# The Mediating Effect of Knowledge Management on Intellectual Capital and Value Creation: Evidence from Sri Lanka

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## Abstract

This paper aims to investigate the impact of Intellectual Capital on Value Creation mediated through Knowledge Management in Sri Lankan companies. The 'static' and the 'dynamic' aspect of knowledge and the theoretical models, which are based on the relationship between Intellectual Capital and Knowledge Management forced the authors to address this research problem. The study was based on the top corporate personnel's views collected through a self-administered questionnaire. Out of 297 Public Listed Companies listed on Colombo Stock Exchange and 517 private companies registered in Ceylon Chamber of Commerce, 263 companies were selected as the sample. Value creation was measured through both non-financial value drivers and financial value drivers, which was an innovative feature of this study. The data was analyzed using multivariate analysis through Partial Least Square Structural Equation Modeling. The findings confirmed a partial mediation of knowledge management. Further, findings revealed a significant and positive impact of intellectual capital on value creation and a significant positive impact of intellectual capital on knowledge management. The impact of knowledge management on value creation was also a significant positive one.

**Keywords:** *Intellectual capital, Knowledge management, Value creation, Mediating effect*

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## Introduction

Knowledge is the most momentous impetus of the businesses in today's knowledge intensive business society since the business society has moved into the knowledge and information era after crossing over the agrarian era and the industrial era. The majority of the businesses tend to convert their mass-production into knowledge intensity. This transformation is observable not only in contemporary businesses, such as, information technology, but also in traditional businesses, for instance, forest industry (Hussi, 2004). Agrarian era and industrial era utilized land and machinery respectively as the factors of production and hence, as the main contributors to the value creation of businesses. But, the intangible assets are paid deeper consideration in the knowledge and information era by the companies for their value creation mechanism. Thus, knowledge becomes the factor of production in this knowledge and information-based business society.

Structural change, globalization, and Information and Communication Technology (ICT) are the major causes for recognizing the knowledge as the factor of production in businesses in the present era (North and Kumta, 2018). The traditional factors of production, such as land, machinery and capital are replaced by knowledge in the current knowledge and information based economy. Companies are producing and selling information and knowledge as products and services now. Industrial countries are converting to knowledge countries due to the globalization. Worldwide connectivity of data and information are facilitated by ICT (North and Kumta, 2018).

In the 20th century, production machineries were the most imperative assets of a company and in the 21st century, the companies consider the knowledge workers and their productivity as the most valuable assets of them. Furthermore, while the quantity and pieces were the measurement system and measurement unit respectively in the industrial age, the efficiency and value respectively are the measurement system and measurement unit in the knowledge age (Pulic, 2004). Thus, it proves the relationship between knowledge and value in this knowledge and information-based business society.

How is this value created? becomes a key concern among the today's businesses. According to Integrated Reporting (IR) framework of International Integrated Reporting Council (IIRC), value is created through different capitals over different time periods for different stakeholders. These different capitals include six types of capitals; financial, manufactured, intellectual, human, social and relationship and natural capital (International Integrated Reporting Council, 2013).

Value creation is a function of organizational knowledge, which includes both Intellectual Capital (IC) and Knowledge Management (KM). In this ideology, IC is given the 'static' aspect of organizational knowledge, while KM is branded as the 'dynamic' aspect of organizational knowledge. Hence, how much is it important the IC in creating value to an organization, the similar weight can be assumed to the KM in organizational value creation (Kianto et al. 2014).

Further, according to the Knowledge based view, knowledge is the major source of value. Thus, a company's value creation depends primarily on company's ability to store and use knowledge. In other words, it highlights the importance of IC (store of knowledge) and KM (use of knowledge) (Wang et al. 2014).

The unsolved academic conversation addressing the influence of knowledge-based issues on value creation is focused its major attention on the concepts of IC and KM. IC denotes the intellectual assets, which an organization belong, while KM means, the activities and processes undertaken by the organization to manage its IC. Thus, it is expected that, IC and KM are related more closely and analogue when literature addresses the impact of both IC and KM on

VC and success of the organizations. However, these literatures consider different aspects and grounds for IC and KM, since, IC is often considered as a static or stock point of view, while KM is more understood as a dynamic or process point of view (Hussinki et al. 2017). Thus, Knowledge and IC are considered as main facilitators of innovation, as well as major sources of the competitive advantage and of value creation (Michele and Rogo, 2012).

Based on the emerging acceptance and recognition of IC as an imperative strategic asset in an organization, which leads in positive way to create sustainable competitive advantage, superior organizational performance and ultimately the organizational value creation, scholarly efforts have been arisen to explore whether IC influence to organizational performance and VC in international setting (Ali and Anwar, 2021; Iacuzzi, et al. 2020; Bchini, 2015; Nuryaman, 2015; Tseng et al. 2015; Berzkalnea and Zelgalve, 2014; Mhedhbi, 2013; Choong, 2008; Ayed, 2007; Cabrita and Vaz, 2005; Bontis et al. 2004; Bontis, 1998). Even though there is an emergent scholarly effort towards recognizing the importance and impact of IC on VC in international settings, such efforts are still in very infancy level in Sri Lanka. Therefore, a contextual gap can be identified within IC and VC literature in Sri Lanka to be filled by research studies.

On the other hand, more scholarly efforts have been undertaken in examining the impact of KM on VC by scholars in variety of foreign countries (Abeysekera, 2021; Campanella et al. 2018; Shakina and Molodchik, 2014; Carlucci, 2012; Edvardsson and Oskarsson, 2011; Rezgui, 2007). But there is lack of research studies in this field of research in Sri Lankan context and hence, another contextual gap can be recognized.

