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Navigating the Institutional Landscape: The Dynamics of Operant Resources and Value Co-Creation for Service Innovation in Pakistani ICT Firms

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ABSTRACT

This research investigates the factors influencing service innovation within Pakistan's ICT SME software development sector to address challenges hindering global competitiveness. A quantitative research approach was adopted, utilizing Partial Least Squares Structural Equation Modelling (PLS-SEM) to analyze the data collected from a sample of 336 software firms. The study integrates Service-Dominant Logic (SDL), Resource Advantage (RA) Theory, and Institutional Theory to explore the interplay of variables affecting service innovation. The results indicate that company-customer relationships, knowledge valuation, and customizing capability significantly impact value co-creation and service innovation. Moreover, institutional logics, particularly cognitive and normative logics, were found to moderate these relationships. This research comprehensively examines the factors influencing service innovation in the Pakistani ICT sector. It extends the application of SDL and Institutional Theory to a specific emerging market context, contributing valuable insights to the field of service innovation.

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1. Introduction

Digitalization has changed how business organizations operate and altered the dynamics in the competitive landscape, making competition a key factor in a country's survival and growth. In this environment, to thrive, it is essential to enhance competitiveness through innovation, financial innovation, and sustainability for achieving organizational success and global competitiveness (Afshar Jahanshahi et al., 2022). With technological advancements transforming industries, businesses are increasingly pressured to innovate to maintain and enhance their competitive advantage (Hagberg et al., 2016). Service innovation is an essential strategy for businesses to meet the needs of global consumers whose expectations are constantly shaped by technological progress (Elo et al., 2023). Research also found that firms that excel in innovation not only improve competitive positioning but also outperform their peers in profitability (Am et al., 2020). However, the rapid pace of technological change, accelerated by disruptions such as the COVID-19 pandemic, has underscored the importance of service innovation in maintaining business continuity and adapting to new market conditions. The pandemic has accelerated the need for organizations to adapt to technology, representing it as a necessity. In this way, companies have improved product and service delivery, redefined customer relationships, enhanced corporate image and reduced operational costs (Hagberg et al., 2016; Kuo et al., 2017; Moorman et al., 2019). However, software programs, mobile applications, and e-commerce systems are still hampered by challenges, highlighting gaps in software development and adaptation efforts (Kamalaldin et al., 2020; Siddiqui, 2022).

The Information and Communication Technology (ICT) sector has become the technology focal point, with software applications development being a key area of growth (Lusch & Nambisan, 2015). However, despite all this, ICT firms are frequently unable to keep up with the scale and speed of technological advancements. However, many organisations must use robust structures to manage and evaluate innovation processes to implement practical service innovations (Raza, 2018). In the context of Industry 4.0, the rapidity of technological change often outpaces the capacity of individual firms to adapt and innovate effectively (Kamalaldin et al., 2020). The digitalization also contributes extensively to industry growth by driving service innovation with ICT software development SMEs (Harsanto et al., 2020). Nevertheless, SMEs in this domain frequently encounter obstacles to innovation due to limited resources and their inability to keep up with technological change. While facing these challenges, SMEs are also deeply motivated to find external expertise and search for knowledge beyond their close bounds, which stimulates innovative results (Spithoven et al., 2013).

The ICT sector in Pakistan holds enormous growth potential, particularly in the IT field. The industry was valued at USD 3.5 billion in 2019 and is expected to reach USD 7 billion within a few years (Invest Pakistan, 2022). However, this growth is mainly due to the outsourcing of contracts from foreign clients, and the country's competitive advantage lies in high-cost labour (Sinkovics et al., 2019). The ICT market size in Pakistan was projected to reach USD 15.10 billion by 2022 and is expected to grow further (Global Data, 2024). Several government initiatives support this growth, including tax incentives and policies to make IT exports easy (Pakistan Bureau of Statistics, 2023). Invest Pakistan (2022), the Pakistan Software Export Board (PSEB), has significantly promoted the sector domestically and internationally. The growth trajectory is also evident from the massive rise in e-commerce registrations (an increase of 76% from 2019 to 2021) and a 10.8% rise in IT services exports (Shah, 2021; Shair et al., 2022). Foreign investments by countries such as China, Germany, and the UAE further contribute to the sector's expansion (State Bank of Pakistan, 2022). Pakistan's government has launched the Digital Pakistan Vision and the Rolling Spectrum Strategy (2020-2023) as part of its development agenda to bridge the digital divide and foster the development of the ICT and IoT sectors (Shair et al., 2022). Pakistan's ICT and software development sector has shown resilience while facing global challenges such as the COVID-19 pandemic. However, some barriers need to be addressed to achieve the full potential of service innovation. Knowledge gaps, limited resources, and a weak institutional framework hinder the effective implementation of innovative strategies, especially in SMEs, where there is a need for greater capacity to implement large-scale innovations (So et al., 2022).

The article adopts a combined approach to study the methods Pakistani ICT SMEs use to surpass service innovation obstacles. A research analysis investigates service innovation dynamics among ICT SMEs by implementing Service-Dominant Logic (SDL), Resource Advantage (RA) Theory, and

institutional theory. This research unites three individual theories to analyze how client involvement and institutional logics, especially the regulative and normative pillars, affect service innovation processes. This research uses SDL at the meta-theoretical level to study client involvement in innovation and the effects of institutional logic. The research merges these theoretical perspectives to create both academic progress and practical guidance for small and medium enterprises seeking to enhance their service innovation ability. The results from the research guide SMEs in dealing with technological and institutional change while improving their international market competitive edge.

2. Theoretical Background and Framework

To understand depth service innovation in ICT SMEs, this study combines three theoretical lenses, namely, Service Dominant Logic (SDL), Resource Advantage Theory (RAT), and Institutional Theory (IT). Service-Dominant Logic (SD Logic), as a meta-theoretical framework, is selected to focus on value co-creation, which is fundamental in understanding how intangible and collaborative resources contribute to innovation. SD Logic differs from traditional innovation models by capturing the dynamic and interactive nature of resource integration, which is especially relevant for service-driven industries (Vargo & Lusch, 2016). Based on RA Theory, SD Logic provides a firm-level perspective on resource heterogeneity and competitive advantage. The application of RA Theory is traditionally based on internal resources. However, this study extends SD Logic to include customers as external actors using its value co-creation framework. This integration links internal resource dynamics with external stakeholder contributions by bridging theoretical gaps.

Institutional Theory is integrated to account for the effect of external environmental factors, such as regulations, cultural norms and societal expectations, that are more pertinent to the case of Pakistan's ICT sector. Firms interact with their environments and use resources for innovation in ways constrained by institutional logics (regulative, normative). The study combines these three perspectives to develop a nuanced framework that integrates internal capabilities, external actors and institutional constraints, contributing theoretically and practically to the field. Building upon the theoretical foundation of Figure 1, this section delves into elucidating each variable included in the study. The subsequent section will present a comprehensive literature review of the variables under investigation, identifying the research gaps this study aims to address.

