of interest to businesses as it can generate customer insights, which can support customisation of sales, personalisation of services, and client interaction (Gonzalez-Serrano et al., 2021). Additionally, it can facilitate market segmentation, generate knowledge about customers and aid in marketing campaigns. Through purchase histories and online conversations of the clients, big data can help culinary services to gain more insight into their clients. For this reason, the application of big data tools and technology in the context of culinary industry is indispensable, and it is therefore imperative to deepen the knowledge and usefulness of this state-of-the art technology. With the development of technology and data utilisation, culinary service providers can continue developing and improving their creations in the food and beverage sector.

2.3 Resource-based View Theory

This study employs the resource-based view (RBV) theory as its under-pinning theory. The theory contends that firms with internal and external resources as well as capabilities that are valuable, rare, non-

substitutable, and inimitable are more likely to achieve competitive advantages (Barney, 2001). Resources are the prime asset for a firm, and can be divided into tangible and intangible resources. Patents, brand names, knowledge and information are some examples of intangible assets, while funds, physical infrastructure, human capital and technology are among those categorised as tangible (Taher, 2012). Capability refers to an organisation's abilities to align resources to better sense and seize opportunities. It results from dynamic interaction from various external environments and is less transferable, which helps create a competitive advantage (Wong & Karia, 2010).

This study refers to RBV and represents the culinary business's resources in the form of big data marketing. Big data marketing refers to the use of novel information technologies that are required to handle massive amounts of data, derived from interactions between people, communities and machines for marketing purposes (De Luca et al., 2021). These technologies include non-relational databases, middle ware, data warehousing and analytic tools which enable organisations to capture unstructured, semi-structured, and structured data in real-time, which cannot be handled by conventional information technology. Through big data marketing, information and knowledge about customers, their purchasing patterns and behaviours can be generated, and considered as intangible resources. These resources are then reconfigured to generate capabilities (Cao et al., 2021; Grishikashvili et al., 2014). It helps businesses to improve their relationship with customers and engage in value creation.

Therefore, using RBV in the form of a theoretical lens, we developed a framework that proposes big data marketing as the main resource that facilitates in enhancing relationship quality, leading to value creation. The research model is presented in Figure 1. Its theoretical constructs and hypotheses development will be discussed in more detail.

2.3.1 Big Data and Relationship Quality

Big data consists of data that are huge in volume, of significant value and have high variety, veracity and velocity (McAfee et al., 2012). In strategic marketing literature, big data is cited as an important organisational resource due to its ability to extract text-quality information from large databases (Erevelles et al., 2016). The volumes of data generated through social media, the relentless rapidity at which data are generated, and the diverse richness of the data are transforming
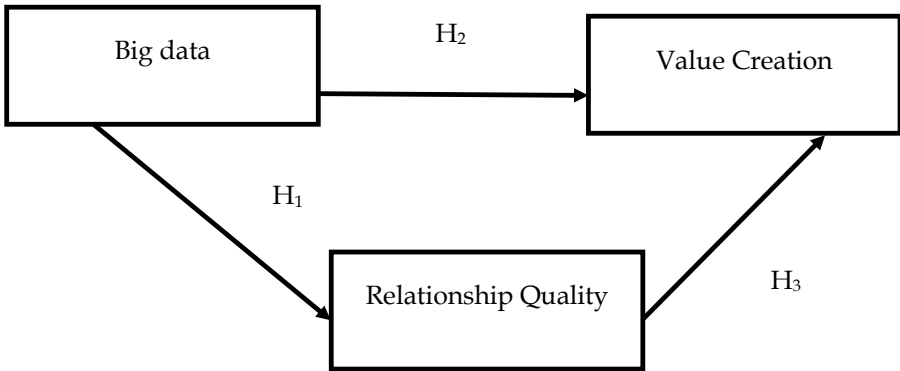
H_4 represents the mediating effect

Figure 1: Research Framework

the customer relationship management. Advances offered by big data tools enable marketers to recognise new gaps and advance their understanding of consumer behaviours (Firestein, 2012). Geospatial data extracted from customers' mobile phones for instance can predict their locations at any given time and day in the future, so that appropriate marketing messages and product offers can be pushed to them (Van Rijmenam, 2014). By doing this, more personalised services can be carried out to strengthen profitable relationships with customers. In another study, Target, the Australian retail fashion chain was able to initiate a long-term customer relationship through big data. Using the technology, the company could estimate the due date weeks of pregnant female shoppers before their competitors and use this insight to influence their customers' purchases of baby items (Sanders, 2014). This shows that big data tools offer great opportunities for improving the relationship between customers and businesses. It enables better service quality through personalised data-based service oriented and customer-oriented offerings, which are made possible with big data investment. Based on these arguments, this study postulates that:

H_1: Big data is positively related to relationship quality.