Even though, the significance of the knowledge assets and the way of managing them have been recognized and continuously discussed within the literature in several disciplines, the puzzle on how knowledge assets and KM processes affect on organizational value creation capacity is still not solved (Schiuma, 2012). Farooq (2018) indicated that, there is a need for future research to investigate the relationship between KM and VC according to Edvardsson and Oskarsson (2011). This is an empirical gap recognized in KM and VC literature and the present study would be a bridge to fill this gap as well. Therefore, this study would be a solution to this existing dilemma on how knowledge assets or in other words, IC, and KM affect to the value creation mechanism and capacity of the organizations. Thus, this would be another important type of empirical research gap, which is going to be bridged through the current study.

Further, the IC and KM literature provide few evidence to prove the importance of combining both IC and KM in obtaining improved and well understandable findings on the impact of firm performance as well as value creation of firms (Hussinki et al. 2017; Kianto et al. 2014; Seleim and Khalil, 2011; Wiig 1997). Therefore, it verifies the necessity of examining the joint effect of IC and KM on VC and opens up the avenues for conducting the empirical studies by combining IC and KM on finding out the impact on VC in the current IC and KM literature. Thus, the current study would be a response to the arguments of Hussinki et al. (2017), Kianto et al. (2014), Seleim and Khalil (2011), and Wiig (1997) that, the IC and KM perspectives should be studied together to deliver better understanding of the bases of firm performance and VC.

On the other hand, though there are limited number of evidence exist in combining IC and KM on exploring the impact of VC, no evidence was found on the mediating role of the KM on the relationship between IC and VC, except the theoretical model proposed by Kianto et al. (2014). They proposed several theoretical models in relation with the relationship between IC and KM on organizational performance and out of those several models, one model described that, the

impact of IC on organizational performance is mediated by KM practices. However, empirical evidence can be found to ensure that, the KM has an ability to act as a mediator between IC and VC, hosting the ideology of interconnection between IC and KM as two aspects in organizational knowledge. One such evidence is; the static and dynamic aspect of knowledge presented by Kianto et al. (2014), Gorelick and Tantawy-Monsou (2005), Michele and Rogo (2012), Mouritsena, et al. (2001), Hussinki et al. (2017), and Haas and Hansen (2005) describing IC is the static aspect of knowledge and KM is the dynamic aspect of knowledge. Haas and Hansen (2005) also state that, IC and KM have distinctive nature, and thus might be regarded as mentioning to knowledge stocks and processes, respectively. Thus, to obtain more successful outcome from the IC aspect, it should be managed properly through KM aspects, since IC is not a dynamic process and it is merely a static or stock of knowledge (Hussinki et al. 2017). It provides an evidence that, IC is to be successful through KM, indicating that, KM has an ability to play the mediator role between IC and VC. Therefore, this is another point, where an empirical gap can be realized, which should be bridging up by undertaking proper research studies on this concern. Thus, the study addressed the research problem of, whether the KM is mediating the relationship between IC and VC in Sri Lankan companies?

Hence, this study attempted to find the answers to the questions of; Does an impact of IC exist towards VC; Is there an impact of IC on KM; Is there an impact of KM on VC; and Does a mediating effect of KM exist on the relationship between IC and VC in companies in Sri Lanka? Therefore, the objectives of the study are; to examine the impact of IC on VC; to identify the effect of IC on KM; to investigate the impact of KM on VC, and to examine the mediating role of KM on the relationship between IC and VC in Sri Lankan Companies.

The findings of the study are significant in several ways to several parties. First, this study will be a bridge to fill the existing research gap of IC, KM and VC literature in Sri Lanka. Second, the findings of the study will be an aid for understanding the importance of IC and KM on VC by the companies. This understanding of the value and significance of this interaction of IC, KM and VC will lead companies to motivate and encourage towards disclosing the non-financial information for the stakeholders of the companies, which fulfil the information needs of the stakeholders and reflect a true picture about the VC of the companies. Third, this study will be very important for the Sri Lankan companies to identify their important IC factors, KM practices and VC mechanisms, which have significant strategic impact on their business processes, but have not been still recognized and disclosed by them in their annual reports. Fourth, this study will be helpful for all the stakeholders, specially for shareholders and owners of Sri Lankan companies to identify the different IC factors, KM practices and VC mechanism of Sri Lankan companies enabling them to make their investment decisions effectively and to upgrade the awareness on IC, KM and VC among them.

The rest of the article is consisted with the literature related to the main concepts of the study, methodology, which describes the way of doing the study, findings and discussion and finally the conclusion.

## Literature Review

### Theoretical Underpinning

The stakeholder theory, Resource based View (RBV), Knowledge based View (KBV), and the Intellectual Capital based View (ICBV) are the major theories behind the study. According to stakeholder theory identified by Freeman and friends in 1980, manager creates value for multiple stakeholders (Windsor, 2017). Freeman (2010) indicates that corporate managers have an obligation towards both companies' shareholders and stakeholders. Both RBV and KBV agree in declaring that the only source of sustainable competitive advantages depends on the firm's ability to develop, use,

and benefit from its knowledge and intellectual capital through learning (Michele and Rogo, 2012). According to the RBV, a firm can obtain the competitive advantages from the strategic assets, and out of the most of such assets a firm belongs, the knowledge and IC are considered as the most valuable strategic assets in the firm. Hence, knowledge and IC are the cornerstones in the RBV (Seleim and Khalil, 2011).

The Knowledge Based View (KBV) was initially suggested by Grant (1996) as an extension of resource-based view. KBV is a theoretical platform which facilitate to study about the consequences of knowledge. KBV emphasizes that, the firm's performance is based on the way that the firm is creating, developing, distributing and using the knowledge. Therefore, in the knowledge-based theory also, knowledge and IC are identified as the most important strategic assets (Seleim and Khalil, 2011).

