International Review of Management and Marketing

ISSN: 2146-4405

available at http: www.econjournals.com

International Review of Management and Marketing, 2026, 16(1), 226-237.

Data Driven Culture and Firm Performance: The Mediating Role of Customer Centric Innovation and Customer Loyalty

Mohammad Wasiq*

College of Administrative and Financial Sciences, Saudi Electronic University, Riyadh 11673, Saudi Arabia.
*Email: m.ahmad@seu.edu.sa

Received: 24 June 2025 **Accepted:** 12 October 2025 **DOI:** https://doi.org/10.32479/irmm.21428

ABSTRACT

The mechanism through which data driven culture enhances customer loyalty and firm performance has been unexplored and limited. In light of this research gap, this study examines the mechanism through which data driven culture enhances customer loyalty and firm performance by shedding light on the role of customer centric innovation. Therefore, the main aim of this study is to explore the mechanism of developing customer loyalty and firm performance based on data driven culture and customer centric innovation. With the help of resource-based view and dynamic capability theory, a conceptual model has been developed and validated with 389 responses from the owners of the SMEs. The study highlighted that data driven culture has a significant effect on customer centric innovation, customer loyalty and firm performance. Customer centric innovation had a positive effect on the customer loyalty and firm performance. Customer centric innovation has a mediating effect on the relationship between data driven culture and firm performance. Furthermore, Customer loyalty had a significant effect on the firm performance. In addition, customer loyalty had a mediating effect on the relationship between data driven culture and firm performance.

Keywords: Data Driven Culture, Firm Performance, Customer Centric Innovation, Customer Loyalty
JEL Classifications: M10, M30

1. INTRODUCTION

Recently, customer centric philosophy is emerged as a priority for firms (Osakwe, 2019). According to Palacios-Marques et al. (2016) customer centric strategy in firms gives a higher perceived value to customers and at same time it increases customer satisfaction, loyalty and trust and ensure a long-term relationship with customers. In theory, customer centricity centres around understanding and satisfying the needs and wants of customers (Sheth et al., 2000). Previous studies have demonstrated the role of customer centricity for the benefits of firm including loyalty (Habel et al., 2020), product innovation (Kwok and Tang, 2023; Chaundhuri et al. 2021), service innovation (van Riel et al., 2021), innovation success (Nik Hashim et al., 2022) and profitability (López-Cabarcos et al., 2020). Habel et al. (2020) revealed that for a firm to achieve competitive advantage, it must be a customer-centric and customer-centricity can be achieved by customer-centric organisational culture. Empirically, there is limited research on factors or constraints that affect SMEs in adopting customer-centric approach that drive innovation. Even though the benefits of customer-centric innovation for SMEs are enormous, not many SMEs have adopted customer-centric innovation approach in India. Customer-centric innovation is essential for SMEs because it has many benefits such as customer loyalty, firm performance etc. SMEs are essential for Indian economy as they constitute 90% of the industrial ecosystem, 45% of manufacturing sector and 40% of Indian exports. Further, 37% of India's gross development products (GDP) are comes from SMEs (Baker et al., 2020). Besides, its contribution, many SMEs are facing different challenges such as lack of innovation, skilled employees, shortage of funds etc. Gunjati and Adake (2020) highlighted that if SMEs have the ability to innovate, based on customer centric approach, they can gain competitive advantage.

As mentioned earlier customer-centricity can be achieved by customer-centric organisational culture and customer-centric organisational culture can be achieved by implementing data driven culture (Yu et al., 2021). Becoming data-driven is one of the top most priorities of organizations (Storm and Borgman, 2020). Chatterjee et al. (2021) state that data driven culture (DDC) is a cultural transformation of a firm in a business-oriented landscape. Following, Kiron et al. (2013), DDC is a culture of belief that having, understanding, and using certain types of data with useful information plays a vital role in the success of a firm. Chatterjee et al. (2021) revealed that DDC enhance firm's product and process innovations. Several firms have adopted big data tools to improve their business performance. This has bought radical changes in business culture of firms to arrive at accurate decision to improve their innovation and performance (Chatterjee et al., 2021). Recent study of Gandhi et al. (2021) highlighted that in business environment, understanding of customer behaviour is important, as customers are an important part of planning and execution. Therefore, it is essential for business to be customer centric. SMEs need to harness data driven culture for innovation based on customer centric approach to foster loyalty and firm performance. Therefore, this study assumes that those SMEs who are customer centric and perform innovation based on DDC are likely to foster customer loyalty and firm performance.

Previous studies have explored the impact of DDC and FP (Chatterjee et al., 2021; Karaboga et al., 2023; Awan et al. 2021). However, the mechanism through which DDC enhances CL and FP has been unexplored and limited. In light of this research gap, this study examines the mechanism through which DDC enhances CL and FP by shedding light on the role of CCI. Therefore, the main aim of this study is to explore the mechanism of developing CL and FP based on DDC and CCI. Hence, the paper focuses on the relationship between DDC, CL, and FP. It emphasizes the understanding of, how DDC enhance CL and FP, particularly through the lens of CCI, which prioritizes customer needs and preferences. In this way, the enhancement of CL and FP based on DDC and CCI can be better understood. Specifically, the author wants to answer the following research questions: (1) How does DDC influence CCI, CL and FP? (2) How does CCI influence CL and FP? (3) How does CL influence FP? (4) To what extent CCI and CL mediates between DDC, CL and FP? By answering the research questions, our study offers several theoretical and managerial contributions. First, it enhances theoretical knowledge by advancing our understanding on the role of DDC and CCI in enhancing CL and FP, thereby filling a notable voids in the literature. Second, it offers practical implications for SME owners, policy makers and marketers. By identifying the mediating mechanisms involved, this study can enhance the development of CL and FP of Indian SMEs.

2. THEORETICAL FRAMEWORK AND HYPOTHESES DEVELOPMENT

2.1. Data Driven Culture and Customer Centric Innovation

Due to globalisation and digital transformation the needs and demands of customers are constantly changing, to meet the needs and demands of customers, companies need to innovate constantly. According to Castaneda and Cuellar (2020) innovation reflects organisation capacities to maintain competitive advantage. A newly introduced service or product becomes an innovation when it meets customer needs and preferences (Kusiak, 2009). In the words of Robertsone and Lapiņa (2023) innovations are the collection of meaningful and impactful ideas that help companies become more efficient. Brodny and Tutak (2024) highlighted that innovation and digitalisation are essential for knowledge-based economy. Bašić (2021) revealed that innovation must be flexible and firms access knowledge in timely manner. Chatterjee et al. (2021) argued that for innovation, company needs data or information which helps a firm to develop new product in order to meet the needs and demands of customers (Matriano and Khan 2019). A firm can get benefits by assessing big data and convert data insights into innovation (Trabucchi and Buganza, 2019). Likewise, the study of Urbinati et al., (2018) highlighted that digital transformation is an enabler of innovation and many firms used digital technologies to manage innovation (Elfaki and Ahmed 2024). With the advancement in big data, the firm's innovations increased. Luo (2022) stated that future of innovation is based on data-driven insights, empowered by a customer-centric approach (Upadhyay and Kumar (2020). Managers can get benefits of converting knowledge from big data to open innovation (Yun et al., 2020). According to Del Vecchio et al. (2018) big data are come from outside boundaries of firm and represents an emerging opportunity of open innovation (Xie et al., 2021). Industries are interested in the use of big data for innovation to develop the needs and wants of customers (Fosso Wamba et al. 2020). Ultimately, the data has the capability or potential on value creation and thus have a significant impact on business models (Eriksson and Heikkilä, 2023). The emerging opportunity from data insights helps firms retain and attract new customers by identifying customer needs, allowing firms to modify products based on customers' needs and preferences (Khurana et al., 2022; Huang et al., 2020). From the perspective of resource based view (RBV) theory, DDC and customer insights are a valuable resources that can be used effectively to develop innovative solutions that meet the needs of customers. Thus, we believed that DDC is vital for organisations and can impact innovation based on customer centric approach and propose the following hypothesis:

H_1: DDC has a positive and significant impact on CCI.