2.3.2 Big Data and Value Creation

Several studies have defined the creation of value as the ability of businesses to solve customer problems with better knowledge and a broader

market perspective, thus allowing the company to make better decisions and innovations (e.g., Della Corte & Del Gaudio, 2014). Customer value creation relates to developing new customer solutions, and increased gain as well as input and output, eventually leading to appropriate and desirable outcomes.

Conventional techniques such as customer relationship management (CRM) has been used as a tool by many businesses to manage and record clients' preferences and information, whereby it helps in operational areas, connectivity and visibility (Kumar & Reinartz, 2018). Yet, with big data tools, companies can move up one step further, since such technology helps them to track merchandise, purchases, customers' preferences, as well as automating transactions and marketing messages (González-Serrano et al., 2020). Through big data, managers can find hidden client information from available data, which help in making more personalised marketing campaigns. In fact, using machine learning tools, businesses can predict client reactions to marketing messages and products offered (Sharma & Pandey, 2020). Text analytics can further help extract text-quality information, such as customer opinions in distribution channels and social media, leading to more effective interactions (Anshari et al., 2019). Through big data, businesses do not only have a good system to collect and process data, but also the ability to learn and understand how customer behaviours and demands are changing for them to respond more quickly to uncertain environments. Within the context of hospitality industry, big data marketing is being used as a tool to determine the client profile, whether they are first-timers or repeaters (Talón-Ballestero et al., 2018). By understanding the differences between the two groups of travellers, tourism companies are able to gain insights on client motivation, do market segmentation effectively, leading to effective business and marketing strategies. For these reasons, the application of big data in marketing helps businesses to create value through the improvement of processes, products and systems. Based on these arguments, this study postulates that:

H_2: Big data marketing is positively related to value creation.

2.3.3 Relationship Quality and Value Creation

Customer relationships are formed from the customers' trust, satisfaction, loyalty and commitment in the products and services provided to them (Crosby, 1990; Athanasopoulou, 2009). A few marketing scholars

have also related relationship quality with willingness to recommend products/services to others (e.g., Huntley, 2006). Customers who have a good relationship with a particular brand have found to be more excited to vouch for the product/service to their contacts and demonstrate a strong involvement in the delivery of product/service. They tend to partake in co-creation, which help generate more customer-centred products (Füller & Matzler, 2007), leading to greater innovation performance (Gemser & Perks, 2015; Kazadi et al., 2016). In fact, several studies have noted the importance of relationship quality in making innovations sustainable (Wisker, 2020), and securing greater market orientation (Smals & Smits, 2012; Najafi-Tavani et al., 2016). Based on these arguments, this study postulates that:

H_3: Relationship quality is positively related to value creation.

While previous studies have demonstrated the positive effects of big data on value creation (Anshari et al., 2019; Sharma & Pandey, 2020; González-Serrano et al., 2021), some scholars have highlighted that the relationship may not be linear (Matthias et al., 2017; Akter et al., 2016; Rubin & Lukoianova, 2013), especially for SMEs. This effect may depend on benefits expected by the customers and overall experiences, satisfaction and commitment towards the brand (Tajvidi et al., 2021). It also appears that when customers have a good relationship with the brand, they may engage in product and process development. For example, in the culinary business, customers are typically sharing their experiences in relation to food consumption through social media such as *Instagram*. Not only do posts about the food help businesses in their marketing and advertisements, they may also use the comments and user involvement in the product discussion as basis for future product development (Ruiz-Molina et al., 2014). Based on these arguments, this study postulates that:

H_4: Relationship quality mediates the relationship between big data marketing and value creation.

3. Methodology

This study employed a quantitative method by using questionnaires. To measure the constructs, only pre-tested and validated items extracted from prior studies were used. Eighteen items were taken from Cao et

al. (2021) and Fernando et al. (2018) to measure the big data construct. The relationship quality construct was measured through 12 items adopted from Grégoire and Fisher (2006), while value creation was measured using 11 items adopted from Zacharias et al. (2016). As expected, the culinary businesses in Indonesia use mainly Indonesian language as they are not well-versed in the English language. Hence, the questionnaire was translated into the Indonesian language without changing the content and meaning of the questions. The translation was performed by two bilingual researchers to avoid language related errors. The researchers are native speakers of the Indonesian language with advanced knowledge of the English language. The questionnaire was first evaluated by four academics in the big data area. Then, it was pilot tested on 20 SMEs. This helped to establish the content and face validity of the instrument used. Appendix 1 shows the sample of items used in the questionnaire.

