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The Impact of Social Capital and Intellectual Capital on Firm Performance with the Mediating Role of Innovation Activities: An Empirical Evidence of Employees of Software Houses of Abbottabad

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Social Capital, Intellectual Capital, Innovation Activities, Firm Performance, Software Companies

ABSTRACT

This study investigates the connection between social capital (SC), intellectual capital (IC), and firm performance (FP) in software firms in Abbottabad, KP, a developing city in Pakistan. In addition, the study investigates how innovation activities (INA) mediate these three factors. Utilizing quantitative methodologies, 400 employees were surveyed. The results indicate that social and intellectual capital enhance innovation and business performance. Innovation activities regulate the relationship between intellectual capital and business performance. This demonstrates how innovation processes make use of intellectual capital to enhance performance. This paper examines these characteristics of software companies in developing economies, thereby filling a research vacuum. This enhances the field's comprehension. The study demonstrates the importance of social and intellectual capital, innovation, and a business-friendly environment for software companies. These insights enable decision-makers, administrators, and executives in the software industry of developing nations to enhance organizational performance and innovation. Additionally, the study establishes research on strategic management and organizational theory. It also encourages future research in various sectors and fields to better comprehend the intricate connections between social capital, intellectual capital, innovation activities, and enterprise success.

INTRODUCTION

In the dynamic landscape of organizational management, the pursuit of outstanding performance is a shared objective across various sectors, be it the competitive private sector or the service-oriented public sector (Royer & Durieux, 2019). Strategic management, as a discipline, offers a plethora of recommendations and theories aimed at enhancing a company's performance, facilitating expansion, and ensuring sustained sustainability in an

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ever-evolving business environment (Ozgun et al., 2020). This study delves into a comprehensive investigation that explores the intricate correlation between a company's social capital (SC) and intellectual capital (IC), coupled with the pivotal role of innovation activities in shaping firm performance (FP).

Set against the backdrop of Abbottabad, a city in the province of Khyber Pakhtunkhwa, Pakistan, this research posits that both social and intellectual capital positively contribute to organizational performance through the dynamic process of creative activities (Fagerberg, Mowery, & Nelson, 2005; Landry, Amara, & Lamari, 2002; Riordan, 2013). In particular, the study focuses on software enterprises in Abbottabad, recognizing their unique operational styles, ethos, and internal dynamics within the broader context of the software industry (Klein & Knight, 2005).

As innovation becomes increasingly integral to the functioning of software enterprises, the study investigates the multifaceted innovation ecosystem within these companies, considering both internally driven initiatives by employees and externally imposed governmental regulations (Damanpour & Schneider, 2006). It emphasizes the reciprocal relationship between the execution of the innovation process and the enhancement of intellectual capital, positioning innovation as a collaborative and collective endeavour (Otto, Szymanski & Varadarajan, 2020).

While existing literature has extensively explored the impact of social capital on company performance, this study distinguishes itself by examining the nuanced connection between social capital and the emergence of creative endeavours (Nahapiet & Ghoshal, 1998). The research acknowledges the scarcity of comprehensive investigations into the role of innovation activities as a mediator in the relationship between social and intellectual capital and organizational performance (Kijkasiwat & Phuensane, 2020; Agustia et al., 2022). This acknowledgment underscores the significance of the study in addressing critical research gaps.

The research objectives are outlined to explore the impacts of social and intellectual capital on firm performance, innovation activities, and the mediating role of innovation in the relationships between capital and performance. Through a series of research objectives, the study aims to provide valuable insights that inform strategic decision-making, managerial practices, and policy formulation, specifically tailored to the unique context of Abbottabad's software industry. By doing so, the research contributes to the theoretical discourse and offers empirical insights that can guide organizations in similar economic environments, thereby

bridging the existing knowledge gap in this domain (Hongyun et al., 2019; Farah et al., 2022).

Research Objectives

The main objectives of the study are as follow:

- To investigate the impact of social capital on firm performance.
- To explore the impact of intellectual capital on firm performance.
- To explore the impact of social capital on innovation activities.
- To explore the impact of intellectual capital on innovation activities.
- To explore the mediating role of innovation activities between social capital and firm performance.
- To explore the mediating role of innovation activities between intellectual capital and firm performance.

LITERATURE REVIEW

Theoretical Underpinnings

Social capital theory suggests that firms' SC is entrenched in the association between organizational members (Nahapiet & Ghoshal, 1998). Associations based on reciprocity, effective communication, respect, and trust can generate organizational value and advantage by enabling novel knowledge creation, knowledge sharing, coordination, and teamwork (Nahapiet & Ghoshal, 1998; Meltzer et al., 2010). The study believes that a company's innovation activities and intellectual capital should not be examined shorn of the social association; instead, both are developed socially. Moreover, IC is deeply entrenched in social association (Nahapiet & Ghoshal, 1998; Kogut & Zander, 1992). Likewise, innovation is a social learning process that includes the cooperation and participation of several company members (Montana, 2006). An organization's resource-based view (RBV) supports this view of innovation. RBV is a strategic framework for management that attempts to describe the differences in performances among organizations (Abdiwahab, 2020). This view focuses on the significance of an organization's deliberate resources in achieving continued viable advantage (Abdiwahab, 2020). According to this view, organizations are considered a group of tangible and non-tangible resources like social phenomena, strategic behaviour, competencies, skills, and capabilities (Abdiwahab, 2020). It considers industry-specific skills, social capabilities, and intangibles entrenched in an organization's structure and considered valuable resources for an organization (Collins, 2021). Thus, intellectual, and social capital must be considered challenging to emulate stretched resources, which are fundamental factors

of firms' performance. This view also considers that knowledge and the concept entrenched in joint procedures are crucial for firm performance. As described earlier, SC performs a knowledge creation, sharing, facilitating, and lubricating role in this process (Allameh, 2018; Zhang et al., 2020; Attar, Kang & Sohaib, 2019; Collins, 2021; Han, Yoon & Chae, 2020).