2.2. Data Driven Culture and Customer Loyalty

The main aim of any organisation is to create and improve the value of customer (Stank et al., 2001). According to customer retention and customer loyalty are the key to the survival of organisations (Blank, 2020). However, the customer needs and demands are dynamic and it is the organisation that are able to meet the needs of customers (Asamoah et al., 2021; Wang and Ngai 2023). In recent times, many organisations have turned to big data but to leverage big data, DDC is required (Anderson, 2015). Organisations develop a DDC in order to gain an insight into their business environments and customers with a hope of customer development (Asamoah et al., 2021). The use of digital technologies is essential for economic growth. highlighted that innovation culture is essential to survive in digital environment (Salah and Ayyash, 2024). Previous studies have highted that companies with high DDC are likely to obtain better customer

results (Hallikainen et al., 2020). Modern customers are powerful, sophisticated and knowledgeable. The prefer companies who directly address their needs (Grandhi et al., 2021). Additionally, this consumer is categorised by ever-changing buying behaviour which necessitates the identification of customers and their buying patterns (Nadler and McGuigan, 2018). As a result, digitalization and marketing analytics are crucial component in current marketing environment. Marketers view big data as a essential tool which helps them to formulate the marketing strategies. Marketers leverage big data to understand customers, and sales promotions (Rosário and Dias, 2023). Rosário and Dias (2023) reveal that many companies use data-driven marketing and connect with audiences to build trust and CL, translating into sales and profit. Wassouf et al. (2020) shown that telecom operator not only focused on profitability but also focused on CL. The emergence of big data helps to describe customer behaviour, sales pattern and build long term loyalty relationship. Rane et al. (2023) shown that CL can be enhance through Artificial Intelligence (AI), Internet of Things (IoT), and Big Data Technologies. Venkateswaran et al. (2024) also highlighted that AI enhance marketing and CL. Thus, based on the above discussion, we hypothesize the following:

H_2: DDC has a positive and significant impact on CL.

2.3. Data Driven Culture and Firm Performance

The role of DDC towards FP is widely recognised (Anton et al., 2023) and DDC is expected to enhance FP (Agyei-Owusu et al., 2021). Many firms have applied data driven approach and leverage data insights to identify new opportunities, improve operations, better serve customers and more (Mikalef et al., 2019). Using data drive approach, companies can make evidence based decision making to pursue their goals (Awan et al., 2021). Business leaders in DDC understand the benefits of relying on data insights to move business. Organisations can use data to determine what customer prefers (Martínez-Caro et al., 2020). Further, insights based on data help companies to innovate product or process to meet the needs of customers. In competitive environment data plays an important role in identifying and translating the data into opportunities (Chatterjee et al., 2021). By leveraging data, companies can develop sales and marketing strategies that can improve FP (Suoniemi et al., 2020). Overall, DDC can create plenty of opportunities for business including innovation, creativity, productivity, informed decision making etc. Chatterjee et al. (2021) stated that DDC increase the firm's data scanning capability. Furthermore, to meet the dynamic needs of market, DDC is helpful to understand the market needs, this is supplemented by dynamic capability theory (DCT). Many empirical studies have highlighted that DDC is an emerging driver of organisational performance (Chatterjee et al., 2021; Agyei-Owusu et al., 2021). Thus, based on the above discussion, we hypothesize the following:

H_3: DDC has a positive and significant impact on FP.

2.4. Customer Centric Innovation and Customer Loyalty

Companies introduce products in the market that meet customer needs and resolve their issues (Tuominen et al., 2022). CCI is a process or product innovation, with customers being the heart of the process. Auer (2023) argued that CCI is a powerful driver of the success of a firm that places the needs and desires of customers first. According to Chang (2022), companies innovate based on customers' need for better experiences. Tuominen et al. (2022) argue that customer needs are essential to address for product or service innovation. In addition, when a company engage customers in product innovation it foster a sense of ownership and loyalty among customers (Tuominen et al., 2022). Building a loyal customer is the main motive of every firms for growth, customer centricity foster loyalty by creating a meaningful and long lasting relationships. When customer feel they are valued, they are more likely to remain loyal to firms (Habel et al., 2020). SMEs take advantage of digital tools and increase their capability for innovation (Priyono and Hidayat, 2024). However, many companies fail due to a lack of understanding of customer needs, resulting in the creation of products that do not meet market needs (Dash, 2024). The customer R&D process is the heart of CCI, who deals with "who are their customers" are and "what they need." Companies that focus on customer R&D processes engage with customers and propel the innovation that drives CL (Selden and MacMillan, 2006). Chang (2022) believed that brands that constantly engage customers and innovate products that fit customers and market needs would gain trust and CL. Auer (2023) argues that by focusing on CCI based on needs, a firm can gain trust, enhance customer satisfaction, and achieve CL. The empirical study of Kim et al. (2016) concluded that the CCI strategy is a key determinant of brand loyalty. Overall, customer centric strategy is helpful for firms to maintain continuous growth. Based on the above discussion, we hypothesize the following.

H_4: CCI has a positive and significant impact on CL.

2.5. Customer Centric Innovation and Firm Performance

Academics and managers belief that customer centric approach nurture customer relationships, enhance customer value, customer satisfaction and firm performance (Lee et al., 2012). According to Gupta and Ramachandran (2021) customer centric approach is a strategy for firms to survive and compete. Osakwe (2020) highlighted many benefits of customer centric approach to firms. CCI is a combination of customer centricity and innovation power (Debruyne, 2014). Many companies use CCI to increase their business value (Wechsler and Schweitzer, 2019). In this competitive world, CCI is important for the design and development of products that fit the needs and preferences of customers (Kwok and Tang, 2023). Passi and Das (2023) argued that knowing customers and uncovering insights are the foundation of innovation. However, Kurtmollaiev et al. (2022) argued that for innovation, customers are judges, and their opinions are rarely listened to. Hampton et al. (2022) demonstrated that the adoption of CCI is necessary for profitability. López-Cabarcos et al. (2020) highlight the significant role of customer centricity and innovation in transferring tacit and explicit knowledge into profitability. Similarly, Tuominen et al. (2022) concluded that innovation based on customer needs is likely to enhance customer satisfaction and retention, which ultimately improves FP. Similarly, Habel et al. (2022; Zengin 2019) conclude that firms can increase their performance based on a customer-centric strategy. Chen et al. (2013) also showed that CCI is positively associated with FP. Based on the above discussion, we hypothesize the following.

H_5: CCI has a positive and significant impact on FP.

2.6. Customer Loyalty and Firm Performance

In marketing literature, CL is a more researched topic in marketing literature. To be competitive, sustaining the CL is essential (Cui et al., 2023). CL can be understood as customers' favorable behavior towards a company (Molinillo et al., 2022). CL plays a vital role in FP (Elgarhy, 2023). Managers pay more attention to loyal customers, as they believe that loyal customers spend more than new ones (Ullah, 2022). More attention has been paid to the link between CL and FP (Agag et al., 2023). Lina (2022) argues that customers become loyal when their emotional needs are met. Alyahya et al. (2023) stated that to improve CL, firms need to provide superior service as compared to their competitors during intersections at every touch point. In this regard, Manyanga et al. (2022) revealed that many firms put effort into turning ordinary customers into loyal ones. On the other hand, losing CL has a profound impact on FP because it reduces customer satisfaction and trust (Utz et al., 2023). Therefore, many firms have implemented strategies such as artificial intelligence chatbots and loyalty programs to sustain CL (Chen et al., 2023). The empirical study by Ismail (2023) concludes that CL has a positive and significant effect on the FP of SMEs. In the context of airline industry, the study of Vilkaitė-Vaitonė and Papšienė (2016) found that CL program has a significant effect on FP. Based on the above discussion, we hypothesize the following.

