Evaluation of strategic orientation-led competitive advantage: the role of knowledge integration and service innovation

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Abstract
Purpose – This paper aims to derive a model that explores how the interplay between knowledge integration capability and innovation impacts strategic orientation, leading to the attainment of sustainable competitive advantage. The study considers the constituents of strategic orientation, namely, customer orientation, competitor orientation and technology orientation, as the basis for achieving sustainable competitive advantage. The study suggests that the firm's capacity for integrating external and internal knowledge shapes how strategic orientation influences sustainable competitive advantage through service innovation.

Design/methodology/approach – This empirical research relies on qualitative and quantitative data gathered from telecom professionals to assess how knowledge integration and service innovation influence sustained competitive advantage. Structured equation modeling is used to examine the model and its interrelationships.

Findings – The research establishes significant relationships between strategic orientations, knowledge integration capability, service innovation and sustainable competitive advantage. Knowledge integration capability and service innovation are found to mediate the relationship between strategic orientations and the achievement of sustainable competitive advantage.

Practical implications – The study highlights the significant contribution of a firm's knowledge integration capability in driving service innovation, especially in technology-intensive service industries facing hypercompetition. It also advocates prioritizing technology orientation and integrating knowledge from internal and external sources for competitive advantage.

Originality/value – To the best of the authors' knowledge, this study is the first to model the effect of knowledge integration capability and service innovation on strategic orientation-led sustainable competitive advantage.

Keywords Knowledge integration capability, Service innovation, Hypercompetition, Competitive advantage

1. Introduction

Hypercompetition, characterized as the new reality of technology-intensive service industries (Lee et al., 2010; Thomas and D’Aveni, 2009; Wiggins and Rueflí, 2005), is marked by market instability, unpredictability and intense competition (Andrevasi and Ferrier, 2019). This dynamic environment is often attributed to exogenous factors, such as globalization, financial instability, new technology and digitalization, leading to the erosion of competitive advantage (D’Aveni et al., 2010; Illnitch et al., 1996). The phenomenon of change, together with its accelerated pace, can significantly influence the strategic growth initiatives of organizations (Dagnino et al., 2017). A firm’s strategy has significant ramifications for its organizational structure, operational activities, capital investments, market relationships and overall performance (Ajmal et al., 2017; Valos and Bednall, 2010).
To effectively navigate this landscape, a firm must establish and prioritize its strategic orientation (SO) based on its desired objectives (Koleoso et al., 2017; Masa‘deh et al., 2018; Olson et al., 2005).

SO aligns organizational characteristics with strategy, creating a competitive advantage (Drazin and de Ven, 1985; Slater et al., 2006; Zhou et al., 2005). Freischner et al. (2022) conceptualize SOs as the outcomes of top management’s cognitive foundations and as precursors to their strategic decision-making. Intangible resources, such as human resource capital, knowledge sharing, training and skill development, among others, contribute to shaping SO and building organizational culture (Chrisman et al., 1998; Gilbert et al., 2006; Narver and Slater, 1990).

Scholars advocate managing knowledge resources in dynamic markets (Eisenhardt and Martin, 2000; Grant, 1996; Venkitachalam and Willmott, 2017). Leiponen (2006a) and Salunke et al. (2019) asserted that mere knowledge generation is inadequate, and integration is essential for innovative and effective service solutions that meet customers’ needs. The surge in new knowledge sources and technologies compels firms to rapidly upgrade their capabilities with external knowledge (Low and Ho, 2016). The assimilation of acquired knowledge from networks is vital for value creation (Wang et al., 2018), thus, encouraging innovation (Zhou and Li, 2012). Hanaysha and Hilman (2015) emphasized innovation’s role in tackling sustainability challenges, while Nag et al. (2023) stressed the necessity of comprehending factors influencing differing innovation levels in organizations.

Globalization and worldwide economic growth necessitate innovation for firms to remain competitive (Chen et al., 2018). Ndubisi et al. (2020) contend that intense competition can prompt superior service innovation (SI) through the utilization of joint innovation capabilities, further augmented by knowledge and capacity complementarity.

This study focuses on the services provided by mobile network operators (MNOs), using the term “service innovation” to encompass advancements in services, including processes and products (Barcet, 2010; Galloj and Windrum, 2009). The primary goal is to develop a model examining the SO crucial for the technology-intensive service industry (e.g. internet service providers, telecom services, information technology services, investment and banking services, e-tailing and alternate payment services) to achieve sustainable competitive advantage (SCA). The research explores the role of internal and external knowledge and innovation in achieving SCA, addressing three questions for technology-based hypercompetitive service firms:

- **RQ1.** How does service innovation influence the relationship between strategic orientation and sustainable competitive advantage?
- **RQ2.** How does knowledge integration-enabled service innovation influence strategic orientation-led sustainable competitive advantage?
- **RQ3.** Which strategic orientation provides the most sustainable competitive advantage for technology-intensive, hypercompetitive service firms?

The study investigates these concepts within the context of MNOs in India, highlighting the importance of SI and knowledge integration capability (KIC) in understanding external changes and attaining SCA. Notably, prior research has not examined knowledge as a mediator between firm-level entrepreneurship and performance (Kim et al., 2012; Lumpkin and Dess, 1996). Here, we argue that SO is insufficient without alignment with the external environment and integration with the generated knowledge. We theorize that SO drives knowledge acquisition and ensures its integration with existing knowledge. The resulting new configurations enhance the mobilization of innovative service solutions, leading to a competitive advantage (Carmona-Lavado et al., 2021; Eisenhardt and Martin, 2000). This capability can allow firms to build completely new services and enter new markets. To date, SI has not been studied together with KIC with the aim of enabling SCA led by SO. The
dynamics remain unclear on how SO translates into SCA in the presence of KIC and SI as mediators, particularly in hypercompetitive technology markets. Additionally, there is a need for research to comprehend the interplay between various SOs and their priorities to enhance SCA.

The contribution of this study lies in the development, testing and empirical verification of a framework that examines the impact of essential components for SCA within a hypercompetitive market. This research makes four important contributions. First, it emphasizes the significance of aligning SO with the external environment to integrate the knowledge generated by service firms. Second, it provides evidence supporting the significant role of knowledge integration and its relationship to SO and SI in building and delivering relevant futuristic service solutions. Third, the research asserts that SI is alone insufficient without knowledge integration to deliver SCA. Fourth, it demonstrates that a properly aligned SO, coupled with the interplay of knowledge integration and SI, enhances the robustness of the model in building competitive advantage. Furthermore, the study aims to address concerns raised by Nag et al. (2023) regarding the current research gap in understanding the factors influencing firm-level innovations in India.

