
Mediated Moderation effect on Innovation capability: Intellectual Capital and Innovation capability of the Apparel Industry in Sri Lanka

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Abstract: The main purpose of this paper is to exhibit the mediation and moderation influence of organizational motivation and organization characteristics between intellectual capital and innovation capability of the Apparel industry in Sri Lanka. The intellectual capital creates a crucial factor for the achievement of the innovation capability. The paper investigates the multidimensional and contingent gradual effect of intellectual capital on innovation capability through the mediating and moderating role. This study was conducted by using random sampling technique to collect the data from the executives and managers in Sri Lanka. The results demonstrated that the intellectual capital has significant positive relationship and mediated through organizational motivation and moderated by organization characteristics on innovation capability. The findings of this research will be useful for Apparel Industry to understand and apply intellectual capital to create innovation in their organizations.

Keywords: Intellectual capital; Innovation capability; Organizational motivation; and Organization characteristics.

1 Introduction

The emergence of the knowledge economy, intense global competition and considerable technological advance has seen innovation become increasingly central to competitiveness. Innovation is diverse and pervasive. It is applicable to every facet of business activity of each enterprise. The importance of innovation to both individual organizations and the economic development of society have been highlighted in the literature as far back as Schumpeter (1942). Huber (1984) postulated that innovation, and institutionalized experimentation, will take on an added importance in post-industrial organizations, whose environments will be characterized by increasing knowledge, complexity and turbulence. More recent research has established a positive link between innovation and business performance (Dess, Lumpkin and Covin, 1997). The ability to innovate on a sustained basis, an innovation capability, is important as research has

shown that organisations possessing innovation capabilities have a sustained competitive advantage (Alvarez and Barney, 2000).

Today, the intellectual capital is recognized as the most important and vital ingredient for the success of organizations in a competitive environment. Present economy is a knowledge-based economy. The main ingredients of the production-based economy were land, labor, capital and physical assets. However, in a knowledge-based economy intellectual capital (IC) has become more important to add values when it is compared to physical assets (Bontis, 2001, Yalama, 2007, Khalique, et.al, 2011). In the same way that intellectual capital has been recognized as the most important source of competitive advantage of various organizations which lead to increase the organizational performance and a country's economic growth. Chong and Lin (2008) and Tovstiga and Tulugurova (2009) also pointed out that intellectual capital is the most powerful source to influence positively on the performance of organizations. Shih, Chang and Lin (2010) argued that there are little studies that focused on the relationship of intellectual capital with the organizational performance.

The apparel sector around the world has grown as a knowledge concentrated sector in dynamic and competitive environment. However, the apparel industry is very important for the development of economy in Sri Lanka. The role of Apparel industry in economy is highly acknowledged. Moreover, the Apparel sector is a good sector for research on intellectual capital issue because this sector is knowledge intensive and its entire staff are moreover are identical intellectually. From the last decade, the Apparel sector has been undergoing dramatic change in both organizational and technological advancement pushing top management to reformulate their business strategies (Cabrita and Bontis, 2008). In addition, Bhartesh and Bandyopadhyay (2005) pointed out that it is very important for organizations to understand their intellectual capital assets and should need to be properly managed if the organizations want to compete successfully in competitive environment. Therefore, it is indispensable that the executives of the apparel industry learn to employ the intellectual capital to improve their organizational performance in a knowledge-based economy.

Sri Lanka is a developing country and a small tropical island off the southern tip of India which is situated in South Asia. Today apparel industry has become one of the largest incomes generating avenue in the country. It has contributed to the 52% of the country's export earnings. In addition to that the industry directly employs nearly 300,000 people as workforce all over the country. There are 891 garment factories of which 177 are small, 468 – medium, and 266 – large scale factories and also the industry produces around 500 mn. pcs. per annum of which woven accounts for 55% and knitted 45% (Saheed, 2005; Sivalogathan, 2013). The industry spreads the huge area of the country and can be seen number of factories are operating in every district in the country. Talking about apparel industry, industry use low technology & it can be introduced as labour intensive industry (Perera, et al 2008; Sivalogathan, V., 2010). The apparel industry is labour intensive industry, so individual behavior & attitudes of these industry workers are very important to identify.

Therefore, the overarching research question of this paper is, "What are the factors and intellectual capital practices that facilitate the development of innovation capability of the Apparel Industry of Sri Lanka?" in answering this question. We draw on the theoretical approaches of the resource based theory of the firm (Penrose. 1959; Barney,

1991) and the innovation literature that focuses on the organization level of analysis (Lawrence and Lorsch, 1967; Nohria and Ghoshal, 1997).