H_6: CL has a positive and significant impact on FP.

2.7. Mediating Role of Customer Centric Innovation on Link between Data Driven Culture and Customer Loyalty

A DDC uses data insights for the decision making and behavior of customers and preferences (Hannila et al., 2022; Elgendy et al., 2022). With the adoption of a DDC, a deeper understanding of its customer base is cultivated, which must be effectively translated into meaningful innovations that cater to customer needs and preferences (Chatterjee et al., 2021). This is where the customer centric approach comes into play. Wechsler and Schweitzer (2019) stated that through CCI, businesses can refine and personalize their offerings based on insights derived from data analysis (Aziz et al. 2023). Consequently, when customers perceive that a company consistently innovates with their interests in mind, they are more likely to develop a sense of loyalty (Molinillo et al., 2022). This loyalty manifests in repeat purchases, positive word-of-mouth, and a greater willingness to advocate for the brand (Belhadi et al., 2023; Khan et al., 2023). Finally, the study proposes that data insights obtained from DDC enhance FP by intervening in the role of CCI. Therefore, the mediating role of CCI bridges the gap between data-driven insights and the ultimate goal of fostering CL, thereby demonstrating the interdependence of these concepts in modern business strategies. Based on the above discussion, we hypothesize the following.

H_7: CCI mediates on link between DDC and CL.

2.8. Mediating Role of Customer Centric Innovation on Link between Data Driven Culture and Firm Performance

A DDC is characterized by organizational commitment and leadership support to leverage data for strategic planning and informed decision making (Bratasanu, 2018; Teng et al., 2023; Colombari et al., 2023). It permits businesses to gain valuable insights into customer behavior, market trends, and operational efficiency (Hannila et al., 2022; Elgendy et al., 2022). However, the mere accumulation of data without effective translation into tangible innovations that resonate with customers (Anton et al., 2023). This is where the CCI steps in. Kwok and Tang (2023) stated that when a company places the customer at the center of its innovation efforts, it ensures that its offerings are not only data-informed, but also highly relevant and valuable. This, in turn, enhances customer satisfaction, loyalty, and advocacy (Hotha, 2023; Syauqi et al., 2023). Consequently, this suggests that CCI serves an intervening role that transforms data-driven insights into tangible business outcomes. By aligning DDC with CCI, companies are better positioned to drive FP through increased customer retention, higher revenue streams, and strengthened market position. This dynamic interplay underscores the importance of integrating data-driven practices with customer centricity to achieve sustainable business success. Based on the above discussion, we hypothesize the following.

H_8: CCI mediates on link between DDC and FP.

2.9. Mediating Role of Customer Loyalty on Link between Data Driven Culture and Firm Performance

A DDC empowers organizations to make informed decisions based on data insights, leading to strategic advantages and improved operational efficiencies (Teng et al., 2023; Delaney and Kitchin, 2023; Hu et al., 2023). However, the true impact of these data-driven efforts is fully realized when they result in an increased CL. When customers perceive that a company is making an effort to personalize their experiences, cater to their needs, and consistently deliver high-quality products or services, they are more likely to develop a strong sense of attachment and trust towards the brand (Alhaddad, 2015). In turn, this loyalty drives positive outcomes such as higher customer retention rates, increased customer lifetime value, and positive word-of-mouth referrals (Thomas et al., 2023). Moreover, loyal customers often advocate for the brand, further driving new customer acquisition (Javed et al., 2023). As an intervening role, CL effectively amplifies the positive effects of DDC on FP. It solidifies the link between data-driven strategies and tangible business results, ultimately contributing to enhanced revenue streams, sustained growth, and strengthened market position. Thus, the intervening role of CL is crucial for realizing the full potential of a DDC in driving overall business success. Based on the above discussion, we hypothesize the following.

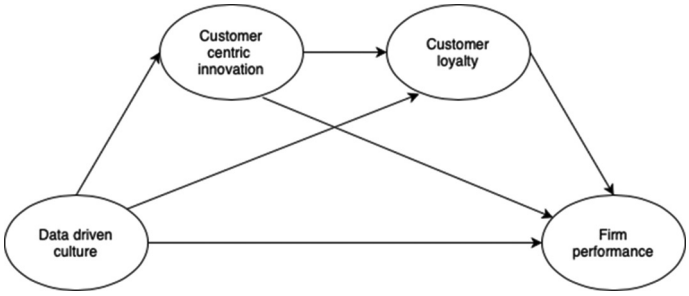
H_9: CL mediates on link between DDC and FP.

3. METHODOLOGY

3.1. Conceptual Framework

Previous studies have explored the impact of DDC and FP (Chatterjee et al., 2021; Karaboga et al., 2023; Awan et al., 2021). However, the mechanism through which DDC enhances CL and FP has been unexplored and limited. In light of this research gap, this study examines the mechanism through which DDC enhances CL and FP by shedding light on the role of CCI. Hence the conceptual framework suggested in Figure 1 is able to enhances CL and FP by shedding light on the role of DDC and CCI. The framework shown

Figure 1: Conceptual framework



in Figure 1 has one independent variable (DDC), one dependent variable (FL) and two mediators (CCI and CL).

3.2. Sample Description

The study population comprised Indian manufacturing firms operating in the Delhi/NCR. Manufacturing firms were selected because the manufacturing sector is a significant contributor to GDP and plays a crucial role in a country's economic development. Another reason for selection is that the Indian manufacturing landscape has witnessed the rapid adoption of technologies such as IoT, automation, AI, and data analytics. This technology-driven transformation provides fertile ground to explore the impact of DDC on FP, as well as the role of CCI and CL in this context.

The study data were obtained from the Ministry of Micro, Small, and Medium Enterprises, Delhi. The literature review and feedback from professors and experts led to the development of questionnaires that were distributed to 492 SMEs. The SME owners were surveyed using a purposive sampling technique. The owners of the SMEs were surveyed because they have the authority to make decisions and possess knowledge, thus making them more suitable for participating in a survey. To receive responses, the authors personally visited SMEs and convince owners to participate in a survey. Overall, 389 responses were received over a period of four months, after which 22 responses were eliminated due to incomplete responses. This in line with the assumption of Krejcie and Morgan (1970), stated that 384 sample size is sufficient representation of population. Finally, 367 responses were retained for the data analysis. The demographic profiles of owners are shown in Table 1.

Based in Table 1, it is observed that 64% respondents were male, and 35.9% respondents are female. On the basis of age, 25% respondents are belonging to age group of 31-35 years, 35.1% respondents are belongs to age group of 36-40 years while 39.7% respondents are belongs to age group of above 40 years. According to qualifications, 56.9% respondents were graduates and 43% respondents are postgraduates. Based on experience, 38.9% respondents have experience of 5-10 years, and 61% respondents have experience of 10-20 years. Furthermore, non-response bias was checked by evaluating *t*-statistics according to the guidance of Armstrong and Overton (1977). No significant difference was found between early and new responses.

3.3. Research Instrument

All the instruments were adapted from previous studies. The scoring of all items was based on a five-point Likert scale ranging from 1 ("strongly disagree" to 5 "strongly agree").

Table 1: Demographic profile of respondents

Variable	Frequency (%)
Gender (n=367)	
Male	235 (64.0)
Female	132 (35.9)
Age (n=367)	
31-35	92 (25.0)
36-40	129 (35.1)
Above 40 years	146 (39.7)
Qualification (n=367)	
Graduate	209 (56.9)
Postgraduate	158 (43.0)
Experience (n=367)	
5-10 years	143 (38.9)
10-20 years	224 (61.0)

DDC was measured by adapting four items from Agyei-Owusu et al. (2021). A sample item includes as "Our organization has the data it needs to make decisions."

Customer-centric innovation (CCI) was measured by adapting five items from Kim et al. (2016). A sample item includes as "Our organization constantly generates new ideas for better services."