The study begins with a comprehensive examination of the theoretical underpinnings of concepts and a brief overview of MNOs to justify their relevance. It formulates hypotheses to explore the interplay between dimensions based on the conceptual model derived from the qualitative study. The methodology is explained, encompassing both qualitative and quantitative aspects of the mixed methods research (MMR). The analysis findings are then examined within the framework of existing literature, followed by a discussion of implications from both theoretical and practical perspectives. The study concludes by discussing limitations and suggesting avenues for future research.

2. Theoretical underpinnings

2.1 Resource-based view and knowledge-based view

The theoretical foundation of this study is based on the theories of resource-based view (RBV) and knowledge-based view (KBV). The RBV theory conceptualizes the resources and capabilities of an organization as a compilation of tangible and intangible assets (Amit et al., 2007; Barney, 1991; Barney et al., 2021). The RBV theory of the firm, as proposed by Barney (1991) and Wernerfelt (1984), together with the resource-based theory of competitive advantage, as refined by Barney and Hesterly (2019), posits that a firm’s superior performance in a competitive environment can be attributed to its resource advantage in certain resources. RBV serves as a tool for firms to assess their competitive condition and facilitates the effective allocation of its strategic resources to gain an edge, aiding in both survival and growth. This perspective emphasizes the importance of competitive advantage for firms (Asiaei and Bontis, 2019; García-Álvarez, 2015).

Furthermore, RBV emphasizes knowledge as essential for SCA (Arend and Lévesque, 2010) and a key resource to generate other resources (Kim et al., 2012).

KBV builds upon the RBV by focusing on how organizations produce, acquire, protect, transfer and use knowledge (Nonaka and Toyama, 2016). The theory considers knowledge as the most valuable strategic organizational resource (Ode and Ayavoo, 2020). Both KBV and the RBV agree on the competent resources that build, enable and enhance SCA (Barney, 1996; Novianti, 2019; Tjahjono and Wahyuningsih, 2023). KBV asserts that knowledge-based resources are difficult to replicate, socially intricate and highly specific to a firm’s products and services (Costello and Donnellan, 2011). Thus, knowledge is a valuable resource that is rare, difficult to imitate and can be effectively organized according to the VRIO framework. This enables the firm to establish a sustained competitive advantage, which aligns with the RBV as proposed by Arend and Lévesque (2010) and Barney (2001).
The dynamic nature of current business settings, including organizational structural modifications, technological progress, the shift from a product-based economy to a knowledge-based economy and the advent of Industry 4.0, contribute to the promotion of the RBV as a framework for achieving performance and competitive advantage (Pereira and Bamel, 2021). This study examines the role of knowledge integration and innovation capabilities as valuable resources for SCA.

2.2 Literature review

2.2.1 Strategic orientations – customer, competitor and technology. Slater et al. (2006) observed that SO relates to firms’ decision-making processes to achieve competitive advantage and superior performance. SOs are conceptualized as guiding concepts significantly influencing the firm’s operations and leading to behaviors that ensure its sustainability and performance (Gatignon and Xuereb, 1997; Johnson et al., 2012). Furthermore, these orientations shape the procedures for strategic decision-making within the organization and their effectiveness (Masa’deh et al., 2018; Noble et al., 2002). This paper investigates how SOs related to customers, competitors and technology impact a firm’s competitive advantage, using insights from a qualitative survey. These three orientations encompass additional aspects like innovation and entrepreneurship, emphasizing the service domain and the integration of knowledge from both external and internal environments – a key component of the conceptual model.

Customer orientation (CuO) is characterized as the company’s inclination to gathering, distribution and reacting to market intelligence to meet customer requirements (Atuahene-Gima and Ko, 2001; Crecelius et al., 2019; Gatignon and Xuereb, 1997). Customer knowledge is now integral to organizational knowledge and extensively used in developing strategies to innovate and gain competitive advantage (Feng et al., 2019; Zanjani et al., 2008). From a knowledge-management perspective on customers, three classifications are used: “knowledge about the customer, knowledge from the customer, and knowledge for the customer” (Wilde, 2011). Additionally, CuO has been found to contribute to acquiring competitive advantages and achieving overall business success (Ziggers and Henseler, 2016).

The consensus among scholars is that enterprises, irrespective of their size or geographical location, must consistently engage in the development of high-quality and creative products to gain a competitive advantage over their rivals (O’Dwyer and Gilmore, 2019; Rosenbusch et al., 2011), particularly within a period characterized by substantial technological advancements (Gotteland et al., 2020). From a simplistic standpoint, a company increases its competitive advantage by defeating its direct and indirect competitors (Day, 1990), driving more efficient resource utilization and innovative service offerings (Dickson, 1992). Market-driving firms alter how rivals behave, preventing the evolution of alternative strategies without their intervention (Jaworski et al., 2000; Schulze et al., 2022). Firms with competitor orientation (CoO) as a strategic choice and ingrained in organizational culture emphasize how they stay ahead of the competition by focusing on both short- and long-term opportunities (Deshpandé and Farley, 1998; Narver and Slater, 1990).

This study describes technology orientation (TO) as incorporating a focus on technology and advancements into product and process offerings (Zhang et al., 2018). TO is distinct from CuO and CoO, which collectively form market orientation (Hakala, 2011; Schulze et al., 2022), and is more useful for stable technological industries (Kohli and Jaworski, 1990). Technology-oriented firms generate customer value through innovative solutions that leverage technical advancements, displaying unwavering dedication to research and development for new technological discoveries and knowledge acquisition (Adams et al., 2019). The resulting technological intelligence is then used to develop novel solutions,
securing a competitive advantage (Cassiman and Veugelers, 2006; Hamel and Prahalad, 1996).

2.2.2 Knowledge integration capability. KIC is described as a combinative capability “to synthesize and apply current and acquired knowledge” (Kogut and Zander, 1992, p. 384). It is a critical capability facilitating the acquisition, sharing and utilization of knowledge (Eslami et al., 2018). This process consolidates information from diverse sources, addressing complex challenges and fostering innovation within firms (Carlile, 2004; Swan et al., 2012). It involves not just processing information but also facilitating knowledge creation through internal and external interaction and collaboration (Levinthal and Myatt, 1994; Pitelis, 2007). Knowledge integration allows the exchange of knowledge and competence, enabling the development of new products and services (Caridi-Zahavi et al., 2016; Zahra et al., 2020). In the KBV, knowledge is a vital driver of competitive advantage, and organizational learning refines and creates knowledge (Mueller et al., 2012; Valentim et al., 2016).