In this study, we only focused on SMEs that were involved in culinary services in West Java, Indonesia. This region was chosen as a sampling frame since the West Java Province often serves as a benchmark for other regions in the creative sector. Moreover, West Java is considered as a province that has a variety of traditional culinary, which has been attracted and demanded by tourists (Hidayat & Asmara, 2017). Samples were selected based on data obtained from the West Java Provincial Cooperative and Small Business Office. Only culinary businesses that had used social media were included in this sample. To ensure the focus, a filter question asking whether the business had used social media/big data was employed. Only the respondents who had answered positively to this question were included in the sample. A total of two hundred businesses who satisfied the identified criteria were contacted through telephone. They were informed of the study, and an assurance of confidentiality as well as voluntariness were also highlighted during the telephone conversation. Upon obtaining their consent, the self-administered questionnaires were personally distributed to the potential respondents. They were given a week to complete the questionnaire. Of the 200 questionnaires distributed, only 150 were retrieved, providing a response rate of 75 per cent. Table 1 depicts the respondents' profiles. Of the 150 respondents, only 1 of them was categorised as a medium scale business. Most of them used Instagram and Facebook, as the communication medium. As expected, majority of the owners were females.

Table 1: Respondents' Profiles

Characteristic	Group	Frequency	Percentage
Size	Small	149	98.84
	Medium	1	1.16
Types of Social Media Accounts Used	Instagram	65	
	Facebook	65	
	WhatsApp	60	
	Others	21	
Owner's Gender	Female	84	55.9
	Male	66	44.1

Note: For types of social media used, respondents were allowed to choose more than one option.

4. Analysis

In this study, data collected were analysed using structural equation modelling (SEM). Partial lease square (PLS) was used to run the SEM. In line with Anderson and Gerbing's approach (1998), the analysis was performed based on two steps. First, a measurement model incorporating all the constructs was tested for convergent and discriminant validity. This step was taken to validate the psychometric properties of the measurements. Upon validating the measurements, a structural model analysis was performed to test the research framework and the hypotheses developed.

Table 2 indicates the results of the convergent validity test. The results showed that all the factor loadings were above the threshold value of 0.7. The composite reliability for the three constructs were between 0.92 to 0.96; and the average variance extracted values (AVE)

Table 2: Convergent Validity

Constructs	Factor Loadings	Composite Reliability	AVE
Big Data Marketing		0.966	0.587
BDM1	0.820		
BDM2	0.884		
BDM3	0.796		
BDM4	0.796		
BDM5	0.726		

Table 2: Continued

Constructs	Factor Loadings	Composite Reliability	AVE
BDM6	0.733		
BDM7	0.769		
BDM8	0.751		
BDM9	0.756		
BDM10	0.803		
BDM11	0.735		
BDM12	0.735		
BDM13	0.735		
BDM14	0.805		
BDM15	0.722		
BDM16	0.697		
BDM17	0.758		
BDM18	0.710		
BDM19	0.769		
Value Creation		0.936	0.552
VC1	0.818		
VC2	0.771		
VC3	0.814		
VC4	0.860		
VC5	0.735		
VC6	0.841		
VC7	0.882		
VC8	0.843		
VC9	0.822		
VC10	0.909		
VC11	0.802		
Relationship Quality		0.960	0.686
RQ1	0.808		
RQ2	0.755		
RQ3	0.801		
RQ4	0.887		
RQ5	0.711		
RQ6	0.806		
RQ7	0.721		
RQ8	0.676		
RQ9	0.504		
RQ10	0.705		
RQ11	0.672		
RQ12	0.798		

Table 3: Discriminant Validity

Variables	Big Data Marketing	Value Creation	Relationship Quality
Big Data Marketing	**0.766**		
Value Creation	0.669	**0.743**	
Relationship Quality	0.465	0.382	**0.828**

Notes: Values in bold represent the square root of the AVE. The other values represent the correlation coefficient between variables at p-value 0.01 level (2-tailed).

were between 0.55 to 0.69. These values indicated that convergent validity was achieved (Hair et al., 2017). To test the discriminant validity, the square root of AVE values was compared to their correlations with other constructs. As noted in Table 3, all the correlation values seemed to be lower than the square root of AVE, indicating that discriminant validity had been achieved (Fornell & Larcker, 1981).

Based on the results of convergent and validity tests, it was concluded that all the constructs used were valid and reliable. A structural model was then constructed to test the research model and hypotheses developed. The structural model was evaluated by investigating the coefficient determination (R^2) square. A 5,000 resample bootstrapping procedure was employed to test the structural model and examine the hypotheses developed. The results revealed that the model was capable of explaining 44.7% of the variance in the relationship quality and 22.6% of the variance in value creation. As highlighted in Table 4, the effect of big data marketing on relationship quality was significant (β = 0.669, t = 8.248, p < 0.001). Therefore, H_1 was supported. This study

Table 4: Structural Model Analysis

Hypotheses	Paths	β	t-value	Results
H_1	Big Data Marketing → Relationship Quality	0.669	8.248	Supported
H_2	Big Data Marketing → Value Creation	0.380	3.403	Supported
H_3	Relationship Quality → Value Creation	0.127	1.041	Not Supported
H_4	Big Data Marketing → Relationship Quality → Value Creation	0.306	1.024	Not Supported

also demonstrated substantial evidence on the relationship between big data marketing and value creation ($\beta = 0.380$, t = 3.403, p < 0.001), hence providing support for H_2. In this study, the association between relationship quality and value creation was not significant ($\beta = 0.127$, t = 1.024, p = 0.299). Therefore, H_3 was not supported. The role of relationship quality as a mediator was also insignificant ($\beta = 0.085$, t = 1.024, p = 0.306), hence H_4 was not supported.

