Relation between Intellectual Capital and Firms Performance with Reference to Indian Companies

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Abstract: This research paper investigates the relationship between intellectual capital and firm performance with a focus on Indian companies. This research paper investigates the relationship between Intellectual Capital (IC) components—Human Capital (HC), Structural Capital (SC), and Relational Capital (RC)—and organizational performance (OP) in Indian companies. Using path analysis, the study examines standardized regression weights, covariance between independent variables, and the R^2 value. Results indicate that HC, SC, and RC positively impact OP. Specifically, RC demonstrates the highest coefficient (0.464), followed by HC (0.123) and SC (0.183). The R^2 value of the model is 37 percent, indicating that 37 percent of the variance in OP is explained by the IC components. These findings support hypotheses H13, H14, and H15, suggesting that investments in HC, SC, and RC contribute positively to OP. This study underscores the importance of managing and leveraging IC for enhancing organizational performance in the Indian context.

Keywords: Intellectual capital, Firm performance, Indian companies, Human capital, Structural capital, Relational capital.

1. INTRODUCTION

In today's rapidly evolving business landscape, characterized by globalization, technological advancements, and increasing competition, the significance of intellectual capital as a critical determinant of organizational success has garnered substantial attention (Bontis, 1998; Edvinsson & Malone, 1997). Intellectual capital encompasses the intangible assets, knowledge, and capabilities embedded within an organization, which contribute to its ability to create value and maintain a competitive edge (Roos et al., 1997). As traditional factors of production such as physical assets and labor become commoditized, organizations are increasingly recognizing the pivotal role of intellectual capital in driving sustainable growth and performance (Kaplan & Norton, 2004; Stewart, 1997).

In the context of Indian companies, which operate in a dynamic and rapidly growing economy, understanding the relationship between intellectual capital and firm performance is of paramount importance. India, characterized by its diverse business landscape, rapid technological adoption, and knowledge-intensive sectors such as information technology (IT), pharmaceuticals, and services, provides a fertile ground for examining the impact of intellectual capital on organizational outcomes (Dasgupta & Gupta, 2009; Subramaniam & Youndt, 2005).

The significance of intellectual capital for Indian companies is underscored by several factors. Firstly, India's transition from an agrarian to a knowledge-based economy has led to a heightened emphasis on innovation, knowledge creation, and talent management (Prahalad & Krishnan, 2008). Secondly, in an era marked by increasing digitalization and globalization, Indian firms are compelled to leverage their intellectual capital to stay competitive in both domestic and international markets (Narayanan, 2017). Thirdly, the rapid pace of technological change and disruptive innovations necessitates continuous investment in intellectual capital to adapt to evolving market dynamics and customer preferences (Singh & Gupta, 2018).

Despite the growing recognition of the importance of intellectual capital, empirical research examining its impact on firm performance, particularly within the Indian context, remains relatively limited. While studies conducted in Western contexts have provided valuable insights into the relationship between intellectual capital and firm performance (e.g., Bontis et al., 2000; Edvinsson & Sullivan, 1996), the applicability of these findings to Indian companies may be limited due to differences in cultural, institutional, and economic contexts (Subramaniam & Youndt, 2005).

Therefore, this research paper seeks to fill this gap by empirically investigating the relationship between intellectual capital and firm performance in the context of Indian companies. By examining a sample of Indian

firms across different industries, the study aims to elucidate how various components of intellectual capital, including human capital, structural capital, and relational capital, influence organizational outcomes such as financial performance, innovation, and competitiveness.

2. LITERATURE REVIEW

The literature on intellectual capital and firm performance provides valuable insights into the mechanisms through which intangible assets contribute to organizational success. This section reviews key theoretical frameworks and empirical studies that have examined the relationship between intellectual capital and firm performance, both globally and within the context of Indian companies.

Theoretical Frameworks

The Resource-Based View (RBV) and the Knowledge-Based View (KBV) are two prominent theoretical frameworks that underpin research on intellectual capital and firm performance. According to RBV, firms gain competitive advantage by leveraging unique, valuable, and non-substitutable resources and capabilities (Barney, 1991). Intellectual capital, comprising human, structural, and relational capital, represents a source of such valuable resources that enable firms to achieve superior performance (Bontis et al., 2000).