2.2.3 Service innovation. Innovation capabilities arise from firms’ ability to develop, merge, exchange and use information to recognize and seize new possibilities (Grant, 1996; Teece, 2018). Dickel and de Moura (2016) highlighted innovation as an essential trait of competitive, dynamic and progressive organizations. For MNOs, innovation can be infused in service provision, enhancing access, managing customer servicing channels and building relationships with both retail and business clients. For this study, service innovation (SI) is defined as the creation of new initiatives in service delivery, conceived internally or adapted from external sources, adding value for the firm and providing novel solutions to customers. We address overlooked aspects of SI implementation noted by Singh et al. (2020). Innovation in service offerings is typically more incremental compared to the drastic changes associated with product innovation (Tether and Howells, 2007). Giachetti and Marchi (2017) underscore the importance of rapid competitive counterinitiatives through innovation for the long-term viability of enterprises in the global mobile phone industry.

2.2.4 Sustainable competitive advantage. This study defines SCA as a company's continuous ability to outperform competitors in a specific market and achieve financial performance beyond the industry average (Becker and Huselid, 2006; Huang et al., 2015). SCA often necessitates innovative approaches to combine and apply knowledge, serving as the basis for enduring competitive advantage in the face of uncertainty and volatility, the challenges most firms encounter today. The telecommunications industry has faced both technological and market instability, unpredictability and rapid obsolescence (Hills and Sarin, 2003). Technology convergence has not only opened new opportunities but also resulted in industrial consolidation (Hacklin et al., 2009). Carlborg et al. (2014) suggested that SI is increasingly crucial for developing and sustaining company performance and competitiveness across various industry sectors. Teece (1986, 2018) proposed the use of “complementary assets” to establish a competitive advantage through innovation. Realizing competitive advantages through innovation necessitates the crucial and frequently overlooked involvement of infrastructural support and technologies (Trischler et al., 2020; Zhang et al., 2021). In the hypercompetitive telecom scenario, firms must strategically manage their SO, knowledge and innovation to sustain a competitive advantage over the long term (D’Aveni et al., 2010).

2.3 Indian mobile network operators
The study explores the mobility sector of the Indian telecommunications industry in a hypercompetitive context following a decade of consolidation. MNOs or mobile service providers, have faced a decline in ARPU [1] with a reduction in their number from 10 to 14 per circle (specified geographical areas for licensing purposes by the Department of Telecommunication of India) to three nationally. The phenomenon of hypercompetition can be seen globally across all technology-based service firms (Khan and Khan, 2019; Oh, 2020;
Roldan, 2019). Hence, the study’s findings may have broader implications beyond India or the telecommunications industry. In this dynamic context, it is crucial for firms to integrate external and internal knowledge and build innovative capabilities.

India had 1.17 billion telephone subscribers in June 2023, with 1.14 billion wireless subscribers and 82.25% wireless tele-density [2] (TRAI, 2023), becoming the second-largest telecom subscriber country in the recent decade. Furthermore, the expansion it has stimulated in other sectors relying on data services and technology has been significant. The country has witnessed a surge in digital payments, with a 76% increase in UPI (Unified Payments Interface) [3] transactions in 2022, reaching a volume of 74 billion and a value of US$1,536bn. This shift is driven by widespread high-speed internet access, a growing smartphone user base and the convenience of digital payments (Shahid, 2022). Telecom operators are actively competing to deliver innovative services in partnerships with Over-The-Top platforms to offer bundled services to customers (Sharma, 2022), tapping into the booming US$12.5bn digital content market (Vaish, 2023).

3. Conceptual model and hypothesis development

The theoretical model in Figure 1 posits that in mobile service provider firms, SO, driven by customer, competitor and technology influences key decision-making for resource allocation, culture building and the pursuit of competitive advantage. While SO is crucial, it may not be sufficient for achieving competitive advantage. The model suggests that mobile service provider firms excel in performance by cultivating capabilities like knowledge integration and innovation. A firm’s knowledge base is enhanced by valuable information about customers, competitors, suppliers and other market factors (Alshanty and Emeagwali, 2019).

This research uses the theoretical background of the RBV, acknowledging that mobile service providers heavily rely on capital assets and exploit both tangible and intangible resources for a competitive advantage in the hypercompetitive industry. The study specifically focuses on intangible resources, including skills, knowledge and information within CuO, CoO and TO, shaping the overall organizational culture. The integration of

![Figure 1 Conceptual model](image-url)

**Notes:** Mediation Relationships: H1b: CuO→KIC→SCA; H1c: CuO→SI→SCA; H1d: CuO→KIC→SI→SCA. H2b: CoO→KIC→SCA; H2c: CoO→SI→SCA; H2d: CoO→KIC→SI→SCA. H3b: TO→KIC→SCA; H3c: TO→SI→SCA; H3d: TO→KIC→SI→SCA

**Source:** Author’s compilation
acquired knowledge is essential for lasting results. A firm’s capabilities, shaped by its resources (Grant, 1991), manifest as intricate routines converting inputs into outputs for enhanced efficiency (Collis, 1994). SOs toward customers, competitors and technology facilitate the integration of knowledge resources (Kogut and Zander, 1992; Shane, 2000). This synthesis within the firm’s learning processes leads to innovation and superior performance (Narayanan et al., 2009; Salunke et al., 2019; Song et al., 2005). In this research, KIC and SI are examined as capabilities, and their relationships with SO and SCA are studied. The key constructs and hypotheses developed based on the model explained are also explored.

3.1 Customer orientation leading to sustainable competitive advantage

Information utilization and learning enable customer-oriented organizations to discover latent customer requirements and innovate (Atuahene-Gima, 1995; Narver et al., 2004). Firms with a strong CuO actively cultivate a culture attentive to the explicit and implicit needs of current and prospective customers (Deshpandé et al., 1993; Narver and Slater, 1990; Ziggers and Henseler, 2016). Developing CuO and knowledge positions helps the firms anticipate customers’ future needs, enabling them to create new products and services for a competitive advantage (Day, 1994; Feng et al., 2012; Su et al., 2006). This research considers CuO as an SO that builds superior customer value based on knowledge acquired through internal and external resources to deliver SCA. Therefore, we propose the following hypotheses:

H1a. Customer orientation is positively associated with sustainable competitive advantage.

3.2 Competitor orientation leading to sustainable competitive advantage

Competitively proactive firms anticipate future trends, modify their competitive environment and seek to capture new markets or elicit new customer preferences to establish market leadership (Schulze et al., 2022). Actively pursuing information on competitors’ resources and services, these firms develop novel tactics to enhance their competitive advantage (Hunt and Morgan, 1996). Developing a knowledge base is essential for strengthening SI capabilities (Chapman et al., 2003). Firms in developing nations adopt a competitive orientation to achieve cost advantages (Dev et al., 2009). Those with CoO actively support the innovation process to sustain a competitive advantage (Han et al., 1998). Molina-Collado et al. (2022) emphasized the necessity for organizations to possess sustainable and distinctive competitive advantages to stay ahead of the competition. Accordingly, we propose the following hypothesis:

H2a. Competitor orientation is positively associated with sustainable competitive advantage.