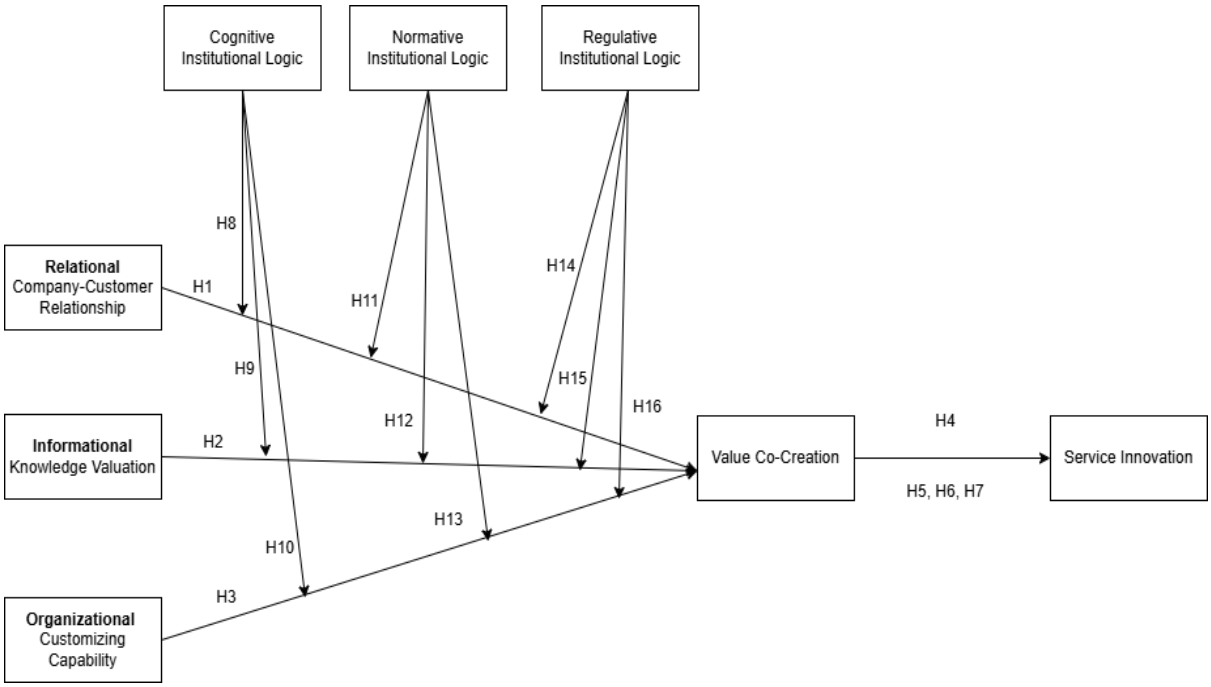

Fig. 1. Theoretical Framework

3. Literature Review

3-1. Company-Customer Relationship and Value Co-Creation

The company-customer relationship is a vital factor driving value co-creation (VCC). Establishing direct business-customer collaboration supports enduring VCC as it helps organizations understand customer requirements to generate innovation. Active customer engagement results in mutual benefits, including improved satisfaction, loyalty, and trust, which, according to Hsieh and Hsieh (2015) and Kamalaldin et al. (2020), boost VCC. SD Logic explains that value emerges from customer participation in co-creation processes, making customer engagement fundamental to value development (Vargo & Lusch, 2004). Companies work with customers through a moving process to build new services through mutual collaboration. Company innovation improves through customer engagement, which includes using services as passive participants while sharing information and co-creating value that helps organizations innovate (Adiguzel et al., 2025). Organizations create improved service solutions that correspond to client requirements by collecting customer wisdom. Service customization, satisfying customer needs, creates innovation by matching services with customer expectations, thereby strengthening company-customer connections (Aslam et al., 2023; Zaborek & Mazur, 2019). The rapidly changing ICT industry relies on tight connections between companies and customers to build competitive advantages, which allow continuous innovation. Research about the impact of these relationships on VCC within ICT SMEs in Pakistan remains scarce. This research seeks to connect the gaps by investigating how company-customer relationships influence value co-creation within the ICT sector of Pakistan. The study explores strategies that ICT SMEs can use to transform customer participation into innovation and competitive market standing.

H1: The company-customer relationship has a significant positive impact on value co-creation.

3-2. Knowledge Valuation and Value Co-Creation

Service innovation depends heavily on knowledge valuation which treats customer information as an essential business resource. Organizations gain the power to innovate through knowledge sharing as it helps them uncover client requirements, market deficiencies, and competitor approaches. Firms and customers who share knowledge obtain valuable insights, leading to improved service offerings and enhanced innovation (Trim et al., 2023). Research indicates that service development innovation performance, together with organizational learning, benefits from the quality of information sharing, according to Liu et al. (2024). Service innovation improves through the knowledge exchange between firms and customers, leading to better relationship quality. The co-creation process depends heavily on customer competencies that incorporate trust, motivation, and perceived value, as these competencies enable companies to create personalized solutions tailored to client requirements (Pathak et al., 2022). Value co-creation emerges from the unified contributions of specialized knowledge between firms and customers to achieve competitive advantage. Although knowledge valuation and value co-creation play vital roles in service innovation, the scarcity of research on how Pakistani firms utilize customer knowledge for innovation remains a notable gap. Pakistan's ICT sector SMEs struggle to effectively use customer insights because they encounter two main obstacles: limited resources and insufficient institutional backing. The research examines ways in which ICT SMEs can overcome their challenges to use customer knowledge more effectively for service innovation advancement and market competition sustainability in this rapidly changing marketplace.

H2: Value co-creation is positively impacted by knowledge valuation.

3-3. Customizing Capability and Value Co-creation

A firm’s capability to customize services is an organizational operant resource that customizes services to address specific customer needs, resulting in VCC (Hsieh & Hsieh, 2015). Studies have suggested that customization enhances innovation by satisfying customer preferences and forming closer customer relationships (Aslam et al., 2023; Zaborek & Mazur, 2019). The literature on market orientation (Pongsathornwiwat et al., 2019; Tajeddini & Trueman, 2012) supports the assertion that firms employing customization to develop customized offerings have a competitive advantage. Although customizing capability has been associated with innovation, the direct impact of VCC in

Pakistan's ICT sector has not been researched. This gap will be addressed by investigating how customizing capability directly impacts VCC in Pakistani ICT SMEs and drives service innovation.

H3: Value co-creation is significantly enhanced by capability customization.

3-4. Service Innovation and Value Co-Creation

Value co-creation (VCC) is a process of developing value collaboratively with customers and stakeholders, and service innovation deemed essential for VCC. Organizations can integrate customer perspectives by engaging customers directly in service design and innovation. This enables organizations to contribute customer perspectives in service design and innovation, thereby leading to enhanced service outcomes (Koskela-Huotari et al., 2016). Customer participation in these processes enhances customer satisfaction, perceived value, and overall organizational performance (Carvalho & Alves, 2023; Xu et al., 2018). Customer involvement and collaboration are essential in-service innovations. Furthermore, it will also foster customer satisfaction and loyalty and create new ideas (Ramani & Kumar, 2008). Organizations can drive practical innovation through operant resources such as insights and customer feedback.

H4: Value co-creation significantly influences service innovation.

3-5. Value Co-Creation as a Mediating Role between Company-Customer Relationship and Service Innovation

Service innovation thrives on strong company-customer relationships, where robust relationships allow for collaborations and customer participation in the innovation process. Organizations have strong bonds with market orientation, implying that organizations have leverage to customer input for driving innovation (Wei et al., 2024). The research indicates a correlation between customer relationship and a positive association with service innovation performance, demonstrating the importance of relational dynamics in fostering service innovation (Tuominen et al., 2022). A relational perspective in the digital service sector implies that cooperative exchanges among partners lead to value co-creation (Knockaert et al., 2019). This relational view provides a critical mechanism through which value co-creation is vital for firms to integrate customer input and be innovative. Therefore, the following hypothesis is formed:

H5: The company-customer relationship and service innovation are mediated by value co-creation.

3-6. Value Co-Creation as a Mediating Role between Knowledge Valuation and Service Innovation

Effective translation of customer needs into market offerings (Sánchez-Gutiérrez et al., 2019) relies heavily on knowledge valuation as an essential informational operant resource. In the digital era, firms can employ technological capabilities to manage and share knowledge fundamental to innovation (Zhou & Wu, 2010). Prior research has largely ignored the influence of external operant resources, such as technological capability and strategic flexibility, in driving service innovation (Savino et al., 2017). To fill this gap, this study investigates how knowledge valuation and value co-creation jointly enable service innovation among Pakistani ICT SMEs, with internal and external capabilities serving as a support for service innovation outcomes.

H6: The knowledge valuation–service innovation relationship is mediated by value co-creation.

3-7. Value Co-Creation as a Mediating Role between Customizing Capability and Service Innovation

Customizing capability is an organizational operant resource that enables collaborative, trust-based customer relationships, leading to value co-creation and service innovation (Edvardsson & Tronvoll, 2013). Market orientation and customer collaboration are adopted to customize a firm, thereby enhancing its competitive advantage and contributing to service innovation (Vargo & Lusch, 2017). In line with the resource-based view, innovation outcomes are shaped by diverse resources and environmental factors (Steinbruch et al., 2022). Even though previous studies have demonstrated the relationship between customizing capability and innovation, research on the role of value co-creation in mediating the customizing capability and service innovation relationship in ICT firms in Pakistan remains to be

conducted. This study explores how value co-creation mediates this relationship, contributing to a deeper understanding of how customizing capabilities drive innovation in the service sector.