CL was measured by developing five items based on the suggestions of professors and industry experts. A sample item includes as "I believe that customer loyalty is important for the success of my business".

Firm performance (FP) was measured by adapting five items from Agyei-Owusu et al. (2021). A sample item includes as "Our organization perform well in terms of increased profit."

3.4. Pilot Testing

The main aim of pilot testing was to verify the tools used in the research. For the pilot testing, 100 respondents were selected and conducted with a duration of 12 days.

3.5. Data Analysis Techniques

For data analysis, the partial least squares (PLS) algorithm and bootstrapping method were used. Data analysis was performed in two stages: (1) model assessment and (2) hypothesis testing (Figure 2).

4. RESEARCH RESULTS

4.1. Model Assessment

Generally, model assessment is concerned with the reliability and validity of survey data. According to Gotz et al. (2010), there are three steps in model assessment: reliability, convergent validity, and discriminant validity. First, the factor loadings of all items were above 0.5 (Hair et al., 2010) and significant (Table 2). The reliability of the constructs was examined by evaluating Cronbach's alpha. As shown in Table 2, the Cronbach's alpha of all the constructs was above the cut-off value of 0.6 (Hair et al., 2010) which indicates that the data are reliable. Convergent validity was measured by examining average variance extracted (AVE) and composite reliability (CR). Based on Table 2, the values of AVE were above the cut-off value of 0.5, and CR values were

Figure 2: SEM model

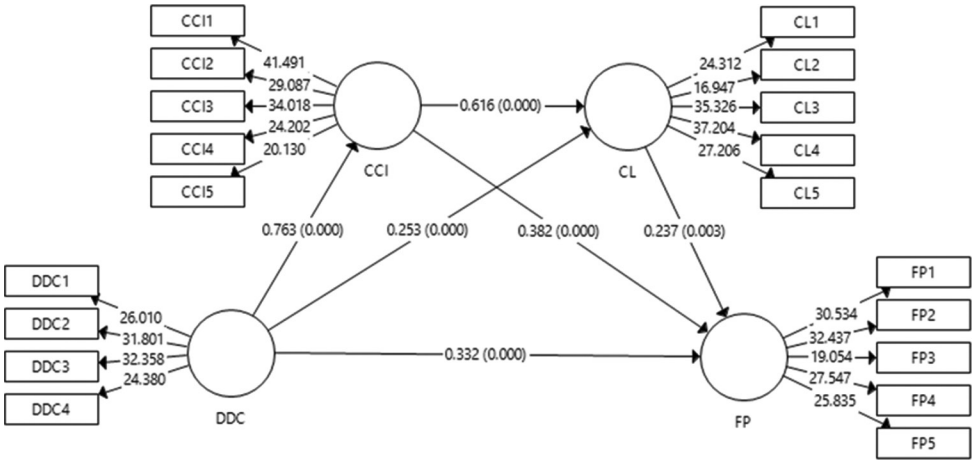


Table 2: Measurement model assessment

Variable	Items	Loadings	α	CR	AVE
Data driven culture (DDC)	DDC1	0.786	0.809	0.875	0.636
	DDC2	0.819			
	DDC3	0.809			
	DDC4	0.775			
Customer centric innovation (CCI)	CCI1	0.830	0.845	0.890	0.619
	CCI2	0.804			
	CCI3	0.813			
	CCI4	0.772			
	CCI5	0.708			
Customer loyalty (CL)	CL1	0.777	0.849	0.892	0.624
	CL2	0.736			
	CL3	0.817			
	CL4	0.829			
	CL5	0.787			
Firm performance (FP)	FP1	0.807	0.844	0.889	0.616
	FP2	0.827			
	FP3	0.704			
	FP4	0.785			
	FP5	0.795			

Table 3: Cross loading

Items	CCI	CL	DDC	FP
DDC1	0.619	0.520	0.817	0.577
DDC2	0.601	0.588	0.831	0.580
DDC3	0.685	0.651	0.795	0.597
DDC4	0.763	0.601	0.579	0.577
CCI1	0.778	0.664	0.573	0.618
CCI2	0.841	0.644	0.655	0.648
CCI3	0.833	0.654	0.698	0.651
CCI4	0.671	0.559	0.463	0.549
CCI5	0.645	0.761	0.550	0.599
CL1	0.662	0.808	0.635	0.618
CL2	0.582	0.605	0.535	0.783
CL3	0.551	0.533	0.480	0.724
CL4	0.616	0.836	0.591	0.624
CL5	0.635	0.813	0.507	0.631
FP1	0.656	0.792	0.580	0.704
FP2	0.683	0.685	0.650	0.819
FP3	0.672	0.685	0.625	0.818
FP4	0.562	0.584	0.512	0.774
FP5	0.607	0.578	0.838	0.607

Table 4: Discriminant validity- Fornell and Larcker's criteria

Constructs	CIC	CL	DDC	FP
CIC	0.787			
CL	0.609	0.790		
DDC	0.763	0.722	0.798	
FP	0.527	0.686	0.694	0.785

Correlation is significant at 0.05, figures in italics represent square root of AVE

Table 5: Discriminant validity-Heterotrait-Monotrait Ratio (HTMT)

Constructs	CIC	CL	DDC	FP
CIC				
CL	0.845			
DDC	0.809	0.837		
FP	0.827	0.824	0.849	

above 0.7 (Chin, 1998). The results indicated that the reported AVE and CR values for all constructs were acceptable. This confirmed the establishment of convergent validity. This study also verified discriminant validity based on Fornell and Larcker's (1981) criteria. From Table 3, the AVE of the constructs was above 0.5, while the square root of the AVE exceeded the inter-item correlations between the constructs, indicating the establishment of discriminant validity. Additionally, discriminant validity was evaluated using the Heterotrait-monotrait (HTMT) ratio. According to Hessler et al. (2015), discriminant validity is shown when the HTMT value is <0.9. It is clear that all study constructs exhibit discriminant validity, as all of the HTMT values in Table 5 are <0.9. Also, as shown in Table 3, each construct should have a higher loading with its associated indicators compared to other things. In this cross-loadings analysis, the correlations between the construct scores and the standardized indicator data are calculated (Gefen and Straub, 2005). R2 values below 0.10 are deemed tolerable, while the exact cutoff number is case-specific. For dependent variables, Henseler and Chin (2010) classify R2 values of 0.67 as large, 0.33 as moderate, and 0.19 as little (refer to Table 6). The values of f2 >0.02, 0.15, and 0.35 suggest modest, medium, and large effects, respectively, according to Cohen 1988. When an external variable significantly affects an internal variable, the result is shown by the value of f2 (Gotz et al., 2010; Table 7). Q2, the blindfolding technique, is used in

Table 6: R2 and Q2

Constructs	R square	R square adjusted	Q2
CCI	0.589	0.588	0.336
CL	0.667	0.665	0.401
FP	0.704	0.701	0.412

Table 7: f2

Constructs	CCI	CL	DDC	FP
CCI		0.470		0.087
CL				0.191
DDC	1.432	0.072		0.048
FP				

Table 8: Outcome of hypothesis testing

Hypotheses	Path	Path coefficient	Standard error	t-static	Test outcome
1	DDC→CCI	0.763	0.033	22.955	Supported
2	DDC→CL	0.253	0.068	3.702	Supported
3	DDC→FP	0.332	0.073	4.529	Supported
4	CCI→CL	0.616	0.067	9.168	Supported
5	CCI→FP	0.382	0.092	4.136	Supported
6	CL→FP	0.237	0.079	3.005	Supported
7	DDC→CCI→CL	0.470	0.058	8.095	Supported
8	DDC→CCI→FP	0.291	0.071	4.126	Supported
9	DDC→CL→FP	0.260	0.039	3.040	Supported

Smart PLS 3.2.9. Q2 need to be greater than zero, as pointed out by Chin (1998). Table 6 for the predictive relevance of the values computed in this study, which are non-zero.