3.3 Technology orientation leading to sustainable competitive advantage

TO firms create customer value through novel solutions leveraging technological advancements and do not solely rely on customer feedback (Adams et al., 2019). TO enables the production of innovations with a greater competitive advantage, leading to more radical innovations (Gatignon and Xuereb, 1997). SOs toward customers, competitors and technology combine knowledge resources (Kogut and Zander, 1992; Shane, 2000), which are pivotal in exploring and identifying potential avenues (Abubakar et al., 2019; Nonaka, 2009). Innovation occurs as the firm learns from the combination of these resources, leading to improved performance (Narayanan et al., 2009; Salunke et al., 2019; Song et al., 2005). Accordingly, we propose the following hypothesis:

H3a. Technology orientation is positively associated with sustainable competitive advantage.
3.4 Knowledge integration capability – building innovation and competitive advantage

Knowledge integration capability (KIC) reflects the organization’s ability to generate new concepts and frameworks using knowledge for innovation and competitive advantage (Antonelli, 1999; Salunke et al., 2019). This involves bringing together existing knowledge and integrating it with new knowledge from external sources (Quaye and Mensah, 2019; Salunke et al., 2019). This research asserts that knowledge integration is crucial not only for achieving competitive advantage but also for guiding the SIs contributing to it. Researchers have highlighted the importance of information tools, knowledge management practices and networks in enhancing a firm’s competitive advantage. (Gummesson, 1999; Hansen et al., 1999; Webber, 1993). Therefore, we propose the following hypotheses:

H4a. Knowledge integration capability is positively associated with the firm’s service innovation capability.

H4b. Knowledge integration capability is positively associated with sustainable competitive advantage.

3.5 Service innovation – strengthening strategic orientation to build competitive advantage

In the hypercompetitive telecom scenario, firms must strategically manage their SO, knowledge and innovation for long-term competitive advantage. Interviews with service providers’ employees revealed uncertainty about the durability of innovations. The firm’s market perception and response vary based on priorities, SOs, unique skills and resources. The sustainability of a firm’s competitive advantage is dependent on the strength of the barriers to these aspects (Bharadwaj et al., 1993). Prior research has indicated that innovation is a dynamic phenomenon contributing to the attainment of SCA and economic growth for firms (Chen et al., 2018; Darroch and McNaughton, 2002). Therefore, it is posited that:

H5. Service innovation capability is positively associated with sustainable competitive advantage.

3.6 Mediation role of knowledge integration capability and service innovation

Existing research suggests applying knowledge plays a crucial role in successfully developing new goods, serving as a significant enabler of innovation and performance (Donate and de Pablo, 2015; Mardani et al., 2018). Hanaysha et al. (2022) referred to SI as a firm’s capacity to offer new or improved services and embrace innovative ways to sustain long-term customer relationships. According to Martelo-Landroguez and Cegarra-Navarro (2014), the integration and alignment of intangible resources, specifically knowledge resources, play a critical role in facilitating innovation. Firms can achieve SCA by applying knowledge to new and improved products and services, organizational practices, production methods, marketing strategies and innovation (Costa and Monteiro, 2016).

The mediating role of knowledge integration has been understudied (De Luca and Atuahene-Gima, 2007). Salunke et al. (2019) argued that incorporating newly acquired knowledge is crucial for creating novel configurations, with KIC mediating the relationship between dynamic learning capabilities and SCA. Rezazadeh et al. (2016) found KIC to mediate the relationship between TO and SCA. Market-oriented firms generate SIs leading to firm performance (Cheng and Krumwiede, 2011). Matear et al. (2002) and Farida and Setiawan (2022) found that innovation mediates the relationship between market orientation, strategy and competitive advantage. Existing literature lacks sufficient emphasis on examining KIC and SI as potential mediators in the relationship between SOs and SCA,
especially in a serial mediation context. Based on this background, we posit the following mediating hypotheses:

**H1b.** Knowledge integration capability mediates the relationship between customer orientation and sustainable competitive advantage.

**H1c.** Service innovation mediates the relationship between customer orientation and sustainable competitive advantage.

**H1d.** Knowledge integration capability and service innovation serially mediate the relationship between customer orientation and sustainable competitive advantage.

**H2b.** Knowledge integration capability mediates the relationship between competitor orientation and sustainable competitive advantage.

**H2c.** Service innovation mediates the relationship between competitor orientation and sustainable competitive advantage.

**H2d.** Knowledge integration capability and service innovation serially mediate the relationship between competitor orientation and sustainable competitive advantage.

**H3b.** Knowledge integration capability mediates the relationship between technology orientation and sustainable competitive advantage.

**H3c.** Service innovation mediates the relationship between technology orientation and sustainable competitive advantage.

**H3d.** Knowledge integration capability and service innovation serially mediate the relationship between technology orientation and sustainable competitive advantage.

4. **Methodology**

This study used an MMR design with an exploratory sequential approach (Creswell et al., 2011). Conducted on Indian MNOs, the combination of qualitative and quantitative methods enhances understanding, providing comprehensive insights into SOs, innovation, knowledge integration and SCA (Creswell, 2015; Onwuegbuzie et al., 2010). Balancing depth and breadth, the research examines the various aspects while providing generalized, quantified outcomes for different service types.

Creswell et al. (2011) categorized the MMR design typology into three distinct categories: convergent, explanatory sequential and exploratory sequential. This study uses an exploratory sequential mixed-methods design, aiming to systematically investigate a phenomenon. The design involves initially collecting qualitative data to explore the phenomenon, followed by the collection of quantitative data to elucidate identified linkages (Clark and Ivankova, 2015). The study applies this design by identifying themes through qualitative data collection, developing a quantitative instrument and subsequently testing it (Terrell, 2012; Wisdom and Creswell, 2013).

4.1 **Qualitative approach for theorizing constructs**

The theoretical constructs and model were derived from semi-structured interviews with relevant samples. SCA is considered the outcome to explore further in the hypercompetitive Indian telecom market, which underwent major consolidation in the past decade. A quantitative approach was then used to confirm the significance of the relationships identified during the semi-structured interview process. The unit of analysis in the study is an SI; each respondent identified the SI they worked on at the chosen service firm and based their responses on that innovation.

4.1.1 **Data collection using semi-structured interviews.** As part of the exploratory sequential design, qualitative inputs were gathered through semi-structured, online interviews with geographically dispersed respondents across India. Participants were selected using
expert sampling, falling under purposive sampling (Etikan et al., 2016; Zickar and Keith, 2023), with a focus on functional managers or above in MNOs, each having over 15 years of total experience and at least ten years in telecom (excluding respondent 11) (Table 1). The selection process considered expertise and functional role without prioritizing specific functions. Interviews were conducted with informed consent and subsequently transcribed.