5. Discussion

Drawing upon the RBV theory, this study has determined the relationship between big data, relationship quality and value creation. The outcomes derived from this research show that big data serves as a crucial factor which increases the value of culinary products and services. The impact of big data on relationship was also found to be substantial, showing that big data can be used for marketing strategies. Surprisingly, this study did not find substantial evidence to: 1) associate relationship quality with value creation; and 2) establish relationship quality as a mediator between big data and value creation.

The significant effect of big data on relationship quality in this study appears to be consistent with Van Rijmenam (2014). The result shows that big data can help culinary businesses to embrace effective marketing strategies for each target segment based on their preferences and needs. In today's environment, social media users can easily post pictures of the cuisine, restaurant environment, and dining experiences through various platforms such as Facebook, Instagram, and Twitter, thus dramatically amplifying word-of-mouth recommendations (Zhu et al., 2019). Many customers today also often refer to social media to read restaurant reviews and the majority of them will try a new restaurant after seeing food-related content. This phenomenon could lead to massive collection of structured, semi-structured, and unstructured data. With big data, it is possible for culinary businesses to transform this information into knowledge, which helps them to understand the customers and devise the best strategy to reach them. When culinary businesses are aware of their customers' needs, they can provide different options to increase customer satisfaction and offer more enjoyable food. Through this virtual community, culinary lovers are able to interact, collaborate, and share information, which lead to higher perceived trusts of the brand. Thus, it is not surprising that the use of big data can help in getting closer to the customers.

This study has also provided evidence on the importance of big data on value creation. As culinary entrepreneurs, sales data and favourite menus are important for their business development. For example, based on big data analytics, suitable dishes can be created and served to customers during certain times (Leung & Loo, 2020). To illustrate this, *Grabhub*, an online delivery platform contrasted past customer orders and weather data, only to find that their customers preferred mac 'n' cheese on chilly days (Sellappan & Shanmugam, 2021). These results were then used to modify the business model, to better suit customers and increase revenues. Tracking customer behaviour in culinary businesses is imperative as it facilitates firms in carrying out changes based on consumer taste and preferences of menu.

Unexpectedly, this study did not provide substantial evidence to associate relationship quality with value creation nor the role of relationship as a mediating variable. The results found that while relationship quality was a valuable tool to generate favourable outcomes, the culinary businesses in West Java had a passive attitude towards cooperation with customers. Most of the people in the province did not realise the importance of customers as an information source for innovation development (Muizu, 2016). The use of big data was only for marketing purposes and to instill trust in the brand/company. They were still confined to a conservative mind-set in conducting business, without thinking about the need to convert relationship quality into meaningful value creation.

6. Conclusion and Implication

The findings obtained from this study contribute to the body of literature and management practices in several ways. First, this study extends the previous empirical work by incorporating relationship quality as a mediator between big data and value creation. The rising popularity of social media usage amongst users has affected how culinary businesses build relationships with their customers. To facilitate relationship building, marketers have begun to focus their attention on the concept of relationship quality. Yet, in this study, the results challenge the status quo of relationship quality as the most influential mediator in relationship marketing.

Second, this study provides empirical support showing the importance of big data as a tool in creating a competitive barrier in the industry. This result corroborates with the RBV theory. As culinary experiences have become a lifestyle that cannot be separated from one 's

daily life, users tend to post their experiences with food and restaurants on social media, creating massive amounts of data. With billions of customers worldwide connecting, the present moment is no doubt the best time for culinary businesses to use big data. The collected and stored data need to be analysed to generate insights about customers, their purchasing patterns and behaviours. Only then would data become intangible resources that could lead to value creation. In this regard, a culinary entrepreneur needs to optimise the use of big data marketing. They should realise that while big data has an impact on relationship quality, they need to be more open with concepts such as open innovation. Furthermore, customers can be used as a resource to generate innovation.

While the present study has offered some useful insights into the role of big data in the context of culinary businesses, there are some limitations that need to be addressed. The first of these is the generalisability of the results. This study focused only on the West Java region. The second limitation is that the survey was confined to only a few variables. Hence, it would be interesting for future studies to consider more variables that are related to the culinary industry.

