


Transformational Impact of Strategic Human Resource Management: A Case of Less Represented Groups in the Fixed Line Telecom Sector

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Abstract—Considering the business challenges faced by fixed-line telecommunication operators due to competition with cellular mobile operators, it has become a potential threat for these operators to survive in the telecommunication industry. Due to a decrease in the fixed-line customers, these operators strive to implement the best strategies of Sustained Competitive Advantage to remain competitive in the telecommunication industry. To handle these challenges, these operators need to implement specific business strategies with an effective role of Knowledge sharing and Strategic Human Resource Management. This study aims to investigate the linkage of Strategic Human Resource Management (SHRM) and Knowledge Sharing (KS) on Sustained Competitive Advantage (SCA), considering the less represented groups in the fixed-line telecommunication sector under the theoretical lens of resource-based theory. After collecting the data from the fixed-line telecommunication sector, a Confirmatory Factor Analysis (CFA) was conducted using SPSS to test the reliability and validity of adapted instruments and hypotheses testing using PLS-SEM. The results of hypothesis testing indicated that the indirect and direct relationships between SHRM and KS with SCA were significant. Hence, the proposed research model applies to different service and production industries in other countries with cross-cultural environments for researchers and practitioners.

Keywords: Sustained Competitive Advantage, Strategic Human Resource Management, Knowledge Sharing, Confirmatory Factor Analysis, Partial Least Squares, Structural Equation Model.

I. INTRODUCTION

In today's competitive and rapidly evolving business landscape, organizations increasingly rely on human capital as a critical driver of innovation, adaptability, and sustained performance. Strategic Human Resource Management (SHRM) plays a pivotal role in aligning human resource practices with organizational objectives to build a capable and resilient workforce. In knowledge-intensive sectors like telecommunications, SHRM contributes to operational efficiency and long-term strategic advantage.

In Pakistan, the fixed-line telecommunication sector has seen a consistent decline in customer subscriptions, largely due to the rapid expansion and dominance of cellular operators. Despite national policies aimed at digital inclusion and broadband expansion, fixed-line providers struggle with performance, innovation, and customer engagement. One area that remains underexplored is the role of inclusive SHRM practices in reversing this trend.

Less represented groups (LRGs), including women, remain marginalized within the telecom workforce. Structural barriers such as gender bias, inaccessible environments, and a lack of targeted development opportunities contribute to their underrepresentation. However, empowering these groups through inclusive SHRM practices such as fair recruitment, training and development, involvement in decision-making, and equitable appraisal offers a strategic opportunity to enhance organizational creativity, knowledge sharing, and innovation.

This study explores the transformational impact of SHRM on LRGs in the fixed-line telecom sector of Pakistan. It specifically investigates how inclusive SHRM practices influence knowledge sharing and contribute to sustained competitive advantage (SCA). By doing so, the research aims to provide both theoretical insight and practical guidance for reshaping HR strategies in a sector facing increasing competitive pressure. This paper has been structured as follows: Section 2 describes the Research Context; Section 3 provides Research Methodology and Section 4 presents Data Collection and Analysis. Section 5 explains the Results and Discussions. Finally, conclusions are provided in Section 6.

II. RESEARCH BACKGROUND

The fixed-line telecommunication sector in Pakistan is undergoing rapid transformation amidst increasing competition from cellular operators and evolving technological demands. Despite substantial investments and supportive national policies such as the National Broadband Policy (MOITT, 2021), fixed-line service providers have faced a continual decline in customer subscriptions. This decline has been largely attributed to limited innovation, operational inefficiencies, and the inability to adapt to shifting consumer expectations.

Strategic Human Resource Management (SHRM) has emerged as a critical mechanism for driving organizational change and innovation. SHRM focuses on aligning human capital development with long-term business goals, ensuring that workforce capabilities are strategically positioned to enhance competitiveness. In the fixed-line telecom sector, however, SHRM remains underutilized, particularly in the context of inclusive talent management. One of the most pressing issues in the industry is the underrepresentation of marginalized groups such as female employees. These less representative groups (LRGs) often face systemic barriers to recruitment, promotion, and participation in decision-making processes. Inclusive SHRM practices can serve as powerful tools to not only enhance diversity and equity but also to unlock untapped potential and drive innovation.

A critical component of this transformation is the establishment of a strong knowledge-sharing culture. Organizations that promote open communication and collaborative learning are better equipped to adapt to market changes, develop innovative services, and achieve sustained competitive advantage (SCA). The interaction between SHRM and knowledge sharing is especially significant in knowledge-intensive sectors like telecommunications, where the ability to harness and apply employee knowledge is a key differentiator. Managing competitiveness has become a crucial challenge for both process and service industries due to global business dynamics. Firms need to reassess their strategies to maintain their market position and overall organizational performance [1].

By focusing on inclusive SHRM strategies and their impact on knowledge sharing and SCA, this study addresses an important gap in both academic research and industry practice. It highlights how empowering LRGs through strategic HR initiatives can foster a more dynamic, innovative, and competitive fixed-line telecom sector in Pakistan.

III. AIMS AND OBJECTIVES

The study aims to examine the Transformational Impact of Strategic Human Resource Management: A Case of Less-Represented group in Fixed Line Telecom sector. The following objectives will achieve the research aim.

- To investigate the relationship between Strategic Human Resource Management (SHRM) and Sustained Competitive Advantage (SCA).
- To investigate the relationship between Strategic Human Resource Management (SHRM) and Knowledge Sharing Culture (KSC).
- To investigate the relationship between Knowledge Sharing Culture (KSC) and Sustained Competitive Advantage (SCA).
- To investigate the mediation of knowledge-sharing culture (KSC) between the relationship of Strategic Human Resource Management (SHRM) & and Sustained Competitive Advantage (SCA).

IV. RESEARCH CONTEXT

In today's rapidly evolving and hyper-connected world, the telecommunications (telecom) sector plays a pivotal role in driving economic growth, enabling digital transformation, and fostering global connectivity. The telecom industry has witnessed remarkable advancements and disruptive changes over the years, from the advent of mobile technology to the proliferation of high-speed broadband networks. To thrive and succeed in this dynamic landscape, telecom companies are constantly seeking innovative strategies and transformational practices to gain and sustain a competitive edge.

The quest for sustained competitive advantage has become increasingly crucial in the telecommunication sector which is regulated by the Pakistan Telecommunication Authority (PTA), which ensures fair competition and oversees the implementation of policies and regulations, given the intensifying competition, evolving consumer demands, and the emergence of disruptive technologies.

The telecom sector provides various telecommunications services, including fixed-line telephony, mobile telephony, broadband internet, and data services. Mobile telephony has experienced remarkable growth and has become the primary means of communication for a vast majority of the population. The introduction of cellular technology revolutionized communication in Pakistan, enabling people to communicate wirelessly and efficiently. Several mobile network operators, both local and international, operate in the country, providing extensive coverage and a wide range of services to consumers. In addition to mobile telephony, Pakistan also has a well-established fixed-line network. Although mobile telephony has surpassed fixed-line telephony in terms of popularity and subscribers. Landlines still play a significant role in connecting businesses, government offices, and households for high-speed broadband services over optical fiber and copper networks.