Both KBV and Intellectual Capital Based View (ICBV) highlight that intangible assets are based on knowledge and its usage. KBV is complemented by ICBV in which IC is categorized into three dimensions: human capital, organizational (structural) capital, and social (relational) capital, which are complementary resources. Both KBV and ICBV are based on the interpretation of hidden, knowledge-based dynamic forces, which provide the foundation for a company's value and competitive advantage. (Ujwary-Gil, 2017).

**Intellectual Capital**

John Kenneth Galbraith invented the terminology of intellectual capital in 1969 and defined it as intellect, knowledge, skills and brainpower activity that whenever employed, will create value (Singh and Rao, 2016). Even though, there is no generally accepted definition identified for IC, there are three common features can be realized in almost all definitions of IC; they are; intangibility; knowledge which is able to create value and impact of combined practice (Cabrita and Vaz, 2005). Most definitions of IC depict it as a non-financial asset without physical existence that can gain economic benefits to the organization.

Intellectual Capital is the knowledge that individuals place into improvement in their own companies; per se, it is an organizational competitive advantage and assists in organizational value creation (Hejase et al. 2016). According to Si (2019), IC is "*the sum of knowledge assets that a company owns or controls, which can bring competitive advantages to an organization and create high value*". Moreover, IC is the most active viable tool affecting the performance of Innovation in a firm (Alrowwad et al., 2020).

Even though IC is classified in different ways in the literature, the three classifications of IC into human, structural/organizational, and relational capital has been used in many studies (Hejase et al. 2016; Bchini, 2015; Cricelli et al. 2014; Demartini and Paoloni, 2013; Jardon and Susana, 2012; Molodchik et al. 2012; Kim et al. 2011; Seleim and Khalil, 2011; Choong, 2008).

Human capital is a main source of organizational value addition, since it is based on skills, knowledge and expertise, competence, attitude, and intellectual agility of employees (Hejase et al. 2016; Kim et al. 2011). Organizational/Structural capital can be intellectualized as a set of tools and structural designs that retain, reinforce and transfer knowledge throughout the organization's activities (de Frutos-Belizón et al. 2019), which remains in the factory or office when the employees leave at the end of the day (Ghosh and Mondal, 2009). Relational capital consist of the capacity of employees of an organization to develop links and connection with themselves and alliance partners of an organization such as customers and suppliers (Seleim and Khalil, 2011) and the knowledge embedded in relationships with stakeholder that influence the organization's life (Bontis and Cabrita, 2008).

**Knowledge Management**

Despres and Chauvel (1999) stressed that, KM can be viewed spontaneously as

important, since the productivity of the companies now more depends on companies' knowledge assets and also KM is considered logically as vague, since it is difficult to define the knowledge due to the fact that, knowledge is everything as well as nothing. But, knowledge is a critical asset for a firm (Di Vaio et al. 2021; Friedrich et al. 2020). Marr et al. (2003) explain KM as the combined term reflecting the processes and practices implemented by organizations to enhance their value through enlightening the effectiveness of producing and application of organizational IC.

Daud and Yusoff (2010) identify the KM as the organizational capability to organize and making available important knowledge wherever and whenever it is needed. KM is a process of planning, organizing, motivating and controlling of people, processes and systems in a firm in order to confirm the effective utilization of knowledge related assets in the firm (Rajesh et al. 2011).

## Value Creation

Value creation is a necessary factor for strategic success of a business firm (Tantalo and Priem, 2016) and is the purpose of any organization (Choi and Click, 2015). Value creation is a systematic method to recognize the significance of management's strategic decision making and the capability to make investments along with produce a return on the capital invested (Sroufe, 2018).

Value creation is a highly employed concept in a number of academic fields. However, it is also a concept for which there is no common definition. The ultimate purpose of the presence of the firm is long term value creation (Teti et al. 2014).

A company cannot create value without keeping good relations with customers, employees, investors, suppliers and communities (Jensen, 2001). Therefore, it is vital to pay a substantial attention on all the stakeholders of the company when creating value. Therefore, the value creation for all the stakeholders are much more vital than merely considering the value creation only for capital providers or in other words, shareholders of the firm (Garcia-Castro and Aguilera, 2015).

## Intellectual Capital and Value Creation

In recent times the concept of intellectual capital has been recognized as a crucial resource and driver of organizational performance and value creation (Marr et al. 2004). According to Bchini (2015), there is a positive and statistically significant relationship between the components of intellectual capital and value creation. Tseng et al. (2015) found that, VC is influenced by both IC and financial capital. Value creation happens as a result of the interrelationship between three IC dimensions: human, structural, and relational (Ujwary-Gil, 2017). Further, Mhedhbi (2013) explored that IC positively effects on the company's VC. Prior literature (Bontis, 1998; Bontis et al. 2004) validate that, IC is significantly and positively associated with organizational performance and organizational VC.

Thus, the first hypothesis of the present study is formulated as;

*H1: IC has a significant positive impact towards VC of a company*

## Intellectual Capital and Knowledge Management

The relationship between IC and KM is implanted in the KBV of the firm (Hsu and Sabherwal, 2011). Pour et al. (2015) found that, the KM and IC have a positive and significant relationship, indicating that, by investment in one of them, other one can also be enhanced. Further, Hsu and Sabherwal (2012) found that IC has an effect on KM of the companies. Wiig, (1997) reported that both IC and KM are major factors affecting for performance of companies, and they cannot be functioned separately for company performance. The effective IC management is closely linked with a company's KM practices (Marr et al. 2003). According to Hsu and Sabherwal (2012), IC contributes to KM, but KM does not affect IC. It further explains that, knowledge stock i.e. IC, affects

to the knowledge flow, i.e. KM, but not vice versa.