> **H7:** Customizing capability is found to mediate the relationship with service innovation through value co-creation.

3-8. Moderating Role of Cognitive Institutional Logics

Socio-cultural frameworks that comprise cognitive institutional logics profoundly affect how entrepreneurs deal with information and knowledge synthesis, as well as how they perform value co-creation activities. The combination of beliefs, norms, and schemas function as cognitive structures that influence decisions and innovative practices inside cultural settings. Firms have to understand cognitive logics to determine how they interact with customers while combining knowledge for value co-creation. According to recent research findings, the relationship between company-customer relationships and value co-creation receives moderation from cognitive logics. Research by Lyu et al. (2022) demonstrated that personal experience with co-creation boosts customer self-efficacy and engagement, therey impacting their value co-creation activities. The research conducted by Frempong et al. (2020) on customer operant resources, along with online value co-creation and electronic-word-of-mouth in solid waste management marketing, demonstrates how cognitive frameworks influence customer engagement and value co-creation (Frempong et al., 2020). An investigation into value co-creation elements under AI technology reveals that consumers' cognitive attitudes play a substantial role in value co-creation processes, while cognitive logic functions as a moderating factor (Rex & Baumann, 2007).

> **H8**: Cognitive institutional logics moderate the relationship between the company-customer relationship and value co-creation.

The cognitive institutional logics determine how firms understand and evaluate knowledge as it is deemed essential in value co-creation processes. Firms that evaluate knowledge properly will improve their innovation potential and their ability to create value with customers. Research conducted by Zhang and Yi (2024) explores the link between knowledge elements and value co-creation in innovation ecosystems, while demonstrating that cognitive frameworks are vital for how firms handle knowledge valuation. Jian et al. (2023) examine how cognitive logics affect knowledge sharing and value co-creation behaviour during peer-to-peer accommodation experiences and loyalty development. The core characteristics of AI-powered value co-creation suggest how cognitive consumer attitudes serve as significant determinants that influence value co-creation, according to Nazir et al. (2024).

> **H9:** Cognitive institutional logics moderate the relationship between knowledge valuation and value co-creation.

Service customization is influenced by cognitive patterns. Decisions regarding service adaptation to meet customer needs originate from the cognitive frameworks of decision-maker, which guide customization practices and value co-creation activities. Research studies indicate how value co-creation behavior influences customer experiences and loyalty within peer-to-peer accommodations while cognitive logics determine service customization and value co-creation processes (Jian et al., 2023). Research by Zhang and Yi (2024) proves that the core elements of AI technology-driven value co-creation depend heavily on how consumers think about their service needs. The research landscape of customer co-creation value demonstrates how cognitive frameworks lead businesses to customize services and co-create value (Bosisio, 2024).

> **H10:** Cognitive institutional logics moderate the relationship between customizing capability and value co-creation.

3-9. Moderating Role of Normative Institutional Logics

Societal values, norms, and beliefs form normative institutional logics that strongly affect entrepreneurial conduct and innovative procedures. Firms follow this logic to define their social responsibilities and customer co-creation practices, specifically during the development of service innovation. Research studies analyze how institutional logics coordinate resource integration by

demonstrating that normative frameworks determine value co-creation (Papageorgiadis & Sharma, 2015). Homburg and Tischer (2023) studied selling transformation for value co-creation, demonstrating how normative logics affect value co-creation practices. Research by Jian et al. (2023) examines how value co-creation activities of peer-to-peer accommodation customers influence their experiences and loyalty, based on societal norms.

> **H11:** The relationship between the company-customer relationship and value co-creation is moderated by normative institutional logics.

Firms use normative logics to determine their approaches toward knowledge valuation. Social norms regarding knowledge exchange and teamwork determine corporate strategies for integrating external information into service development procedures. Research by Zhu et al. (2023) has investigated how value co-creation actions shape customer loyalty and experience within peer-to-peer accommodation systems, while demonstrating the social influence on knowledge exchange and co-creation. Research findings on AI technology-driven value co-creation demonstrate that consumer cognitive attitudes play a major role in value co-creation through their moderating effect (Zhang & Yi, 2024). Research by Bosisio (2024) demonstrates that cognitive frameworks guide both knowledge sharing and value co-creation processes into customer co-creation value.

> **H12:** The relationship between knowledge valuation and value co-creation is moderated by normative institutional logics.

Firms modify their services based on societal values and norms, establishing how services meet customer requirements. Firms use normative logic to develop innovative service customization, leading to value co-creation. Researchers are now exploring institutional logics that facilitate resource integration through normative frameworks, as these logics determine how service customization and value co-creation processes develop (Papageorgiadis & Sharma, 2015). The research demonstrates that normative frameworks help companies develop superior customer engagement, resulting in better service customization and innovation.

> **H13:** The relationship between customizing capability and value co-creation is moderated by normative institutional logics.

3-10. Moderating Role of Regulative Institutional Logics

Organizations face substantial behavioral and innovation process changes due to formal regulatory institutional logics, which include both rules and policies, as well as regulatory standards. Organizations function under these logics to determine the legal and regulatory boundaries that affect their ability to create value for their customers. Multiple research investigations demonstrate how regulatory frameworks affect value co-creation since organizations must follow legal standards to achieve effective customer participation and innovative practices. Solid waste management marketing research conducted by Frempong et al. (2020) indicates how regulatory environments affect customer operant resources, online value co-creation, and electronic word-of-mouth. Research suggests that regulatory frameworks influence consumer behavior and value co-creation when it comes to consumer responses toward environmentally friendly products (Rex & Baumann, 2007).

> **H14**: The relationship between the company-customer relationship and value co-creation is moderated by regulative institutional logics.

The regulatory environment determines how businesses both perceive knowledge assets and employ them in their operations. Intellectual property rights and other legal protections determine firms' value and methods of knowledge utilization. A research work on intellectual property rights and innovation demonstrates that powerful regulatory structures serve to defend intellectual capital while promoting collaborative value generation (Papageorgiadis & Sharma, 2015). Regulatory frameworks have direct effects on market outcomes and innovation, as they guide strategic company choices in multiple industries (Chowdhury et al., 2018). Research demonstrates that businesses that collaborate more frequently achieve better innovation abilities within environments characterized by robust regulations (Bosma et al., 2018).

H15: The relationship between knowledge valuation and value co-creation is moderated by regulative institutional logics.

Service customization falls under legal frameworks which establish guidelines for service quality standards, intellectual property rights, and service standards. These regulatory frameworks guide service providers to modify their services for customer satisfaction purposes, affecting the value co-creation journey. Research studies demonstrate that the proper regulation of environments facilitates service innovation. EU government regulations drive firms to develop innovative service solutions, while adapting their offerings which leads to better customer satisfaction and co-created value (Papageorgiadis & Sharma, 2015). Studies about intellectual property rights indicate that legal frameworks encourage businesses to protect their services while building customized solutions corresponding to customer needs (Abbasi et al., 2025; Papageorgiadis & Sharma, 2015).

H16: The relationship between customizing capability and value co-creation is moderated by regulative institutional logics.

The present literature identifies these gaps in knowledge so this research develops an integrated framework that uses Service-Dominant Logic (SDL), Resource Advantage (RA) Theory, and institutional theory to study how Pakistani ICT sector SMEs can surmount their service innovation barriers. The proposed holistic research model integrates theoretical principles with real-world limitations to enable better understanding of the service innovation factors. The research investigates ways for SMEs to enhance their service innovation abilities through practical recommendations in a rapidly changing technological and institutional environment.

The study addresses these research gaps to explain how SMEs can employ client involvement, institutional logics, and resource-based capabilities to address sector challenges and achieve innovation success in the competitive ICT sector.