Telecom companies that are effectively offering such services are not only facing challenges from traditional rivals but also contending with new entrants and non-traditional players that are disrupting the industry's landscape. To remain relevant and gain a competitive edge, telecom organizations must proactively adapt and transform their operations, business models, and service offerings.

The current study aimed to highlight the challenges for telecommunication companies globally and narrow them down to Asia & Asia-Pacific region, and then at the national level in Pakistan. Globally in the telecommunication service industry, the subscription of cellular mobile customers has reached up to 5.6 billion and its projection is going to touch 6 billion by 2025 throughout Asia Pacific, CIS (Commonwealth of Independent States), Europe, Latin America, MENA (Middle East/North Africa), North America and Sub-Saharan Africa [2]. Similarly, at the Asia Pacific regional level, the subscription to cellular mobile services is increasing yearly. The statistics of annual global subscriptions of cellular mobile customers are shown in Figure 1.

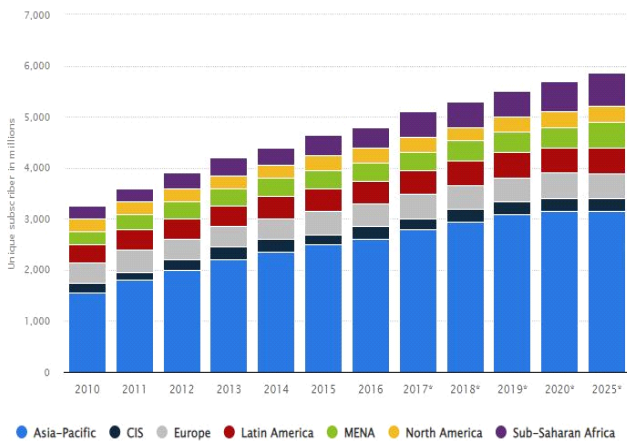


Figure 1 Annual subscription of cellular mobile customers in the world [2]

The subscription of fixed line services worldwide has decreased from 1.25 billion to 866 million globally (Africa, the Americas, Arab States, Asia & Pacific, CIS, and Europe). At the regional Asia & Pacific level, the fixed line customer subscription has also decreased to 362 million. The customer statistics of annual fixed-line service subscriptions in the world are shown in Figure 2. [3].

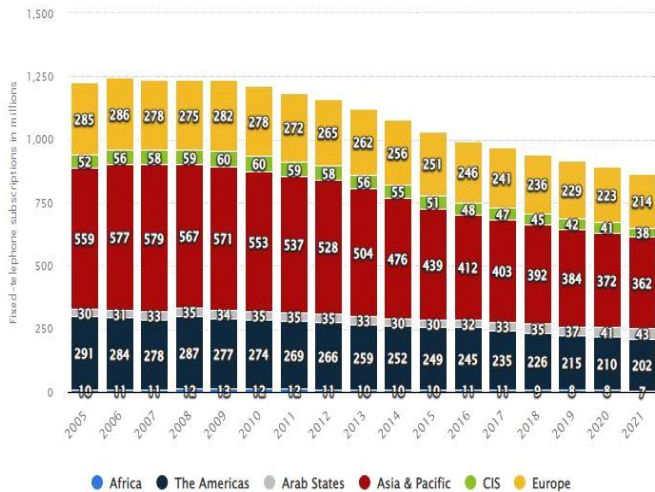


Figure 2 Annual subscription of fixed-line customers in the world [3]

However, at the national level in Pakistan's telecommunication sector, the annual report of the Pakistan Telecommunication Authority (PTA) indicated that there are six cellular mobile operators in Pakistan providing voice, video, and data services to cellular mobile customers [4].

The report of the PTA [5] also highlighted that the subscription of cellular mobile customers in Pakistan increased continuously and reached 184.25 million. The subscription statistics of cellular mobile customers in Pakistan on both a monthly and yearly basis are shown in Figure 3 and monthly are shown in Figure 4.

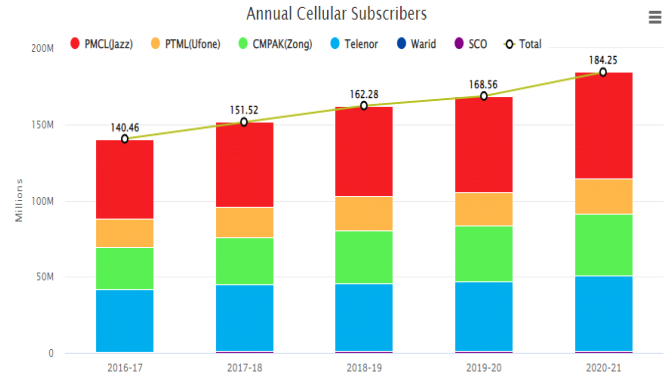


Figure 3 Annual subscription of cellular mobile customers in Pakistan [4]

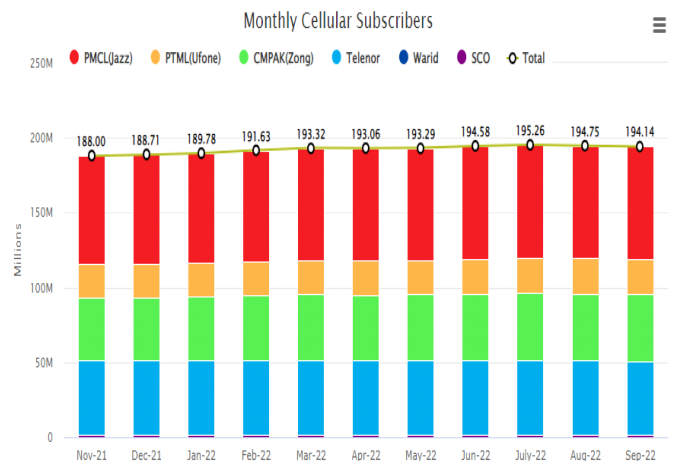


Figure 4 Monthly Subscription of cellular mobile customers in Pakistan [5]

In the fixed-line telecommunication sector of Pakistan, there are nine fixed-line operators providing voice, video, and data services over fixed copper and optical fiber cable networks [6].

Fixed-line service subscriptions in the telecommunication sector of Pakistan have decreased continuously and reduced from 5 million to 2.35 million from 2004 to 2022 [6]. The subscription statistics of the annual fixed line published by PTA are shown in Figures 5 and 6.