4.2. Hypotheses Testing

The next step was to test the research model for causal relationships between variables. The research model was analyzed based on path coefficients, t-values, and p-values using the PLS algorithm along with the bootstrapping method. The Table 8 findings indicated that DDC had a positive and significant impact on CCI ($\beta = 0.763$, $t = 22.955$, $P = 0.000$). DDC had a positive and significant impact on CL ($\beta = 0.253$, $t = 3.702$, $P = 0.000$). DDC had a positive and significant impact on FP ($\beta = 0.332$, $t = 4.529$, $P = 0.000$). CCI had a positive and significant effect on CL ($\beta = 0.616$, $t = 9.168$, $P = 0.000$). CCI had a positive and significant impact on FP ($\beta = 0.382$, $t = 4.136$, $P = 0.000$). CL had a positive and significant impact on FP ($\beta = 0.237$, $t = 3.005$, $P = 0.000$). Based on mediating effect, CCI mediates on link between DDC and CL ($\beta = 0.470$, $t = 8.095$, $P = 0.000$). CCI mediated the link between DDC and FP ($\beta = 0.291$, $t = 4.126$, $P = 0.000$). Finally, CL mediated the link between DDC and FP ($\beta = 0.260$, $t = 3.040$, $P = 0.000$). Table 4 displays the outcomes of hypothesis testing, and Figure 2 shows the SEM model.

5. DISCUSSION

The main goal of this research is to examine how DDC drives CL and achieves superior FP by shedding light on the role of CCI. The findings of the direct effect are discussed, followed by the indirect effect. The relationship between DDC and FP was examined previously, but this study has taken extra effort by investigating the intervening role of CCI and CL on the relationship between DDC and FP. First, DDC has a positive and significant impact on CCI. This suggests that DDC highly influence innovation, making the firm more competitive (Chatterjee et al., 2021). Duan et al. (2020) stated that DDC help firms to place the product in the market. Visvizi et al. (2022) stated that using DDC firms may generate different types of innovation patterns. When the innovation is customer centric, firm observe several customer outcomes such as enhanced customer value, customer loyalty and customer satisfaction.

Second, DDC has a positive and significant impact on CL. This finding is consistent with that of Ojo-Kolawole (2023) and Rosário and Dias (2023). Organisations develop a DDC in order to gain an insights into their business environments and customers with a hope of customer development (Asamoah et al., 2021). Previous studies have highted that companies with high DDC are likely to obtain better customer results (Hallikainen et al., 2020). Modern customers are powerful, sophisticated and knowledgeable. The prefer companies who directly address their needs (Grandhi et al., 2025). Additionally, this consumer is categorised by ever-changing buying behaviour which necessitates the identification of customers and their buying patterns (Nadler and McGuigan, 2018). As a result digitalization and marketing analytics are crucial component in current marketing environment. Marketers view big data as an essential tool which helps them to formulate the marketing strategies. Marketers leverage big data to understand customers, and sales promotions (Rosário and Dias, 2023).

Third, DDC has a positive and significant impact on FP. This finding is consistent with Karaboga et al. (2022), who showed that DDC has a positive and significant effect on the operational performance of firms. (Karaboga et al., 2022; Wong and Ngai, 2023) demonstrated that DDC enhance both financial and operational performance of the firm. Chatterjee et al. (2021) highlighted that with the use of DDC, firms can get opportunity to streamline their business which enhance their FP. Gupta and George (2016) stated that DDC is an intangible resource of firm which is associated with increased market and operational performance. Almazmomi et al. (2022) shown that DDC is important in light of competitive advantage of firms (Medeiros and Maçada, 2022).

Fourth, CCI has a positive and significant impact on CL. This finding is consistent with those of Selden and MacMillan (2006), Chang (2022), Auer (2023), and Kim et al. (2016). CCI is directly concerned with the involvement of customer in innovation that meet the needs of customer.

By developing products and services that align with customer preferences, businesses can strengthen their CL. Engaging customers in the innovation process through feedback and co-creation fosters a sense of ownership and connection, thus further enhancing loyalty. By continually innovating with customers in mind, businesses can cultivate stronger relationships with customers, leading to increased CL, higher customer lifetime value, and sustained business success. Therefore, adopting customer approach is beneficial for firm in terms several customer outcomes. Gupta and Ramachandran (2021) highlighted that the

firms which transitioning from product centric to customer centric are likely to see several customer benefits. Kreuzer et al. (2020) revealed that customer centric approach is an important success factor, that must be prioritize by the companies to get the benefits.

Fifth, the CCI had a positive and significant impact on FP. Innovation is an important source for firms to gain competitive advantage, profitability than non-innovators. Firms can innovate by interacting with customers and other organisations. Several studies have suggested that open innovation is a foundation of success. Innovation allows businesses to differentiate themselves in the market by offering unique, tailored solutions that resonate with customers, giving them an edge over their competitors. Products and services that are developed with the involvement of customers has several outcomes such as customer satisfaction and loyalty. Meeting customer needs through innovative solutions can lead to increased sales, higher customer retention rates, and improved revenue and profitability. This finding is consistent with those of Tuominen et al. (2022), Habel et al. (2022), and Chen et al. (2013).

Sixth, CL has a positive and significant impact on FP. This finding is consistent with the study of Ismail (2023); Vilkaitė-Vaitonė and Papšienė (2016). Sustaining CL is essential for a firm to be competitive. CL can be understood as customers' favorable behavior towards a company. CL plays a vital role in the FP. Managers pay more attention to loyal customers, as they believe that loyal customers spend more than new ones. Lina (2022) argues that customers become loyal when their emotional needs are met. Alyahya et al. (2023) stated that to improve CL, firms need to provide superior service as compared to their competitors during intersections at every touch point.

Seventh, CCI mediates the link between DDC and CL. The intervening role of CCI is crucial in connecting a DDC with a CL. A DDC enables organizations to effectively use data to understand customer behavior and preferences by providing useful insights. However, it is not sufficient to simply collect data; it must be turned into innovations that meet customer expectations. This is where CCI comes in, tailoring products and experiences to exceed customer preferences. When customers see consistent innovation catering to their interests, they tend to become more loyal, resulting in a loyal customer base.

Eighth, CCI mediates the association between DDC and FP. A DDC lays the foundation for informed strategic decision-making and strategic planning. Insights from DDC are transformed into meaningful innovations that cater to the needs of customers. CCI plays a role in tailoring products and experiences to exceed customer expectations. When customers see consistent innovation catering to their interests, they tend to become more loyal. Loyalty leads to positive business outcomes, including higher customer retention, increased revenue, and a stronger market position.

Ninth, CL mediates the link between DDC and FP. A DDC empowers organizations to effectively utilize data to understand customer behavior, needs, preferences, market demands, and operational efficiency. The DDC lays the foundation for strategic decision making and strategic initiatives. Strategic decision-making and strategic initiatives are based on a customer-centric strategy that meets the needs of customers and makes efforts to turn ordinary customers into loyal customers, which ultimately improves FP. As Table 8 shows, all nine of the initial assumptions proposed in this study have been accepted.

6. CONCLUSION

The results of study revealed that DDC influenced the CCI, CL and FP. A DDC can serve as foundation upon which firms can draw meaningful insights from large volume of data, enabling informed decision and streamline business process. When the meaningful insights drawn from data driven approach and used in innovation along with customer centric approach, business can translate this into innovation and creativity that meet the needs of customers. Apart from that CL is a by-product of CCI and plays a crucial role in fostering FP. Second, CCI influenced CL and FP. CCI reflects a deeper understanding of customer needs and preferences which influence both CL and FP. When company is perceived by customer as customer centric, it fosters CL and FP. Thus, by offering innovative solutions to customers enhance several customer outcomes.