Social Capital & Innovation Activities

In the literature, several definitions of social capital (SC) exist. This study defines SC as characteristics, properties, and values, including shared norms and visions, understanding, mutual trust, and social interaction that permits company employees to work towards the goal effectively (Kim & Shim, 2018). Structural capital is an intricate attribute, including cognitive, relational, and structural capital. Structural capital is the entire network of accessibility and association of network individuals (Swanson et al., 2020). From the organization's perspective, accessibility among the organization's members, both in respect of spatial proximity and hierarchical structure, is significant for sharing and communication.

On the other hand, relational capital (RC) is related to the relationship quality in a network. Normative features of this capital include identification, norms, reciprocity, trust, and mutual respect (Swanson et al., 2020). Finally, cognitive capital (CC) is about common goals, shared vision, values, and understanding (Allameh, 2018; Zhang et al., 2020; Attar, Kang & Sohaib, 2019).

Leenders et al. (2003) found a U-shaped inverted association between team creativity and tie strength. The author described that a very high or deficient level of involvement frequency hinders creativity. On the contrary, the team's creativity was observed to be the highest, with a modest frequency of interaction. Additionally, Damanpour (2017) reported that less involvement frequency is considered adequate for the creation innovation at the idea stage, while during the execution stage of innovation, more involvement frequency and closed ties should be focused on building solidarity. As the idea generation stage in this study does not happen in healthcare, it is not considered. Only the execution stage of innovation is considered as it is relevant for this study. Thus, close ties and a high level of social interactions are presumed to influence innovation activities positively. Based on the above-stated arguments, the following hypothesis is formulated:

***H_1**: There is a significant impact of social capital on innovation activities.*

Intellectual Capital and Innovation Activities

Unlike social capital, intellectual capital is also added to the list of concepts with several definitions besides the difficulty of its conceptualization. From the literature, it can be

observed that IC is a complex concept including three main attributes: customer, structural and human capital (Gogan et al., 2016; Hashim et al., 2015; Hameed & Anwar, 2018; Dhar, 2019; Barkat & Beh, 2018; Cisneros & Hernandez-Perlines, 2018). IC is described as the knowing capability and knowledge of a company containing customer, structural and human capital. Human capital (HC) is a company's members' skills, experience, capability, and knowledge (Häuberer, 2011). HC is the power and knowledge stock that a company holds through its members (Häuberer, 2011).

On the other side, structural capital includes complete knowledge, excluding human capital such as manuals, organizational charts, routines, processes and procedures, strategies and policies, and business procedures. Knowledge left after an employee leaves an organization is what structural capital is (Häuberer, 2011). Customer capital is the knowledge entrenched in a company's network and relationship with its customers (Häuberer, 2011). This study considered the patients as customer capital since they are the customers of a hospital. This study will not focus on relationships with other stakeholders and external institutions. Based on the above-stated arguments, the following hypothesis is formulated:

***H_2**: There is a significant impact of intellectual capital on innovation activities.*

Social Capital and Firm Performance

Firm performance is described as a multidimensional concept including both non-financial and financial attributes that helps in measuring the success in view of the already decided aims. Empirical studies on the linkage between SC and FP revealed both indirect and direct association (Farsi et al., 2013; Leana & Pil, 2006). Existing literature revealed that social capital improves firm performance via encouraging coordination and cooperation or via encouraging the transfer of knowledge leading in improve intellectual capital that ultimately improves the firm performance via enhanced innovation (Farsi et al., 2013; Garcia-Perez et al., 2020; Abeysekera, 2021; Hsu & Sabherwal, 2012).

The positive impact of INA on FP has been studied well in the present literature (Walker et al., 2011; Magnier-Watanabe & Benton, 2017). Although, this study considers investigating the influence on innovation activities (INA) instead of innovation itself on FP. Executing and adopting innovation is a multidimensional procedure influencing several transitional attributes during the process (Magnier-Watanabe & Benton, 2017). It is a fact when process innovation is taken under consideration in which the influence is presumed to be mainly implicit rather than immediate (Magnier-Watanabe & Benton, 2017). Therefore, the study considers the effect to be indirect (Fagerberg, Mowery & Nelson, 2005; Riordan, 2013). It

can be observed that the attempts exercised, and activities made in the procedure of innovation execution might contribute to a company's IC ultimately contributing to firm performance. Based on the above-stated arguments, the following hypotheses are formulated:

***H_3**: There is a significant impact of social capital on firm performance.*

Intellectual Capital and Firm Performance

According to Bontis (1998), an organization's performance is significantly impacted by its relational capital, which acts as a manifestation of the organization's external connections and collaborative efforts. According to recent study, the existence of a strong network of interpersonal ties may give various benefits to an organization's overall effectiveness. According to Gassmann et al. (2017) and Royer & Durieux (2019), the introduction of collaborative partnerships, networks, and alliances had a favorable influence on the operational and financial performance of the organizations under examination. Furthermore, intellectual property rights, which may be seen as a physical representation of relational capital, play an important role in protecting an organization's inventions. As a result, these innovations have a direct influence on the firm's market positioning and competitive advantage (Royer & Durieux, 2019). Recent research has drawn substantial attention to the collective influence of intellectual capital traits on corporate performance. Royer and Durieux (2019) performed research on the combined influence of human, structural, and relational capital alignment, and integration on organizational performance, as did Subramaniam and Youndt (2019). Research has shed light on the dynamic nature of this connection, identifying contextual characteristics such as industry dynamics, organizational culture, and leadership style as factors that influence it (Gnyawali & Park, 2009; Jung et al., 2018). The research has shown the dynamic nature of this connection. When analyzed within the context of software firms in Abbottabad, Pakistan, the impact of intellectual capital on firm accomplishment takes on a new perspective. These businesses' success may be linked to their concentration on knowledge-intensive processes, innovative activities, and collaborative partnerships, all of which demonstrate different types of humans, structural, and relational capital (Lacity & Hirschheim, 1993). The rapid pace of technical change, along with the necessity for constant innovation in the software business, emphasizes the significance of intellectual capital in defining an organization's overall level of performance. A hypothesis has been developed based on the preceding discussion.

***H_4**: There is a significant impact of intellectual capital on firm performance.*

Innovation Activities as a Mediator

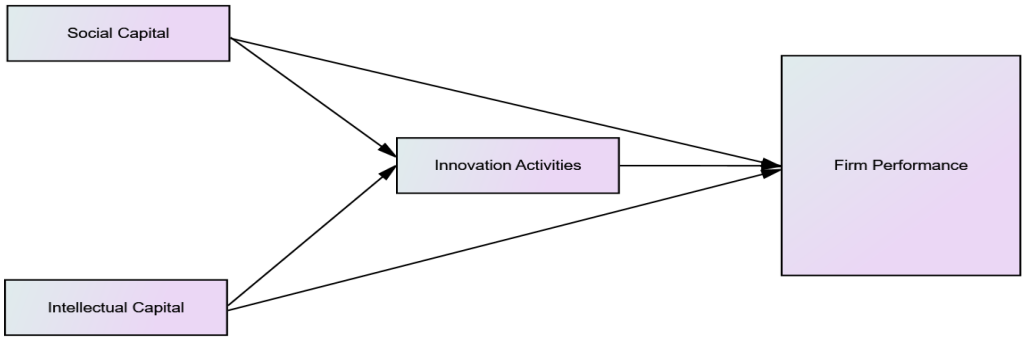
In literature, generally, the influence of innovation activities as a mediator are examined. This study will consider a distinct methodology and examine the influence of innovation activities as a mediator between intellectual capital, social capital, and firm performance. In Abbottabad, KP, majority of project related to innovation are government initiated. For these kinds of project only execution phase innovation will be considered since idea generation phase usually takes outside the organization particularly in the software houses. Hence, innovation is not employee originated and thus is not entirely results of the hospital's intellectual capital. Although, IC is fundamental in the execution stage of innovation, and it is implausible to report with complete surety that the innovation would have been originated irrespective of the policy of government.

Additionally, innovation is a process of knowledge creation and learning with the help of which novel issues are described, novel knowledge is made to resolve the existing and persistent issues (Damanpour, 2017). Moreover, the execution of innovation solely is not the input driver in the creation process of knowledge (Damanpour, 2017; Suppresser & Clausen, 2012). Hence, it can be stated that activities and efforts performed during action of executing innovation may originate learning and knowledge sharing thus contributory to intellectual capital of a company (Murphy et al., 2016). Based on the above-stated discussion on the positive impact of social capital on innovation activities in the prior sector, the following hypothesis is formulated:

***H_5**: Innovation activities plays a mediating role between intellectual capital and firm performance.*

***H_6**: Innovation activities plays a mediating role between social capital and firm performance.*

Theoretical Framework



METHODOLOGY

The methodology employed in this study aimed to investigate the impact of Social Capital (SC) and Intellectual Capital (IC) on Firm Performance (FP) within the unique context of Abbottabad, Pakistan, with a specific focus on software companies. Adopting a quantitative approach, the study utilized convenience sampling to survey 400 employees from software houses in Abbottabad, KP and sample was derived by priori studies methods (Ozgun et al., 2022). Data collection occurred through a well-structured survey instrument, covering demographic information and constructs related to Social Capital (SC) adopted from Ozgun et al. (2022); Nguyen & Ha (2020), Innovation Capital (IC) adopted from Mohapatra et al. (2019); Tran et al. (2022); Xu & Li (2020), Innovation Activities (INA) adopted from Damanpour (2017); Agustia et al. (2022), and Firm Performance (FP) adopted from Ozgun et al. (2022); Tran et al. (2022). The survey instrument's reliability and validity were assessed, and the study employed structural equation modelling (SEM) for data analysis, acknowledging its advantages in handling multiple dependent and mediating variables. Prior to model assessment, assumptions such as linearity, normality, and multicollinearity were tested, ensuring the robustness of the analytical process. This comprehensive approach aimed to provide nuanced insights into the intricate relationships between social and intellectual capital, innovation activities, and firm performance in the software industry of Abbottabad, contributing to the existing body of knowledge.