A preliminary assessment of the initial three respondents led to minor modifications in the questions, mainly maintaining open-ended formats for flexibility. Thematic saturation was achieved after 14 interviews, with each session lasting between 35 min and 1 h. The questions were designed around:

- the overall evolution and scenario of the telecom industry;
- the changes it had undergone;
- the strategic focus of MNOs;
- how service providers have differentiated; and
- the performance parameters.

The interviews were conducted over a span of six months.

Data from interviews was analyzed concurrently to meet the study’s requirements and address any gaps in subsequent interviews (Miles and Huberman, 1994). The main concepts were discovered and categorized based on previous research points. A secondary verification was conducted by a senior functionary from one of the MNOs, not involved in the interviews, who reviewed the coding process and agreed with the researchers’ perspectives.

Five dimensions emerged, later developed into constructs for a quantitative study aimed at facilitating MNOs in achieving SCA. SCA, considered the outcome, complemented the model as the sixth construct. Insights from discussions revealed that service providers had varying SOs, and not all needed simultaneous prioritization. Consequently, we built a model focusing on the three most critical SOs related to SCA, incorporating mediation from KIC and SI.

### 4.2 Quantitative methodology

The subsequent phase of the exploratory sequential MMR design investigated the theoretical constructs related to SOs – customer, competitor and technology, along with

<table>
<thead>
<tr>
<th>Informant</th>
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<th>Telecom experience</th>
<th>MNO experience</th>
<th>Function</th>
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Source: Authors’ compilation
KIC, SI and SCA within the developed conceptual model. The evaluation of SCA was based on the assessment of specific SIs by telecom professionals affiliated with the 11 surveyed firms. These professionals shared insights on how these SIs contributed to their firm’s SCA relative to other companies. The study explores telecom professionals’ responses to gain insights into factors influencing the sustainability of competitive advantages in firms.

Drawing on established theories, constructs were developed and corresponding measures and scales were scrutinized. A questionnaire, aligned with the theoretical foundations, was created and validated through inputs from the qualitative study. Respondents, selected through convenience sampling, were telecom professionals with experience in the industry and functional roles. The questionnaires were distributed to employees of MNOs, specifically targeting individuals designated as managers and above who have worked or are currently working in functional roles within MNOs. Survey links were distributed to respondents via email or the WhatsApp messaging application, with questions hosted on the QuestionPro platform. Over 400 contacts received the survey link, targeting telecom professionals with industry experience since the liberalization of the sector in 1995. Of the 388 individuals who viewed the survey, 221 initiated the response process and 152 responses with complete and unique SIs were considered, resulting in a 39.2% response rate. Sampling adequacy, assessed through the Kaiser-Meyer-Olkin Measure, yielded a value of 0.921, indicating sufficient sampling. Thus, 152 responses were included in the final study; details of these respondents are given in Table 3.

4.2.1 Common method variance. To mitigate concerns related to common method bias (Conway and Lance, 2010), this study used a comprehensive approach. First, constructs were developed through a mixed methods strategy, using qualitative data for construct formation and subsequent quantitative analysis of survey responses. Second, participants were assured of confidentiality and anonymity, emphasizing the absence of right or wrong answers (Chang et al., 2010). Third, filler questions were interspersed throughout the survey to create psychological separation between constructs (Podsakoff et al., 2003) with elimination of responses lacking suitability. Fourth, a post hoc single factor analysis, following Harman (1976), indicated that a single factor accounted for 39.7% of the variance, below the 50% threshold. Fifth, variance inflation factors were examined, and all latent variables showed values below 3.3, confirming the absence of common method bias and collinearity in the model (Kock, 2015; Kock and Lynn, 2012).

4.2.2 Measures. The CuO construct, based on Deshpandé et al. (1993) for market orientation, comprised ten items. The CoO construct, rooted in Narver and Slater (1990), consisted of 11 components. TO, operationalized using Gatignon and Xuereb (1997) conceptualization, was represented by 12 items. These constructs, adapted for mobile services based on expert input from interviews, were assessed on a five-point Likert scale (anchored by “Strongly disagree” to “Strongly agree” at the end points).

The SI construct, rooted in Salunke et al. (2013) and adapted for mobile services, encompassed both interactive and supportive SI concepts. Measured on a Likert-type scale with eight items, it addressed changes in mobile services. The KIC construct, derived from Salunke et al. (2019) and refined with industry inputs, included three concepts with two items each related to knowledge creation, extension and modification. This construct was assessed on a five-point Likert scale (anchored by “Strongly disagree” to “Strongly agree” at the end points).

The SCA construct was based on the four items derived from Salunke et al. (2019) and measured using a Likert scale (anchored by “Strongly Disagree” and “Strongly Agree” at the end points).

5. Results

5.1 Results of the qualitative study

The digital transcription of interviews underwent correction for accent and accuracy, followed by summarization to emphasize key ideas (Campbell et al., 2021; Miles and Huberman, 1994).
Using thematic analysis, a first-order examination condensed transcript data into relevant words, sentences and short paragraphs. Second-order categories were deduced, focusing on sub-factors of SO (e.g., related to customer service, new technology and competition), KIC and SI (e.g., new segments, plans and platforms) (Braun and Clarke, 2019; Thompson, 2022). This helped in deducing the broader overarching themes, which were further built into constructs by examining the literature around them. In addition, we found KIC and SI to be the themes affecting SCA. Table 2 shows the findings of the qualitative study with the first-order codes, consolidating them under categories and aggregate dimensions.

5.2 Result of quantitative study

The analysis began with exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). EFA was used to determine whether all the items of a given latent construct loaded together with factor loadings greater than 0.5 (Yong and Pearce, 2013); those items that did not load together or had factor loadings less than 0.5 were removed from the analysis, and CFA was conducted. All loadings of all the latent constructs exceeded 0.5, signifying a good factor structure (Yong and Pearce, 2013). The reliability of the constructs was assessed using

Table 2 | Findings of the qualitative study (semistructured interviews)