4. Material and Methods

4-1. Sample and Procedure

The population for this research includes all the software houses registered in Lahore, Karachi and Islamabad with PSEB. This sector has recently been selected due to its exceptional growth during COVID-19, depending on technology, foreign investments, and promising prospects. These cities were chosen due to their high concentration of software houses and economic importance. The list of the registered software houses was obtained from the website of the PSEB, which provided exhaustive information about the firms. A sample of 1,344 software development firms operating in Lahore, Karachi, and Islamabad were included in this research. Project managers of these companies were selected as the data collection unit to seek an understanding of operant resources, customer value co-creation, and influences of institutional logics on service innovation. Data were collected based on a sampling frame developed from the PSEB list. The frame ensured that only software houses registered with PSEB and having projects operational for at least six months were included in the sampling frame. Freelancers were excluded due to their non-standardized operations and project-based nature. The entire data collection process spanned nine months, allowing ample time for participant recruitment, follow-ups, and survey administration.

4-2. Sampling

When the entire population is difficult and expensive to research, sampling becomes critical. The Pakistan Software Export Board (PSEB) reports that there are 4,031 registered ICT firms in Pakistan, primarily located in Islamabad, Karachi, Lahore, Peshawar, and Quetta. Total registred software houses included 1,360. Peshawer and quetta were excluded due to their neglible representauon of software house. To ensure that the sample size was representative of the firms in each city, Proportional Stratified Sampling was employed. The research employed proportionate stratified sampling to maintain equal regional distribution which minimized sampling biases and increased statistical accuracy. The homogeneous nature of the ICT sector demanded proportional sampling because its market dynamics and business scale, together with regulatory support, differed between Lahore and Karachi and Islamabad. The sampling method produces a balanced distribution of cities,

which enables valid comparisons between locations and allows for proper extrapolation of results to Pakistan's software industry as a whole. The sampling method helps minimize errors in the analysis and provides an exact evaluation of service innovation combined with institutional logic analysis. The final sample sizes for the cities were as follows:

Table 1. Summary of ICT Firms and Selected Software Development Firms in Pakistan

City	Total ICT Firms	Total Software firms	% of Total Firms	Sample Selected Based on Strata Size
Islamabad	1,418	468	34%	161
Karachi	1,056	444	33%	144
Lahore	1,200	432	32%	137
Peshawar	256	11	6.30%	Excluded
Quetta	101	5	2.50%	Excluded
Total	4031	1360	100%	442

A convenience sampling approach selected project managers since software houses were unwilling to provide contact information due to confidentiality issues. A Raosoft Calculator confirmed a sample size of 444 and recommended a range of 300 to 450 for Structural Equation Modeling (SEM) based on a-priori calculations. Therefore, for this study, the final sample size was established at 444.

4-3. Measures

The structured questionnaire utilized in this study consisted of six sections: 3 items of company customer relationship (Hsieh & Hsieh, 2015), 5 items of knowledge valuation (Pérez-Nordtvedt et al., 2008), 3 items of customizing capability (Zhang & Chen, 2008), 4 items of value co-creation (Iden et al., 2020), 13 items of institutional logic (Busenitz et al., 2000), and 7 items of service innovation (Hsieh & Hsieh, 2015). Confidentiality of all responses was ensured by a cover letter outlining the study's purpose, instructions, and so forth. The questionnaire was pretested by six experts (three academics and three professionals) for clarity, validity and accuracy for feedback to improve its design and wording. The short survey confirmed that it took 10-12 minutes to complete. The study's objectives were made known to the participants, and the responses of the participants were confidential. In the case of voluntary involvement, participants could decline participation or skip questions. We employed convenience sampling because the software houses were unwilling to share contact details for confidentiality reasons. In Lahore, we conducted multiple visits and sent email reminders for data collection. In contrast, surveys for Islamabad and Karachi were administered online using Google Forms.

5. Data Analysis

This section presents the results of statistical analysis, objectives, and questions. An overview of participant organizations, response rates, and how missing values were dealt with is provided. Normality, CMV, and outliers were checked. The study used Partial Least Squares Structural Equation Modeling (PLS-SEM), evaluating the measurement and structural models. Descriptive analysis detailed participant organizations, response rates, and data preparation procedures. The stratified sampling method resulted in the selection of 442 software firms from a total of 1,444 firms. Questionnaires were distributed according to each city, with 161, 144, and 137 questionnaires were sent to Islamabad, Karachi, and Lahore, respectively. Responses were collected in person from Lahore, while emails for response collection were routed through Islamabad and Karachi. The response rate was 77.6%, with 336 usable responses after handling incomplete data. The sample comprises a diverse range of software projects, including 143 web development projects and 81 educational software applications. The sizes of the companies vary; however, 55.6% have between 5 to 50 employees.

5-1. Common Method Variance (CMV) and Measurement Model Assessment

This paper attempts to address the CMV problem through procedural and statistical remedies. From the Harman single-factor test, no single factor explained most covariance among the variables, perhaps implying that CMV may not be significant in this study. Measurement and structural models were

tested using SmartPLS 4.0, following the two-stage approach: first, the validity and reliability of the measurement model was checked; second, the structure model was evaluated. Individual item reliability was reviewed for all indicators, retaining the loadings above the threshold of 0.708. The criteria of practical relevance supported retaining the item loadings above 0.50 as relevant (Hair et al., 2014). The convergent validity and reliability are summarized in Table 1, where AVE is at or near 0.5, and CR or Cronbach's Alpha values meet or exceeded thresholds established by Hair et al. (2017) and Nunnally (1967). The Discriminant validity was verified through the Heterotrait-Monotrait ratio or HTMT. All the values were below the critical threshold of 0.90, as stated by Henseler et al. (2009), indicating that the constructs are different from each other. The path coefficients and loadings were tested using bootstrapping with 5000 resamples. All constructs were multi-item reflective measures with high internal consistency. In general, the results prove strong reliability and validity for the measurement instruments of this study.

5-2. Reason for Using PLS-SEM

Given the non-parametric nature of PLS-SEM, it is preferred not to require normal data distribution. Although the values fell within the univariate normality threshold of ±2, multivariate normality could not be supported in the data. Mardia's tests indicated significant deviations from normality, with skewness $\beta = 31.86$, and kurtosis $\beta = 201.80$, further justifying the suitability of SmartPLS. The non-parametric approach is well-suited for handling non-normal data without any issues.

5-3. Measurement Model Assessment

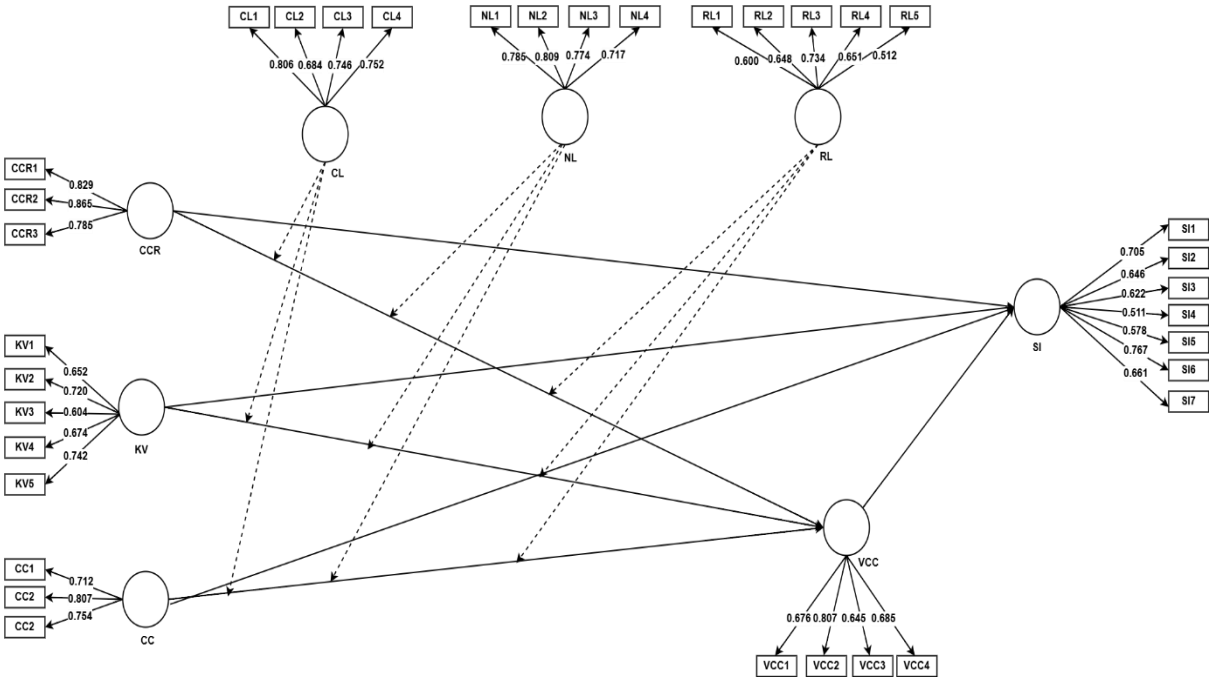

Fig. 2. Measurement Model

5-4. Indicator Reliability

Indicator loadings should be higher than 0.708 to be deemed reliable. For loadings below this threshold, those ranging between 0.40 and 0.70 were considered for deletion if such action would enhance either reliability or Average Variance Extracted (AVE). No indicators were deleted, as all exceeded the specified thresholds.