ANALYSIS

Demographic Profile of the Respondents

The demographics of survey respondents are displayed in Table 1. The table depicts the gender and level of education of respondents. 331 (82.75%) of 400 respondents were male, while 69 (17.25%) were female, as shown in the table. Two respondents had completed middle school (0.25%) while 196 (49%) or 202 (50.75%) had completed high school. Most poll respondents had a high school diploma, according to the demographic profile. Since the sample included software company employees in Abbottabad, KP, the demographic profile may not be representative of the population.

Table 1. Demographic Profile of the Respondents

Variables	Particulars	Frequency	Percent	Cum. Percent
Gender	Male	331.0	82.75	82.75
	Female	69.0	17.25	100.00
Education	Middle School	1.0	0.25	0.25
	High School	1.0	0.25	0.50
	Associate degree	27.0	6.75	7.25

	Bachelor's Degree	341.0	85.25	92.50
	Master's Degree	30.0	7.50	100.00
Position	Non-managerial	140.0	35.00	35.00
	Lower manager	114.0	28.50	63.50
	Middle manager	134.0	33.50	97.00
	Senior Manager	12.0	3.00	100.00

Exploratory Factor Analysis

The sample adequacy test for exploratory factor analysis (EFA) is presented in Table 2, evaluating the Kaiser-Meyer-Olkin (KMO) score and Bartlett sphericity test. A notably high KMO score of 0.915 suggests that the data is well-suited for factor analysis, indicating significant common variance between variables. The Bartlett sphericity test further supports this, revealing a statistically significant relationship among variables. Table 2 outlines the total variation explained by the EFA factor, with one component capturing 27.86% of the data's variance. While this suggests a substantial explanatory power, the presence of only one component implies that additional factors might contribute to a more comprehensive understanding of data variance. The results of the EFA, presented in Table 2, showcase the pattern matrix with variable factor loadings. Variables like HRC5, INA5, and HRC4 exhibit strong correlations with the factor, indicating reliability as indicators of the underlying construct. Despite the strength of these associations, the extraction of only one EFA component suggests the potential presence of additional factors essential for capturing the full complexity of the underlying constructions.

Table 2. Summary Statistics of Exploratory Factor Analysis

Test		Score
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.915
	Approx. Chi-Square	16740.817
Bartlett's Test of Sphericity	Df.	990
	Sig.	.000

Confirmatory Factor Analysis

Figure 1 displays the CFA results of the research. The purpose of canonical factor analysis (CFA) is to determine if a proposed measurement model suits the data. The diagram illustrates the proposed gauging model. This model consists of latent variables and their respective correlated indicators. In this diagram, circles represent latent variables while rectangles represent observable indicators. The hypothesized relationships between latent variables and observable indicators are shown by arrows connecting circles and rectangles. Several fit indices are also presented to evaluate the degree to which a measurement model suits the data. Among the fit indices are the chi-square statistic, the root means square error of approximation, the comparative fit index, and the standardized residual. SRMR has been

integrated. In this study, the hypothesized measurement model considers two latent variables and their correlated indicators: social capital and intellectual capital. Fit indices indicate that the model fits the data well. The chi-square statistic is statistically significant, indicating a discrepancy between the model and the data. The model suits the data well, as indicated by the other fit indices. The calculated RMSEA is 0.000, which is considerably lower than the recommended value of 0.08. The model is a good fit. The CFI is 1.000, which exceeds the minimum threshold of 0.90, indicating an outstanding correlation between the variables. The fit appears to be satisfactory given that the SRMR is 0.000, which is below the 0.08 threshold. Figure 1's CFA results indicate that the hypothesized measurement model matches the observed data well and that the latent variables of social capital and intellectual capital are excellent predictors of the investigated underlying dimensions.