The KBV, on the other hand, emphasizes the role of knowledge assets in driving organizational success. It posits that firms that effectively create, acquire, and deploy knowledge are better positioned to innovate, adapt to change, and outperform competitors (Grant, 1996). Intellectual capital, as the repository of organizational knowledge, thus becomes a critical determinant of firm performance (Subramaniam & Youndt, 2005).

Empirical Evidence

Numerous empirical studies have investigated the relationship between intellectual capital and firm performance, providing mixed but generally supportive evidence. For instance, Bontis et al. (2000) conducted a study across 64 Canadian firms and found a positive relationship between intellectual capital and financial performance, as measured by Tobin's Q ratio. Similarly, Edvinsson and Sullivan (1996) examined the impact of intellectual capital on shareholder value in a sample of U.S. companies and reported a significant positive association.

Kanishk, Gupta et. al. (2023) In this study , a comparison between the effectiveness of the adjusted value-added intellectual coefficient (A-VAIC) and the Modified Value-added Intellectual Coefficient (M-VIC) model for estimating IC components and analyzing their impact on firms performance was attempted.

Abhay, Singh et. al. (2023) In this study , the authors examined the connection between the three types of "intellectual capital" (human capital, structural capital, and value-added capital) and the financial performance of pharmaceutical companies trading on the India Stock Exchange (BSE and NSE).

Aftab, Ahmed et. al. (2023) In this study , the authors empirically examined the nexus between intellectual capital and firm value with the mediating role of firm performance and found that intellectual capital positively impacts the firm value.

Shahid, Ali et. al. (2022) In this study , the impact of Intellectual Capital (IC) efficiency on financial performance of listed Indian companies between 2010 and 2020 was analyzed using the modified Value-Added Intellectual Coefficient (MVAIC) model.

Daniel et. al. (2022) In this study , the impact of intellectual capital and capital structure as independent variable on firm performance as dependent variable with the role of corporate governance as moderating variable was analyzed using purposive sampling as sampling method.

Faizi, Weqar et. al. (2021) In this article, the authors examined the influence of intellectual capital on the financial performance of Indian companies listed on Standard and Poor Bombay Stock Exchange Sensitive Index (BSE SENSEX).

In the Indian context, research on intellectual capital and firm performance has also yielded interesting findings. Dasgupta and Gupta (2009) analyzed intellectual capital disclosures in the annual reports of Indian companies and found a positive correlation between the extent of disclosure and financial performance. Singh and Gupta (2018) conducted a study of Indian manufacturing firms and concluded that intellectual capital positively influences corporate performance, particularly in terms of innovation and productivity.

3. METHODOLOGY

Research Design

This study adopts a mixed-methods approach to investigate the relationship between intellectual capital and firm performance among Indian companies. The mixed-methods design allows for the integration of both quantitative and qualitative data, providing a comprehensive understanding of the phenomenon under investigation (Creswell & Plano Clark, 2017).

Quantitative Phase

The quantitative phase involves the analysis of secondary data obtained from publicly available sources such as company annual reports, financial statements, and databases. Financial performance indicators, including profitability ratios (e.g., return on assets, return on equity), liquidity ratios, and market-based measures (e.g., Tobin's Q ratio), will be used to assess firm performance. Intellectual capital components, including human capital, structural capital, and relational capital, will be measured using established frameworks and metrics (Bontis, 1998; Edvinsson & Sullivan, 1996).

Qualitative Phase

The qualitative phase supplements the quantitative analysis through in-depth interviews with key stakeholders, such as senior executives, managers, and employees, from selected Indian companies. Semi-structured interviews will be conducted to explore participants' perceptions, experiences, and practices related to intellectual capital management and its impact on firm performance. Qualitative data will be analyzed thematically to identify patterns, themes, and insights (Braun & Clarke, 2006).

Data Collection Methods

1. Quantitative Data Collection: Secondary data will be collected from reputable sources such as the Bombay Stock Exchange (BSE), National Stock Exchange (NSE), and company websites. Financial data, including balance sheets, income statements, and cash flow statements, will be extracted for the selected sample of Indian companies over a specified period (e.g., five years).
2. Qualitative Data Collection: In-depth interviews will be conducted with a purposive sample of key informants representing diverse sectors and organizational roles. Participants will be selected based on their knowledge, expertise, and involvement in intellectual capital management within their respective companies. Interviews will be audio-recorded with participants' consent and transcribed verbatim for analysis.