5-5. Convergent Validity

The AVE is supposed to be more than 0.5; however, when CR exceeds 0.6, an AVE of more than 0.4 can also be termed good (Hair et al, 2014). Following these suggestions, it proved that convergence validity was strong.

5-6. Cronbach's Alpha

Cronbach's alpha values above 0.7 indicate strong internal consistency. Values ranging from 0.6 to 0.7 are considered acceptable, while values exceeding 0.95 suggest redundancy. In this study, all alpha values met these threshold standards.

5-7. Composite Reliability

The composite reliability was based on PLS-SEM. The minimum threshold set for it is 0.70. All values ranged from a low of 0.80 to a high of 0.87, thereby indicating high internal consistency.

5-8. Discriminant Validity

Discriminant validity was measured by the HTMT ratios. The threshold value for HTMT is 0.90 (Henseler et al., 2009). All HTMT values fell below this threshold value, thereby supporting the model's discriminant validity.

Table 2. Summary of Convergent Validity and Reliability

Constructs	Items	Indicator Reliability	Convergent Validity	Internal Consistency	
		Outer Loadings >0.5	AVE >0.5	Composite Reliability >0.7	Cronbach's Alpha >0.7
Company-customer Relationship	CCR1	0.829	0.68	0.87	0.77
	CCR2	0.865			
	CCR3	0.785			
Knowledge Valuation	KV1	0.652	0.51	0.81	0.71
	KV2	0.720			
	KV3	0.604			
	KV4	0.674			
	KV5	0.742			
Customizing Capability	CC1	0.712	0.58	0.80	0.63
	CC2	0.807			
	CC3	0.754			
Regulative Institutional Logics	RL1	0.600	0.48	0.80	0.62
	RL2	0.648			
	RL3	0.734			
	RL4	0.651			
	RL5	0.512			
Cognitive Institutional Logics	CL1	0.806	0.56	0.84	0.74
	CL2	0.684			
	CL3	0.746			
	CL4	0.752			
Normative Institutional Logics	NL1	0.785	0.60	0.85	0.78
	NL2	0.809			
	NL3	0.774			
	NL4	0.717			
Value Co-Creation	VCC1	0.676	0.50	0.80	0.66
	VCC2	0.807			
	VCC3	0.645			
	VCC4	0.685			
Service Innovation	SI1	0.705	0.47	0.83	0.76
	SI2	0.646			
	SI3	0.622			
	SI4	0.511			
	SI5	0.578			
	SI6	0.767			
	SI7	0.661			

Note. CC = Customizing Capability, CCR = Company-customer relationship, KV = Knowledge valuation, RL Regulative Logic, NL = Normative Logic, CL = Cognitive Logic, VCC = Value co-creation, SI = Service Innovation

Table 3. Heterotrait-Monotrait Ratio (HTMT) – Matrix

	CC	CCR	CL	VCC	KV	NL	RL	SI
CC								
CCR	0.744							
CL	0.833	0.799						
VCC	0.884	0.821	0.747					
KV	0.897	0.762	0.890	0.825				
NL	0.690	0.670	0.804	0.549	0.625			
RL	0.892	0.653	0.762	0.890	0.842	0.538		
SI	0.865	0.767	0.790	0.825	0.740	0.886	0.765	

Note. CC = Customizing Capability, CCR = Company-customer relationship, KV = Knowledge valuation, RL = Regulative Logic, NL = Normative Logic, CL = Cognitive Logic, VCC = Value co-creation, SI = Service Innovation

The reliability and validity of the measurement model were satisfactory for all indicators and constructs, thereby indicating that the model was reliable.

5-9. Structural Model

Subsequently, the structural model was evaluated to determine its capability to predict the constructs.

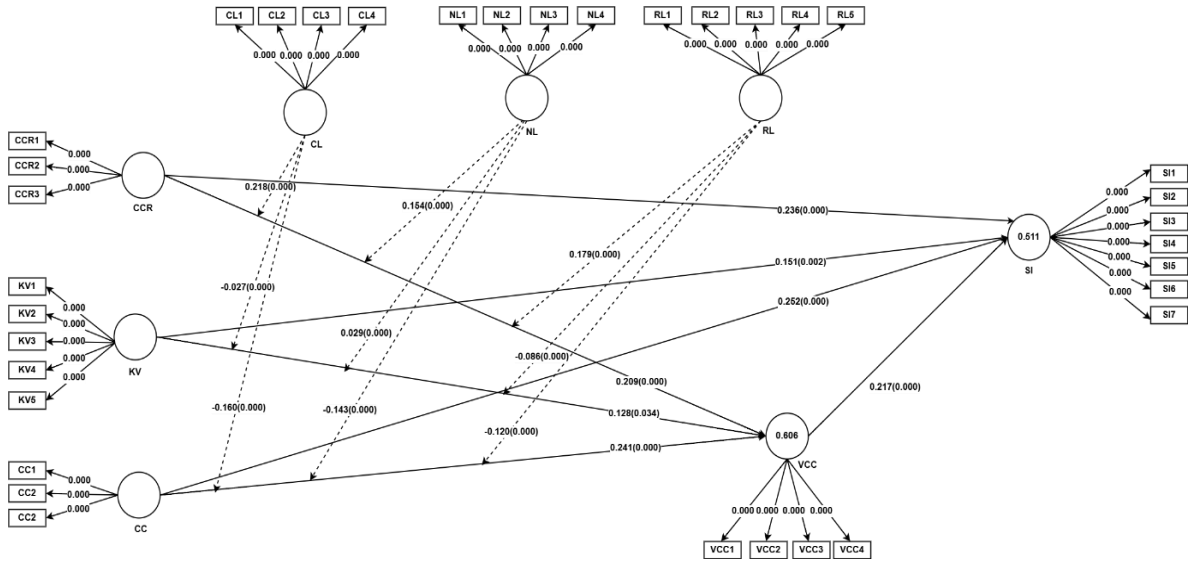

Fig. 3. Structural Model

5-10. Assessment of the Structural Model for Collinearity Issues

Investigation of collinearity is essential in constructing a structural model. A latent variable analysis of the structural model should be performed only when there are no collinearities among the constructs. VIF detects each collinearity issues. According to Hibbert et al. (2012), the recommended threshold value to examine collinearity is 5, while Diamantopoulos et al. (2008) suggest the threshold value at 3.3. As presented in Table 3, the inner VIF values for each construct in this study range from 1.823 to 2.984, which is below the threshold of 5 recommended by Hair et al. (2012) and 3.3 as suggested by Diamantopoulos et al. (2008). Consequently, this study does not raise any collinearity issues.