References

Abbasi, A., Sarker, S., & Chiang, R.H. (2016). Big data research in information systems: Toward an inclusive research agenda. *Journal of the Association for Information Systems, 17*(2), 1–32. https://doi.org/10.17705/1jais.00423

Akter, S., Wamba, S.F., Gunasekaran, A., Dubey, R., & Childe, S.J. (2016). How to improve firm performance using big data analytics capability and business strategy alignment? *International Journal of Production Economics, 182*, 113–131. https://doi.org/10.1016/j.ijpe.2016.08.018

Anderson, J.C., & Gerbing, D.W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin, 103*(3), 411–423.

Anshari, M., Almunawar, M.N., Lim, S.A., & Al-Mudimigh, A. (2019). Customer relationship management and big data enabled: Personalization & customization of services. *Applied Computing and Informatics, 15*(2), 94–101. https://doi.org/10.1016/j.aci.2018.05.004

Athanasopoulou, P. (2009). Relationship quality: A critical literature review and research agenda. *European Journal of Marketing, 43*(5/6), 583–610. https://doi.org/10.1108/03090560910946945

Barney, J. B. (2001). Resource-based theories of competitive advantage: A ten-year retrospective on the resource-based view. *Journal of Management, 27*(6), 643–650. https://doi.org/10.1177%2F014920630102700601

Bell, D., Hollows, J., & Jones, S. (2017). Campaigning culinary documentaries and the responsibilization of food crises. *Geoforum, 84*, 179–187. https://doi.org/10.1016/j.geoforum.2015.03.014

Bharadwaj, N., & Noble, C.H. (2015). Innovation in data-rich environments. *Journal of Product Innovation Management, 3*(32), 476–478.

Boulding, W., Staelin, R., Ehret, M., & Johnston, W.J. (2005). A customer relationship management roadmap: What is known, potential pitfalls, and where to go. *Journal of Marketing, 69*(4), 155–166. https://doi.org/10.1509/jmkg.2005.69.4.155

Cao, G., Tian, N., & Blankson, C. (2021). Big data, marketing analytics, and firm marketing capabilities. *Journal of Computer Information Systems*. Advance online publication. https://doi.org/10.1080/08874417.2020.1842270

Côrte-Real, N., Oliveira, T., & Ruivo, P. (2017). Assessing business value of big data analytics in European firms. *Journal of Business Research, 70*, 379–390. https://doi.org/10.1016/j.jbusres.2016.08.011

Crosby, L.A., Evans, K.R., & Cowles, D. (1990). Relationship quality in services selling: An interpersonal influence perspective. *Journal of Marketing, 54*(3), 68–81. https://doi.org/10.1177/002224299005400306

Demil, B. & Lecocq, X. (2015). Crafting an innovative business model in an established company: The role of artifacts. In *Business Models and Modelling: Advances in Strategic Management* (pp. 31–58), Emerald Group Publishing Limited. https://doi.org/10.1108/S0742-332220150000033003

Dekimpe, M.G., Geyskens, I., & Gielens, K. (2020). Using technology to bring online convenience to offline shopping. *Marketing Letters, 31*(1), 25–29. https://doi.org/10.1007/s11002-019-09508-5

Della Corte, V., & Del Gaudio, G. (2014). A literature review on value creation and value capturing in strategic management studies. *Corporate Ownership & Control, 11*(2), 328–346. https://doi.org/10.22495/cocv11i2c3p2

De Luca, L.M., Herhausen, D., Troilo, G., & Rossi, A. (2021). How and when do big data investments pay off? The role of marketing affordances and service innovation. *Journal of the Academy of Marketing Science, 49*(4), 790–810. https://doi.org/10.1007/s11747-020-00739-x

Dwityas, N.A., Briandana, R., & Aulia, P. (2020). Consumer journey of culinary products through social media in Indonesia. *Humanities & Social Sciences Reviews, 8*(1), 306–314. https://doi.org/10.18510/hssr.2020.8141

Erevelles, S., Fukawa, N., & Swayne, L. (2016). Big Data consumer analytics and the transformation of marketing. *Journal of Business Research, 69*(2), 897–904. https://doi.org/10.1016/j.jbusres.2015.07.001

Fernando, Y., Chidambaram, R.R., & Wahyuni-TD, I.S. (2018). The impact of Big Data analytics and data security practices on service supply chain performance. *Benchmarking: An International Journal, 25*(9), 4009–4034. https://doi.org/10.1108/BIJ-07-2017-0194

Firestein, S. (2012). *Ignorance: How it drives science*. Oxford University Press.