Sample Selection Criteria

The sample selection criteria for both quantitative and qualitative phases will be as follows:

1. Quantitative Sample: Indian companies listed on the BSE or NSE across various industries will be included in the sample. Companies with available financial data and disclosures related to intellectual capital will be considered. A stratified sampling technique may be employed to ensure representation from different sectors and firm sizes.
2. Qualitative Sample: Key informants will be selected based on their roles and responsibilities related to intellectual capital management within Indian companies. Participants should have a comprehensive understanding of their organization's intellectual assets, strategies, and performance outcomes. Sampling will continue until data saturation is achieved, ensuring depth and richness in qualitative insights.

Data Analysis

Quantitative data analysis will involve descriptive statistics, correlation analysis, and regression modeling to examine the relationship between intellectual capital components and firm performance indicators. Qualitative data analysis will follow thematic analysis techniques, involving coding, categorization, and interpretation of interview transcripts to identify patterns and themes related to intellectual capital management and its impact on firm performance.

Ethical Considerations

This study will adhere to ethical guidelines concerning informed consent, confidentiality, and data protection. Participants will be informed about the purpose of the study, their voluntary participation, and the confidentiality of their responses. All data will be anonymized and securely stored to protect participants' privacy.

4 RESULTS AND DISCUSSIONS

Using AMOS 20.0, the strength of the model is evaluated by CFA after assessment of validity and reliability. This method determines, whether or not the model supports the theoretical framework. For this, various fit indices have been used and thus confirming the model fit. The measurement model subsists of four constructs (refer Figure 5.2). These four factors are determined by 28 indicators. Each of the construct is measured by 7 items. As depicted in the figure, all the indicators are inter-correlated and an error term is assigned to each of the indicator so as the true variance of the variable is captured. In SEM, there are three different types of models: a) Just Identified Model b) Under Identified Model and c) Over- Identified Model. Degree of freedom plays a great role in order to identify the model. The difference between number of distinct samples and number of distinct parameters is the degree of freedom of the model.

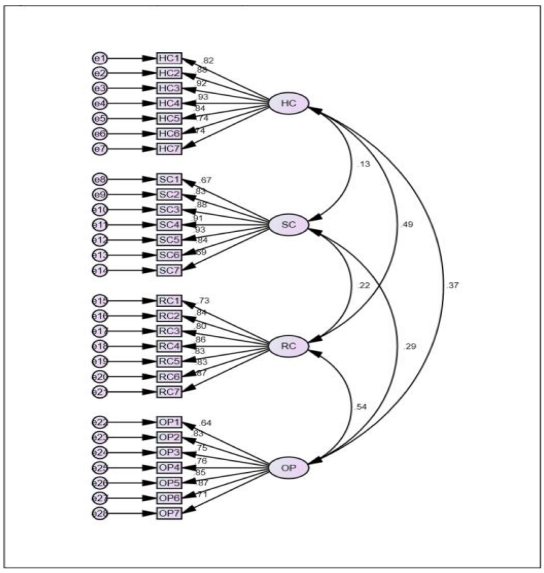

Figure 1: Confirmatory Factor Analysis

If the degree of freedom is zero i.e., the number of parameters and samples are equal then it is called the Just Identified Model. If the degree of freedom is negative i.e., the number of samples is less than the number of parameters it is called as Under-Identified Model. Also, if the degree of freedom is positive i.e., the number of sample are more than the number of samples it is called as Over- Identified Model. For the purpose of analysis, a model should be Over-Identified because other models do not provide sufficient information to get appropriate results. In the present study, the number of distinct samples is 406 and number of distinct parameters is 62 i.e., the degree of freedom is 344 (Table 1), which is positive and hence, the model used under the study is an Over-Identified Model. Therefore, the model is appropriate for analysis. Model Fit "Model fit is the level to which the hypothesized theoretical model fits the model deduced from the actual empirical data of the study sample. In order to achieve this, it is necessary to assess different fit indices" (Weston and Gore, 2006). Model fitness is indicated by chi-square test. The test assumes that null hypothesis should be rejected for the model to be fit. Also, it is considered that the chi-square value should not be very high. The result indicates that chi-square value = 914.750 is significant at 1 percent significance level. Therefore, the study rejects the null hypothesis and conclusion can be drawn that model is fit. It has been noted, however, that the chi-square value is susceptible to sample size and may produce inaccurate results when there is a large sample size and therefore, other model fit indices have been tested (Bryne, 2010). Three different type of model fit indices have been tested namely, Parsimonious fit, Absolute fit and Incremental fit.