Table 4. Collinearity Statistics (VIF)

	CC	CCR	CL	KV	NL	RL	SI	VCC
CC							1.987	2.282
CCR							1.823	2.648
CL								2.753
KV							2.016	2.984
NL								1.954
RL								1.895
SI								
VCC							2.08	

Note. CC = Customizing Capability, CCR = Company-customer relationship, KV = Knowledge valuation, RL = Regulative Logic, NL = Normative Logic, CL = Cognitive Logic, VCC = Value co-creation, SI = Service Innovation

In this regard, 28 hypotheses were developed to test the significance of the relationships within the structural model among the constructs. The t-statistics were calculated for each path using the SmartPLS 4.0 bootstrapping function, with a significance level of 0.05, a one-tailed test, and a total of 5,000 subsamples. Consequently, the critical values for 1 percent ($\alpha = 0.01$), 5 percent ($\alpha = 0.05$), and 10 percent ($\alpha = 0.1$) are 2.33, 1.645, and 1.28, respectively, for the one-tail test (Ramayah et al., 2018). Table 4 depicts a wide range of path coefficient values from -0.128 to 0.305, all falling from -1 to +1. As noted by Hair et al. (2017), a path coefficient close to +1 denotes a strong positive relationship, while a coefficient closer to 0 signifies a weak relationship.

Table 5. Direct Relationship Hypotheses

Hypothesis	Path	β	Std. Error	BCI LL	BCI UL	t-value	p-value	Decision
H1	CCR > VCC	0.209	0.06	0.104	0.302	3.462	0	Supported
H2	KV > VCC	0.128	0.07	0.008	0.237	1.82	0.034	Supported
H3	CC > VCC	0.241	0.055	0.144	0.324	4.4	0	Supported
H4	VCC> SI	0.217	0.061	0.112	0.314	3.557	0	Supported

Note. CC = Customizing Capability, CCR = Company-customer relationship, KV = Knowledge valuation, RL = Regulative Logic, NL = Normative Logic, CL = Cognitive Logic, VCC = Value co-creation, SI = Service Innovation

The results of the t-test indicate that, except for knowledge valuation which is significant at the 5% level, all relationships have a t-value greater than or equal to 1.645, indicating significance at the 0.01 level. Company customer relationship (β=0.209, t-value=3.462, p<0.01), knowledge valuation (β=0.128, t-value=1.82, p<0.05), and customizing capability (β=0.241, t-value=4.4, p<0.01) are all positively related to VCC. There is a positive and significant relationship between VCC and service innovation at the 1% significance level (β=0.217, t-value =3.557, p<0.01). Company-customer relationship (with β=0.236, t-value=5.622, p<0.01), knowledge valuation (β=0.151, t-value=3.433, p<0.01), and customizing capability (β=0.252, t-value=5.752, p<0.01) have positive, significant associations with service innovation at a 1% significance level.

5-11. Mediation Hypotheses

Table 6. Mediation Analysis

Hypothesis	Path	Path Coefficients	Std. Error	BCI LL	BCI UL	t-value	p-value	Decision
H8	CCR>VCC> SI	0.045	0.017	0.018	0.073	2.692	0.004	Supported
H9	KV>VCC>SI	0.028	0.017	0.001	0.055	1.640	0.040	Supported
H10	CC>VCC>SI	0.052	0.018	0.024	0.081	2.977	0.001	Supported

Note. CC = Customizing Capability, CCR = Company-customer relationship, KV = Knowledge valuation, VCC = Value co-creation, SI = Service Innovation

The indirect impacts of company-customer relationship ($\beta = 0.045$, $t = 2.692$, $p < 0.01$), knowledge valuation ($\beta = 0.028$, $t = 1.640$, $p < 0.05$), and customizing capability ($\beta = 0.052$, $t = 2.977$, $p < 0.01$) on service innovation through VCC were significantly positive, with 0.018-0.073, 0.001-0.055, and 0.024-0.081 as lower and upper limits, respectively, thereby supporting H2: VCC mediates the positive impacts between company-customer relationship, knowledge, and customizing capability on service innovation.

5-12. Moderation Analysis

Table 7. Moderation Analysis

Hypotheses	Path	Path Coefficients	Std. Error	BCI LL	BCI UL	t-value	p-value	Decision
H11	CLxCCR -> VCC	0.218	0.099	0.064	0.386	2.231	0.014	Supported
H12	CLxKV -> VCC	-0.027	0.072	-0.14	0.097	0.35	0.353	Not supported
H13	CLxCC -> VCC	-0.160	0.087	-0.303	-0.015	1.882	0.023	Supported
H14	NLxCCR->VCC	0.154	0.077	0.271	0.019	2.005	0.023	Supported
H15	NLxKV -> VCC	0.029	0.061	-0.066	0.13	0.483	0.318	Not supported
H16	NLxCC -> VCC	-0.143	0.067	-0.028	0.25	2.105	0.717	Not supported
H17	RLxCCR -> VCC	0.179	0.067	0.079	0.293	2.677	0.004	Supported
H18	RLxKV -> VCC	-0.085	0.077	-0.221	0.026	1.149	0.134	Not supported
H19	RLxCC -> VCC	-0.128	0.064	-0.038	-0.251	2.012	0.023	Supported

Note. CC = Customizing Capability, CCR = Company-customer relationship, KV = Knowledge valuation, RL = Regulative Logic, NL = Normative Logic, CL = Cognitive Logic, VCC = Value co-creation

Table 6 presents the moderating effects of regulative, cognitive, and normative institutional logics. The cognitive pillar positively moderates the relationship between CCR and VCC, while it negatively moderates the relationship between CC and VCC. However, it must moderate the relationship between knowledge valuation and value co-creation. In other words, the relationship between CCR and VCC will be stronger if the cognitive pillar is strong, while in the case of CC, otherwise, it will be weaker. Similarly, the normative pillar significantly and positively moderates the relationship between the company-customer relationship and value co-creation. However, this does not hold regarding customizing capability, knowledge valuation, and value co-creation. In other words, the stronger the normative pillar, the stronger the relationship between the company-customer relationship and value co-creation (VCC). The regulative pillar significantly and positively moderates the relationship between customizing capability and the company-customer relationship with value co-creation. However, it does not moderate the relationship between knowledge valuation and value co-creation. When the regulative pillar is strong, the relationship between customizing capability and the company-customer relationship with VCC will be enhanced.

5-13. Explanatory Analysis

The R-squared values in the study ranged from 0.606 for VCC to 0.511 for SI, indicating a moderately predictive influence of the models. Therefore, the model explained 60.6% of the variance in VCC and 51.1% in SI.

Table 8. R-Squared

Predictors	Outcomes	R-sq
Customizing Capability Company-customer relationship Knowledge Valuation	Value Co-creation	0.606
Value Co-creation	Service Innovation	0.511

5-14. Effect Size (f^2) of Study Variables

The effect size was computed by f^2 to estimate the substantive effect of each variable. According to Cohen's guidelines, effect sizes are categorized as small (0.02), medium (0.15), and large (0.35). This study found that the effect sizes varied, with some paths demonstrating substantial effects while others exhibited small effects.

Table 8. Effect Size f^2

Path	f-square	Effect Size
CC -> SI	0.007	Small
CC -> VCC	0.248	Medium
CL -> VCC	0.002	Small
CR -> SI	0.723	Large
CR -> VCC	0.004	Small
KV -> SI	0.192	Medium
KV -> VCC	0.069	Medium
NL -> VCC	0.029	Small
RL -> VCC	0.003	Small
VCC -> SI	0.038	Small

Note. CC = Customizing Capability, CCR = Company-customer relationship, KV = Knowledge valuation, RL = Regulative Logic, NL = Normative Logic, CL = Cognitive Logic, VCC = Value co-creation

5-15. Model's Predictive Value

Q^2 for all endogenous variables is > 0, indicating predictive relevance for the model. This was assessed by conducting a blindfolding procedure that showed that the model had effective predictions of the endogenous constructs.

Table 10. Q^2

Predictors	Outcomes	Q-sq
Customizing Capability Company-customer relationship Knowledge Valuation	Value Co-creation	0.529
Value Co-creation	Service Innovation	0.478

The evaluation of hypotheses indicated that out of twenty-eight tested hypotheses, twenty-two were supported based on the path coefficients and significance levels.