Fornell, C., & Larcker, D.F. (1981). Evaluating Structural equation models with unobservable variables and measurement error. *Journal of Marketing Research, 18*(1), 39–50. https://doi.org/10.1177/002224378101800104

Füller, J., & Matzler, K. (2007). Virtual product experience and customer participation—A chance for customer-centred, really new products. *Technovation, 27*(6-7), 378–387. https://doi.org/10.1016/j.technovation.2006.09.005

Gemser, G., & Perks, H. (2015). Co-creation with customers: An evolving innovation research field. *Journal of Product Innovation Management, 32*(5), 660–665. https://doi.org/10.1111/jpim.12279

George, G., Osinga, E.C., Lavie, D., & Scott, B.A. (2016). Big data and data science methods for management research. *Academy of Management Journal, 59*(5), 1493–1507. https://doi.org/10.5465/amj.2016.4005

González-Serrano, L., Talón-Ballestero, P., Muñoz-Romero, S., Soguero-Ruiz, C., & Rojo-Álvarez, J.L. (2021). A big data approach to customer relationship management strategy in hospitality using multiple correspondence domain description. *Applied Sciences, 11*(1), 256–275. https://doi.org/10.3390/app11010256

Grégoire, Y., & Fisher, R.J. (2006). The effects of relationship quality on customer retaliation. *Marketing Letters, 17*(1), 31–46. https://doi.org/10.1007/s11002-006-3796-4

Grishikashvili, K., Dibb, S., & Meadows, M. (2014). Investigation into big data impact on digital marketing. *Online Journal of Communication and Media Technologies, 4*(October 2014 – Special Issue), 26–37. https://doi.org/10.30935/ojcmt/5702

Hair, J.F., Sarstedt, M., Ringle, C.M., & Gudergan, S.P. (2017). *Advanced issues in partial least squares structural equation modeling*. Sage Publications.

Hidayat, A.R., & Asmara, A.Y. (2017). Creative industry in supporting economy growth in Indonesia: Perspective of regional innovation system. *IOP Conference Series: Earth and Environmental Science* (Vol. 70, No. 1, p. 012031). IOP Publishing.

Hu, Y., Manikonda, L., & Kambhampati, S. (2014, June 1-4). *What we Instagram: The first analysis of Instagram photo content and user types* [Conference Presentation]. Eighth International AAAI Conference on Weblogs and Social Media. Ann Arbor, Michigan, USA.

Huntley, J.K. (2006). Conceptualization and measurement of relationship quality: Linking relationship quality to actual sales and recommendation intention. Industrial Marketing Management, 35(6), 703–714. *https://doi.org/10.1016/j.indmarman.2005.05.011*

Indonesia Central Bureau of Statistics (2018). *Perkembangan Beberapa Indikator Utama Sosial-Ekonomi Indonesia Agustus 2018*. https://www.bps.go.id/publication/2018/11/06/90b3bb70fb2b94def26d0326/perkembangan-beberapa-indikator-utama-sosial-ekonomi-indonesia-agustus-2018.html

International Data Corporation. (2016). *Worldwide big data and business analytics revenues forecast to reach $187 billion in 2019*.

Jabbar, A., Akhtar, P., & Dani, S. (2020). Real-time big data processing for instantaneous marketing decisions: A problematization approach. *Industrial Marketing Management, 90*, 558–569. https://doi.org/10.1016/j.indmarman.2019.09.001

Kazadi, K., Lievens, A., & Mahr, D. (2016). Stakeholder co-creation during the innovation process: Identifying capabilities for knowledge creation among multiple stakeholders. *Journal of Business Research, 69*(2), 525–540. https://doi.org/10.1016/j.jbusres.2015.05.009

Kwon, O., Lee, N., & Shin, B. (2014). Data quality management, data usage experience and acquisition intention of big data analytics. *International Journal of Information Management, 34*(3), 387–394. https://doi.org/10.1016/j.ijinfomgt.2014.02.002

Kumar, A., Shankar, R., & Aljohani, N.R. (2020). A big data driven framework for demand-driven forecasting with effects of marketing-mix variables. *Industrial Marketing Management, 90*, 493–507. https://doi.org/10.1016/j.indmarman.2019.05.003

Kumar, V., & Reinartz, W. (2018). *Customer relationship management*. Springer-Verlag.

Lansley, G., & Longley, P. (2016). Deriving age and gender from forenames for consumer analytics. *Journal of Retailing and Consumer Services, 30*, 271–278. https://doi.org/10.1016/j.jretconser.2016.02.007

Leung, R., & Loo, P.T. (2020). Co-creating interactive dining experiences via interconnected and interoperable smart technology. *Asian Journal of Technology Innovation*, 1–23. https://doi.org/10.1080/19761597.2020.1822748

Masige, S. (2020, March 11). A look back at the Aussie retailers which have collapsed or gone into administration over the past few years. *Business Insider*. https://www.businessinsider.com.au/australia-retail-collapse-2020-1

Matthias, O., Fouweather, I., Gregory, I., & Vernon, A. (2017). Making sense of big data–can it transform operations management? *International Journal of Operations & Production Management, 37*(1), 37–55. https://doi.org/10.1108/IJOPM-02-2015-0084

McAfee, A., Brynjolfsson, E., Davenport, T.H., Patil, D.J., & Barton, D. (2012). Big data: The management revolution. *Harvard Business Review, 90*(10), 60–68.