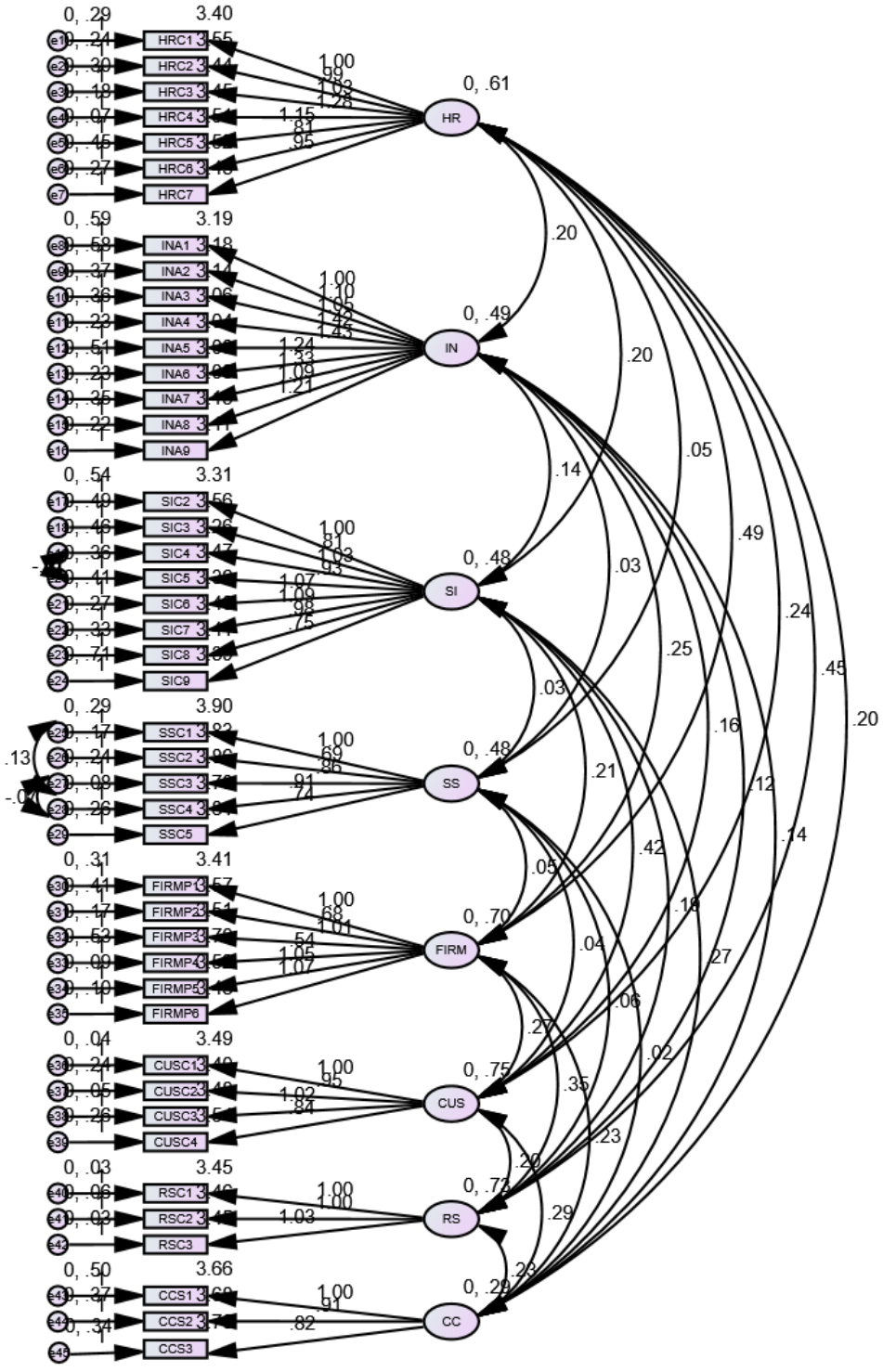


Figure 2. Confirmatory Factor Analysis Outer Path

Table 3 displays the CFA estimation results for the research. The purpose of canonical factor analysis (CFA) is to determine if a proposed measurement model suits the data. The table below displays outer path estimates from the CFA model. These estimations provide factor loadings between latent variables and their observable indicators that have been normalized.

In the "Path Estimate" column, the peripheral route estimates, their S.E., C.R., and p-values are displayed. In this study, the hypothesized measurement model considers two latent variables and their correlated indicators: social capital and intellectual capital. The outer route estimates of Table 5 display the standardized factor loadings of latent variables on observable indicators. Loadings on factors reveal the relationship between each observable indicator and its concealed variable. Low loadings indicate a feeble correlation between the observable indicator and the hidden variable. The correlation between observable variables and hidden variables is illustrated in Table 5. The factor loading of HRC5 on the social capital latent variable is 0.935%. HRC5 has close ties to social capital. As before, INA5 has a factor loading of 0.925 on the latent variable measuring intellectual capital. INA5 has a close relationship with intellectual capital. Table 5 demonstrates that the CFA estimates correspond to the observed data and that the latent variables of social capital and intellectual capital are excellent indicators of the being measured underlying constructs. Additionally, the CFA estimates support the measurement model.

Table 3: CFA

Path	Estimate	S.E.	C.R.	P-Value
HRC1 <-- HRC	1			
HRC2 <-- HRC	0.989	0.048	20.795	0.000
HRC3 <-- HRC	1.029	0.051	20.174	0.000
HRC4 <-- HRC	1.282	0.053	24.011	0.000
HRC5 <-- HRC	1.15	0.045	25.824	0.000
HRC6 <-- HRC	0.814	0.052	15.5	0.000
HRC7 <-- HRC	0.951	0.048	19.895	0.000
INA1 <-- INA	1			
INA2 <-- INA	1.097	0.083	13.158	0.000
INA3 <-- INA	1.05	0.074	14.204	0.000
INA4 <-- INA	1.422	0.091	15.548	0.000
INA5 <-- INA	1.425	0.088	16.242	0.000
INA6 <-- INA	1.238	0.087	14.171	0.000
INA7 <-- INA	1.328	0.083	16.048	0.000
INA8 <-- INA	1.088	0.075	14.499	0.000
INA9 <-- INA	1.214	0.077	15.859	0.000
SIC2 <-- SIC	1			
SIC3 <-- SIC	0.805	0.07	11.567	0.000
SIC4 <-- SIC	1.031	0.078	13.218	0.000
SIC5 <-- SIC	0.931	0.07	13.327	0.000
SIC6 <-- SIC	1.069	0.077	13.902	0.000
SIC7 <-- SIC	1.093	0.073	15.006	0.000
SIC8 <-- SIC	0.985	0.07	14.009	0.000
SIC9 <-- SIC	0.751	0.076	9.878	0.000