2. Literature review

2.1 Intellectual capital

The term intellectual capital was first proposed by Galbraith (1969), as a form of knowledge, intellect, and brainpower activity, which used knowledge to create value. The importance of intellectual capital in a knowledge-based economy is widely accepted and Stewart (1997) pointed out that intellectual capital is referred as to the accumulation of all knowledge, skills and expertise of employees that can lead to take competitive advantages. In addition, Bontis (1998) illustrated that intellectual capital comprises three components: human capital, customer capital and structural capital. Moreover, researchers argued that intellectual capital is mainly based on human capital, customer capital, structural capital, social capital, technological capital and spiritual capital. Many studies indicate that intellectual capital has significant positive impact on the performance of organizations. The dimensions of intellectual capital are the main sources of firm competitive advantage and superior performance (Bontis, 1998; Khalique, et.al, 2011). In this study, we have summarised only three components of intellectual capital namely human capital, organizational capital and social capital and tested empirically.

Human capital is mainly based on the individual abilities, knowledge, know-how, talent, education, skills and experiences of employees in organizations (Bontis, Keow and Richardson, 2000; Edvinsson & Malone 1999; Shaari et al., 2010). Human capital is a critical factor that create intellectual capital in organizations, and the most important component of intellectual capital, and it is critical for creativity and innovation (Bontis 1998; Stewart 1997). Snell and Dean (1992) pointed out that human capital is creative, bright and skilled employees with expertise in their function. Rastogi (2000) stated that human capital is an important input for organizations especially for employees continuous improvement mainly on knowledge, skills, and abilities. Thus, the definition of human capital is referred to as “the knowledge, skills, competencies, and attributes embodied in individuals that facilitate the creation of personal, social and economic well-being” (OECD, 2000). Therefore, Human capitals refer to processes that relate to training, education and other professional initiatives in order to increase the levels of knowledge, skills, abilities, values, and social assets of an employee which will lead to the employee’s satisfaction and performance, and eventually on a firm performance.

Organizational capital is also one of the most important components of intellectual capital. Organizational capital is a glue of organization. It based on the internal structure of the organization, to the processes and procedures, guidelines, rules and etc. It encompasses of all non-human storehouse of knowledge in organizations including organizational competitive intelligence, routine, formula, policies, procedures and databases (Salleh and Selamat, 2007; Cabrira, 2009; Khalique, et.al, 2011).

Social capital is recognized as one of the most important components of intellectual capital. Bourdieu and Wacquant (1992) defined social capital as a “sum of resources accumulated in the organization by a stable network of intra organizational

relationships”. Naphat and Goshal, (1998) argued that organizations having high social capital can take more competitive advantage and they pointed out that it mainly based on three dimensions which is widely accepted such as structural, cognitive and relational. These dimensions of social capital create the value of the intellectual capital of an organization. Cohen and Prusak (2001) stipulated that social capital represents the value of human connections based on confidence and on personal networks. Social capital includes relationships, attitudes and values that manage interactions among people and contribute to economic and social development in a society as well as in an organization.

New knowledge creation that results from learning from internal and external sources can help firms attain superior performance because of first mover advantages, responsiveness to customers and the ability to adapt to changing and uncertain environments (Van Wijk et al., 2007). Innovation capability is further not tradable in factor markets, path dependent, and is influenced by a firm’s previous experiences. Cockburn, Henderson, and Stern (2000) argue that the key to competitive advantage lies in a firm’s ability to identify and respond to environmental changes in advance of competitors.

2.2 Innovation Capability

Lawson and Samson (2001) see innovation capability as higher-order integration capabilities and propose a mixed model comprising vision and strategy, harnessing the competence base, organizational intelligence, creative and idea management, organizational structures and systems, culture and climate, and management of technology. Teece & Pisano (1994) further developed the area proposing dynamic capabilities theory as the “subset of the competences/capabilities which allow the firm to create new products and processes and respond to changing market circumstances”. An innovation capability can be defined as the ability to continuously transform knowledge and ideas into new products, processes and systems for the benefit of the firm and its stakeholders. Organizational innovation capability concerns an organization's ability to combine different types of resources, especially firm-specific knowledge embodied in their employees, for creating new resources that enable firms to achieve and sustain their competitive advantage.

Innovation capability is defined by Kim (1997) as the ability to create new and useful knowledge based on previous knowledge. According to Burgelman et. al. (2004), innovation capability is “the comprehensive set of characteristics of an organization that facilitate and support innovation strategies”. Lawson and Samson (2001) extend the definition considering that an innovation capability is a higher order “integration capability”: they have the ability to meld and manage different key organizational capabilities and resources that successfully stimulate the innovation activities. Therefore, an importance of management literature indicated that innovation capability has also come to be an important part of the competitive power of the firms. Innovation capability refers to the firm’s ability to transform and knowledge and ideas into new products, processes systems for the benefit of the firms (Lawson and Samson, 2001). Concisely, innovation also needs the transformation and exploitation of existing knowledge. Nonaka (1994) suggested, main importance of innovation occurs in organization when employees share their knowledge.

