



Structural Equation Modeling of the Impact of Intellectual Capital on the Organizational Performance of Sports Federations.

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Abstract

The present study seeks to conduct a Structural equation modeling to examine the impact of intellectual capital on the organizational performance of sports federations. The method is correlational and survey. The population consists of all sports federations. A sample of 242 individuals were selected by Morgan's table and the random sampling method. The research utilizes Bontis' (2007) intellectual capital questionnaire and Yang's (2004) organizational performance questionnaire as measurement tools. The surveys' validity was verified by 8 professors specializing in sports management. The reliability of the research questionnaires was assessed using Cronbach's alpha coefficient, yielding values of 0.83 and 0.91 for the relevant questionnaires. The data analysis employed Pearson's correlation test and structural equation modelling. The GFI index of 0.95, AGFI index of 0.96, NFI index of 0.97, CFI index of 0.95, and RMSEA index of 0.031 all suggested that the structural modelling fit. The findings indicated that intellectual capital, as evidenced by a beta coefficient of 0.63, was a reliable predictor of organizational performance. The overall findings indicate that the augmentation of intellectual capital and its various components within the firm resulted in improved employee performance.



Keywords: Intellectual capital, human capital, structural capital, customer capital, performance.

Introduction

Today, a novel asset model has been introduced in the organizational domain, where the organization's assets are broadly classified into two categories: tangible assets, which are physical in nature, and intangible assets, which are non-physical. These intangible assets are commonly referred to as capital. The term used to describe this concept is "intellectual", and assessments have typically focused on evaluating intangible assets, sometimes known as intellectual capital (Restogi, 2002). The widening disparity between the book value and market value of companies, known as intellectual capital, has heightened the significance of intellectual property. Intellectual capital is widely regarded as the fundamental asset of a business, consisting of three primary components: human capital, structural capital, and customer capital.

In contemporary times, intellectual capital and intangible assets hold significant and elevated value within organizations. These resources are integral components of the abundant resources available and are recognized as crucial elements for the success of any organization. Intellectual capital is a crucial intangible asset for organizations and is highly valued for its role in developing essential assets. Intellectual capital originates from the realm of research and knowledge and has the potential to significantly contribute to the ongoing success of a company (Seetharaman, 2002).

The intangible component of the economy relies on intellectual capital, with knowledge and information serving as its primary and fundamental elements. Organizations require information and knowledge in various forms and types to enhance their performance and actively engage in today's markets. The survival of organizations and institutions are contingent upon the performance of its employees. The human resources plays a crucial role in every business across all domains of activity. Therefore, the most vital element of labor and activity is the individuals who make decisions, execute, and forecast forthcoming actions upon them. Empirical evidence demonstrates that organizations and institutions face numerous challenges when employees underperform. Consequently, in the realm of employment, opportunities are occasionally offered that allow individuals to prioritize their career objectives without altering their career path (Rothberg and Yeung, 2009).

Organizational performance is a crucial topic in management study. It is widely recognized as the primary indicator of success in various types of organizations, including sports groups and institutions. According to human resource management specialists, performance encompasses factors such as organizational success, performance of groups within the organization, and personal satisfaction. It involves analyzing performance at the individual, group, and organizational levels. According to the Oxford dictionary, performance is the whole execution of



a task or activity, whereas evaluation is the process of scrutinizing and quantifying the quality, value, and characteristics of that effort. Multiple studies and surveys have demonstrated that performance is a complex and socially influenced construct (Seyed Naqavi et al., 2013). The organizational performance is influenced by a variety of factors, including both intangible elements such as the growth of organizational knowledge, and objective and tangible elements such as economic and financial outcomes.