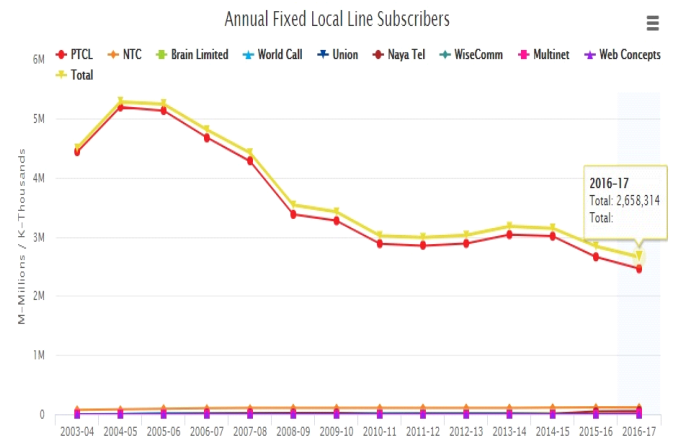


Figure 5 Annual subscription of fixed-line customers in Pakistan from 2003 to 2017 [7]

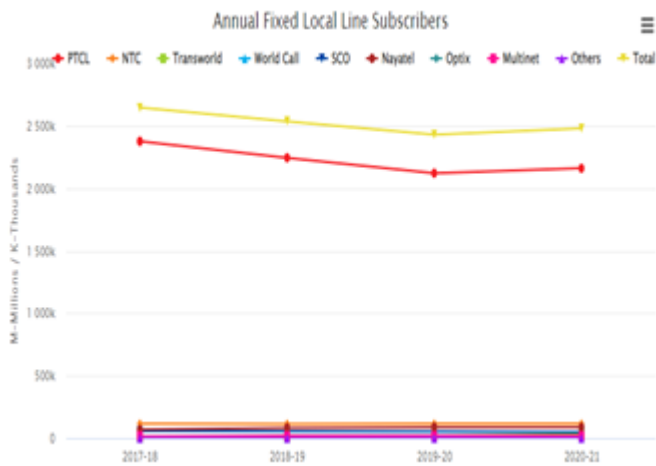


Figure 1 Annual subscription of fixed-line customers in Pakistan from (2017 to 2022) [6]

The Ministry of Information Technology and Telecommunication (MOITT) has aligned telecom operators with national broadband goals to expand high-speed internet access across Pakistan by 2025, presenting growth opportunities, especially for fixed-line operators facing declining subscriptions. To stay competitive, these companies must adopt strategic business approaches.

Strategic Human Resource Management (SHRM) has emerged as a vital organizational function that enhances a firm's long-term competitiveness through effective management of its human capital. In labor-intensive and knowledge-driven sectors like telecommunications, inclusive SHRM practices play a critical role in leveraging diverse talent and promoting organizational agility. Grounded in the Resource-Based View (RBV), SHRM treats human capital as a valuable resource for achieving sustained competitive advantage (SCA).

This study focuses on the strategic role of SHRM in empowering less-represented groups (LRGs) within the fixed-line telecommunication sector of Pakistan, where inclusion and diversity remain underdeveloped. A key factor in achieving sustained competitive advantage (SCA) is cultivating a strong knowledge-sharing culture. In today's dynamic market, knowledge is recognized as a core organizational resource. The ability to share and apply both explicit and tacit knowledge across the workforce enhances innovation, service delivery, and strategic responsiveness. When SHRM practices are designed to support diversity, collaboration, and continuous learning, they not only foster inclusion but also enable employees to contribute meaningfully to knowledge flows within the organization.

This research investigates how inclusive SHRM practices contribute to knowledge sharing and how, in turn, knowledge sharing leads to sustained competitive advantage. It explores the mediating role of knowledge-sharing between SHRM and SCA. The study also emphasizes how empowering LRGs through inclusive HR strategies enhances organizational performance, innovation, and long-term sustainability in the fixed-line telecom sector.

Most of the literature on sustained competitive advantage is found in the production industries. The current study indicated

its need in the service industry in the context of the fixed-line telecommunication sector. Evident from previous literature that strategic human resource management is an important source of sustained competitive advantage in organizations. The underpinning theories and previous empirical studies helped to finalize the study's conceptual model. Hypothesized relationships between the three research constructs Sustained Competitive Advantage, Strategic Human Resource Management, and Knowledge Sharing Culture, considering the less represented groups are studied with the support of previous empirical studies that helped to represent the conceptual strength of the proposed model.

The absence of studies on the mediating effect of knowledge sharing between sustained competitive advantage and strategic human resource management demonstrates the need for this study to address this research gap not only in the literature but also in the fixed-line telecommunication sector of Pakistan.

Sustained Competitive Advantage

Jay Barney's 1991 paper, "Firm Resources and Sustained Competitive Advantage", stated that a resource must be valuable, rare, inimitable, and non-substitutable (VRIN) for a firm to have a sustained competitive advantage [8]. He describes competitive advantages such as:

"A firm is said to have a sustained competitive advantage when it is implementing a value-creating strategy not simultaneously being implemented by any current or potential competitors and when these other firms are unable to duplicate the benefits of this strategy". This concept emphasizes the role of resources and strategies that competitors cannot easily imitate in allowing a firm to remain competitive over time.

Fixed-line operators need to improve customer experience by providing high-quality service, strong connectivity, and unique value-added services like cloud solutions and business communication systems. Gaining a lasting competitive advantage depends on focusing on customer-driven innovation, which is essential for the industry's long-term success and stability [9]. Sustained Competitive Advantage (SCA) is a critical focus in strategic management, defining an organization's ability to maintain superior performance over competitors over an extended period. Pakistan's fixed-line telecom sector has struggled due to the growth of mobile communication and digital technology. However, companies like PTCL and broadband providers must maintain a lasting competitive edge. To stay strong in the market, they need to focus on adopting new technology, improving infrastructure, managing skilled employees effectively, and offering unique services. These strategies will help them remain leaders in a changing industry.

Strategic Human Resource Management

Strategic Human Resource Management (SHRM) involves the alignment of HR practices and policies with strategic business objectives to improve business performance and foster a high-performance workforce [10].

According to [11], Strategic Human Resource Management (SHRM) encompasses the process of integrating HR strategies and practices into organizational strategies, policies, and

processes to achieve competitive advantage and enhance organizational performance.”. Strategic Human Resource Management (SHRM) has evolved from traditional personnel management to a comprehensive strategic partner in business success. Literature indicates that SHRM plays a critical role in aligning human capital with business strategy, especially in dynamic industries like telecommunications. Prior studies highlight that inclusive SHRM fosters employee engagement, knowledge sharing, and performance [12] [13]. The Resource-Based View (RBV) supports the idea that human capital when managed strategically is a key driver of sustained competitive advantage [8] [14]. However, empirical research on LRGs in telecom remains limited, especially in SHRM. Inclusive SHRM practices ensure that diverse talents, including those from less represented groups (LRGs), are recognized, developed, and retained as key contributors to organizational goals.

The Resource-Based View (RBV) of the firm emphasizes that human capital when properly managed, becomes a unique and inimitable asset that contributes to sustained competitive advantage [8].

Dimensions of Strategic Human Resource Management

Strategic Human Resource Management (SHRM) is defined as the proactive management of people, aligning HR policies and practices with the strategic goals of the organization. The effectiveness of SHRM is often evaluated through key dimensions such as:

- Recruitment and selection
- Training and development
- Employee involvement
- Compensation and reward
- Competency-based performance appraisal,
- Work conditions.

Each of these elements contributes significantly to building a skilled, motivated, and high-performing workforce. All these six dimensions collectively impact knowledge sharing and sustained competitive advantage (SCA). Knowledge sharing acts as a bridge that transfers the benefits of SHRM practices into organizational learning and innovation. The Resource-Based View (RBV) suggests that human capital and the mechanisms to share and utilize knowledge are central to maintaining a firm’s competitive edge.