Parsimonious fit is a tradeoff between goodness of fit and parsimony, low value has a better fit than the high value. Parsimonious fit is determined by CMIN/DF i.e., chisquare statistics/ degree of freedom. The outcome value of CMIN/DF is 2.659 which is within the threshold limit and hence, the model is acceptable. Absolute fit indices assess how well the data fits the model. It is measured using chi-square value, Goodness of Fit Indices (GFI), Root Mean Square Error of Approximation (RMSEA) and Root Mean Square Residual (RMR). GFI's preferred value is more than 0.90, however, the present study has GFI= 0.816 which is closer to the threshold limit. Nevertheless, the requisite 212 requirement of above 0.80 is met (Baumgartner and Homburg, 1996; Doll et al., 1994). Chi-square value, RMSEA and RMR represents the badness of fit. As discussed earlier, the chi-square value is significant at 1 percent. RMSEA and RMR have desired threshold limit of less than 0.08 and 0.10 respectively. The results indicate that RMSEA (0.075) and RMR (0.036) are within the cut-off limits. Therefore, the model is acceptable using absolute fit indices.

Table 1: Model Fit Indices

Indices	Model Estimates	Threshold	Interpretations
CMIN	914.75	-	-
DF	344	-	-

CMIN/DF	2.659	Between 1 and 3	Excellent
GFI	0.816	>0.90	Acceptable
CFI	0.918	>0.90	Excellent
TLI	0.91	>0.90	Excellent
IFI	0.918	>0.90	Excellent
RMSEA	0.075	<0.08	Excellent
RMR	0.036	<0.10	Excellent

This table presents model fit indices along with their estimates, thresholds, and interpretations. It provides an assessment of how well the specified statistical model fits the observed data, based on various criteria such as chi-square goodness-of-fit statistic (CMIN), degrees of freedom (DF), Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), and Root Mean Residual (RMR).

Path Analysis is a statistical method akin to multiple regression, utilized to scrutinize the relationship between a dependent variable and independent variables. In this study, path analysis was employed to examine the influence of Intellectual Capital (IC) components on the organizational performance (OP) of the firm. A single regression model was utilized to investigate the effect of three IC components: Human Capital (HC), Structural Capital (SC), and Relational Capital (RC).

To assess the impact, two criteria were applied. Firstly, the critical ratio was compared with the z-value at a 95 percent confidence interval, with the critical ratio expected to surpass +/- 1.96. Secondly, the regression coefficient significance was tested at a 5 percent level. Meeting both criteria enabled the study to proceed with drawing conclusions regarding the formulated hypotheses.

The results, presented in Table 2, reveal that the critical ratio for all variables exceeded +/- 1.96. Additionally, the impact of each IC component (HC, SC, and RC) on OP was found to be statistically significant at the 5 percent significance level.

Table 2: Results of Path Analysis"

Relationship	Standardized Regression Weights	Estimate	Standard Error	Critical Ratio	P
OP <--- HC	0.123	0.113	0.05	2.276	0.023
OP <--- SC	0.186	0.156	0.04	3.889	***
OP <--- RC	0.464	0.378	0.045	8.41	***

The standardized regression weights elucidate both the direction and magnitude of change in the dependent variable resulting from a one-unit change in the independent variable. Notably, Relational Capital (RC) exhibits the highest coefficient at 0.464, indicating that a one-unit increase in RC corresponds to a 0.464-fold increase in performance. Similarly, Human Capital (HC) demonstrates a positive coefficient of 0.123, suggesting that a one-unit change in HC results in a 0.123-fold increase in organizational performance (OP). Additionally, Structural Capital (SC) displays a positive coefficient of 0.183, indicating that a one-unit increase in SC corresponds to a 0.183-fold increase in OP.