An indicator of developed countries is their emphasis on the importance of human resources. In the present day, it is imperative for any firm to acknowledge the significance of the human resources and its valuable contribution in delivering services. Ensuring the productivity of human resources involves establishing a framework for coordination between the company and its employees. This framework aims to establish shared goals and ensure that both the organization and its employees achieve their respective objectives. To thrive in today's competitive and dynamic business landscape, businesses must assess, quantify, and appreciate their intellectual capital (Lopez, 2008). In today's knowledge-based landscape, intellectual capital is not only regarded as the primary component of an organization's capital, but also as a source of enduring competitive advantage. Hence, it is imperative for managers to not only enhance their expertise in the realm of intellectual capital, but also foster and amplify this domain within the business by fortifying its constituents (namely, human capital, structural capital, and customer capital). The effectiveness and productivity of an organization are primarily determined by its knowledge and intellectual capital. Understanding the nature and the methods used to measure and value this capital allows for effective planning, optimization, control, and continuous monitoring within the organization (Bontis, 1998).

Sajjadi and Talebian Nia (2015) examined the correlation between intellectual capital and organizational performance in Iran's Ministry of Sports. The findings demonstrated that intellectual capital have a positive and meaningful impact on the performance of the Ministry of Sports' employees. Furthermore, there was a clear and meaningful positive correlation between the various sub-components of intellectual capital and organizational performance (Jameelah Hashim, 2015). Therefore, it can be inferred that intellectual capital and its various aspects serve as the foundation for enhancing organizational performance. In their study entitled "The Impact of Intellectual Capital on Organizational Performance in Malaysian Government Organizations," Jameelah Hashim et al. (2015) found compelling evidence that intellectual capital has a meaningful impact on the performance of organizations in Malaysia. All aspects of intellectual capital were significant predictors of organizational performance. Rashid et al. (2013) conducted an empirical study in the telecommunication sector of Pakistan to examine the relationship between intellectual capital and organizational performance. This study focused on analyzing several



telecommunication firms operating in different cities of Pakistan. The findings demonstrated a meaningful correlation between the various components of intellectual capital (human capital, structural capital, and relational capital) and the organizational performance.

Dehghan et al. (2014) examined the correlation between intellectual capital and organizational performance. The data was categorized and examined using descriptive and inferential statistical techniques. The findings indicated a positive and significant relationship between intellectual capital and its constituents, namely human capital, structural capital, and relational capital, with the performance of bank employees. Ahmadian and Ghorbani (2012) investigated the correlation between intellectual capital and organizational performance as analyzed by the Ministry of Economic Affairs and Finance. The structural equation modeling to assess the research hypotheses revealed a statistically significant relationship between the various components of intellectual capital (human capital, structural capital, and relational capital) and organizational performance. Sharfi and Abbaspour (2012) conducted a study on the correlation between intellectual capital and performance in universities and higher education institutions. They found that the various components of intellectual capital are related to the university performance. Furthermore, they concluded that performance can be predicted based on intellectual capital. Given the moderate standing of universities in these aspects, better management of intellectual capital in universities results in enhanced university performance. In their 2013 study, Seyyed Naqavi et al. examined the impact of intellectual capital on the performance of Saderat Bank branches in Tehran province. They specifically focused on the mediating role of learning capacity. The findings demonstrated that intellectual capital have an impact on the organizational performance. Furthermore, the learning ability plays a crucial role in determining how intellectual resources impact the overall success of a company.

One crucial step towards achieving the country's sports goals is to closely monitor the performance of sports federations, which play a vital role in the growth of sports in the nation. Despite efforts made in the areas of human resources, knowledge management, training, and structure, it appears that these initiatives lack adequate consistency. After conducting preliminary interviews with officials and employees of sports federations and reviewing relevant documents, the researcher concluded that these organizations have weaknesses that impact their performance in achieving their goals in the field of sports and physical education.