Therefore, the second hypothesis can be formulated as;

*H2: IC has a significant positive impact on KM of a company*

## Knowledge Management and Value Creation

Carlucci (2012) investigated how knowledge assets have effect in organizational VC mechanisms. The study suggests a knowledge assets mapping methodology for revealing and evaluating how organizational knowledge assets, individually and as a group, participate in company's VC. According to Daud and Yusoff (2011), the creation of organizational value encompasses the organizational ability to recognize, create and constantly manage knowledge as a strategic resource in the organization. Rezgui (2007) identified that, KM systems enhance value creation when they develop the social conditions that connect team members together. Farooq (2018) stated that, KM is an important predictor of organizational VC. Edvardsson and Oskarsson (2011) showed that companies with KM show more VC than the companies without KM.

Hence, the third hypothesis is formed as follows;

*H3: KM has a significant positive impact towards VC of a company*

## Knowledge Management as a Mediator between Intellectual Capital and Value Creation

The IC literature provides evidence on the impact of IC on VC or firms' performance with a mediating effect of diverse factors. Kamukama et al. (2011) investigate the mediating role of competitive advantage on the relationship between IC and financial performance of microfinance institutions in Uganda. Hsu and Wang (2010) examine the mediating effect of dynamic capabilities on the impact of IC and firms' performance of

Taiwanese high-technology firms. Furthermore, Han and Li (2015) identify the mediating role of knowledge-based dynamic capability on the relationship between IC and innovative performance of the firms in China. However, no evidence was found in the literature on the mediating role of KM on the relationship between IC and VC.

Even though no such evidence was explored, it is imperative to investigate the mediating role of KM on the relationship between IC and VC, since, as IC represents the stock of the knowledge (Michele and Rogo, 2012; Kianto et al. 2014), it cannot contribute to VC independently and the knowledge stock should be properly managed to get the successful outcome from the organizational knowledge. As KM denotes the dynamic aspect of organizational knowledge (Michele and Rogo, 2012; Kianto et al. 2014), KM is the best player of the mediating role on the relationship between IC and VC. Moreover, KM and IC are paired concepts and thus cannot be separated. IC is recognized as a driver of innovation and competitive advantage of an organization, and on the other hand, KM is the activity of obtaining, developing, and nourishing IC in the organization (Daud and Yusoff, 2011).

Gorelick and Tantawy-Monsou (2005) emphasized in their definition on KM that, the KM has a mediating effect on the relationship between IC and VC of the organization. They further stressed that, people, processes and technology can be integrated through the KM framework and KM is a framework for creating value for organizational stakeholders. The people, processes and technology refer to the organizational IC. Therefore, it is evidenced that, the components of IC can be linked to create the value through KM framework. Thus, KM here plays a role of mediator between IC and VC.

According to Kaplan and Norton (2004), Cabrita and Vaz (2005) stated that, intellectual assets of a company rarely have a direct impact on company's performance, rather they work indirectly through cause and

effect relationships. This suggests that, the relationship between IC and VC is mediated by another indicator and KM can be employed as the mediator, since the IC represents the knowledge stock, while KM represents the knowledge flow.

Hsu and Sabherwal, (2012) state that, neither IC nor KM affects performance directly. It implies that, there may not have a direct impact of either IC or KM on VC as well, since organizational performance affects to organizational VC. Therefore, mediating role is required between IC and VC. Thus, KM is employed to play the mediating role between IC and VC. Hsu and Sabherwal (2011) also concluded the mediating role of KM capabilities on the impact of IC on innovations and firms' performance.

Further, a theoretical model, which explained the mediating role of KM on IC and VC, was proposed by Kianto et al. (2014). Hussanki et al. (2017) revealed that, IC must be well managed through KM in order to create value since IC is not an active process. Furthermore, IC is the knowledge stock and KM can be considered the knowledge process (Haas and Hansen, 2005). The literature provides more evidence to the similar thought of IC and KM are as static and dynamic aspect of organizational knowledge (Hussinki et al. 2017; Kianto et al. 2014; Michele and Rogo, 2012; Gorelick and Tantawy-Monsou, 2005; Haas and Hansen, 2005; Mouritsena, et al. 2001), which presents a base for the mediating role of KM on the relationship between IC and VC.

Hence, the fourth hypothesis can be formulated;

*H4: There is a mediating effect of KM on the relationship between IC and VC of a company*

## Methodology

The positivism is the research philosophy of the present study while it is an explanatory type of research. Moreover, it follows a deductive approach and it is adopting quantitative research method based on the characteristics of the study. This study is measuring the phenomena in numerical way and it uses survey methodology for collecting data. The study employs cross-sectional research design, where the researcher collects data (views) from the respondents only at one time.

### Population and Sample

The population of the present study is all Sri Lankan companies (including 297 Public Listed Companies (PLCs) and 517 private companies as at 31st December 2019). The study is limited only to the private companies, which are registered under the Ceylon Chamber of Commerce (CCC). Accordingly, the total population of the current study is 814 Sri Lankan companies including both PLCs and private companies.

Thus, the sample for the study is 263 according to Krejcie and Morgan (1970) and this number is proportionately divided between PLCs and private companies. The final sample calculation is illustrated in following table.

**Table 01: Sample of the study**

| Companies | Population | Number of Companies as a percentage of Population (%) | Sample |
|---|---|---|---|
| PLCs | 297 | 36 | 95 |
| Private | 517 | 64 | 168 |
| **Total** | **814** | **100** | **263** |

*Source: Compiled by authors*

The systematic random sampling technique is employed to select the sample for the present study.