6. Discussion

The research investigates the impact of operant resources, value co-creation, and institutional logic on service innovation in Pakistan's software development industry context. The results affirm that operant resources-company-customer relationship, knowledge valuation, and customizing capability—represent significant facilitators of the VCC processes, while these processes positively influence service innovation performance. The study supports H1 and confirms that the company-customer relationship (CCR) positively influences value co-creation (VCC). This finding is consistent with previous research (Frow et al., 2015; Prahalad & Ramaswamy, 2004), suggesting that strong collaboration is necessary for long-term VCC to develop by better understanding of customer needs. This also supports the argument that such relationships lead to customer-oriented innovations, as Lusch and Nambisan (2015) suggested. In addition, networking functionalities facilitate group collaboration, invention, and stakeholder engagement (Pongsathornwiwat et al., 2019; Sewpersadh, 2023). Therefore, this study indicates that maintaining strong company-customer relationships in Pakistan's ICT sector is critical for achieving shared value. This is then built upon to confirm H2, indicating that VCC can be significantly improved by knowledge valuation (KV). Integrating customer insights into VCC frameworks demonstrates the importance of recognizing the value of customer knowledge to create innovative services. It is essential in Pakistan's IT industry, where requirement elicitation is integral to delivering customized solutions. This finding is supported by prior research (Frempong et al., 2020; Hsieh & Hsieh, 2015), arguing that the advantage of customer knowledge is competitive. Furthermore, SOPs facilitate collaboration effectively (Saha et al., 2022). Additionally, H3 is shown to hold that CC strongly affects VCC. It is consistent with prior studies (Hsieh & Hsieh, 2015; Zhang & Chen, 2008) which endorse customization to meet various customer needs. Furthermore, agile software development (ASD) fosters collaboration and customer satisfaction (Chiyangwa & Mnkandla, 2018; Wafa et al., 2022). Consequently, CC allows Pakistan's IT SMEs to provide tailored solutions that enhance VCC and long-term client relationships. Furthermore, these findings are validated, and H4 is supported, indicating a positive relationship between VCC and service innovation. This result is consistent with the research (Koskela-Huotari et al., 2016; So et al., 2022) that claims VCC drives innovation by engaging customers in service development. Xu et al. (2018) and Lei et al. (2019) demonstrate that customer participation in co-creation combines operant resources to stimulate innovation. VCC is important for large, complex projects in Pakistan's IT sector that involves many phases and requires collaboration. Collectively, these results highlight the practical importance of forming company-customer relationships, valuing customer knowledge, and enhancing customization capabilities to drive service innovation in Pakistan's ICT sector. Additionally, H5 supports that CCR affects service innovation through VCC. The membership of Strong CCR develops trust and collaboration, thereby facilitating innovation in service. This is consistent with Tuominen et al. (2022) and Knockaert et al. (2019), who argue that customer relationship orientation plays a key role in innovation. VCC enables developers to incorporate client insights into innovative solutions within the software development process. This fosters CCR and stakeholder engagement, facilitating the creation of sustainable service innovations customized to dynamic clients' needs for Pakistan's IT SMEs. The results from H6 demonstrate that VCC is an important mechanism through which KV affects service innovation. KV contributes to the customer value creation and competitiveness (Sánchez-Gutiérrez et al., 2019). This finding supports RA Theory and SD Logic, which focus on the significance of intangible resources, such as knowledge in fostering service innovation (Varadarajan, 2023; Wibowo et al., 2021). Investment in knowledge management and customer insight leveraging for co-creation can help IT SMEs in Pakistan to innovate services. These findings align with H7, which finds that VCC mediates the relationship between CC and service innovation. CC allows the firms to create trust based collaboration and tailor solutions according to client needs, thereby fostering innovation. This is consistent with Lusch and Nambisan (2015) and Vargo and Lusch (2017) in that operant resources, such as customization, further market orientation and competitive advantage. Customization in the IT sector of Pakistan's small and medium-sized enterprises (SMEs) can be crucial for achieving effective value co-creation (VCC) and enhancing innovation in outcomes during and

after project delivery. Collectively, these findings underscore the significance of relational and informational operant resources in facilitating VCC and, consequently, driving service innovation in information and communication technology (ICT) projects. It supports the hypothesis that the cognitive pillar (H8) moderates the relationship between CCR and VCC. This aligns with research on national culture's effect on CCR and customer satisfaction (Arshed et al., 2022; Corsaro, 2022). Businesses that create products and advertising that align with cultural expectations increase customer trust and service delivery (Estrin et al., 2019). However, trust can erode if a company cannot adapt to cultural norms (Stam, 2015). Therefore, CCR is influenced by the cognitive pillar, enabling shared knowledge necessary for aligning strategies to customer needs (Bosma et al., 2018; Oftedal et al., 2017). The cultural and religious values must be understood for project selection and delivery for the IT sector of Pakistan (Ahmed, 2023). For example, CCR avoids societal norms and conflicting projects, reflecting the role of the cognitive pillar. However, the cognitive pillar does not moderate the relationship between KV and VCC (H9), contrary to the findings of cognitive innovation frameworks (Sarfaraz et al., 2014). The reason could be that Pakistan's IT sector is not fully integrated with cognitive resources due to resource constraints and language barriers (Rahman et al., 2021). Future research should identify how enhancing cognitive capacities can improve value co-creation in the sector. As with the cognitive pillar, the CC and VCC relationship is negatively moderated by the cognitive pillar (H10). Cultural diversity complicates customisation, which introduces communication barriers (Corsaro, 2022). These situations may challenge smaller firms in developing economies such as Pakistan (Audretsch & Link, 2019). Project selection and client interaction in IT firm located in Pakistan are shaped by cultural and religious influences (Rahman et al., 2021). Companies that match their SOPs with religious values align more effectively with client expectations. On the contrary, the normative pillar strengthens the relationship between CCR and VCC (H11) more than what prior studies (Yip & McKern, 2014) have done regarding the roles of societal norms and professional practices in collaboration and innovation. In Pakistan's IT sector, institutions such as the Pakistan Software Export Board (PSEB) facilitate collaboration and networking, leading to better VCC outcomes. Nevertheless, the moderating effect of the normative pillar on KV and VCC is insignificant (H12). This may be attributed to the absence of well-developed frameworks for knowledge valuation in Pakistan's software industry. The lack of robust norms limits the impact of knowledge valuation (KV) on value co-creation (VCC). Additionally, the relationship between client-customer relationships (CC) and VCC is not substantially moderated by the normative pillar (H13).

This outcome could be explained by the lack of industry-wide standards in Pakistan's software sector (Masudi, 2023). Improving the impact of KV and CC on VCC could be achieved by strengthening normative frameworks consistent with global standards, thereby making the industry more innovation-driven. The regulatory pillar also tested as the moderator between CCR, KV, CC and VCC. It emphasises the role of formal rules, legal frameworks, and government programmes in building the entrepreneurial ecosystem. Resource availability is facilitated by regulatory support to achieve value co-creation. This positive moderation is consistent with the finding from prior studies that a trustworthy environment, supported by a strong legal environment, can synergize with CCR to strengthen the relationship with VCC (H17). Tax incentives and tech hubs support entrepreneurial activities in Pakistan's IT sector backed by government initiatives. Nevertheless, the regulatory pillar's moderating effect on KV and VCC (H18) is insignificant. KV on VCC is constrained by Pakistan's inconsistent data protection laws and underdeveloped regulatory frameworks. Addressing these issues may involve strengthening privacy laws and instituting standardized guidelines. Likewise, the regulatory pillar is useless for CC and VCC (H19). Costs and flexibility are increased and the co-creation process becomes more complicated by weak institutional environments and administrative barriers. Our regulatory framework requires change, and simultaneously, is more supportive of innovation and ethical standards.

The findings from this study present helpful, practical implications for Pakistani ICT SMEs that can facilitate improved client interaction and institutional adaptation to achieve innovation. Cooperation with customers and the integration of institutional settings can encourage service innovation. Future research can validate and generalize these dynamics to other sectors or regions.