By aligning these SHRM dimensions with strategic goals and fostering a culture of inclusion, fixed-line telecom firms in Pakistan can empower less-represented groups and harness the collective knowledge and creativity of a diverse workforce. This not only contributes to operational excellence but also supports long-term growth and resilience in a highly competitive industry.

Knowledge Sharing Culture

Knowledge sharing is gathering, organizing, transferring, and reusing knowledge within the organization and making this knowledge available to everyone. Knowledge sharing is an act of making information available to everyone within the organization [15]. Knowledge sharing is an activity of

exchanging abilities, information, skills, expertise, and experiences among people, friends, peers, family members in society, and may be among the employees in the organizations.

Hypothesis Development

Four hypotheses have been developed in this study to measure the significant relationships between the current study’s constructs based on theoretical and conceptual findings and with the support of previous studies. The research hypotheses in Table 1 are as follows:

TABLE I. RESEARCH HYPOTHESIS

Research Hypothesis	
H1	Strategic Human Resource Management has a significant relationship with Sustained Competitive Advantage.
H2	Strategic Human Resource Management has a significant relationship with Knowledge Sharing Culture.
H3	Knowledge Sharing Culture has a significant relationship with Sustained Competitive Advantage.
H4	Knowledge Sharing Culture mediates the relationship between strategic human resource management and Sustained Competitive Advantage.

V. METHODOLOGY OF RESEARCH

Introduction

Section 3 describes the methodology used to conduct the proposed research. The methodology is categorized into four distinct phases, which are described individually below. The research methodology flowchart is shown in Figure 7.

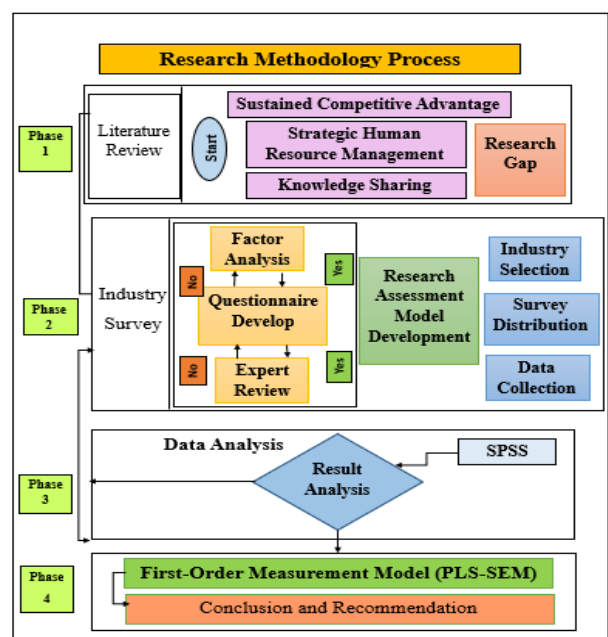


Figure 7 Research Methodology Flow Diagram

Phase 01

Phase 1 consists of several steps, which include a detailed literature review and an understanding of the thesis background with identification of the research gap.

Phase 02

Development of Conceptual Model

Three variables make up the conceptual model to assess the transformative impact of Strategic Human Resource Management in the telecommunication industry..

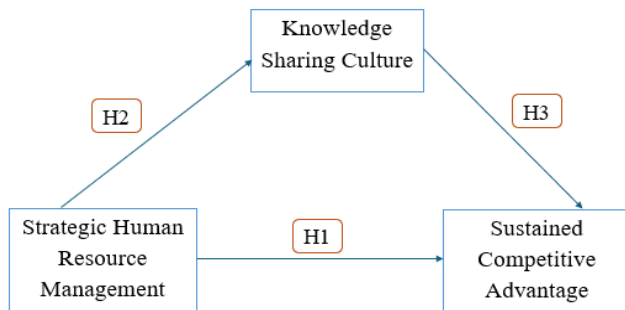


Figure 8 Research Model

Based on these variables, a survey was created and reviewed by two academic and one industrial experts for content validity. The conceptual model is shown in Figure 8

Instrument Adaptation

The instruments used in this study for collecting data for each variable were adapted from previous studies. It can be listed below in Table 2.

TABLE II. ADAPTATION OF RESEARCH INSTRUMENTS

Variables	References
Sustained Competitive Advantage	Chang (2011)
Knowledge Sharing Culture	Tai-Kuei Yu, Long-Chuan Lu, Tsai-Feng Liu (2010)
Strategic Human Resource Management Practices	Bohlander and Snell (2009), Dietz et al. (2010), Sisson (1994), McKinsey (2004), Siqueira (2008)

The adapted construct's instruments were previously used in different studies, and reliability and validity were assessed multiple times. The current study also ensured the reliability and validity of the adapted instrument in the pilot study through Confirmatory Factor Analysis to ensure that the instruments were still valid after adaptation.

Phase 3

Using SPSS (Statistical Package for the Social Sciences), a Confirmatory Factor Analysis (CFA) is performed on the data collected from 60 employees working in different telecom companies. A pilot study on the selected instrument revealed

that the instrument is internally consistent by meeting the criterion of Cronbach's alpha above 0.7 for reliability.

Phase 04

In this phase, the development of the Measurement Model and Structure Model with all its formative constructions is done using Partial Least Squares-Structural Equation Modeling (PLS-SEM). The evaluation of the measurement model includes measuring reliability and validity.

VI. DATA COLLECTION AND ANALYSIS

Section 4 of the paper presents the Data Collection Process and the techniques used to analyze the data of the study.

Data Collection Process

The population of study for this research was the employees working in fixed-line telecommunication companies in Pakistan. In the fixed-line telecommunication sector of Pakistan, six companies are providing fixed-line telecommunication services across the country. Data was collected in this study in two stages, in different time frames. In the first stage, data were collected for a pilot study to validate the adapted instruments of Strategic Human Resource Management (SHRM), Knowledge Sharing, and Sustained Competitive Advantage in fixed-line telecommunication companies from previous studies. In the second stage, data were collected for descriptive and inferential statistical analysis to test the hypothesized relationships between dependent and independent variables. A questionnaire is developed using a 5-point Likert scale to assess the research model. It consists of two sections. Section A comprises demographic background, and Section B involves research variables and related questions. The respondents of this questionnaire were management-level employees working in different positions in fixed-line telecom companies. Initially, Data was collected through online Microsoft Forms. The emails were sent to the group of Assistant Managers, Managers, and Senior Managers to ensure the random participation of every management-level employee.

Sampling Frame

There are six fixed-line companies in the telecommunication sector of Pakistan. Out of these six fixed-line companies, PTCL holds more than 50% of the market share in the telecommunication industry of Pakistan. PTCL has 18000 employees, out of which 4190 are management employees working with different responsibilities according to their roles and functions. The management positions are categorized as Assistant Managers, Managers, Senior Managers, and Executives. The job location may differ, but the roles, functions, and job descriptions are mostly the same and contribute equally to the company's vision, mission, and business. Hence, homogeneity in the population is observed inside each fixed-line company.

Sampling Size

The sample size for this study is calculated using the Krejci and Morgan formula, which is mentioned below.