This study seeks to examine the correlation between a specific variable and the organizational performance of sports federations. These federations are recognized as the guardians of sports and play a crucial role in the advancement and growth of national sports. The focus is on analyzing the intellectual capital within these federations. The discrepancy between the desired and current state of responding to environmental changes and the effective and timely utilization of intellectual and



Intangible assets has resulted in the aforementioned organizations encountering challenges in achieving optimal and satisfactory performance. They will have challenges in delivering high-quality services and staying competitive in a rapidly changing and unpredictable sports industry. Hence, a key objective of this research is to analyze the current organizational state and evaluate the performance of these organizations. Intellectual capital can be utilized to leverage the advantages of knowledge management, leading to the reduction of issues and challenges, as well as the pursuit of excellence and the attainment of a sustainable competitive edge and optimal organizational performance.

As previously stated, there is a significant lack of awareness regarding intellectual capital in sports federations, and managers and employees possess limited knowledge in this domain. Given the significance of intellectual assets and the correlation between greater intellectual assets and higher levels of optimal performance in companies, as well as the focus of managers and officials at the elite sport to see how sports organizations may become more agile and improve their performance, the following questions will guide the research and provide answers:

1. Is there a relationship between intellectual capital and organizational success in sports federations?
2. Is the structural model of the specified variables in sports federations has a good fit?

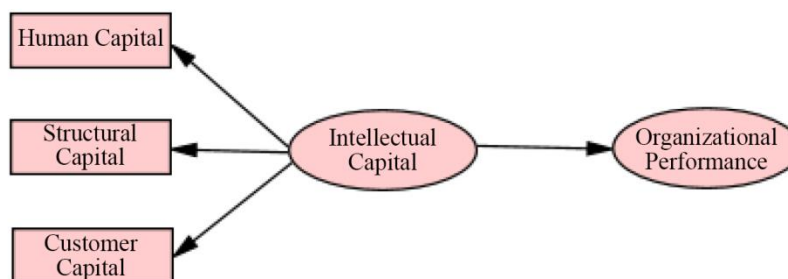


Figure 1. Theoretical framework of the study.

Methods

For its intended purpose, the research method is survey and correlational. The field method was used for data collection. The population comprised all employees of sports federations. The rationale for selecting sports federations as the population stems from their significant and influential position in the realm of sports. These organizations have received limited attention in prior studies. The federations were carefully chosen to ensure a wide representation and to minimize any difficulties in gathering information. The researcher concluded that among these



federations, there were several focused on team sports and others on individual sports. The selection process involved a multi-stage cluster sampling method, with random selection. The chosen federations include football, water polo, hockey, handball, wrestling, archery, fencing, and swimming. The research population size was 242, who were chosen using the total sampling method. This study utilized library research to supplement the background, and employed two questionnaires to gather the perspectives of the statistical sample: the intellectual capital questionnaire, developed by Bontis (2007), consisting of 24 items categorized into three sections. The valuation process utilized a 5-point Likert scale to assess the component, which encompasses structural capital, human capital, and customer capital. The organizational performance questionnaire developed by Yang (2004) consists of 8 items that assess organizational performance. The questionnaire was assessed using a 5-point Likert scale. A content-dependent approach was employed to assess the validity of these surveys. The research objectives and questionnaire were provided to 8 sports management academics, who then provided their corrective remarks. The Cronbach's alpha coefficient was used to determine the reliability of the intellectual capital questionnaire, resulting in a value of 0.83. Similarly, the organizational performance questionnaire had a Cronbach's alpha coefficient of 0.91, indicating high reliability. Two levels of statistical analysis, descriptive and inferential, have been conducted. Descriptive statistics were utilized to analyze the average and standard deviation, as well as inferential statistics such as the correlation coefficient. The model was designed using the structural equation modeling (SEM) approach in AMOS.

Results

Given the susceptibility of the Kolmogorov Smirnov (K.S) test to large sample sizes (242 questionnaires in this study), we assessed the normality assumption of the data by examining the skewness and kurtosis. To ensure that the data is normally distributed using these indices, it is essential for the standard error of skewness and standard error of kurtosis to be smaller than 2 in absolute value.