SSC1 <-- SSC	1			
SSC2 <-- SSC	0.688	0.043	15.963	0.000
SSC3 <-- SSC	0.86	0.04	21.315	0.000
SSC4 <-- SSC	0.909	0.049	18.686	0.000
SSC5 <-- SSC	0.741	0.05	14.769	0.000
FIRMP1 <-- FIRMP	1			
FIRMP2 <-- FIRMP	0.681	0.045	15.023	0.000
FIRMP3 <-- FIRMP	1.012	0.042	23.82	0.000
FIRMP4 <-- FIRMP	0.538	0.048	11.255	0.000
FIRMP5 <-- FIRMP	1.05	0.04	26.173	0.000
FIRMP6 <-- FIRMP	1.071	0.042	25.767	0.000
CUSC1 <-- CUSC	1			
CUSC2 <-- CUSC	0.949	0.031	30.162	0.000
CUSC3 <-- CUSC	1.021	0.02	52.002	0.000
CUSC4 <-- CUSC	0.836	0.032	26.317	0.000
RSC1 <-- RSC	1			
RSC2 <-- RSC	1.001	0.017	57.236	0.000
RSC3 <-- RSC	1.033	0.015	70.203	0.000
CCS1 <-- CCS	1			
CCS2 <-- CCS	0.909	0.098	9.245	0.000
CCS3 <-- CCS	0.818	0.091	9.031	0.000

The results of the study's validity are shown in Table 6. The statistical approach to validity analysis can evaluate the convergent and discriminant validity of the measurement model. HRC, INA, SIC, SSC, FIRMP, CUSC, RSC, and CCS are listed in the table. The variables are depicted in rows, and the columns contain various measures of validity, including the square root of the average variance extracted (in bold), composite reliability (CR), average variance extracted (AVE), maximum shared variance (MSV), and so on. The table also displays the correlations between each variable and the other model variables, as well as the correlation between any two variables with the highest value (MaxR(H)). The measurement model has strong convergent and discriminant validity, as shown in Table 6. All variable CR values are greater than 0.70, so the internal consistency is reliable. The results are convergent because all AVE values are greater than 0.50. Since the square root of the AVE values for each variable is greater than its correlation with any other variable, discriminant validity is sufficient. In addition, the results indicate that certain components overlap. HRC, SIC, and SSC all have MSV values that exceed 0.50, indicating that they share a significant amount of variance with other model variables. These variables have MSV values that exceed the permissible threshold. However, the correlations between these variables and the other model variables are weak, indicating that the constructs are autonomous.

Correlation Analysis

Table 4 displays the results of the research's correlation analysis. Correlation analysis assesses the strength and direction of relationships between variables. HRC, INA, SIC, SSC, FIRMP, CUSC, RSC, and CCS are listed in the table. The table displays correlation coefficients for each combination of variables in rows and columns. Table 8 indicates that multiple data sets are related. As an example, FIRMP and HRC are positively correlated (r = 0.681), indicating that higher HRC levels are associated with improved business performance. Higher human resource capital is associated with improved organizational efficacy. The correlation between RSC and FIRMP (r = 0.441) indicates that greater levels of relational capital are associated with improved firm performance. All the relationships between SIC and HRC (r = 0.395), CUSC and FIRMP (r= 0.350), and CCS and RSC (r= 0.455) are significant. These variable combinations have unique values. Although most relationships are faint, they suggest that the investigated concepts may overlap.

Table 4. Correlation Analysis

Variables	HRC	INA	SIC	SSC	FIRMP	CUSC	RSC	CCS
HRC	1							
INA	.381**	1						
SIC	.395**	.329**	1					
SSC	.129**	.051	.082	1				
FIRMP	.681**	.437**	.421**	.092	1			
CUSC	.343**	.295**	.664**	.100*	.350**	1		
RSC	.595**	.200**	.354**	.120*	.441**	.256**	1	
CCS	.428**	.349**	.552**	.107*	.432**	.496**	.455**	1