Equation 1

$$n = \frac{x^2 N P (1-P)}{e^2 (N-1) + x^2 P (1-P)}$$

whereas

n = Sample size

N= Population size

x² = chi-square of a degree of freedom and confidence level 95%

e Acceptable estimation error

Hence, the sample size calculated is 361 in the study.

The questionnaire consists of 63 questions, out of which 46 items belong to strategic human resource practices, 11 belong to the knowledge-sharing culture, and 06 belong to sustained competitive advantage. The scale items were developed in English and adapted in the same language for distribution. After validation from academic and industrial experts, the final questionnaire was formulated and ready for distribution. The questionnaire was distributed among 500 employees, out of which only 381 responses were received. Univariate tests were also performed for statistical inference, and analysis of both measurement and structural models was done by using Smart PLS 4, the Partial Least Squares-Structural Equation Modeling (PLS-SEM) technique applied to test the hypothesis defined in the study.

Data Analysis Techniques

In this study, two software tools for statistical analysis have been used. The Statistical Package for Social Science, developed by IBM and Smart PLS, was used for data analysis. Both tools are used in most of the previous studies for data analysis. This section includes the statistical analysis, which is performed on the data collected through the fixed-line telecommunication sector in Pakistan. SPSS is used to analyze and summarize the characteristics of collected data through the mean. Univariate tests are also performed for statistical inference. Using Smart PLS, the Partial Least Squares-Structural Equation Modeling (PLS-SEM) technique is applied to test the hypothesis defined in the study. Further, this study also involves mediation analysis and its role between independent and dependent variables.

First-Order Measurement Model

The first-order measurement model’s evaluation includes the measurement of reliability and validity of constructs. The model comprises eight constructs: SCA, CPA, CR, RS, I, TD, WC, and KSC, with all formative indicators. Figures 9 and 10 show the measurement and structural model of the study.

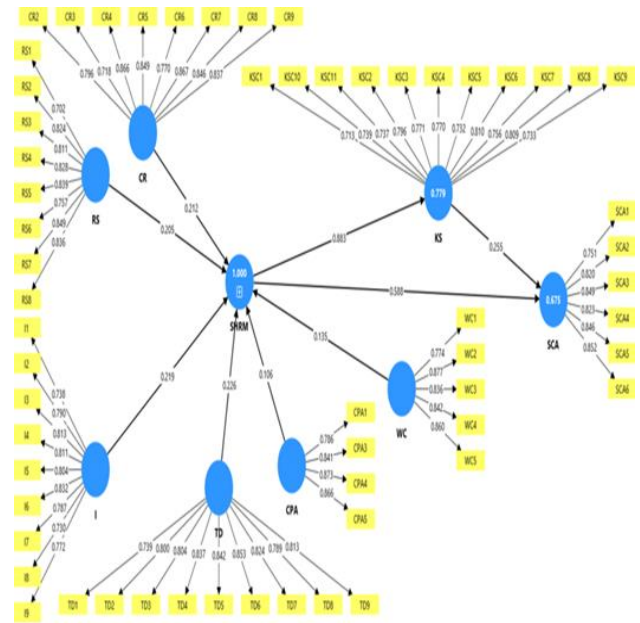


Figure 9 First-Order Measurement Model

Structure Model

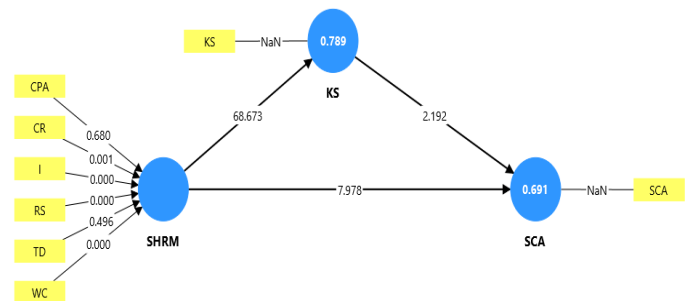


Figure 10 Structure Model

Results and Discussions

Section 5 includes the results from the research work conducted to investigate the “Transformational Impact of Strategic Human Resource Management: A Case of Less Represented Groups in Fixed Line Telecom Companies”.

The results of both the Measurement and the Structure Model will be discussed and compared here as follows:

TABLE III. RESULT OF FIRST-ORDER MEASUREMENT MODEL

Dimensions / Constructs	Items	CPA	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
	SCA1	0.751	0.905	0.908	0.927	0.679

Sustained Competitive Advantage	SCA2	0.820				
	SCA3	0.849				
	SCA4	0.823				
	SCA5	0.846				
	SCA6	0.852				
Competency-Based Performance Appraisal	CPA1	0.786	0.863	0.869	0.907	0.709
	CPA3	0.841				
	CPA4	0.873				
	CPA5	0.866				
Compensation and Reward	CR2	0.796	0.930	0.931	0.942	0.673
	CR3	0.718				
	CR4	0.866				
	CR5	0.849				
	CR6	0.770				
	CR7	0.867				
	CR8	0.846				
Involvement	I1	0.738	0.923	0.924	0.936	0.619
	I2	0.790				
	I3	0.813				
	I4	0.811				
	I5	0.804				
	I6	0.832				
	I7	0.787				
	I8	0.730				
	I9	0.772				
Recruitment and Selection	RS1	0.702	0.923	0.925	0.937	0.652
	RS2	0.824				
	RS3	0.811				
	RS4	0.828				
	RS5	0.839				
	RS6	0.757				
	RS7	0.849				
	RS8	0.836				
Training and Development	TD1	0.739	0.935	0.937	0.946	0.659
	TD2	0.800				
	TD3	0.804				
	TD4	0.837				
	TD5	0.842				
	TD6	0.853				
	TD7	0.824				
	TD8	0.789				

	TD9	0.813				
Work Conditions	WC1	0.774	0.894	0.895	0.922	0.703
	WC2	0.877				
	WC3	0.836				
	WC4	0.842				
	WC5	0.860				
Knowledge Sharing Culture	KSC1	0.713	0.927	0.929	0.938	0.579
	KSC2	0.796				
	KSC3	0.771				
	KSC4	0.770				
	KSC5	0.732				
	KSC6	0.810				
	KSC7	0.756				
	KSC8	0.809				
	KSC9	0.733				
	KSC10	0.739				
	KSC11	0.737				

Explanation

Table 3 shows the results of the reliability and validity of the first-order measurement model. In this study, values of Cronbach's alpha, as mentioned in the table, are above 0.7, indicating that the scale items are internally consistent. Similarly, the values of composite reliability and reliability coefficient are also above 0.7 and below 0.95, clearly indicating that the constructs successfully meet the reliability criteria in the first-order measurement model. Also, there are 60 indicators, and all indicators are formative in the first order. All the indicators have good factor loadings, which are above 0.7 and successfully meet the convergent reliability criteria. The results of convergent validity, which is Average Variance Extracted (AVE), achieved in this study are shown above in Table 3, which is above 0.5, clearly indicating that all constructs successfully meet the convergent validity criteria.