Table 1. standard error of skewness and kurtosis.

Variables	standard error of skewness	standard error of kurtosis
Intellectual Capital	-1.70	1.43
Human Capital	-1.22	1.22
Structural capital	-1.62	1.67



Received: 16-01-2024

Revised: 12-02-2024

Accepted: 07-03-2024

Customer capital	-1.86	1.07
performance	-0.55	-0.30

Based on the findings in Table No. 1, standard error of skewness and standard error of kurtosis are smaller than the absolute value of 2. Consequently, the research data follows a normal distribution.

Table 2 . Displays the mean, standard deviation, and internal correlation among the research variables.

Variables	Mean	Std.	Intellectual Capital	Human Capital	Structural capital	Customer capital	performance
Intellectual Capital	3.02	0.87	1				
Human Capital	3.11	1.04	0.96*	1			
Structural capital	2.95	1.17	0.92*	0.82*	1		
Customer capital	3.09	1.01	0.93*	0.85*	0.79*	1	
performance	3.23	1.13	0.61*	0.56*	0.54*	0.61*	1

* $P \leq 0.05$

Table 2 displays the significant relationships among the research variables. The table clearly demonstrates a positive and statistically significant relationship between intellectual capital and organizational performance ($P < 0.05$). Furthermore, there exists a positive and statistically significant relationship between performance and human capital, structural capital, and customer capital ($P < 0.05$).

Table 3. The goodness of fit indices for the research model.

Indices	χ^2	Df	χ^2/df	GFI	AGFI	NFI	CFI	RMSEA
Research model	127.21	241	3.08	0.95	0.96	0.97	0.95	0.031



According to most scientists, chi square to degree of freedom (χ^2/df) ratios between 2 and 3 are considered appropriate. However, there are differing opinions on this topic. For instance, Schumacker and Lomax deem values ranging from 1 to 5 as appropriate. The ratio in this research is 3.08. Concerning the indices (GFI, AGFI, NFI, and CFI), it has been said that the model's fit improves when these indices approach a value of one. Bentler and Bonnet have suggested that values equal to or greater than 0.9 are indicative of the appropriateness of theoretical models. The investigation yielded the following results for the indices: GFI = 0.95, AGFI = 0.96, NFI = 0.97, and CFI = 0.95.

The RMSEA index is derived from the model's errors and serves as a quantification of the model's inadequacy. Some researchers argue that this index should be below 0.05, while others believe that a value below 0.08 is more suitable. The index yielded a value of 0.031 in this investigation. Based on the information provided and the numbers shown in Table 3, it can be concluded that the current model is well-suited and fits optimally.

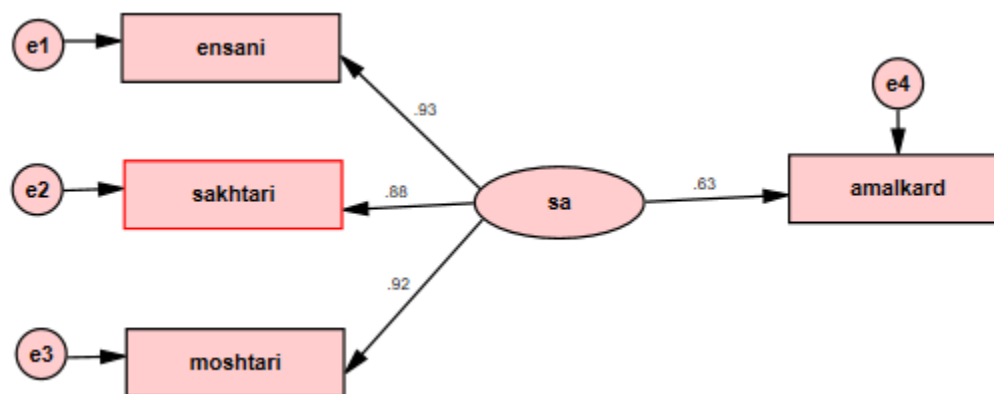


Figure 2. The research model under standard estimation settings.