Mehra, T., Agarwal, I., & Swami, S. (2018). Ephemeral marketing: Conceptualization and measurement of its effectiveness in the restaurant industry. *Asian Journal of Management, 9*(1), 87–91. https://doi.org/10.5958/2321-5763.2018.00013.6

Muizu, W.O.Z., & Yudomartono, H. (2016). Competency development of culinary creative industries. *Academy of Strategic Management Journal*, 15, 67–72.

Najafi-Tavani, S., Sharifi, H., & Najafi-Tavani, Z. (2016). Market orientation, marketing capability, and new product performance: The moderating

role of absorptive capacity. *Journal of Business Research, 69*(11), 5059–5064. https://doi.org/10.1016/j.jbusres.2016.04.080

Pantano, E., Giglio, S., & Dennis, C. (2020). Integrating big data analytics into retail services marketing management: The case of a large shopping center in London, UK. In S. Dadwal (Ed.), *Handbook of Research on Innovations in Technology and Marketing for the Connected Consumer* (pp. 205–222). IGI Global.

Purwantini, A.H., & Anisa, F. (2018). Anteseden dan Konsekuen Penggunaan Media Sosial Bagi UMKM: Analisis Perspektif Organisasi. *Jurnal Ekonomi dan Bisnis, 19*(3), 12–23.

Rafiq, M., Fulford, H., & Lu, X. (2013). Building customer loyalty in online retailing: The role of relationship quality. *Journal of Marketing Management, 29*(3–4), 494–517. https://doi.org/10.1080/0267257X.2012.737356

Raguseo, E. (2018). Big data technologies: An empirical investigation on their adoption, benefits and risks for companies. *International Journal of Information Management, 38*(1), 187–195. https://doi.org/10.1016/j.ijinfomgt.2017.07.008

Rashidirad, M., & Salimian, H. (2020). SMEs' dynamic capabilities and value creation: the mediating role of competitive strategy. *European Business Review, 32*(4), 591–613. https://doi.org/10.1108/EBR-06-2019-0113

Rekarti, E., & Doktoralina, C.M. (2017). Improving business performance: A proposed model for SMEs. *European Research Studies Journal, 20*(3), 613–623. https://doi.org/10.35808/ersj/73

Ridwan Maksum, I., Yayuk Sri Rahayu, A., & Kusumawardhani, D. (2020). A social enterprise approach to empowering micro, small and medium enterprises (SMEs) in Indonesia. *Journal of Open Innovation: Technology, Market, and Complexity, 6*(3), 50–67. https://doi.org/10.3390/joitmc6030050

Rubin, V., & Lukoianova, T. (2013). Veracity roadmap: Is big data objective, truthful and credible? *Advances in Classification Research Online, 24*(1), 4–15. http://doi.org/10.7152/acro.v24i1.14671

Ruiz-Molina, M.-E., Gil-Saura, I., & Berenguer-Contrí, G. (2014). Information and communication technology as a differentiation tool in restaurants. *Journal of Foodservice Business Research, 17*(5), 410–428. https://doi.org/10.1080/15378 020.2014.967639

Rust, R T., & Huang, M.H. (2014). The service revolution and the transformation of marketing science. *Marketing Science, 33*(2), 206–221. https://doi.org/10.1287/mksc.2013.0836

Saggi, M.K., & Jain, S. (2018). A survey towards an integration of big data analytics to big insights for value-creation. *Information Processing & Management, 54*(5), 758–790. https://doi.org/10.1016/j.ipm.2018.01.010

Sanders, N.R. (2014). *Big data driven supply chain management: A framework for implementing analytics and turning information into intelligence*. Pearson Education.

Sellappan, P., & Shanmugam, K. (2021). Delineating entrepreneurial orientation efficacy on retailer's business performance. *Management Decision, 59*(4), 858–876. https://doi.org/10.1108/MD-01-2019-0062

Sharma, A., & Pandey, H. (2020). Big data and analytics in industry 4.0. In A., Nayyar, & A. Kumar (Eds.), *A roadmap to Industry 4.0: Smart production, sharp business and sustainable development* (pp. 57–72). Springer. https://doi.org/10.1007/978-3-030-14544-6_4

Smals, R.G., & Smits, A.A. (2012). Value for value — The dynamics of supplier value in collaborative new product development. *Industrial Marketing Management, 41*(1), 156–165. https://doi.org/10.1016/j.indmarman.2011.11.022

Sudiwijaya, E., & Ambardi, K. (2021). E-Commerce strategy in driving sharing economy in culinary industry. *Komunikator, 13*(1), 52–65. https://doi.org/10.18196/jkm.131050