TABLE IV. CROSS-LOADING TABLE FOR DISCRIMINANT VALIDITY (FIRST-ORDER FORMATIVE MEASUREMENT MODEL)

	CP A	CR	I	KS	RS	SC A	TD	WC
CPA1	0.786	0.590	0.584	0.586	0.589	0.498	0.573	0.564
CPA3	0.841	0.622	0.578	0.587	0.574	0.488	0.597	0.542
CPA4	0.873	0.741	0.712	0.703	0.701	0.623	0.696	0.653
CPA5	0.866	0.731	0.635	0.667	0.676	0.593	0.675	0.632
CR2	0.669	0.796	0.652	0.644	0.638	0.598	0.656	0.605

CR3	0.578	0.718	0.620	0.637	0.617	0.554	0.595	0.595
CR4	0.680	0.866	0.690	0.679	0.707	0.642	0.658	0.640
CR5	0.650	0.849	0.659	0.639	0.664	0.597	0.667	0.598
CR6	0.608	0.770	0.649	0.661	0.605	0.618	0.608	0.623
CR7	0.697	0.867	0.678	0.678	0.671	0.637	0.700	0.641
CR8	0.687	0.846	0.701	0.683	0.648	0.630	0.673	0.634
CR9	0.678	0.837	0.691	0.687	0.666	0.608	0.701	0.658
I1	0.539	0.564	0.738	0.590	0.564	0.508	0.531	0.616
I2	0.569	0.590	0.790	0.613	0.592	0.533	0.568	0.582
I3	0.561	0.604	0.813	0.640	0.628	0.555	0.606	0.617
I4	0.570	0.673	0.811	0.674	0.665	0.668	0.618	0.621
I5	0.580	0.645	0.804	0.673	0.642	0.632	0.632	0.657
I6	0.615	0.653	0.832	0.678	0.632	0.574	0.629	0.677
I7	0.620	0.646	0.787	0.641	0.608	0.551	0.618	0.596
I8	0.620	0.685	0.730	0.670	0.646	0.607	0.622	0.626
I9	0.619	0.694	0.772	0.715	0.701	0.640	0.667	0.659
KSC1	0.637	0.653	0.677	0.713	0.602	0.565	0.646	0.592
KSC2	0.597	0.638	0.659	0.796	0.636	0.665	0.602	0.653
KSC3	0.535	0.581	0.639	0.771	0.590	0.582	0.534	0.599

KSC4	0.59 1	0.64 9	0.64 5	0.77 0	0.62 6	0.62 4	0.60 4	0.62 1
KSC5	0.60 2	0.66 6	0.62 3	0.73 2	0.66 2	0.60 7	0.63 0	0.60 8
KSC6	0.60 9	0.61 4	0.67 7	0.81 0	0.68 8	0.63 3	0.57 5	0.65 9
KSC7	0.53 7	0.53 8	0.59 0	0.75 6	0.56 4	0.48 2	0.49 3	0.55 6
KSC8	0.55 1	0.59 1	0.63 0	0.80 9	0.63 2	0.59 0	0.55 7	0.65 2
KSC9	0.52 2	0.53 1	0.55 1	0.73 3	0.51 2	0.53 2	0.48 7	0.59 1
KSC1 0	0.55 1	0.53 7	0.60 5	0.73 9	0.55 6	0.48 7	0.52 9	0.58 3
KSC1 1	0.59 4	0.73 0	0.66 2	0.73 7	0.69 4	0.66 3	0.66 0	0.64 1
RS1	0.57 7	0.58 3	0.62 0	0.57 2	0.70 2	0.60 4	0.56 7	0.57 1
RS2	0.57 4	0.62 7	0.66 5	0.69 1	0.82 4	0.64 9	0.62 0	0.66 9
RS3	0.60 1	0.64 3	0.64 8	0.65 9	0.81 1	0.68 6	0.61 6	0.65 2
RS4	0.61 4	0.64 5	0.64 4	0.68 5	0.82 8	0.61 0	0.65 2	0.64 6
RS5	0.61 6	0.65 2	0.65 3	0.67 9	0.83 9	0.66 3	0.66 2	0.67 0
RS6	0.56 9	0.59 8	0.55 3	0.56 8	0.75 7	0.49 9	0.60 0	0.50 7
RS7	0.65 6	0.69 3	0.69 7	0.68 8	0.84 9	0.65 6	0.67 7	0.68 3
RS8	0.67 8	0.68 9	0.69 7	0.69 2	0.83 6	0.64 2	0.66 4	0.66 6
SCA1	0.50 6	0.56 7	0.55 7	0.55 0	0.57 1	0.75 1	0.52 2	0.55 8
SCA2	0.54 8	0.59 2	0.58 6	0.61 5	0.62 7	0.82 0	0.54 6	0.60 8
SCA3	0.60 1	0.66 1	0.67 6	0.69 2	0.66 5	0.84 9	0.63 5	0.67 5
SCA4	0.52 8	0.60 1	0.61 6	0.65 7	0.66 6	0.82 3	0.58 5	0.64 0
SCA5	0.54 3	0.64 4	0.63 4	0.64 0	0.65 8	0.84 6	0.62 2	0.63 9
SCA6	0.52 4	0.61 3	0.61 3	0.66 3	0.65 3	0.85 2	0.55 1	0.65 7
TD1	0.55 2	0.55 6	0.55 3	0.48 7	0.53 2	0.47 5	0.73 9	0.48 4
TD2	0.58 6	0.64 6	0.60 0	0.59 0	0.62 3	0.55 5	0.80 0	0.56 7
TD3	0.62 1	0.67 1	0.61 2	0.60 2	0.63 7	0.56 3	0.80 4	0.60 2
TD4	0.64 0	0.69 1	0.68 1	0.67 5	0.70 5	0.62 9	0.83 7	0.66 1
TD5	0.62 9	0.64 8	0.63 8	0.62 4	0.64 9	0.57 3	0.84 2	0.58 0
TD6	0.66 3	0.68 2	0.66 3	0.65 5	0.67 1	0.61 0	0.85 3	0.62 5
TD7	0.60 4	0.65 4	0.63 0	0.62 8	0.65 5	0.56 2	0.82 4	0.58 4
TD8	0.58 2	0.61 7	0.65 1	0.63 6	0.59 9	0.55 8	0.78 9	0.61 8
TD9	0.65 1	0.68 7	0.64 5	0.63 7	0.64 8	0.58 8	0.81 3	0.64 1
WC1	0.57 9	0.61 9	0.65 8	0.60 2	0.63 6	0.58 8	0.65 0	0.77 4
WC2	0.59 5	0.66 3	0.68 6	0.69 8	0.69 5	0.66 6	0.63 6	0.87 7
WC3	0.58 5	0.62 7	0.65 0	0.69 3	0.69 6	0.70 8	0.59 4	0.83 6

WC4	0.59 6	0.60 0	0.65 7	0.70 1	0.61 8	0.59 7	0.60 0	0.84 2
WC5	0.63 1	0.67 9	0.69 8	0.69 7	0.65 1	0.64 7	0.60 6	0.86 0

Explanation

Table 4 shows the results of discriminant validity for the first-order measurement model. The Cross-Loadings of each indicator of each construct have higher values on the respective construct and lower values on other constructs, indicating that the research constructs are truly distinct. Graphical representation for discriminant validity is shown above in Figure 11.