According to Figure 2, intellectual capital, with a beta coefficient of 0.63, is a strong predictor for the development of employee performance. To clarify, intellectual capital and its many elements account for 63% of the variation in organizational performance within sports federations.

Discussion and Conclusion

The success of businesses relies heavily on the employees' ability to fulfill their duties in a suitable and efficient manner. Good performance encompasses productivity, quality, profitability, and client orientation. Therefore, prosperous firms dedicate significant resources to discern the factors that influence the performance and conduct of their staff. The effectiveness of businesses in executing



missions and attaining organizational objectives is heavily reliant on the conduct and performance of its employees. Hence, it is imperative to ascertain the underlying causes of this behavior and performance, and thoroughly investigate the aspects that influence optimal performance.

The organizational performance encompasses the successful attainment of both internal and external objectives and strategies, while effectively utilizing available resources and fostering innovation, ultimately resulting in overall customer satisfaction.

The findings demonstrated a significant relationship between human capital and the Employee performance inside sports federations. These findings are consistent with Seyed Naqavi et al. (2013), Dehghan et al. (2014), and Jameelah Hashem (2015). In their 2014 study, Dehghan et al. examined the correlation between intellectual capital and organizational performance. Their findings demonstrated a positive and significant relationship between intellectual capital, including human capital, and organizational performance. Human capital encompasses the intellectual assets of an organization's employees, such as their knowledge, skills, and abilities. It serves as a catalyst for innovation and strategic revitalization, manifested through activities like brainstorming, leveraging past files and experiences, and fostering a culture of creativity within the organization. Enhancing personal skills is a key means of cultivating human capital. The firm's most valuable assets are its human capitals, which are mobile and not tied to any one organization. This is because employees are seen as the owners of human capital. The employees generate intellectual capital through their competences, views, and intellectual agility. These competences encompass the aptitudes, qualifications, and mentality of employees, which encompass their behavioral aspects. Intellectual agility empowers individuals to modify processes and devise creative ways to address challenges and enhance organizational performance.

One further finding in this study was the relationship between structural capital and the organizational performance in sports federations. As the organization's structural capital increases, the Employee performance likewise increases. This finding is consistent with the Jardón et al. (2009), Dehghan et al. (2014), Chen et al. (2004), and Rashid et al. (2013).

Structural capital refers to the collection of non-human knowledge resources within an organization. This encompasses databases, organizational charts, processes, and solutions. These resources contribute to the firm's worth, extending beyond its physical assets. This sort of capital, serving as a foundational infrastructure, enhances the efficiency and speed of human capital, hence improving the overall performance of the business. Structural capital is the property of the organization and remains within the company even when employees depart.

The research findings also demonstrated the correlation between relational capital and the Employee performance in sports federations. These findings are consistent with Seyed Naqavi et al. (2011), Ahmadi and Ghorbani (2012), and Rashid et al. In their 2015 study entitled "The Impact



of Intellectual Capital on Organizational Performance in Malaysian Government Organizations," Jameelah Hashem et al. found that intellectual capital had a significant influence on the performance of Malaysian organizations. Furthermore, the presence of customer capital was a significant indicator for the performance of the company.

When analyzing this finding, it can be concluded that customer capital encompasses both the present worth and the possible future worth of the organization's connection with customers. Maintaining ongoing and consistent communication with customers appears to have a positive impact on the organizational performance in a productive and beneficial manner. If the firm effectively communicates with customers in a principled and truthful manner, it will outperform competitors and enhance its overall performance. Customer capital refers to the value that is derived by interacting with customers, and it has a direct impact on the performance of a business, both in the now and in the future. While client ties are indeed crucial, it is necessary to not just concentrate on this particular category of relationships when considering relational capital. Relational capital is determined by how well a business adjusts to its external environment. It encompasses customer loyalty, the organization's reputation, its relationships with suppliers, and the effectiveness of its customer feedback systems.