### Conceptual Framework

Based on the IC literature, it was found that, IC and its dimensions have an impact of organizational VC (Ali and Anwar, 2021; Iacuzzi, et al. 2020; Bchini, 2015; Nuryaman, 2015; Tseng et al. 2015; Berzkalnea and

Zelgalve, 2014; Mhedhbi, 2013; Choong, 2008; Ayed, 2007; Kamath, 2007; Cabrita and Vaz, 2005; Bontis et al. 2004; Stewart, 1999; Bontis, 1998 Barney, 1991; Edvinsson and Malone, 1997). Further, KM literature propose that, there exist an impact of KM practices on organizational VC (Campanella et al. 2018; Shakina and Molodchik, 2014; Carlucci, 2012; Edvardsson and Oskarsson, 2011; Ghosh and Mondal, 2009; Rezgui, 2007; Marr et al. 2003; Wiig, 1997).

Moreover, Kianto, et al. (2014) suggested that, the relationship between IC dimensions and Value creation indicated through organizational performance of companies is mediated by KM practices adopted by those companies.

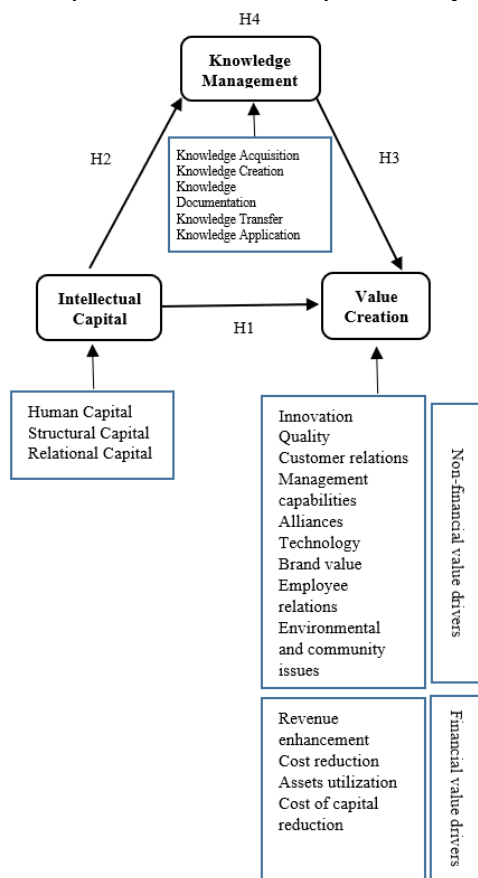Accordingly, the Figure 01 illustrates the conceptual framework of the present study.



**Figure 01: Conceptual Framework**
*Source: Developed by the authors*

## Method of Data Collection

This study uses self-administered questionnaire for data collection. The questionnaires are sent electronically via emails in this study. The questionnaire consists with two sections; Section A is comprised with respondent's and company profile, Section B is comprised with Likert scale questions relating to the views on IC, KM, KI and VC. Section B has four sub sections; B-I for IC; B-II for KM; B-III for KI and B-IV for VC.

The unit of analysis for the current study is the company and it is represented by the respective highest position in the top management of the company. Accordingly, Chief Executive Officer (CEO) or Chairman or Managing Director (MD) or General Manager (GM) would be selected as the respondents for the survey questionnaire.

### Method of Data Analysis

Based on the objectives of the current study, the main statistical technique under the parametric tests of inferential statics, which is more applicable; is regression analysis. Apart from inferential analysis, the present study employs descriptive statistics as well to represent the central tendency and dispersion of the data, such as; mean and standard deviation.

The SPSS (version 25) and the Structural Equation Modeling (SEM) with SmartPLS 3 are used for the purpose of data analysis.

## Data Analysis and Discussion

### Pilot Survey

A pilot survey was done using 40 Sri Lankan companies including both PLCs and private companies. Responses were received only from 31 companies. After analyzing the collected data through pilot survey, the Cronbach's Alpha for all the indicators were calculated to identify the reliability of the questionnaire. The Table 02 illustrates the results of reliability analysis.

**Table 02: Results of Reliability Analysis – Pilot Survey**

| No. | Indicator | Cronbach's Alpha | Cronbach's Alpha (after deleting items) |
|---|---|---|---|
| 1 | Human capital | .859 | |
| 2 | Structural capital | .580 | |
| 3 | Relational capital | .730 | |
| 4 | Knowledge Acquisition | .628 | |
| 5 | Knowledge documentation | .657 | |
| 6 | Knowledge transfer | .671 | |
| 7 | Knowledge creation | .772 | |
| 8 | Knowledge application | .877 | |
| 9 | Innovation | .927 | |
| 10 | Quality | .756 | |
| 11 | Customer relations | .141 | .585 |
| 12 | Management capabilities | .837 | |
| 13 | External relationships | .961 | |
| 14 | Technology | .826 | |
| 15 | Brand value | .948 | |
| 16 | Employee relations | .216 | .748 |
| 17 | Environmental and community issue | .623 | |
| 18 | Revenue enhancement | .822 | |
| 19 | Cost reduction | .961 | |
| 20 | Assets utilization | .664 | |
| 21 | Cost of capital reduction | .735 | |

*Source: Compiled by the authors based on SPSS output*

It is observed from the above table that majority of the indicators satisfy the very good reliability criteria according to Zikmund et al. (2010). Only two indicators were found with low relaibility, but after applying the deletion option, the relaibility of those two indicators also got fair relaiability values.