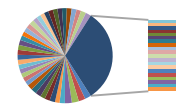
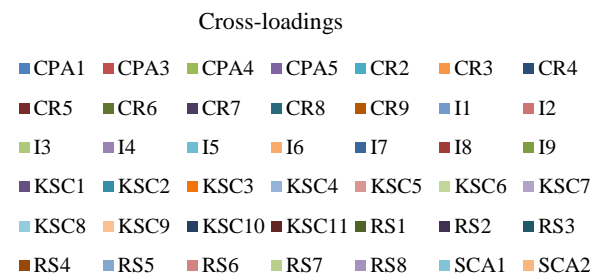


Figure 11 Cross-Loadings for Discriminant Validity

TABLE V. HTMT CRITERION FOR DISCRIMINANT VALIDITY (FIRST-ORDER FORMATIVE MEASUREMENT MODEL)

	CP A	CR	I	KS	RS	SC A	TD	W C
CP A								
CR	0.89							
I	0.83	0.87						
KS	0.84	0.86	0.89					
RS	0.84	0.86	0.86	0.87				
SC A	0.74	0.81	0.81	0.83	0.84			
TD	0.83	0.86	0.83	0.80	0.84	0.76		
W C	0.80	0.83	0.87	0.88	0.86	0.85	0.80	
	9	6	9	7	5	0	4	

Explanation

Table 5 shows the results of another approach used to measure the discriminant validity, which is the Heterotrait-Monotrait ratio (HTMT).

In this criterion, the HTMT value above 0.8 and below 0.9 is warranted. The results against this approach show that correlation values are below 0.85, declaring that constructs are truly distinct and successfully meet the discriminant validity

assessment criterion. Here is the graphical representation of numerical results for the HTMT criteria shown in Figure 11.

TABLE VI. TABLE 6 R² VALUES OF THE ENDOGENOUS LATENT VARIABLES

Latent Construct	R ² value	Results
KS	0.789	Substantial
SCA	0.691	Substantial

Explanation

The measure Coefficient of Determination represents the model's predictive power and is calculated by squaring the correlations between actual and predicted values of the endogenous construct. R² measures the combined effect of an exogenous variable on the endogenous variable. Hence, it represents the amount of variance explained by exogenous constructs in the endogenous constructs [16]. The range of R² values is from 0 to 1. The results listed above in Table 6 indicate that SHRM explains KS and the R² value of KS for SHRM as an independent variable is 0.789, which seems substantial. The results also indicate that SHRM could account for 78.9% of the variance in KS in the fixed-line telecommunication sector of Pakistan.

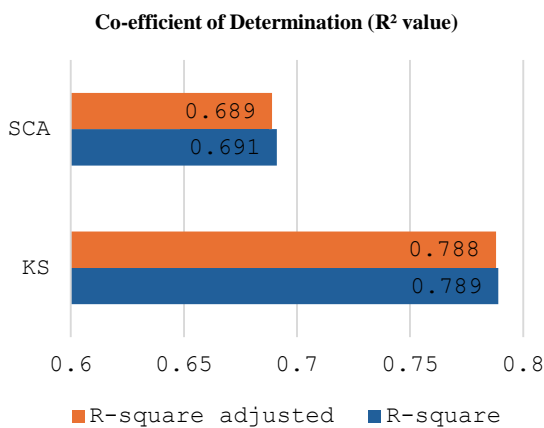


Figure 12 Coefficient of Determination

Figure 12 shows the graphical representation. Similarly, the R² value of SCA for the independent variable SHRM is 0.691, which indicates 69% of the independent variable's variance in SCA.

TABLE VII. THE EFFECT SIZE OF THE INDIRECT CONSTRUCTS USING SMART PLS

Constructs	f-square	Results
KS -> SCA	0.025	Medium
SHRM -> KS	3.734	Large
SHRM -> SCA	0.296	Large

Explanation

The ranges for assessing the effect size are 0.02, 0.15, and 0.35, representing the small, medium, and large effect sizes for exogenous constructs on endogenous constructs [17].

Effect Size

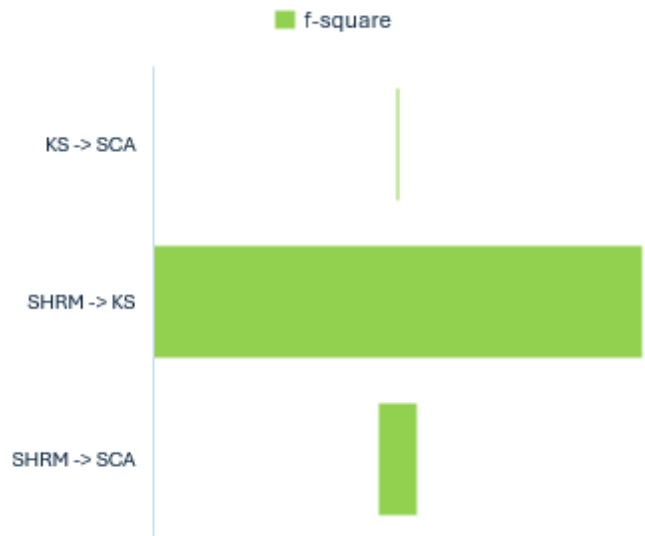


Figure 2 Results of Effect Size

The value of f² less than 0.02 indicates that there is no effect. Table 7 shows that the effect of Knowledge Sharing on Sustained Competitive Advantage is medium. Likewise, Strategic Human Resource Management has a large effect on both Knowledge Sharing as well as Sustained Competitive Advantage. It can be represented graphically as shown below in Figure 13.

TABLE VIII. RESULTS OF HYPOTHESIS TESTING

Constructs	f-square	Results
KS -> SCA	0.025	Medium
SHRM -> KS	3.734	Large
SHRM -> SCA	0.296	Large

Explanation

Table 8 shows the results of structural model relationships, including values of path coefficient, T values, P values, standard deviation, confidence intervals upper and lower, and respective decisions. For the 5% significance level, p-values should be less than 0.05, which indicates that the relationships are significant. The value for the t-statistics above 1.95 is acceptable. The range of upper and lower bounds for the confidence interval does not include zero and lies in the positive quadrant, clearly indicating the significant positive relationships between independent and dependent variables. The t-values at the significance level of 5% are greater than 1.96, therefore, the coefficients of SHRM and KS are statistically significant. Likewise, the p-values at a significant level of 5% are less than 0.05, indicating the significant direct

relationship between the independent SHRM and KS with the dependent variable SCA. Based on analysis of path coefficients, t-values, p-values, standard deviation, and confidence intervals, it is concluded that hypothesis H1 supports the significant positive relationship between SHRM and SCA with [$\beta = 0.658, t = 0.488, 0.811; p \leq 0.05$] at the significance

level of 5%. Likewise, the second hypothesis H2 supports the significant positive relationship between SHRM and KS with [$\beta = 0.888, t = 0.850, 0.911; p \leq 0.05$] at the significance level of 5%. The study's third and last hypothesis, H3, supports the significant positive relationship between KS and SCA with [$\beta = 0.19; t = 0.027, 0.36; p$

≤ 0.05] at the significance level of 5%. A graphical representation of the results is shown in Figure 14.