<table>
<thead>
<tr>
<th>First-order codes (terms close to informants’ language)</th>
<th>Second-order categories</th>
<th>Aggregate dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uniformity in services across India</td>
<td>Customer satisfaction</td>
<td>Customer orientation</td>
</tr>
<tr>
<td>Having sales and service retail outlets to improve accessibility</td>
<td></td>
<td></td>
</tr>
<tr>
<td>“Setting up stores at block level”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quality of service is of paramount importance</td>
<td>Customer needs</td>
<td></td>
</tr>
<tr>
<td>“bargaining power of the company has reduced and (for the) customer it has increased”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quicker response to competitor’s new plans (tariff, segment, etc.)</td>
<td>Competition intelligence</td>
<td>Competition orientation</td>
</tr>
<tr>
<td>Employees/customers informing about market/competition, which is shared across multiple departments</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capturing mindshare with media presence</td>
<td>Competitive advantage</td>
<td></td>
</tr>
<tr>
<td>Network availability</td>
<td></td>
<td></td>
</tr>
<tr>
<td>“Coverage in villages and cities similar to avoid attrition”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uninterrupted high-speed connectivity</td>
<td>Service technology enhancement</td>
<td>Technology orientation</td>
</tr>
<tr>
<td>App-based customer service</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increase in data consumption</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Household appliances connected with MNO network (Internet of Things)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>“It’s going to be (going forward) 500 or 600 GB consumption per household on an average”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Convergence (e.g. voice over internet)2</td>
<td>New technology/Product rollouts</td>
<td></td>
</tr>
<tr>
<td>Electronic SIM2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>“Three crore kilometers of cable has been laid, which is huge”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mobile platforms to register complaints and queries</td>
<td>New touchpoints</td>
<td>Service innovation</td>
</tr>
<tr>
<td>Click and mortar presence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use of chatbots for customer service</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aadhar and e-KYC (electronic know your customer) for activation</td>
<td>Ease of use</td>
<td></td>
</tr>
<tr>
<td>Physical recharge and electronic recharge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>“Technology has to be demystified for better understanding and usage”</td>
<td>Synthesizing and implementation of information</td>
<td>Knowledge integration capability</td>
</tr>
<tr>
<td>Investment in technology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enhancements in technology to facilitate customers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>“It’s a combination of both (service quality and branding), which will help you grow”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Understanding the evolving needs or customers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employing gig workers to have the latest know-how and integrate it by training employees</td>
<td>Integrating knowledge</td>
<td></td>
</tr>
<tr>
<td>“They looked at the enterprise segment very differently had a strategic approach in terms of how do they mine their enterprise customers”</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Authors’ compilation
convergent validity and discriminant validity measures. The assessment of the convergent validity of the latent variables was conducted using factor loadings and average variance extracted (AVE), as presented in Table 4. As per Fornell and Larcker (1981a), satisfactory convergent validity for a latent construct is indicated when the AVE value exceeds 0.4 and the composite reliability (CR) exceeds 0.6. All the constructs met this criterion, indicating the presence of convergent validity. The measurement of reliability for all latent constructs was assessed using CR and Cronbach’s alpha, as presented in Table 4.

Discriminant validity was assessed based on the Fornell and Larcker (1981) test, using a pair of constructs and their AVE. The comparison of correlations with the square root of the AVE (Table 4) demonstrated the distinctiveness of all constructs. The results in Table 5 were used for H1a, H1b, H1c, H1d, H2a, H2b, H2c, H2d, H3a, H3b, H3c and H3d, results from Table 5 were used.

5.2.1 Model fit. Table 5 reports the model fit indices, as well as the structural relationships and results for H4a, H4b and H5. The model fit indices are all found to be acceptable. The chi square/df for the model is less than 5 (Wheaton et al., 1977). The model fit indices were measured using root mean square error of approximation (RMSEA), standardized root mean squared residual (SRMR), comparative fit index (CFI) and Tucker Lewis index (TLI).

Table 3 Sample demographics of survey respondents

<table>
<thead>
<tr>
<th>Total experience</th>
<th>&lt;2 years</th>
<th>&gt;2 to 5 years</th>
<th>&gt;5 to 10 years</th>
<th>&gt;10 to 15 years</th>
<th>&gt;15 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.32%</td>
<td>0.00%</td>
<td>2.63%</td>
<td>31.58%</td>
<td>64.47%</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total telecom experience</th>
<th>0 to 1 year</th>
<th>1 to 3 years</th>
<th>&gt;3 to 5 years</th>
<th>&gt;5 to 10 years</th>
<th>&gt;10 to 15 years</th>
<th>&gt;15 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>1%</td>
<td>1.32%</td>
<td>5.26%</td>
<td>28.95%</td>
<td>25.66%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Authors’ compilation

Table 4 Correlations, measures of reliability and validity

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>SD</th>
<th>AVE</th>
<th>CR</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. CuO</td>
<td>29.809</td>
<td>5.935</td>
<td>0.528</td>
<td>0.896</td>
<td>0.727</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. CoO</td>
<td>31.296</td>
<td>4.954</td>
<td>0.516</td>
<td>0.934</td>
<td>0.586***</td>
<td>0.719</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. TO</td>
<td>33.934</td>
<td>6.741</td>
<td>0.640</td>
<td>0.941</td>
<td>0.551***</td>
<td>0.574***</td>
<td>0.800</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. KIC</td>
<td>19.132</td>
<td>3.228</td>
<td>0.547</td>
<td>0.854</td>
<td>0.558***</td>
<td>0.610***</td>
<td>0.720***</td>
<td>0.739</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. SI</td>
<td>20.645</td>
<td>4.324</td>
<td>0.505</td>
<td>0.859</td>
<td>0.454***</td>
<td>0.478***</td>
<td>0.582***</td>
<td>0.569***</td>
<td>0.710</td>
<td></td>
</tr>
<tr>
<td>6. SCA</td>
<td>14.730</td>
<td>2.983</td>
<td>0.549</td>
<td>0.827</td>
<td>0.432***</td>
<td>0.466***</td>
<td>0.667***</td>
<td>0.679***</td>
<td>0.584***</td>
<td>0.741</td>
</tr>
</tbody>
</table>

Notes: ***Correlation is significant at the 0.01 level (two-tailed); The square root of AVE is on the diagonal
Source: Authors’ compilation

Table 5 Model fit indices and structural relationships for hypothesis testing

<table>
<thead>
<tr>
<th>Path</th>
<th>χ²</th>
<th>χ²/df</th>
<th>RMSEA</th>
<th>SRMR</th>
<th>CFI</th>
<th>TLI</th>
</tr>
</thead>
<tbody>
<tr>
<td>CuO → SCA</td>
<td>983.98</td>
<td>1.32</td>
<td>0.046</td>
<td>0.054</td>
<td>0.943</td>
<td>0.937</td>
</tr>
<tr>
<td>CoO → SCA</td>
<td>80.16</td>
<td>0.047</td>
<td>0.328**</td>
<td>0.406*</td>
<td>0.301***</td>
<td></td>
</tr>
<tr>
<td>TO → SCA</td>
<td>0.558</td>
<td>0.018</td>
<td>0.268*</td>
<td>0.372**</td>
<td>0.167*</td>
<td></td>
</tr>
<tr>
<td>CuO → SCA</td>
<td>0.293**</td>
<td>0.542***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: ***Correlation is significant at the 0.01 level (two-tailed); **Correlation is significant at the 0.05 level (two-tailed); *Correlation is significant at the 0.1 level (two-tailed)
Source: Authors’ compilation
All the indices met the minimum threshold requirements (Barrett, 2007). TLI and CFI are acceptable if they are greater than 0.90 (Bentler, 1990). The SRMR value was less than 0.05, indicating acceptability according to the established criteria (Byrne, 2010; Diamantopoulos et al., 2000). The RMSEA of 0.046 was less than the threshold of 0.07 considered acceptable (Hu and Bentler, 1999; Steiger, 2007).