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

1. Structural Equation Modelling (SEM)

Innovation Activities as a Mediator between Social Capital and Firm Performance

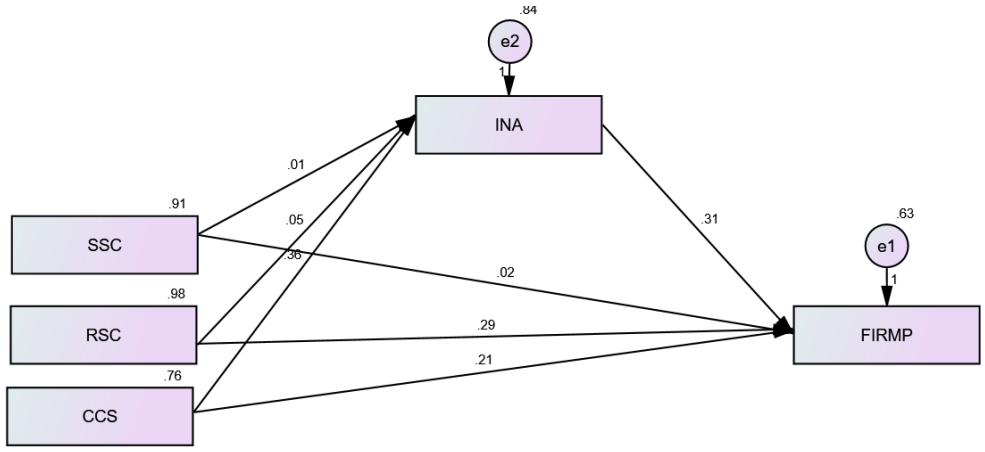


Figure 3. SEM Estimates for SC - INA - FIRMP

The results of the study's SEM analysis are presented in Table 5. SEM analysis is a statistical technique used to test the hypothesized relationships between model variables. The following table estimates the direct effects of route coefficients on model variables. The model predicts correlations between its variables, while the route coefficients evaluate their magnitude and direction. Table 5 indicates that several variables have direct effects. RSC demonstrates a significant direct relationship with FIRMP (path estimate = 0.256, p = 0.01), indicating that relational capital enhances firm performance. The p-value for this route estimate is less than 0.01. Cognitive capital has a significant direct effect on FIRMP (path estimate = 0.496, p = 0.01), indicating that cognitive capital enhances firm performance. Nevertheless, there are no significant direct associations between INA and RSC (path estimate = 0.051, p > 0.05) or CCS (path estimate = 0.363, p 0.01), indicating that innovation activities have no direct effect on relational or cognitive capital.

Table 5. SEM Estimates for Social Capital - Innovation Activities - Firm Performance

Path	Estimate	S.E.	C.R.	P-Value
INA <-- RSC	0.051	0.046	1.11	0.27
INA <-- CCS	0.363	0.052	6.98	0.000
INA <-- SSC	0.011	0.048	0.23	0.822
FIRMP <-- RSC	0.287	0.04	7.18	0.000
FIRMP <-- CCS	0.211	0.048	4.40	0.000
FIRMP <-- INA	0.313	0.043	7.28	0.000
FIRMP <-- SSC	0.022	0.042	0.52	0.597
FIRMP <-- INA <-- RSC	0.016	0.017	0.94	0.375
FIRMP <-- INA <-- CCS	0.114	0.026	4.38	0.005
FIRMP <-- INA <-- SSC	0.003	0.015	0.20	0.807

Innovation Activities as a Mediator Between IC and FP

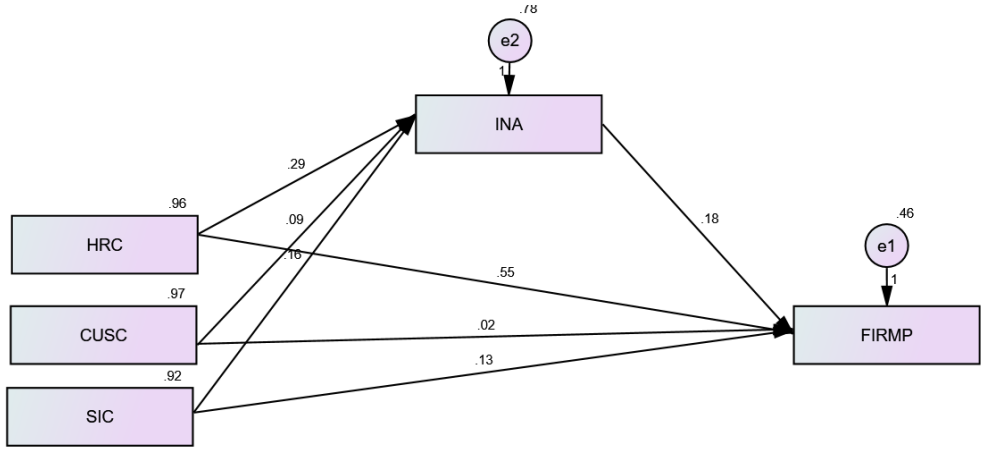


Figure 4. SEM Estimates for IC - INA - FIRMP

The table 6 displays indirect impact estimations and route coefficients linking model variables. Estimates of indirect effects illustrate the magnitude and direction of interactions between model variables when mediated by another variable. Table 6 demonstrates indirect effects between numerous parameters. Between RSC and FIRMP, INA mediates an indirect effect (path estimate = 0.016, $p > 0.05$). Innovation-related activities partially mediate the relationship between relational capital and business performance. Similarly, INA mediates a considerable indirect link between CCS and FIRMP (path estimate = 0.114, $p = 0.01$), indicating that innovation activities modulate the cognitive capital-firm performance relationship to some extent. Innovation activities do not moderate the relationship between relational or cognitive capital and firm performance, as there are no indirect effects between INA and RSC or CCS that are statistically significant (path estimate = 0.017, $p > 0.05$). Path analysis has examined this.