2.3 Organizational motivation

The effects of Intellectual capital on Innovation capability and firm competitive advantage should be mediated by organizational motivation of internal and external factors. This argument is consistent with the work of Zahra and George (2002) who claim that firms that focus extensively on learning from and exploring the environment can constantly renew their knowledge stock but cannot benefit from it unless they can exploit what they have learned from their environment. Similarly, in his seminal work on the role of exploration and exploitation in organizational motivation, March (1991) notes that Adaptive systems that engage in exploration to the exclusion of exploitation are likely to find that they suffer the costs of experimentation without gaining many of its benefits. They exhibit too many underdeveloped new ideas and too little distinctive competence. Therefore, the absorptive capacity theorists suggest organizational motivation should play a mediating role in the Intellectual capital and Innovation capability lead to firm competitive advantage and performance relationship.

Innovation capability is often regarded to be a key factor in realizing firm innovations. Firms innovate in order to gain an advantage over competitors, perhaps by becoming more cost-efficient, by tailoring products to meet unique customer requirements, or by improving access to service in new markets. Reputation and Demanding customers are the key driving forces for firm to innovate. Also the customer requirement provides the important and direct input for firms. Build a market share and opportunity identification are the start of any innovation. The right opportunity identification is the key to the firm innovation results. Government policy and support plays an important role for country innovation system. With unique challenges and barriers of innovation faced by firms, government need to build up conducive environment for firm innovation, like facilitate the entry of small new players, provide necessary incentives, lower the entry and exit barriers, helping with network build up, market intelligence etc.

2.4 Organizational Characteristics

Several firm-level variables that can potentially affect the outcomes of this study were used as moderate variables. Firm size was measured as the total number of employees of the operation. Firm age was measured as the age when the firm was originally established in. Upstream competence of the firm was also controlled for. Presence of an upstream value activity was measured by combining two items which asked about the firm status and the employee involvement in the business process. Numerous organizational factors beyond intellectual capital may influence innovative capabilities. For example, large organizations may be more likely to develop innovative capabilities owing to their extensive resource bases (Henderson & Cockburn, 1994); however, smaller organizations may be more innovative owing to their flexibility (Cohen, 1995). Thus, we measured size of organization as the number of fulltime employees, and age of organization, whether the organization has been established before. We controlled for prior performance, as associated slack resources in organizations could influence their innovative capabilities (Hill & Rothaermel, 2003). We measured status of organization by asking question that has been awarded. Lastly, nature of the organization, we measured how employee can contribute effectively to achieving organization goals. The nature of the organizations

and employee contribution are competing in environment control which is known to influence their innovative capabilities.

In order to identify the relationship of intellectual capital with the Innovation capability and Organizational performance of apparel industry in Sri Lanka, three components of intellectual capital, namely human capital, organizational capital and social capital were employed. Previous studies revealed that intellectual capital is positively associated with the organizational performance of organizations (Bontis, et al., 2000; Huang and Wu, 2010, Sivalogathan and Wu, 2013). The research model adopted for this study is mainly based on three independent variables and two dependent variables, i.e., innovation capability and organizational performance. The research model hypothesized that there is a direct and positive association between intellectual capital and organizational performance (Stewart, 1997, Bontis et al., 2000, Huang and Wu, 2010, Bueno et al., 2004). The flow of relationship between the variables is depicted in Figure1.

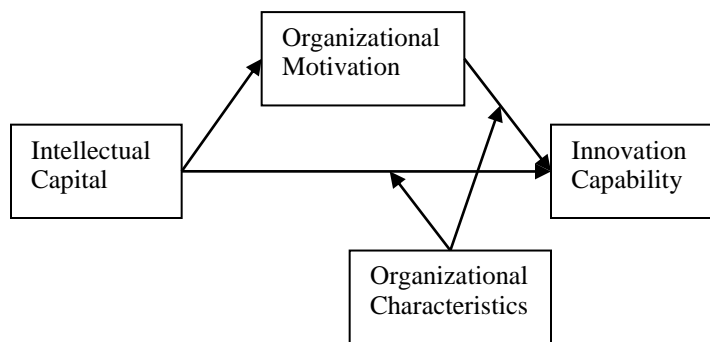


Figure 1 Conceptual Framework.

Source: Author developed

Based on the above model, the following four research hypotheses were constructed.