6.1. Theoretical Implications

This study has several implications, as the findings confirm the significant direct and indirect effects. Specifically, the mediating roles of CCI and CL have been established. The findings also contribute to the literature by reducing the research gap regarding the variables. The finding that CCI has a mediating role on DDC-CL and DDC-FP and that CL has a mediating role on DDC-FP opens a research avenue, as previous research was limited. Another contribution of this study is the testing of the direct effect, which confirms that DDC has a significant effect on CCI, CL, and FP; CCI has a significant effect on CL; and FP and CL have a significant effect on FP.

6.2 Managerial Implications

In addition, this study offers managerial implications. owners, managers, and policymakers to achieve CL and superior FP based on DDC and CCI. The following implications are critical for achieving CL and improving FP: First, managers should invest in analytics tool and data infrastructure to support DDC. This include data analytics platforms, data management systems, training of employees to make them proficient in data analysis technique. By leveraging these resources, company drive CCI which enhance CL and FP. Second, organisations should integrate data insights into innovations and ensure product and service development are aligned with customer needs and preferences. Therefore, by adopting data driven insights into innovation, firms can get benefits in terms of customer outcomes and FP.

6.3 Limitations and Future Research Direction

This study has some limitations that can be addressed in future studies. First, the owners of Indian manufacturing firms participated in the survey. Future studies should incorporate employees as survey participants. Second, this study used quantitative data to examine causal relationships between the variables. Future

studies might include qualitative or mixed methods to obtain better insights. Third, CCI and CL were considered as the mediating variables. Future studies might include other variables, such as knowledge management, business strategy, and innovation capability.

REFERENCES

Agag, G., Durrani, B.A., Shehawy, Y.M., Alharthi, M., Alamoudi, H., El-Halaby, S., Abdelmoety, Z.H. (2023), Understanding the link between customer feedback metrics and firm performance. Journal of Retailing and Consumer Services, 73, 103301.

Agyei-Owusu, B., Amedofu, M.K., Asamoah, D., Kumi, C.A. (2021), The Effect of Data Driven Culture on Customer Development and Firm Performance: The Role of Supply Chain Information Sharing and Supply Chain Information Quality. In: Conference on e-Business, e-Services and e-Society. p481-492.

Alhaddad, A. (2015), Perceived quality, brand image and brand trust as determinants of brand loyalty. Journal of Research in Business and Management, 3(4), 1-8.

Almazmomi, N., Ilmudeen, A., Qaffas, A.A. (2022), The impact of business analytics capability on data-driven culture and exploration: Achieving a competitive advantage. Benchmarking: An International Journal, 29(4), 1264-1283.

Alyahya, M., Agag, G., Aliedan, M., Abdelmoety, Z.H. (2023), A cross-cultural investigation of the relationship between eco-innovation and customers boycott behaviour. Journal of Retailing and Consumer Services, 72, 103271.

Anderson, C. (2015), Creating a Data-Driven Organization: Practical Advice from the Trenches. Sebastopol: O'Reilly Media, Inc.

Anton, E., Oesterreich, T.D., Aptyka, M., Teuteberg, F. (2023), Beyond digital data and information technology: Conceptualizing data-driven culture. Pacific Asia Journal of the Association for Information Systems, 15(3), 1.

Armstrong, J.S., Overton, T.S. (1977), Estimating nonresponse bias in mail surveys. Journal of Marketing Research, 14(3), 396-402.

Asamoah, D., Nuertey, D., Agyei-Owusu, B., Akyeh, J. (2021), The effect of supply chain respon-siveness on customer development. The International Journal of Logistics Management, 32, 1190-1213.

Auer, I. (2023), How to Drive Business Success with Customer Centric Innovation Strategies. Available from: https://www.scale-company.com/post/how-to-drive-business-success-with-customer-centric-innovation-strategies

Awan, U., Shamim, S., Khan, Z., Zia, N.U., Shariq, S.M., Khan, M.N. (2021), Big data analytics capability and decision-making: The role of data-driven insight on circular economy performance. Technological Forecasting and Social Change, 168, 120766.

Aziza, F., Al Haquea, T., Hossainb, M.B., Rahmanc, A., Siama, S.A.J. (2023), Customer behavior analysis through data analytics in the Bangladeshi retail industry. Malaysian E Commerce Journal, 7(2), 78-84.

Baker, H.K., Kumar, S., Rao, P. (2020). Financing preferences and practices of Indian SMEs. Global Finance Journal, 43, 100388.

Bašić, M. (2021), Organisational learning antecedents and open innovation: Differences in internationalisation level. International Journal of Innovation Studies, 5(4), 161-174.

Belhadi, A., Kamble, S., Benkhati, I., Gupta, S., Mangla, S.K. (2023), Does strategic management of digital technologies influence electronic word-of-mouth (eWOM) and customer loyalty? Empirical insights from B2B platform economy. Journal of Business Research, 156, 113548.

Blank, S. (2020), The Four Steps to the Epiphany: Successful Strategies for Products that Win. Hoboken: JohnWiley and Sons.

Bratasanu V. (2018), Leadership decision-making processes in the context of data driven tools. Quality-Access to Success, 19(166), 77.

Brodny, J., Tutak, M. (2024), Assessing the level of innovativeness and digitalization of enterprises in the European Union States. Journal of Open Innovation: Technology, Market, and Complexity, 10(1), 100210.

Castaneda, D.I., Cuellar, S. (2020), Knowledge sharing and innovation: A systematic review. Knowledge and Process Management, 27(3), 159-173.

Chang, S. (2022), How to Create a customer-centric innovation strategy. Available from: https://www.ey.com/en_id/consulting/how-to-create-a-customer-centric-innovation-strategy#:~:text=a%20customer%2dcentric%20approach%20to,better%20experiences%20across%20touch%20points

Chatterjee, S., Chaudhuri, R., Vrontis, D. (2021), Does data-driven culture impact innovation and performance of a firm? An empirical examination. Annals of Operations Research, 1-26.

Chaudhuri, R., Chatterjee, S., Vrontis, D., Thrassou, A. (2021), Adoption of robust business analytics for product innovation and organizational performance: The mediating role of organizational data-driven culture. Annals of Operations Research, 339, 1757-1791.

Chen, J., Sawhney, M., Neubaum, D.O. (2013), Customer-Oriented Innovation and fIrm Performance. Available from: https://www.ssrn/2178114

Chen, Q., Lu, Y., Gong, Y., Xiong, J. (2023), Can AI chatbots help retain customers? Impact of AI service quality on customer loyalty. Internet Research, 33(6), 2205-2243.

Chin, W.W. (1998), The partial least squares approach to structural equation modelling. Modern Methods for Business Research, 295(2), 295-336.

Colombari, R., Geuna, A., Helper, S., Martins, R., Paolucci, E., Ricci, R., Seamans, R. (2023), The interplay between data-driven decision-making and digitalization: A firm-level survey of the Italian and US automotive industries. International Journal of Production Economics, 255, 108718.

Cui, L., He, S., Deng, H., Wang, X. (2023), Sustaining customer loyalty of fresh food e-tailers: An empirical study in China. Asia Pacific Journal of Marketing and Logistics, 35(3), 669-686.

Dash, A. (2024), Do customer centricity and innovativeness mediate the relationship between total quality management and the corporate success of SaaS companies? Benchmarking: An International Journal, 31(3), 903-919.

Debruyne, M. (2014), Customer Innovation: Customer-Centric Strategy for Enduring Growth. London: Kogan Page Publishers.

Del Vecchio, P., Di Minin, A., Petruzzelli, A.M., Panniello, U., Pirri, S. (2018), Big data for open innovation in SMEs and large corporations: Trends, opportunities, and challenges. Creativity and Innovation Management, 27(1), 6-22.

Delaney, A., Kitchin, R. (2023), Progress and prospects for data-driven coordinated management and emergency response: The case of Ireland. Territory, Politics, Governance, 11(1), 174-189.

Duan, Y., Cao, G., Edwards, J.S. (2020), Understanding the impact of business analytics on innovation. European Journal of Operational Research, 281(3), 673-686.