**Main Survey**

Questionnaire was sent through emails and the respondent or a representative of the respondent was contacted via telephone and informed about the survey. During the period of data collection, three telephone call rounds were executed (one telephone call per month) to make respondents alive in the survey. And also 6 reminder emails were sent once in two weeks. The researcher has visited some companies based on the invitations received by the companies and had discussions with the respondents in addition to fill the questionnaires. At the end of data collection there were 227 responded questionnaire. The following table summarizes the details about responded questionnaires.

**Table 03: Responded Questionnaires**

| Companies | Number of companies in the sample | Number of companies rejected to respond | Number of questionnaires not received | Total |
|---|---|---|---|---|
| PLCs | 95 | 05 | 06 | 84 |
| Private | 168 | 11 | 14 | 143 |
| Total | 263 | 16 | 20 | 227 |

*Source: Compiled by authors*

The response rate is 86.3 percent indicating a very good response rate according to the scholars (Mugenda and Mugenda, 2003; Kothari, 2004).

**Reliability Assessment of Main Survey**

Further, the reliability is also tested after the main survey of the study and the result of reliability assessment is illustrated in following table.

**Table 04: Reliability Assessment of Main Survey**

| Variable | Cronbach's Alpha |
|----------|------------------|
| IC | 0.913 |
| KM | 0.881 |
| VC | 0.932 |

*Source: Compiled by authors based on survey data*

According to the rule of thumb of reliability assessment, all the variables' reliability are very good (Zikmund et al. 2010).

**Data Cleaning**

The main two approaches for cleaning the data are missing value analysis and treatment for outliers. No missing values (item nonresponse) were found in the current study based on the frequency analysis results, but 36 unit non-responses were found. Accordingly 227 cases retained for the data analysis. The boxplots were used to detect the univariate outliers and the Mahalanobis distance was applied to detect the multivariate outliers in the current study. According to the outliers' detection, 5 univariate outliers and 3 multivariate outliers were identified and removed. Therefore, total 8 cases removed from the data set of the study. Hence, the remaining number of cases is 219 out of 227 responses received from the survey.

**Testing for Multivariate Assumptions**

Histograms, Normal Q-Q plots, Kolmogorov-Smirnov Test, Shapiro-Wilk Test, skewness and kurtosis tests are used to test the normality assumption in the current study. The visual inspection of histograms and Normal Q-Q plots of the variables of the study shows that, they have an approximately normally distributed shape. But, Kolmogorov-Smirnov Test, Shapiro-Wilk Test, skewness and kurtosis did not support

to the normality assumption. Therefore, it is assumed that, the data in the present study are not normally distributed. It was observed from the current study that the linearity between IC and VC as well as between KM and VC were achieved. It was identified through scatter plots. After running the correlation for all independent variables of the study (IC and KM), it was examined that all the correlation coefficients were less than to 0.8 indicating that there is no multicollinearity (Shieh, 2010) among independent variables of the current study. According to the residual plots obtained using the data of the study, it was observed that the residuals are randomly scattered around the horizontal line explaining the ri=0. Apart from that the correlation between predicted values and absolute values are not statistically significant (p/sig. > 0.05) both in Pearson Correlation (sig. value = 0.660) and Spearman Correlation (sig. value = 0.820). Thus, the homoscedasticity assumption was also satisfied according to Su & Berenson, (2017) as cited from Neter and Wasserman (1974).

**Percentage Analysis for General Information**

The percentage analysis of respondent's gender indicates that 85.8 percent of the respondents are males and the female respondents' percentage is 14.2. It shows that the majority (51.1 percent) of top personnel in the companies in Sri Lanka is in the age category of 46 years and 55 years. The majority of the respondents (46.1 percent) is in the category of 11 years to 15 years working experience in the positions of CEO/Chairman/MD/GM. Further, 74.4 percent of respondents has a Master's degree and 0.5 percent of respondents has obtained PhD qualification. The percentage analysis shows that 52.1 percent of respondents has some kind of professional qualifications.

The majority of the companies (48.4 percent) represents the category of goods. 40.6 percent of companies is service providing companies and 11 percent of companies involves in information related business.

According to the percentage analysis, it can be observed that, 63 percent of the selected companies is private sector companies and 37 percent of PLCs responded to the survey.

In order to describe the variables in current study, researcher used mean to represent the central tendency of variables and standard deviation to represent the dispersion of the variables as recommended by Subedi (2016). The results of descriptive analysis are shown in following Table 05.

**Table 05: Results of Descriptive Analysis**

| Variable | Mean | Standard Deviation |
|---|---|---|
| Intellectual capital | 3.9015 | .29425 |
| Knowledge management | 3.7345 | .29350 |
| Value Creation | 3.8886 | .29453 |

*Source: Compiled by authors*

According to the table 5, the mean values for all the variables in the current study stay near to 4 specifying favorable responses for the questions in the questionnaire in relation with all the variables in the study. Since, the Likert scale used in the present study comprises with the answers from weak form to strong form. When it identifies the standard deviation of the variables, it can be observed that all the standard deviation values are less than to 1.0 and spread around 0.3.

**Multivariate Data Analysis – PLS-SEM**

Initially the total effect of IC on VC was derived, and following figure illustrates the path model relating to the total effect of IC on VC derived from the SmartPLS output.
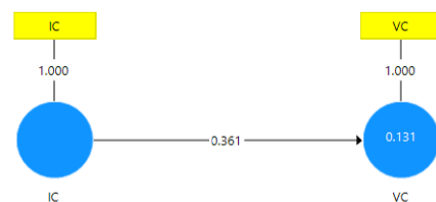


**Figure 02: Path Model – IC on VC**
*Source: Survey Data – 2020/21*

**Table 06: Path Coefficients – IC on VC**

| Path | β Coefficient | Sample Mean (M) | Standard Deviation (STDEV) | t - Statistics | P- Values | CI 5% | CI 95% |
|---|---|---|---|---|---|---|---|
| IC -> VC | 0.361 | 0.361 | 0.049 | 7.358 | 0.000 | 0.279 | 0.440 |
| $R^2$ | 13.1% | | | | | | |

*Source: Survey Data – 2020/21*

The Table 06 depicts the major statistics relating to the total effect of IC on VC before including the KM as the mediator.