6-1. Theoretical Implications

This study contributes significantly by integrating Resource-Advantage (RA) theory, Institutional Theory, and Service-Dominant (SD) Logic to develop a holistic framework to explain how operant resources enable competitive advantage (Hunt & Morgan, 1995; Vargo & Lusch, 2004). Focusing on the interplay of operant resources, value co-creation (VCC), and institutional logics extends our understanding of resource dynamics and highlights how institutional arrangements shape resource value and actors' perceptions within service ecosystems (Hunt & Morgan, 1995; Scott, 2013). Using Scott's framework, the study categorizes institutional pressures (regulative, normative, cognitive) to study their impact on resource integration and firm performance, addressing the gaps found in prior research (Greenwood et al., 2009; Thornton et al., 2012). The research highlights the key role of customer participation in VCC, where customer participation is identified as a critical operant resource for supporting service innovation and differentiation (Lusch & Nambisan, 2015; Prahalad & Ramaswamy, 2004). Industry 4.0 demands and provides insights relevant to Pakistan's software industry by advocating for a customer-centric approach to innovation and suggesting how engaging customers can help address institutional constraints and promote innovation (Chesbrough, 2020; Edvardsson & Tronvoll, 2013). The study integrates SD Logic into RA theory by offering a meta-theoretical perspective, emphasising the need to reconcile institutional conflict to generate value and enable service innovation. This approach fills the gaps found in RA theory by stressing customer involvement, cultural cognitive pillars, institutional complexity, and its broader contribution to the literature on service innovation and resource advantage.

6-2. Practical Implications

6-2-1. Practical Implications for Software Houses

In this research, the IT sector of Pakistan's software houses is provided with practical strategies that combine institutional logics with legal compliance requirements, customer engagement systems, and knowledge-sharing practices to enhance their business sustainability and competitiveness. For global market trust and credibility, firms need to work within legal structures that implement both intellectual property laws and data privacy regulations. By enhancing these legal aspects, clients obtain confidence to exchange knowledge and collaborate, which ultimately produces better requirement gathering and international business relationships. Foreign investors tend to refrain from entering markets where there is a lack of legal protection, which ultimately restricts market expansion potential. The implementation of formalized feedback processes within Customer Relationship Management (CRM) systems can enhance enduring client relationships by facilitating open communication channels and improving service quality. The systems help businesses address customer issues ahead of time, guide project management, and boost customer loyalty rates. The research adopts a normative approach to show how the industry needs unified knowledge exchange practices. Software houses must establish formal internal processes to assess organizational knowledge, which should integrate the most effective requirement engineering and project implementation approaches into workforce development programs. Organizations that focus on knowledge dissemination enhance their capacity to innovate, achieve better project results, and adapt to market changes. Business success through long-term partnerships and global competitiveness requires firms to develop customer-centric models, including regular client interaction, follow-up activities, and client-focused strategic plans. Companies that adjust their service models according to market evolution will establish market differentiation, leading to long-term competitive advantages.

6-2-2. Practical Implications for Policymakers

Pakistan's IT sector depends heavily on policymakers' efforts to determine its institutional framework. The research indicates that Pakistan needs better laws and stronger regulations to defend intellectual property and stop unethical data practices while improving knowledge exchange between clients and companies. Establishing international data privacy standards will improve foreign client trust and facilitate Pakistani firms in developing global partnerships. Visible systems and clear accountability within service delivery need structured mechanisms which enable clients to send feedback alongside ethical protocols for data usage. Implementing these measures will develop an environment of trust between software houses and their international clients, leading to better service quality and improved

market standing. The research emphasizes the need to create a knowledge-sharing platform which receives governmental support for industrial partnerships. The normative pillar of IT can improve through policymaker programs, including workshops, certifications and networking events that create a learning environment for innovation. Countries that maintain established IT industries have succeeded by implementing such initiatives to boost their competitiveness and economic development. Future IT professionals will better address changing client requirements by implementing changes to academic curricula that include requirement engineering modules, client engagement, and strategic knowledge management training. Combining industry-relevant educational programs produces better employment outcomes and improved academic-industry joint initiatives, thereby representing key requirements for Pakistan's IT sector progress. Firms will respond to incentives, including tax credits and grants as these tools allow them to implement customer-oriented business models while investing in process improvements. Firms that receive financial and policy-driven support to follow international standards will enhance their sector-wide global connections and maintain long-term sustainability.

7. Conclusion

The research investigates the complex connections between operant resources, value co-creation, and institutional logics with service innovation in Pakistan's growing software industry. The research demonstrates how these elements drive innovation by emphasizing value co-creation and institutional compliance to achieve positive results. The data reveals that software companies in Pakistan must deal with two significant issues: high project failure statistics and multifarious regulatory framework complexities. The research promotes collaboration as an answer to address these obstacles by bringing clients into project development stages from the beginning. Proper client needs assessment leads to better joint value creation and development of service innovation. The research results match the findings previously documented in customer value co-creation and service innovation studies. Omar et al. (2020) examined how service firms within SMEs use customer value co-creation behaviors to build brand equity, specifically in the service industry sector. The researchers established that customer involvement enhances brand perception, so we adopted a Service-dominated logic framework to boost cooperation and customer-oriented thinking (Omar et al., 2020). The authors Tashakkori et al. (2023) created a model which shows how value co-creation assissts in customer retention in service projects. The authors conducted mixed-method research proving that client satisfaction and non-monetary values directly affect customer retention and reinforce our concept of early client involvement for maximising joint value creation (Tashakkori et al., 2023). Our research creates a complete understanding of service innovation effects by explaining both value co-creation mediation and institutional logic moderation. Future research needs to study customer feedback processes and institutional logics in detail as the findings suggest that better extraction methods for project requirements are essential. The study advances theoretical and practical understanding of service innovation by providing practical guidance for ICT firms aiming to enhance their innovation abilities. An SD logic combined with value co-creation strategies enables organizations to address challenges in the digital era to establish a global competitive advantage.

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Appendix A

Dimension	Statement	1	2	3	4	5
Relational Operant Resource (Company-Customer Relationship)	The participating clients are considered friends of our company.					
	Our company has a close relationship with participating clients rather than maintaining an arm's length relationship.					
	The relationship between participating clients and our company has improved.					
Informational Operant Resource (Knowledge Valuation)	The knowledge obtained through dialogic co-creation is useful for the IT project requirements.					
	The knowledge obtained through dialogic co-creation is highly applicable to the IT project requirements.					
	The knowledge obtained through dialogic co-creation is highly valued for the IT project requirements.					
	It is unlikely that a competitor could acquire the knowledge obtained through dialogic co-creation for the IT project requirements.					
	It is difficult to obtain the knowledge required for the IT project through other approaches besides dialogic co-creation.					
Organizational Operant Resource (Customizing Capability)	We have the capability to target the specific needs of clients for their IT project requirements.					
	We can provide exactly what clients require for their IT project.					
	Our ability to customize IT solutions based on clients' needs allows us to identify new market opportunities.					
Service Innovation Outcomes	The service innovation outcomes have the potential to enhance our company's competitive advantage.					
	The service innovation outcomes positively impact our company's financial performance.					
	The service innovation experiences allow us to create innovative solutions for our clients.					
	The service innovation experiences improve customer satisfaction and retention.					
	In comparison to our competitors, our company has a high success rate of developing innovative solutions that meet the needs of our clients.					
	In comparison to our competitors, our company has a high success rate of implementing innovative solutions in the market.					
	Our company's service innovation is perceived superior to that of our competitors.					
Value Co-Creation	Our clients actively participate in making decisions about their IT project requirements.					
	Our clients work with us to find solutions to problems related to their IT project requirements.					
	Our clients are actively involved in developing their IT project requirements.					
	We actively encourage our clients to participate in developing their IT project requirements.					
Institutional Logics						
Regulative	Regulatory bodies in the industry provide guidelines and support for software houses to comply with legal and ethical standards.					
	The government provides incentives and funding opportunities for software houses that meet certain criteria.					
	The local and national regulatory bodies provide resources and information for software houses to navigate changing regulations and policies.					
	The government supports organizations that help software houses develop and implement new technologies and practices.					
	Even after facing challenges or setbacks, regulatory bodies offer support and resources for software houses to rebound and continue their operations.					
Cognitive	Individuals are aware of legal requirements and risks associated with their projects.					
	They are skilled in assessing and managing risks associated with their projects.					
	Those who start new projects are knowledgeable in identifying and mitigating risks.					
	Most people have access to information and resources helping help them identify and target relevant markets for their products.					
Normative	Turning new ideas into businesses is an admired career path in the software industry.					
	In the software industry, innovative and creative thinking is viewed as the route to success.					
	Project managers who take risks and initiate new projects are admired in the software industry.					
	People in the software industry tend to greatly admire project managers who start and complete new projects successfully.					