Elfaki, K.E., Ahmed, E.M. (2024), Digital technology adoption and globalization innovation implications on Asian Pacific green sustainable economic growth. Journal of Open Innovation: Technology, Market, and Complexity, 10(1), 100221.

Elgarhy, S.D. (2023), Effects of service quality, loyalty programs, pricing strategies, and customer engagement on firms' performance in Egyptian travel agencies: Mediating effects of customer retention. Journal of Quality Assurance in Hospitality and Tourism, 24(6),

753-781.
Elgendy, N., Elragal, A., Päivärinta, T. (2022), DECAS: A modern data-driven decision theory for big data and analytics. Journal of Decision Systems, 31(4), 337-373.
Eriksson, T., Heikkilä, M. (2023), Capabilities for data-driven innovation in B2B industrial companies. Industrial Marketing Management, 111, 158-172.
Fornell, C., Larcker, D.F. (1981), Evaluating structural equation models with unobservable variables and measurement error. Journal of Marketing Research, 8(1), 39-50.
Fosso Wamba, S., Queiroz, M.M., Wu, L., Sivarajah, U. (2020), Big data analytics-enabled sensing capability and organizational outcomes: Assessing the mediating effects of business analytics culture. Annals of Operations Research, 333, 559-578.
Gandhi, S.J., Robb, C.C., Lee, A. (2021), The entrepreneurial intrapreneur: A managerial approach to building entrepreneurial competencies. International Journal of Entrepreneurship and Innovation Management, 25(2-3), 211-232.
Gefen, D., Straub, D. (2005), A practical guide to factorial validity using PLS-Graph: Tutorial and annotated example. Communications of the Association for Information Systems, 16(1), 5.
Gotz, O., Liehr-Gobbers, K., Krafft, M. (2010), Evaluation of Structural Equation Models Using the Partial Least Squares (PLS) Approach. In: Handbook of Partial Least Squares. Heidelberg, Berlin: Springer. p691-711.
Grandhi, S., Chhetri, P., Molla, A. (2025), Assessing the effect of open innovation on firm performance: A study of Indian IT organisations. European Journal of Innovation Management, 28(6), 2581-2606.
Grandhi, B., Patwa, N., Saleem, K. (2021), Data-driven marketing for growth and profitability. Euromed Journal of Business, 16(4), 381-398.
Gunjati, S.B., Adake, C.V. (2020), Innovation in Indian SMEs and their current viability: A review. Materials Today: Proceedings, 28, 2325-2330.
Gupta, M., George, J.F. (2016), Toward the development of a big data analytics capability. Information and Management, 53(8), 1049-1064.
Gupta, S., Ramachandran, D. (2021), Emerging market retail: Transitioning from a product-centric to a customer-centric approach. Journal of Retailing, 97(4), 597-620.
Habel, J., Kassemeier, R., Alavi, S., Haaf, P., Schmitz, C., Wieseke, J. (2020), When do customers perceive customer centricity? The role of a firm's and salespeople's customer orientation. Journal of Personal Selling and Sales Management, 40(1), 25-42.
Hair, J.F., William, C.B., Barry, J.B., Anderson, R.E. (2010), Multivariate Data Analysis. 7th ed. USA, Englewood Cliffs, NJ: Prentice Hall.
Hallikainen, H., Savimäki, E., Laukkanen, T. (2020), Fostering B2B Sales with Customer Big Dataanalytics. Industrial Marketing Management, 86, 90-98.
Hampton, H., Foley, A.M., Del Rio, D.F., Sovacool, B. (2022), Developing future retail electricity markets with a customer-centric focus. Energy Policy, 168, 113147.
Hannila, H., Silvola, R., Harkonen, J., Haapasalo, H. (2022), Data-driven begins with DATA; potential of data assets. Journal of Computer Information Systems, 62(1), 29-38.
Henseler, J., Chin, W.W. (2010), A comparison of approaches for the analysis of interaction effects between latent variables using partial least squares path modeling. Structural Equation Modeling, 17(1), 82-109.
Hotha, K.K. (2023), Unleashing the power of innovation in CDMOs through customer-centricity and culture of service. American Journal of Industrial and Business Management, 13(4),234-246.
Hu, F., Qiu, X., Jing, G., Tang, J., Zhu, Y. (2023), Digital twin-based decision making paradigm of raise boring method. Journal of Intelligent Manufacturing, 34(5), 2387-2405.
Huang, S., Potter, A., Eyers, D. (2020), Social media in operations and supply chain management: State-of-the-Art and research directions. International Journal of Production Research, 58(6), 1893-1925.
Javed, N., Khalil, S.H., Ishaque, A., Khalil, S.M. (2023), Lovemarks and beyond: Examining the link between lovemarks and brand loyalty through customer advocacy in the automobile industry. Plos one, 18(4), e0285193.
Karaboga, T., Zehir, C., Tatoglu, E., Karaboga, H.A., Bouguerra, A. (2023), Big data analytics management capability and firm performance: The mediating role of data-driven culture. Review of Managerial Science, 17(8), 2655-2684.
Khan, S.M., Ali, M., Puah, C.H., Amin, H., Mubarak, M.S. (2023), Islamic bank customer satisfaction, trust, loyalty and word of mouth: The CREATOR model. Journal of Islamic Accounting and Business Research, 14(5), 740-766.
Khurana, I., Dutta, D.K., Ghura, A.S. (2022), SMEs and digital transformation during a crisis: The emergence of resilience as a second-order dynamic capability in an entrepreneurial ecosystem. Journal of Business Research, 150, 623-641.
Kim, S., Kim, I., Hyun, S.S. (2016), First-class in-flight services and advertising effectiveness: Antecedents of customer-centric innovativeness and brand loyalty in the United States (US) airline industry. Journal of Travel and Tourism Marketing, 33(1), 118-140.
Kiron, D., Ferguson, R.B., Prentice, P.K. (2013), From value to vision: Reimagining the possible with data analytics. MIT Sloan Management Review, 54(3), 1.
Krejcie, R.V., Morgan, D.W. (1970), Sample size determination table. Educational and Psychological Measurement, 30(3), 607-610.
Kreuzer, T., Röglinger, M., Rupprecht, L. (2020), Customer-centric prioritization of process improvement projects. Decision Support Systems, 133, 113286.
Kurtmollaiev, S., Lervik-Olsen, L., Andreassen, T.W. (2022), Competing through innovation: Let the customer judge! Journal of Business Research, 153, 87-101.
Kusiak, A. (2009), Innovation: A data-driven approach. International Journal of Production Economics, 122(1), 440-448.
Kwok, C.P., Tang, Y.M. (2023), A fuzzy MCDM approach to support customer-centric innovation in virtual reality (VR) metaverse headset design. Advanced Engineering Informatics, 56, 101910.
Lee, J.Y., Sridhar, S., Henderson, C.M., Palmatier, R.W. (2012), Effect of customer-centric structure on firm performance. Marketing Science Institute Working Paper Series, 34(2), 250-268.
Lina, R. (2022), Improving product quality and satisfaction as fundamental strategies in strengthening customer loyalty. AKADEMIK: Jurnal Mahasiswa Ekonomi and Bisnis, 2(1), 19-26.
López-Cabarcos, M.Á., Srinivasan, S., Vázquez-Rodríguez, P. (2020), The role of product innovation and customer centricity in transforming tacit and explicit knowledge into profitability. Journal of Knowledge Management, 24(5), 1037-1057.
Luo, J. (2022), Data-driven innovation: What is it? IEEE Transactions on Engineering Management, 70(2), 784-790.
Manyanga, W., Makanyeza, C., Muranda, Z. (2022), The effect of customer experience, customer satisfaction and word of mouth intention on customer loyalty: The moderating role of consumer demographics. Cogent Business and Management, 9(1), 2082015.
Martínez-Caro, E., Cegarra-Navarro, J.G., Alfonso-Ruiz, F.J. (2020), Digital technologies and firm performance: The role of digital organisational culture. Technological Forecasting and Social Change, 154, 119962.
Matriano, M., Khan, F.R. (2019), Customer-centric innovation: Case of Oman entrepreneurship. International Journal of Management, Innovation and Entrepreneurial Research, 5(1), 33-39.