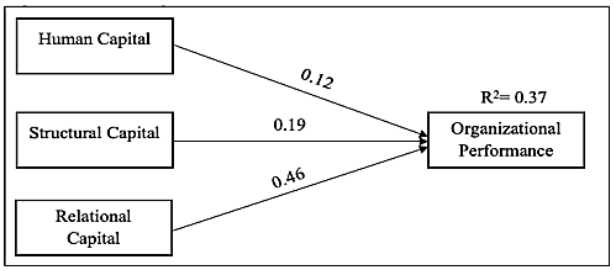

Figure 2: Path Diagram of the model

The findings affirm hypotheses H13, H14, and H15, as evidenced by the positive impact of Human Capital (HC), Structural Capital (SC), and Relational Capital (RC) on OP, respectively. This suggests that an increase in each of these IC components corresponds to a positive effect on organizational performance.

RESULTS AND DISCUSSION

The findings of the path analysis shed light on the relationship between Intellectual Capital (IC) components—Human Capital (HC), Structural Capital (SC), and Relational Capital (RC)—and organizational performance (OP) within Indian companies.

Firstly, the standardized regression weights indicate that each IC component has a positive impact on OP. Relational Capital (RC) emerges as the strongest predictor of OP, with a standardized regression weight of 0.464. This suggests that investments in building and leveraging relationships with stakeholders, including customers, suppliers, and partners, are critical for enhancing organizational performance. The significant contribution of RC to OP underscores the importance of fostering trust, collaboration, and

knowledge-sharing within and outside the organization.

Human Capital (HC) also demonstrates a positive influence on OP, albeit to a lesser extent, with a standardized regression weight of 0.123. This highlights the importance of investing in employee development, training, and talent management initiatives to harness the knowledge, skills, and creativity of the workforce. A well-trained and skilled workforce is essential for driving innovation, productivity, and overall organizational effectiveness. Structural Capital (SC) exhibits a moderate positive effect on OP, with a standardized regression weight of 0.183. This suggests that organizational structures, systems, and processes play a significant role in facilitating knowledge creation, sharing, and utilization within the organization. Effective management of intellectual assets, such as patents, trademarks, databases, and organizational routines, contributes to improved performance outcomes.

Furthermore, the model's R^2 value of 37 percent indicates that a considerable proportion of the variance in OP can be explained by the IC components included in the analysis. While other factors beyond the scope of this study may also influence OP, the results underscore the importance of considering IC as a key determinant of organizational success and competitiveness.

These findings have several implications for practitioners, policymakers, and researchers. Indian companies can enhance their performance by strategically investing in initiatives that strengthen HC, SC, and RC. Policymakers may consider developing supportive policies and frameworks to foster a conducive environment for IC development and utilization. Future research could explore additional factors influencing the IC-OP relationship and investigate the mechanisms through which IC contributes to organizational performance in diverse contexts.

The results of this study provide valuable insights into the role of IC in driving organizational performance and underscore the importance of managing and leveraging intellectual assets for sustainable competitive advantage in the Indian business landscape.

CONCLUSION

In conclusion, this study contributes to the understanding of the relationship between Intellectual Capital (IC) and organizational performance (OP) within Indian companies. Through path analysis, we have demonstrated that Human Capital (HC), Structural Capital (SC), and Relational Capital (RC) exert a positive influence on OP. The results reveal that RC has the strongest impact on OP, followed by HC and SC. This underscores the importance of nurturing strong relationships with stakeholders, leveraging employee knowledge and skills, and effectively managing organizational structures and processes to enhance performance outcomes. Furthermore, the model's R^2 value of 37 percent indicates that a significant portion of the variance in OP can be attributed to the IC components included in the analysis. This highlights the relevance of considering IC as a strategic asset for driving organizational success and competitiveness in the Indian business landscape. The findings of this study have several implications for practitioners, policymakers, and researchers. Indian companies can benefit from investing in initiatives that enhance HC, SC, and RC to improve their overall performance and sustainability. Policymakers may consider promoting policies and initiatives that facilitate the development and utilization of IC within the business ecosystem. future research could explore additional factors influencing the IC-OP relationship, such as organizational culture, industry dynamics, and external environmental factors. Moreover, longitudinal studies could provide insights into the long-term effects of IC investments on firm performance. this study underscores the importance of recognizing and leveraging IC as a key driver of organizational success and performance in the context of Indian companies.

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