5.2.2 Relationships. The structural equation modeling was administered using AMOS. The direct relationship, without the mediator, between SOs and SCA is found to be significant:

- CuO → SCA [$H1a: \beta = 0.519 (p = 0.005)$];
- CoO → SCA [$H2a: \beta = 0.698 (p = 0.009)$]; and
- TO → SCA [$H3a: \beta = 0.80 (p = 0.006)$].

In the presence of KIC as a mediator, only technical orientation showed a significant positive relationship with SCA (Table 5), whereas in the presence of SI as a mediator, all the SOs had a significant positive relationship with SCA (Table 6).

In the structural model, the direct effects between CuO, CoO, TO and KIC were found to be significant:

- CuO → KIC [$\beta = 0.167 (p = 0.059)$];
- CoO → KIC [$\beta = 0.293 (p = 0.034)$]; and
- TO → KIC [$\beta = 0.542 (p = 0.004)$].

The direct effect between TO and SI was also significant among the SOs:

- CuO → SI [$\beta = 0.062 (p = 0.547)$];
- CoO → SI [$\beta = 0.025 (p = 0.871)$]; and
- TO → SI [$\beta = 0.281 (p = 0.064)$].

There was also a significant positive relationship between KIC and SI, KIC and SCA, and SI and SCA:

- KIC → SI [$H4a: \beta = 0.372 (p = 0.023)$];
- KIC → SCA [$H4b: \beta = 0.406 (p = 0.022)$]; and
- SI → SCA [$H5: \beta = 0.301 (p = 0.008)$].

<table>
<thead>
<tr>
<th>Table 6</th>
<th>Test for mediation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relationship</td>
<td>Direct effect without mediator</td>
</tr>
<tr>
<td>CuO → KIC → SCA</td>
<td>0.519***</td>
</tr>
<tr>
<td>CuO → SI → SCA</td>
<td>0.519***</td>
</tr>
<tr>
<td>CoO → KIC → SCA</td>
<td>0.661***</td>
</tr>
<tr>
<td>CoO → SI → SCA</td>
<td>0.661***</td>
</tr>
<tr>
<td>TO → KIC → SCA</td>
<td>0.8***</td>
</tr>
<tr>
<td>TO → SI → SCA</td>
<td>0.8***</td>
</tr>
<tr>
<td>CuO → KIC → SI → SCA</td>
<td>0.519***</td>
</tr>
<tr>
<td>CoO → KIC → SI → SCA</td>
<td>0.698***</td>
</tr>
<tr>
<td>TO → KIC → SI → SCA</td>
<td>0.8***</td>
</tr>
</tbody>
</table>

Notes: ***Correlation is significant at the 0.01 level (two-tailed); **Correlation is significant at the 0.05 level (two-tailed); *Direct relationship from CuO, CoO, TO to SCA; CuO = customer orientation; CoO = competitor orientation; TO = technology orientation; KIC = knowledge integration capability; SI = service innovation; SCA = sustainable competitive advantage

Source: Authors’ compilation
5.2.3 Mediation tests. The Sobel test was conducted to test the effect of KIC and SI as mediators (Sobel, 1982) across the models for the hypothesized relationships. KIC was found to be fully mediating the CuO and SCA, and CoO and SCA, whereas with TO, the mediation was partial (Table 6). With SI as the mediator, the relationship between SOs and SCA was partially mediating (Table 6). The models with CuO and CoO fully supported serial mediation (Table 6) with KIC and SI between SOs and SCA, whereas the model with TO only supported it partially. Serial mediation was tested as per Taylor et al. (2008).

KIC was found to mediate the relationship between all the SOs and SCA:

- CuO → KIC → SCA \[H1b: \beta = 0.475 (p = 0.000006)\];
- CoO → KIC → SCA \[H2b: \beta = 0.650 (p = 0.000018)\]; and
- TO → KIC → SCA \[H3b: \beta = 0.381 (p = 0.000487)\].

SI mediated the relationship between all the SOs and SCA:

- CuO → SI → SCA \[H1b: \beta = 0.288 (p = 0.000970)\];
- CoO → SI → SCA \[H2c: \beta = 0.352 (p = 0.000623)\]; and
- TO → SI → SCA \[H3c: \beta = 0.329 (p = 0.003670)\].

With the addition of KIC as a mediator to this relationship, that is, having serial mediation with KIC and SI, the relationships were again significant:

- CuO → KIC → SI → SCA \[H1d: \beta = 0.505 (p < 0.00001)\];
- CoO → KIC → SI → SCA \[H2d: \beta = 0.668 (p = 0.000012)\]; and
- TO → KIC → SI → SCA \[H3d: \beta = 0.464 (p = 0.00017)\].

6. Discussion

This research examines the relationships between SOs (customer, competitor and technology) and SCA, mediated by KIC and SI in the hypercompetitive mobile service provider space. The study is motivated by the telecommunications industry’s tumultuous phase, marked by consolidation and shifts in the SOs of mobile service providers. In the intensely competitive service sector, sustaining competitive advantage and enhancing performance are imperative. To counter service commoditization, fostering a culture of continuous innovation is crucial (Jassawalla and Sashittal, 2002; Khazanchi et al., 2007). This necessitates building a culture of improving service capability KIC and SI. Our findings indicate that SI acts as a mediator between the three SOs and SCA, addressing the primary research question. The study explores the uncharted domain of knowledge integration, its interplay with SI and its impact on competitive advantage in the telecommunications industry. Aligned with Von Hippel’s (2016) and Philipson’s (2020) insights on diverse innovation sources, including users, technology providers, and suppliers, the research addresses the gap identified by Adams et al. (2019) regarding insufficient attention to factors influencing the SO and innovation performance relationship. Emphasizing the significance of achieving knowledge integration across SOs, the study highlights its role in enhancing SI performance and competitive advantage. The investigation into the mediating role of KIC between the three SOs and SCA addresses the second research question. The findings substantiate the relationships posited by the hypotheses, indicating that SOs are pivotal drivers for mobile service providers aiming to ensure the sustainability of their competitive advantage. Industry participants noted during discussions and interviews that SIs might not be readily recognized as innovations, often seen as incremental steps to enhance service and customer delivery. Empirical evidence by Stövell (2018) supports the idea that managers inherently integrate opportunity identification into their daily behavior through observation, knowledge sharing, discussion and decision-making. Lianto et al. (2018) termed this
phenomenon “continuous innovation”, also known as “continuous improvement” (Boer and Gertsen, 2003) and “incremental innovation” (Tushman and O’Reilly, 2002) in literature. De Jong and Vermeulen (2003) proposed that, given the nature of service firms, managers are more closely involved in innovation. Intra-functional and inter-functional information-sharing is emphasized, with multifunctional teams facilitating new service development (Vermeulen and Dankbaar, 2002). In addressing the third research question, it is evident that TO provides the most enduring competitive advantage for technology-based hypercompetitive service organizations. The robust direct relationship between these constructs aligns with the findings of Yousaf et al. (2020). Thus, all the research questions have been thoroughly explored and answered within the framework of this study.