Medeiros, M.M., Maçada, A.C.G. (2022), Competitive advantage of data-driven analytical capabilities: The role of big data visualization and of organizational agility. Management Decision, 60(4),953-975.

Mikalef, P., Boura, M., Lekakos, G., Krogstie, J. (2019), Big data analytics and firm performance: Findings from a mixed-method approach. Journal of Business Research, 98, 261-276.

Molinillo, S., Aguilar-Illescas, R., Anaya-Sanchez, R., Carvajal-Trujillo, E. (2022), The customer retail app experience: Implications for customer loyalty. Journal of Retailing and Consumer Services, 65, 102842.

Nadler, A., McGuigan, L. (2018), An impulse to exploit: the behavioral turn in data-driven marketing. Critical Studies in Media Communication, 35(2), 151-165.

Nik Hashim, N.M.H., Hock Ann, Y., Ansary, A., Xavier, J.A. (2022), Contingent effects of decision-making and customer centricity on public-sector innovation success. Journal of Nonprofit and Public Sector Marketing, 34(1), 36-70.

Ojo-Kolawole, H. (2023), Data Driven Customer Engagement. Available from: https://documentserver.uhasselt.be/bitstream/1942/41160/2/c69582f9-5259-4704-acc2-edfb8f6ad3b6.pdf

Osakwe, C.N. (2020), Customer centricity: An empirical analysis in the micro-sized firm. Journal of Strategic Marketing, 28(5), 455-468.

Palacios-Marques, D., Guijarro, M., Carrilero, A. (2016), The use of customer-centric philosophy in hotels to improve customer loyalty. Journal of Business and Industrial Marketing, 31(3), 339-348.

Passi, P., Das, S. (2023), Consumer-centric innovation in food and nutrition industry. In: Nutrition Science, Marketing Nutrition, Health Claims, and Public Policy. Cambridge: Academic Press. p259-266.

Priyono, A., Hidayat, A. (2024), Fostering innovation through learning from digital business ecosystem: A dynamic capability perspective. Journal of Open Innovation: Technology, Market, and Complexity, 10(1), 100196.

Rane, N. (2023), Enhancing Customer Loyalty through Artificial Intelligence (AI), Internet of Things (IoT), and Big Data Technologies: Improving Customer Satisfaction, Engagement, Relationship, and Experience. Available from: https://ssrn.com/abstract=4616051.

Robertsone, G., Lapiņa, I. (2023), Digital transformation as a catalyst for sustainability and open innovation. Journal of Open Innovation: Technology, Market, and Complexity, 9(1), 100017.

Rosário, A.T., Dias, J.C. (2023), How has data-driven marketing evolved: Challenges and opportunities with emerging technologies. International Journal of Information Management Data Insights, 3(2), 100203.

Salah, O.H., Ayyash, M.M. (2024), E-commerce adoption by SMEs and its effect on marketing performance: An extended of TOE framework with ai integration, innovation culture, and customer tech-savviness. Journal of Open Innovation: Technology, Market, and Complexity, 10(1), 100183.

Selden, L., MacMillan, I.C. (2006), Manage customer-centric innovation-systematically. Harvard Business Review, 84(4), 108.

Sheth, J.N., Sisodia, R.S., Sharma, A. (2000), The antecedents and consequences of customer - Centric marketing. Journal of the Academy of Marketing Science, 28(1), 55-66.

Stank, T.P., Keller, S.B., Daugherty, P.J. (2001), Supply chain collaboration and logistical service performance. Journal of Business Logistics, 22, 29-48.

Storm, M., Borgman, H. (2020), Understanding Challenges and Success Factors in Creating a Data-Driven Culture. Available from: https://scholarspace.manoa.hawaii.edu/items/668684e6-140a-4153-83ce-2f5ce7518966

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 and Management, 57(7), 103365.

Syauqi, M.R., Pandjaitan, D.R.H., Nabila, N.I. (2023), The influence of customer experience, customer satisfaction and customer loyalty towards brand power (study on go-ride service by Gojek in Bandar Lampung). International Journal of Asian Business and Management, 2(5), 731-748.

Teng, Y., Zhang, J., Sun, T. (2023), Data-driven decision-making model based on artificial intelligence in higher education system of colleges and universities. Expert Systems, 40(4), e12820.

Thomas, N.O., Singh, S., Gangwar, M. (2023), Customer retention using loyalty cards program. International Journal of Business Innovation and Research, 30(2), 200-217.

Trabucchi, D., Buganza, T. (2019), Data-driven innovation: Switching the perspective on big data. European Journal of Innovation Management, 22(1), 23-40.

Tuominen, S., Reijonen, H., Nagy, G., Buratti, A., Laukkanen, T. (2022), Customer-centric strategy driving innovativeness and business growth in international markets. International Marketing Review, International Marketing Review, 40(3), 479-496.

Upadhyay, P., Kumar, A. (2020), The intermediating role of organizational culture and internal analytical knowledge between the capability of big data analytics and a firm's performance. International Journal of Information Management, 52, 102100.

Urbinati, A., Chiaroni, D., Chiesa, V., Frattini, F. (2020), The role of digital technologies in open innovation processes: An exploratory multiple case study analysis. R and d Management, 50(1), 136-160.

Utz, M., Johanning, S., Roth, T., Bruckner, T., Strüker, J. (2023), From ambivalence to trust: Using blockchain in customer loyalty programs. International Journal of Information Management, 68, 102496.

Van Riel, A.C., Andreassen, T.W., Lervik-Olsen, L., Zhang, L., Mithas, S., Heinonen, K. (2021), A customer-centric five actor model for sustainability and service innovation. Journal of Business Research, 136, 389-401.

Venkateswaran, P.S., Dominic, M.L., Agarwal, S., Oberai, H., Anand, I., Rajest, S.S. (2024), The Role of Artificial Intelligence (AI) in Enhancing Marketing and Customer Loyalty. In: Data-Driven Intelligent Business Sustainability. Pennsylvania: IGI Global. p32-47.

Vilkaitė-Vaitonė, N., Papšienė, P. (2016), Influence of customer loyalty program on organizational performance: A case of airline industry. Inžinerinė ekonomika,109-116.

Visvizi, A., Troisi, O., Grimaldi, M., Loia, F. (2022), Think human, act digital: Activating data-driven orientation in innovative start-ups. European Journal of Innovation Management, 25(6), 452-478.

Wassouf, W.N., Alkhatib, R., Salloum, K., Balloul, S. (2020), Predictive analytics using big data for increased customer loyalty: Syriatel Telecom Company case study. Journal of Big Data, 7, 1-24.

Wechsler, J., Schweitzer, J. (2019), Creating customer-centric organizations: The value of design artefacts. The Design Journal, 22(4), 505-527.

Wong, D.T., Ngai, E.W. (2023), The effects of analytics capability and sensing capability on operations performance: The moderating role of data-driven culture. Annals of Operations Research, 2023, 1-36.

Xie, Z., Wang, J., Miao, L. (2021), Big data and emerging market firms' innovation in an open economy: The diversification strategy perspective. Technological Forecasting and Social Change, 173, 121091.

Yu, W., Wong, C.Y., Chavez, R., Jacobs, M.A. (2021), Integrating big data analytics into supply chain finance: The roles of information processing and data-driven culture. International Journal of Production Economics, 236, 108135.

Yun, J.J., Kim, D., Yan, M.R. (2020), Open innovation engineering-preliminary study on new entrance of technology to market. Electronics, 9(5), 791.

Zengin, S. (2019), Customer centric innovation in banking sector. In: Handbook of Research on Managerial Thinking in Global Business Economics. Pennsylvania: IGI Global. p79-95.