Sun, S., Cegielski, C.G., Jia, L., & Hall, D.J. (2018). Understanding the factors affecting the organizational adoption of big data. *Journal of Computer Information Systems, 58*(3), 193–203. https://doi.org/10.1080/08874417.2016.1222891

Suoniemi, S., Meyer-Waarden, L., Munzel, A., Zablah, A.R., & Straub, D. (2020). Big data and firm performance: The roles of market-directed capabilities and business strategy. *Information & Management, 57*(7), Article 103365. https://doi.org/10.1016/j.im.2020.103365

Taher, M. (2012). Resource-based view theory. In Y. Dwivedi, M. Wade, & S. Schneberger (Eds.), *Information systems theory. Integrated series in information systems*, vol. 28. (pp. 151–163). Springer. https://doi.org/10.1007/978-1-4419-6108-2_8

Tajvidi, M., Wang, Y., Hajli, N., & Love, P. E. (2021). Brand value co-creation in social commerce: The role of interactivity, social support, and relationship quality. *Computers in Human Behavior, 115*, Article 105238. https://doi.org/10.1016/j.chb.2017.11.006

Talón-Ballestero, P., González-Serrano, L., Soguero-Ruiz, C., Munoz-Romero, S., & Rojo-Álvarez, J.L. (2018). Using big data from customer relationship management information systems to determine the client profile in the hotel sector. *Tourism Management, 68*, 187–197. https://doi.org/10.1016/j.tourman.2018.03.017

Van Rijmenam, M. (2014). *Think bigger: Developing a successful big data strategy for your business*. Amacom.

Watson, H.J. (2014). Tutorial: Big data analytics: Concepts, technologies, and applications. *Communications of the Association for Information Systems, 34*(1), 1191–1208. https://doi.org/10.17705/1CAIS.03462

Wisker, Z.L. (2020). Examining relationship quality in e-tailing experiences: A moderated mediated model. *Marketing Intelligence & Planning, 38*(7), 863–876. https://doi.org/10.1108/MIP-05-2019-0284

Wong, C.Y., & Karia, N. (2010). Explaining the competitive advantage of logistics service providers: A resource-based view approach. *International*

Journal of Production Economics, 128(1), 51–67. https://doi.org/10.1016/j.ijpe.2009.08.026

Xu, Z., Frankwick, G.L., & Ramirez, E. (2016). Effects of big data analytics and traditional marketing analytics on new product success: A knowledge fusion perspective. *Journal of Business Research, 69*(5), 1562–1566. https://doi.org/10.1016/j.jbusres.2015.10.017

Zacharias, N.A., Nijssen, E.J., & Stock, R.M. (2016). Effective configurations of value creation and capture capabilities: Extending Treacy and Wiersema's value disciplines. *Journal of Business Research, 69*(10), 4121–4131. https://doi.org/10.1016/j.jbusres.2016.03.039

Zhu, J., Jiang, L., Dou, W., & Liang, L. (2019). Post, eat, change: The effects of posting food photos on consumers' dining experiences and brand evaluation. *Journal of Interactive Marketing, 46*, 101–112. https://doi.org/10.1016/j.intmar.2018.10.002

Appendix 1

Sample of Items Used in the Questionnaire

Big Data Marketing

Our firm captures data from social media sites to tailor services precisely to meet customer needs.

Our firm analyses interrelationships among functional areas using computation power

Our firm draws on large data sets (product complaints, sales, advertisement, customer satisfaction polling, etc.) to identify pattern to make economic values.

Our firm maximizes algorithmic accuracy to analyse large data sets.

Our firm analyses purchase transaction records based on variety sources/ formats including cell phones GPS signals to track changes in consumer behavior.

In our firm, we have access to very large, unstructured, or fast-moving data for analysis.

We integrate marketing data from multiple internal sources into a data warehouse or mart for easy access.

We integrate external data with internal to facilitate high-value analysis of our market environment.

Relationship Quality

Overall, I'm extremely dissatisfied/overall extremely satisfied.

My expectations were not met at all/my expectations were exceeded.

I believe that this vendor is consistent in quality and service.

I believe that this vendor is keen to fulfil my needs and wants.

I believe that this vendor is honest.

I believe that this vendor wants to be known as one that keeps promises and commitments.

Value Creation

In our company, the generation of innovations is supported by

 … variations of processes.

 … planned experimentation.

 … the playful use of processes.

In our company, the generation of innovations is supported by

 … in-house search for solutions.

 … experience-based process improvements.

 … processes of selection and reuse of existing routines.

In general, we carry out extensive internal adjustments to work effectively with our customers.

In general, developing our employees (e.g., training) to work effectively with our customers is very costly and time-consuming.

In general, our logistics systems are adjusted to work effectively with our customers.