6.1 Theoretical implications

Our findings are consistent with previous studies and demonstrate an established association between the market orientation elements – customer and competition orientations – and SI studies (Day, 1994; Grawe et al., 2009; Kohli and Jaworski, 1990). In examining the established relationships between CuO and SI, as well as between CoO and SI, the consistent results align with existing literature. The introduction of KIC in this research contributes to the understanding of their relationship within the context of MNOs. KIC is identified as a mediator that generates new configurations, enhancing SI capability to improve SCA. This finding is in accordance with studies by Leiponen (2006) and Salunke et al. (2019), emphasizing the role of KIC in providing innovative service solutions that effectively address customer needs. Additionally, prior research has not investigated the serial mediation of the relationships between SOs and SCA by KIC and SI. The relationship of CuO and CoO with SCA is not significant in the structural equation model. However, when treated separately and serially mediated through KIC and SI, these relationships become significant, operating collectively to achieve SCA. The partial mediation by SI evolves into full mediation with KIC and SI serially mediating the relationship. This finding aligns with Du Plessis (2007) study on the impact of knowledge management on innovation, emphasizing the crucial role of innovation in facilitating continuous improvements within firms. We find significant industrial support for the development of SCA within the context of TO. The results indicate a significant positive correlation between TO, KIC, SI and SCA, aligning with recent literature emphasizing the importance of TO in adapting to new technology, its application and addressing company performance issues (Parida et al., 2017; Zhang et al., 2018). The ability to innovate is a crucial organizational resource for navigating external uncertainties (Calantone et al., 2002; Hussein et al., 2016; Johnson et al., 1997). In the study, SI is seen to have a significant positive relationship with SCA but only partially mediates the relationship between SOs and SCA. Our research empirically establishes that the effectiveness of SI is enhanced when mediated by KIC.

Mobile service provider firms leverage CuO, CoO and TO in varying proportions, demonstrating a mixed approach for competitive advantage. The dominance of TO, with its strong influence on innovation, underscores its pivotal role in firms heavily reliant on technology. TO’s significance is further enhanced by the mediating effects of KIC and SI, affirming its foundational importance in fostering sustained competitive advantage. The partial mediation in TO relationships reflects the capital-intensive nature of the technology-driven industry, suggesting that firms investing in technology may achieve prolonged SCA. The model underscores the collaborative role of TO with CuO and CoO in SCA attainment within the information and communication technology industry.

6.2 Managerial implications

In the telecom industry, technology is a cornerstone for numerous innovations. Examples include churn analysis, clickstream analysis, new product development, network optimization, traffic routing, seamless Aadhaar card [4] linkage for customer acquisition and know your
customer (KYC) compliance, backend complaint resolution, customized plans based on customer needs and distribution setups with e-recharge facilities through apps and retail outlets. This study highlights the crucial roles of SI and KIC in understanding and adapting to evolving customer mindsets, contributing to SCA. Knowledge acquisition is identified as a pivotal factor, aligning with research emphasizing its role in exploring new avenues and enhancing innovation. Darroch’s (2005) findings on knowledge dissemination, customer knowledge utilization and competitive responsiveness for innovation find support in this research.

The empirical examination of the relationship between KIC and SI suggests managers concentrate on cultivating TO, KIC and SI as critical capabilities aligned with their SO to enhance SCA. In a hypercompetitive mobile service provider environment, innovations must involve the integration of knowledge on users and technology, along with an understanding of competition, regulators and policymaking. Continuous incremental innovations, fueled by both internal and external knowledge, are essential to stay ahead of the competition.

Given the extensive investments in technology-intensive firms, the utilization of data analytics tools is crucial for resource allocation based on return on capital, cost and capital efficiency. The study also explores serial mediation in the relationship between SOs and SCA, where the mediation by KIC and SI is found to be significant across customer, competitor and technology orientations. These findings align with previous research indicating a positive correlation between business success and the integration of diverse orientations (Deutscher et al., 2016), emphasizing the mutual support provided by orientations (Adams et al., 2019). It is acknowledged that senior managers, making strategic decisions, possess the knowledge and insights to optimize the use of CuO, CoO and TO orientations to enhance SCA.

6.3 Limitations and suggestions for future research

While this research delves into previously unexplored areas, it has certain limitations. The study’s confined scope within the MNO industry in India may constrain the generalizability of findings. However, given the universal reliance on technology in high-technology service industries, such as IT services, investment and banking services, the findings for Indian MNOs could have broader applicability. Second, the dynamic nature of the industry introduces a limitation, as it underwent policy changes and other developments during the research period. Key industry factors, including policy changes, operators’ investment capacity (which can be vital in creating novel solutions and extending reach to rural India) and the coexistence of wireline and wireless data, impact the study. Additionally, the assumption that wireline subscriptions were stagnant has been challenged by new data, revealing its rapid growth with innovations like voice-over Wi-Fi. While these factors present limitations, they also offer avenues for further research, with existing studies exploring the regulator’s impact and spectrum pricing. Extending the model to other hypercompetitive service industries and incorporating longitudinal studies could enhance our understanding of SO and innovation’s role across different sectors. Notably, services and products exhibit inherent differences, influencing innovation outcomes.

7. Conclusion

Our research contributes to the service innovation literature by conducting the first MMR study that examines the interaction between capabilities for knowledge integration and service innovation to generate sustainable competitive advantage within the mobile service providers’ context in India. Prioritizing SOs based on knowledge acquisition and exchange fosters service innovations, validating the RBVs and KBVs. The study underscores the importance of supplementing knowledge acquisition with the KIC framework. The mobile service provider context, characterized by evolving voice and data lifecycles, provides a rich subject for
research in a hypercompetitive industry. As the industry undergoes convergence, new operators may enter, prompting existing providers to consider vertical integration through capabilities like knowledge integration and service innovation. The study’s empirical evidence supports the notion that competitive advantages resulting from KIC-induced service innovation can endure over time. Managers and policymakers can leverage these findings to drive product development and strategic expansion.

Notes

1. Average Revenue Per User.
2. The number of phone connections per hundred population.
3. UPI is an instant real-time payment system developed by the National Payments Corporation of India to facilitate inter-bank transactions through mobile phones.
4. National identification card in India.

References


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Further reading


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