Table 6. SEM Estimates for Intellectual Capital - Innovation Activities - Firm Performance

Path	Estimate	S.E.	C.R.	P-Value
INA <-- CUSC	0.094	0.064	1.47	0.173
INA <-- SIC	0.156	0.065	2.40	0.019
INA <-- HRC	0.287	0.057	5.04	0.005
FIRMP <-- CUSC	0.022	0.057	0.39	0.681
FIRMP <-- SIC	0.132	0.05	2.64	0.014
FIRMP <-- INA	0.177	0.045	3.93	0.005
FIRMP <-- HRC	0.553	0.047	11.77	0.005
HRC <-- INA <-- FIRMP	0.051	0.016	3.188	0.005
SIC <-- INA <-- FIRMP	0.028	0.014	2.000	0.019
CUSC <-- INA <-- FIRMP	0.017	0.012	1.417	0.174

Hypotheses Testing

Table 7 displays the results of the study's hypothesis testing. Testing hypotheses is a statistical method for confirming the relationships between model variables. Each of the study's hypotheses is depicted in the table along with their corresponding options and mediation. The statistical analysis confirmed or rejected each of the enumerated hypotheses. According to Table 11, the evidence supports numerous hypotheses. Both Hypotheses 2 (IC INA) and 4 (IC FIRMP) demonstrated a positive association between intellectual capital, innovation activities, and firm performance. Both hypotheses were validated. The results of Hypothesis 5 (IC INA FIRMP) demonstrated that innovation activities moderate the relationship between intellectual capital and firm performance. Numerous alternative explanations were debunked by statistical analysis. The null results of Hypotheses 1 (SSC INA) and 3 (SSC FIRMP) indicate that social capital does not significantly influence innovation activities or firm performance. Consumer capital and innovation activities are unrelated, concluded Hypothesis 5. Also disproven.

Conclusion

This study investigated the relationship between social capital (SC), intellectual capital (IC), and innovation activities (INA) and business performance (FP) in Abbottabad, Pakistan. The study investigates software companies in underdeveloped nations such as Pakistan to gain insight into their business practices. Four hundred software developers from Abbottabad responded to a questionnaire. The collection of data was quantitative. The study linked social capital, intellectual capital, innovation, and corporate performance. Innovation and corporate success were positively affected by social and intellectual capital. Innovation activities moderated the relationship between intellectual capital and business performance. This indicates that innovation benefits business performance by increasing the utilization of intellectual capital. The impact of social capital on innovation and organizational performance was indirect. This study contributes to the literature on how social and intellectual capital affects organizational performance, particularly in software companies from developing nations. This study investigates how innovation activities mediate the connection between intellectual capital and business success. This helps to explain the unique dynamics and norms of software companies. The study also fills a void. Most of the research on intellectual capital, social capital, and business success has ignored the effects of internal and external circumstances, focusing instead on macro-level issues. This study bridges that

divide. The study highlights the need to comprehend how innovation activities affect social and intellectual capital as well as organizational effectiveness. The innovation process closes the disparity.

Recommendations

The report makes several recommendations for Pakistan's software industry decision-makers, administrators, and leaders. Maximize the company's social capital first. One can accomplish this by promoting cooperation, knowledge exchange, and networking within and beyond the organization. Communication and collaboration have the potential to increase social capital, which can enhance innovation and business success. Second, software companies should prioritize the expansion of their intellectual capital. Investments in personnel training and development, encouragement of innovation, and promotion of lifelong learning may increase the intellectual capital of an organization. Intellectual capital enables businesses to make better use of their employees' abilities, thereby enhancing creativity and performance. Thirdly, business executives must recognize the significance of innovation in connecting intellectual capital to the success of their companies. Understanding this relationship will enable them to develop innovative and performance-enhancing methods for utilizing intellectual capital. Decision-making may be aided by tools that assess the impact of innovation on a company's performance. Future research should concentrate on longitudinal studies to determine how rising social and intellectual capital influences innovation and business success over time. This will aid in identifying sustainable methods and the long-term impact of performance enhancements within an organization.

Additionally, software developers must seek out opportunities for collaboration with other stakeholders, such as educational and research institutions and software competitors. Collaboration has the potential to enhance innovation efforts and the organization by facilitating information exchange, technology acquisition, and market knowledge.

Implications

This research has implications for multiple academic and software industry stakeholders. According to the findings of the study, software companies must invest in social and intellectual capital to improve innovation and business success. By promoting cooperation and sharing of information, businesses can utilize employee skills and foster innovation. Market advantage may result. By understanding how innovation activities mediate the relationship between intellectual capital and company performance, managers and leaders can develop effective strategies for utilizing their intellectual capital to enhance performance. The

study demonstrates that legislators and other government entities in developing countries such as Pakistan must encourage innovation and creativity. Governments can promote the social and intellectual capital of software companies by funding ideas, research collaborations, education, and training. This will strengthen the ecosystem for innovation. Focusing on workforce development and incentivizing innovative initiatives could contribute to the growth and prosperity of the software industry. This study contributes to the existing body of literature on social and intellectual capital and organizational performance. The study demonstrates the effect of these characteristics on innovative activity. These findings improve our comprehension of how these factors affect the viability of businesses. To generalize and expand the findings, additional research may be conducted in additional industries and regions. Benefits will accrue to strategic management and organizational theory.

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