Figure 14 Hypotheses Testing

Hence, the study supports the three direct relationships between Strategic Human Resource Management and Sustained Competitive Advantage, Strategic Human Resource Management and Knowledge Sharing, and Knowledge Sharing and Sustained Competitive Advantage.

Mediation Analysis

Two methodologies are employed in scholarly works for quantitative analysis of mediating variables: the Sobel test and the resampling technique [18]. In this investigation, utilizing PLS-SEM, a resampling technique is implemented to conduct a mediation assessment of indirect factors. The bootstrap procedure includes a two-tailed test at a significant level of 5% with a confidence interval. This test was performed because the hypothesis highlighted that KS mediates the relationship between SHRM and SCA.

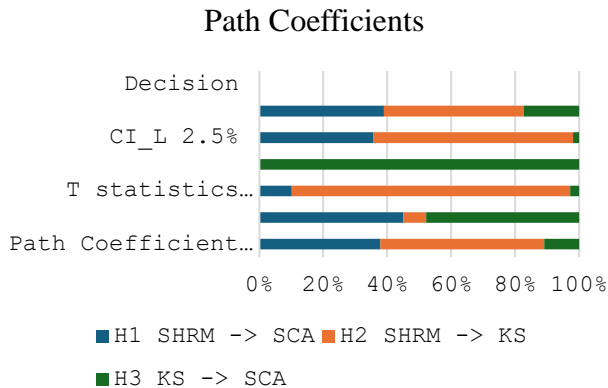


TABLE IX. TABLE 9 RESULTS OF INDIRECT EFFECTS (MEDIATION ANALYSIS)

Hypothesis	Relationships	Path Coefficient (β)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values	CI_L 2.5%	CI_U 97.50%	Decision
H1	SHRM -> SCA	0.658	0.082	7.978	0	0.488	0.81	Supported
H2	SHRM -> KS	0.888	0.013	68.673	0.000	0.858	0.910	Supported
H3	KS -> SCA	0.19	0.087	2.192	0.028	0.027	0.36	Supported

The results of the two-tailed test include p-value, t-value, and confidence interval. The results from Table 9 show that mediation is significant at a t-value above 1.96 and a p-value below 0.05. A graphical representation of the results is shown in Figure 15.

research gap in this study. For mediation analysis, the bootstrap procedure indicated an indirect effect with [$\beta=0.169; t=0.024, 0.320; p=0.05$] at a significance level of 5%. Thus, it can be concluded that the mediation of KS between SHRM and SCA is statistically significant. Hence, the proposed hypothesis H4 is that Knowledge Sharing mediates the relationship between

Strategic Human Resource Management and Sustained Competitive Advantage support a significant positive relationship of Knowledge Sharing between Strategic Human Resource Management and Sustained Competitive Advantage.

Discussion on Results

This study addresses four research questions based on the problem statement and conceptual relationships of different factors like Strategic Human Resource Management, Knowledge Sharing Culture, and Sustained Competitive Advantage. This study also aimed to define four research objectives to investigate the relationships of under-discussed factors with Sustained Competitive Advantage. To statistically validate the conceptual findings, this study tested hypotheses to find the significant relationships between independent variables and dependent variables after collecting data from the fixed-line telecommunication sector of Pakistan. The study's research questions, objectives, and hypotheses are recapitulated in Table 10.

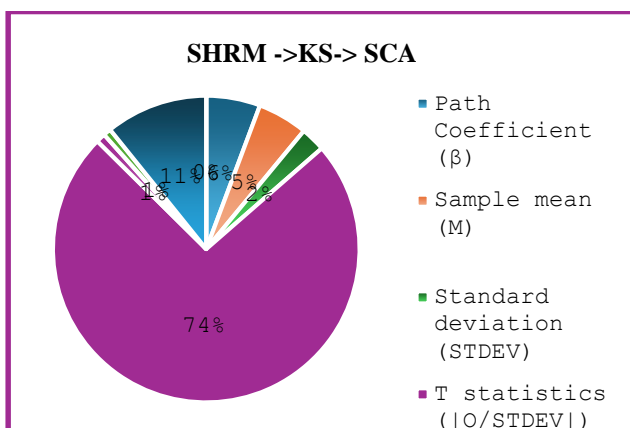


Figure 15 Mediation Test

Explanation

Previous literature has no empirical support for the mediation of KS between SHRM and SCA, and there is a

TABLE X. RECAPITULATIONS OF THE STUDY

Research Questions	Research Objectives	Hypothesis	Results
RQ 1: What is the relationship between Strategic Human Resource Management and Sustained Competitive Advantage?	RO 1: To investigate the relationship between Strategic Human Resource Management (SHRM) and Sustained Competitive Advantage (SCA).	H1: SHRM has a significant relationship with SCA.	Supported
RQ2: What is the relationship between Strategic Human Resource Management & Knowledge-sharing Culture?	RO 2: To investigate the relationship between Strategic Human Resource Management (SHRM) and Knowledge Sharing (KS).	H2: SHRM has a significant relationship with KS	Supported
RQ 3: What is the relationship between Knowledge Sharing Culture & and Sustained Competitive Advantage?	RO 3: To investigate the relationship between Knowledge Sharing (KS) and Sustained Competitive Advantage	H3: KS has a significant relationship with SCA.	Supported
RQ 4: Does Knowledge Sharing Culture mediate between Strategic Human Resource Management and Sustained Competitive Advantage?	RO 4: To investigate the mediating effect of KS between Strategic Human Resource Management (SHRM) and Sustained Competitive Advantage (SCA)	H4: KS mediates the relationship between SHRM and SCA	Supported

CONCLUSION

The study addresses the research questions by measuring the impact of variables SHRM on SCA, focusing on the mediating effect of KS within the fixed-line telecommunication sector of Pakistan. The key aspect of the study is understanding how strategic human resource management (SHRM) enhances the participation and professional growth of less-represented groups (LRGs), ensuring all employees contribute effectively to business success.

After reviewing the literature and previous empirical research, this study confirms that strategic HRM practices like recruitment and selection, involvement, training and development, work conditions, compensation and rewards, and competency-based performance appraisals positively influence knowledge-sharing culture. All these theoretical findings are also statistically validated by measuring the degree of applicability of each construct. Another finding of the study is the role of LRGs in the fixed-line telecommunication sector. This sector has struggled with inclusiveness in problem-solving and decision-making roles. By implementing SHRM practices that support diversity and inclusion, organizations can maximize the workforce's potential. This study defined the research objectives to address the research problem. It validated the hypothesized significant relationship of the independent variable SHRM with the dependent variable SCA. The present study also addressed the research gap by measuring the mediation of KS between the relationships of SHRM and SCA. This indirect mediation of KS with the independent variable SHRM and the dependent variable SCA is also found to be statistically significant. It is concluded that the theoretical findings of the study align with the statistical results after collecting data from a cross-sectional survey. The research model of this study applies not only to the fixed-line telecommunication sector but also to other sectors and countries with cross-cultural environments.

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