The PLS-SEM results confirm the positive impact of IC on VC indicting a positive β coefficient (b=0.361). The significance of β coefficient is established through all three significance measurements (t = 7.358, p = 0.000, CI = 0.279 and 0.440). Thus, the findings indicate that IC has a significant positive impact on VC of the companies in Sri Lanka. Moreover, IC has 13.1 percent of explaining power on the variance of VC. All these findings support for H1 of the study. Therefore, the first hypothesis of the study can be accepted.

KM is playing the role of mediator on the relationship between IC and VC. When dealing with a mediation analysis, it is important to identify the total effect, direct effect and indirect effect. The Figure 02 and table 6 presented above present the total effect before including the KM as the mediator for the path model. Accordingly, the total effect of IC on VC is 0.361 (β =

0.361) and the explaining power of IC on the variance of VC is 13.1 percent. Further, the table 6 indicates that the total effect of IC on VC is significant (t = 7.358, p = 0.000, CI = 0.277 and 0.439).

Then, the Figure 03 shows the direct and indirect effects after including KM as the mediator to the path model and Table 7 presents the significance statistics of the direct and indirect effects.
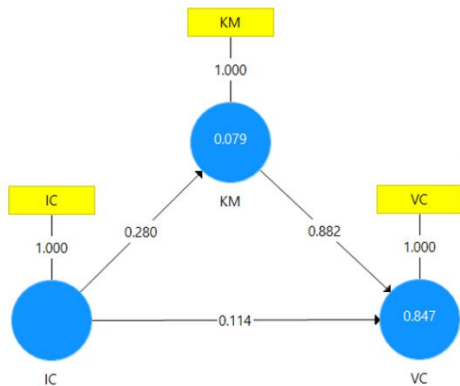
It is observed from the above figure that the explaining power of IC on VC ($R^2$ = 84.7%) after introducing the KM as the mediator has been extremely increased. The $R^2$ of IC on VC before introducing KM as the mediator, is just 13.1%. Thus, the explaining power is radically increased after KM came into the model playing the mediator role, implying that KM has a significant power to influence to the relationship between IC and KM.



**Figure 03: Direct and Indirect Effect of IC on VC Mediated through KM**

*Source: Survey Data – 2020/21c*

**Table 07: Significance of the Direct Effect and Indirect Effect of IC on VC Mediated through KM**

| Path | β Coefficient | Sample Mean (M) | Standard Deviation (STDEV) | t - Statistics | P - Values | CI 5% | CI 95% |
|---|---|---|---|---|---|---|---|
| IC -> KM | 0.280 | 0.281 | 0.057 | 4.920 | 0.000 | 0.183 | 0.369 |
| IC -> VC | 0.114 | 0.115 | 0.035 | 3.259 | 0.001 | 0.055 | 0.170 |
| KM -> VC | 0.882 | 0.882 | 0.017 | 51.318 | 0.000 | 0.851 | 0.907 |
| $R^2$ | 84.7% | | | | | | |

*Source: Survey Data – 2020/21*

The direct effect of IC on VC (C') is 0.114 (β = 0.114) and it is significant (t =4.920, p = 0.001, CI = 0.055 and 0.170). The effect between IC and KM (a) is 0.280 (β = 0.280), which is also significant (t = 4.920, p = 0.000, CI = 0.183 and 0.369). It assisted to accept the $H_2$ of the current study. Further, the effect of KM on VC (b) is 0.882 (β = 0.882) and it is significant (t = 51.318, p = 0.000, CI =

0.851 and 0.907). This findings supported to accept the H3 of the study. The indirect effect is the product of 'a' and 'b' (0.280*0.882 = 0.247), which is the effect of IC on VC through KM. This effect is explained through the specific indirect effects obtained from the bootstrapping tables in PLS-SEM output. That specific indirect effect is illustrated in the following table.

**Table 08: The Specific Indirect Effect of IC on VC through KM**

| Path | β Coefficient | Sample Mean (M) | Standard Deviation (STDEV) | t - Statistics | P - Values | CI 5% | CI 95% |
|---|---|---|---|---|---|---|---|
| IC -> KM -> VC | 0.247 | 0.248 | 0.051 | 4.878 | 0.000 | 0.162 | 0.328 |

*Source: Survey Data – 2020/21*

The value of specific indirect effect (β = 0.247) shows the indirect effect of IC on VC through the mediator of KM. The significance statistics given by the bootstrapping results show that the indirect effect is also significant (t = 4.878, p = 0.000, CI = 0.162 and 0.328).

The mediation analysis shows that, the total effect of IC on VC without the mediator (KM) is 0.361 (Table 6) and the direct effect of IC on VC with the mediator (KM) is reduced up to 0.114 (Table 7). The difference between this total effect (0.361) and the direct effect (0.114) is the indirect effect (0.247) illustrated in Table 8. This shows that after introducing KM as a mediator to the path model, the direct impact of IC on VC is reduced by 0.247, which is the indirect effect. It indicates that the relationship between IC and VC is partially mediated by KM. This partial mediation of KM is further confirmed by the significance of both direct effect and indirect effect.

Following table depicts the summary of the statistics relating to the mediator analysis.