The results of the primary hypothesis test conducted using the structural equation modelling indicate that intellectual capital has an impact on the performance of the organization's employees. This implies that there exists a positive and statistically significant relationship between intellectual capital and employee performance. These findings are consistent with Seyed Naqavi et al. (2011), Ahmadi and Ghorbani (2012), and Rashid et al. Sajjadi and Talebian-Nia (2015) examined the correlation between intellectual capital and organizational performance within Iran's Ministry of Sports. The findings demonstrated a clear and significant relationship between intellectual capital and the Employee performance within the Ministry of Sports. Furthermore, there was a clear and significant positive correlation between the various components of intellectual capital and the overall performance of the business (Jameelah Hashim, 2015).

Any process that arises from human power, knowledge, information, experience, invention, organizational learning ability, communication with clients, and organizational structure can be categorized as intellectual capital. If it has the ability to store or value knowledge in the future, or convert employees' implicit knowledge into explicit knowledge. The further pertains to the concept that intellectual capital involves the conversion of knowledge into practical applications, such as relationships and processes. In order to be classified as intellectual capital, these applications must effectively transform knowledge into a valuable product or service that benefits the organization. The capital in question is the primary and consistent catalyst for organizational performance, and it is the most accurate reflection of the organization's inherent value.



Intellectual capital can impact organizational performance and the attainment of organizational objectives. By analyzing the intellectual capital of sports federations, it is possible to enhance the functioning and environment of these institutions, which are considered the primary drivers of sports.

Intellectual capital components are analyzed individually and collectively as means to enhance organizational performance. However, the level of emphasis placed on each component varies across different organizations' reports. Effectively communicating with external stakeholders is a challenging endeavor that requires the establishment of necessary support systems and the presence of skilled, creative, and innovative people capable of effectively managing this responsibility. The interaction between human capital and structural capital directly impacts the customer capital. When these two forms of capital expand, the customer capital also increases, leading to an increase in financial capital. Consequently, it is anticipated that the customer capital will also experience growth. Human capital and structural capital must be efficient. An organization's level of contact with external organizations and customers directly correlates with its desire to acquire knowledge through the feedback it receives from these sources. From the standpoint of structural capital, developing efficient communication with external stakeholders would enhance operational processes pertaining to customer relations in the structural capital. Ultimately, the cumulative effect of these elements will enhance the organizational performance and propel it towards growth and greatness.

Researchers have given limited emphasis to the study of intellectual capital and its impact on organizational performance in sports organizations and institutions. Although there is empirical data about the correlation between intellectual capital and organizational performance, it appears that intellectual capital can be considered an influential factor in organizational performance. The findings of the current investigation indicate that intellectual capitals, including human, relational, and structural, have a significant influence on organizational performance. Furthermore, customer capital shown greater efficacy. Therefore, it is recommended that sports federations prioritize customer capital and implement strategies to enhance and cultivate. For instance, sports federations can contribute to this objective by establishing mechanisms to solicit novel ideas from customers, thereby facilitating the implementation of customer-oriented management strategies. Additionally, it is recommended that these businesses prioritize the enhancement of communication skills and the establishment of flexible structures that facilitate these connections, as a means to enhance their performance. Organizations with adequate human resources and a well-defined structure have a higher level of innovation and idea generation. The augmentation of communication and structural capital fosters the enhancement of the dissemination of ideas within



the organization and has a significant impact on organizational performance. Hence, in order to enhance their maximum efficiency, companies should prioritize the assessment of intellectual capital and its constituent elements.

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Power System Technology

ISSN:1000-3673

Received: 16-01-2024

Revised: 12-02-2024

Accepted: 07-03-2024

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