**Table 09: Summary Statistics of Mediation Analysis**

| Total Effect (IC->VC) | | Direct Effect (IC->VC) | | Indirect Effect of IC on VC (IC -> KM -> VC) | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Coefficient | P - value | Coefficient | P - value | Coefficient | SD | t - value | P - value | CI (5% - 95%) | |
| 0.361 | 0.000 | 0.114 | 0.001 | 0.247 | 0.051 | 4.878 | 0.000 | 0.162 – 0.328 | |

*Source: Survey Data – 2020/21*

Thus, hypothesis four of the current study (H4), i.e., there is a mediating effect of KM on the relationship between IC and VC of a company, can be accepted.

**Summary of Hypotheses Testing**

The following table depicts the summary of hypotheses testing in the current study.

**Table 10: Summary of Hypotheses Testing**

| No. | Hypothesis | Type of impact | Accepted/ Rejected |
|---|---|---|---|
| H1 | IC has a significant positive impact towards VC of a company | Significant positive | **Accepted** |
| H2 | IC has a significant positive impact on KM of a company | Significant positive | **Accepted** |
| H3 | KM has a positive impact towards VC of a company | Significant positive | **Accepted** |
| H4 | There is a Mediating Effect of KM on the Relationship between IC and VC of a Company | Significant positive | **Accepted** |

*Source: Compiled by authors*

Accordingly, all four hypotheses of the present study were accepted.

## Conclusion

This study is carried out using Sri Lankan PLCs and private companies as the population. Data was collected through self-administered questionnaire and the unit of analysis was the company and the respondents were the top personnel of the company (CEO/Chairman/MD/GM). Accordingly, 227 companies responded to the questionnaire. At the stage of data cleaning, 8 cases were removed from the data as outliers and hence the final data set consisted with 219 valid questionnaires.

The study tried to answer to four questions and to fulfil four objectives. Does an impact of IC exist towards VC; Is there an impact of IC on KM; Is there an impact of KM on VC; and Does a mediating effect of KM exist on the relationship between IC and VC in companies in Sri Lanka? were the research questions which were answered through the present study. Moreover, to examine the impact of IC on VC; to identify the effect of IC on KM; to investigate the impact of KM on VC, and to examine the mediating role of KM on the relationship between IC and VC in Sri Lankan Companies were the objectives which were filled by undertaking the current study.

A positive significant impact of IC on VC was found answering for the first research question and fulfilling first objective of the study. This finding is consistent with the findings of prior literature (Tseng et al. 2015; Nuryaman, 2015; Shakina and Molodchik, 2014; Mhedhbi, 2013; Ayed, 2007; Bontis et al. 2004; Marr et al. 2004; Bontis, 1998).

Further, it was found that there is a significant positive impact of IC on KM addressing the second research question and achieving the second objective of the study. It was constant with the previous literature (Hsu and Sabherwal, 2012; Seleim and Khalil, 2011; Marr et al. 2003; Wiig, 1997).

Moreover, a significant positive impact of KM on VC was found for answering to the third research questions and it achieved the third objective of the current study. This finding is consistent with the findings of prior literature (Farooq, 2018; Carlucci, 2012; Daud and Yusoff, 2011; Edvardsson and Oskarsson, 2011; Liao and Wu, 2010; Rezgui, 2007; Wiig, 1993).

Finally, the last question was answered by finding out a partial mediation of KM on the relationship between IC and KM. It is consistent with the findings of Hussinki et al. (2017); Kianto et al. (2014); Michele and Rogo, (2012); Hsu and Sabherwal, (2012); Gorelick and Tantawy-Monsou, (2005); Cabrita and Vaz, (2005) Haas and Hansen, (2005); and Mouritsena, et al. (2001). This finding supported to achieve the last objective of the present study.

Based on the research findings, the several conclusions can be reached. The major conclusion of the study is, *knowledge can influence positively to the VC of companies in Sri Lanka*. It is reached through the identification of significant positive impact of both intellectual capital on value creation and knowledge management on value creation in Sri Lankan companies. This conclusion is consistent with previous studies in the literature (Positive impact of both intellectual capital and knowledge management on value creation - Hussinki et al. 2017; Kianto et al. 2014; Seleim and Khalil, 2011; Wiig 1997), (Positive impact of intellectual capital on value creation - Hsu and Sabherwal, 2012; Seleim and Khalil, 2011; Marr et al. 2003; Wiig, 1997), and (Positive impact of knowledge management on value creation - Farooq, 2018; Carlucci, 2012; Daud and Yusoff, 2011; Edvardsson and Oskarsson, 2011; Liao and Wu, 2010; Rezgui, 2007; Wiig, 1993). However, most of these studies were done separately to explore the impact of intellectual capital and value creation and the impact of knowledge management and value creation and not in the same research study. Very few were found in the previous literature, which were based on exploring the impact of both intellectual

capital and knowledge management on value creation.

Furthermore, the study concludes that *the knowledge management plays a significant partial mediation role on the relationship between intellectual capital and value creation of companies in Sri Lanka.* This is consistent with (Hussinki et al. 2017; Kianto et al. 2014; Michele and Rogo, 2012; Hsu and Sabherwal, 2012; Gorelick and Tantawy-Monsou, 2005; Cabrita and Vaz, 2005 Haas and Hansen, 2005; Mouritsena, et al. 2001)

the argument of intellectual capital is the static aspect of knowledge and therefore cannot be functioned isolate for the value creation. Hence, intellectual capital should be supported by knowledge management, which is the dynamic aspect of knowledge, to influence to the companies' value creation. Thus, this study supported to this argument by concluding the partial mediation role of knowledge management on the relationship between intellectual capital and value creation of Sri Lankan companies.

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