H1: Intellectual capital has a significant, positive effect on Innovation capability of the Apparel Industry in Sri Lanka.

H2: Organizational motivation has positive association with Innovation capability of the Apparel Industry in Sri Lanka.

H3: Organizational motivation will mediate the relationship between Intellectual capital and Innovation capability of the Apparel Industry in Sri Lanka.

H4: Organizational characteristics will moderate the relationship between Intellectual capital and Innovation capability of the Apparel Industry in Sri Lanka.

H5: Organizational characteristics will moderate the mediated relationship by organizational motivation between Intellectual capital and Innovation capability of the Apparel Industry in Sri Lanka.

3. Research Methodology

A structured questionnaire based survey having 42 items was used to collect the data from Apparel Industry in Sri Lanka. The amended version of Bontis, (1998), Ismail (2005), Bueno et al., (2004), Young, et al., (2007), Choudhury (2010), Mei-Chun Chen(2001), Shu-Hsiao Tsen et.al (2010), Minbaeva, et.al (2003) Omar,et.al (2011), Yitmen (2011), Smith et al. (2005), Galunic et al (2004), Landry et al. (2002), Lubatkin et al. (2006), questionnaires items were used for this study. The amendments were made to ensure that the constructs is relevant to this research in Sri Lankan context. A total of 450 set of questionnaires were distributed in Sri Lanka. A total of 196 set of complete questionnaires were returned. The response rate was 44% which was considered as a good.

The questionnaire design of the research follow each observable dimension and the “itemized measurement” method was adopted for implementation. The measurement of questionnaire adopted five-point Likert scale, a score of 1 to 5 was given according to the extent of agreement and disagreement, to test the interaction between the independent variables and the mediating variable, the Baron and Kenny methods was used. With regard to the questionnaire design of intellectual capital the about three dimensional scales of human capital, organizational capital and social capital were used to design 15 questions. With regard to the questionnaire design of organizational motivation, the scales of 4 questions were designed, and design of organization characteristics four questions were used such as size, age, rewards, and unionized employee. As to the measuring indicator of Innovation capability a total of 6 questions were used.

The data were screened and cleaned, to ensure the reliability of the instrument, Cronbach Alpha was used. Cronbach Alpha value is widely used to check the reliability of the construct. The results showed that human capital had a coefficient of 0.848, organizational capital of 0.911, social capital of 0.881, Intellectual capital of 0.857 and organizational motivation of 0.618. All constructs had showed above the suggested value 0.5 (Nunnally and Bernstein, 1994). Therefore, on the basis of reliability test it was assumed that the scales used in this research is reliable to capture the constructs.

4. Results and Discussions

As indicated earlier this research study attempted to explore the relationship between the components of intellectual capital and organizational performance of apparel industry and six research hypotheses were constructed. To test research hypotheses Pearson correlation was used. The results of the study indicate that the components of intellectual capital are positively related to the organizational performance of apparel industry in Sri Lanka. The result also shows that human capital has more positive relationship with Innovation capability as compared to other variables. Moreover, judging from the findings of the Pearson correlation social capital is the second variable and organizational capital is the third variable that shows positive relationship with innovation capability. Therefore, the findings supported these research hypotheses of the study. The results of Pearson correlation are depicted in Table 1.

Table 1: Descriptive statistics and Pearson Correlation

<i>Variables</i>	<i>Mean</i>	<i>SD</i>	<i>Cronbach Alpha</i>	<i>IC</i>	<i>InC</i>	<i>OM</i>
Intellectual Capital (IC)	3.76	0.701	0.904			
Innovation Capability (InC)	3.88	0.714	0.857	0.822**	0.000	
Organizational Motivation (OM)	3.69	0.862	0.618	0.815**	0.738**	0.000
Organizational Characteristics (Och)	2.77	0.514	-	0.422**	0.343**	0.236*
<i>After Controlling of OM</i>						
IC					0.564**	0.000
Och				0.408**	0.257*	0.001
<i>After Controlling of Och</i>						
IC					0.795**	0.000
OM				0.812**	0.720**	0.000

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

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

Source: Survey data

A single-factor analysis of variance on the innovation measure reveals the expected effect of Intellectual capital on Innovation capability, $F(3, 66) = 46.598$, $p < .000$. All possible pairwise comparisons between group means using a pooled error term reveals that those assigned to the highly had a significantly more positive on innovation capability.

We illustrate the causal steps strategy using our pilot study data. First recall that it has already been established above that Intellectual capital (X) affected Innovation capability (Y), as revealed by a statistically significant single-factor ANOVA. There is also evidence from a single-factor ANOVA that X affects motivation (M) influenced on innovation capability, $F(3, 66) = 50.685$, $p < .000$. All possible pairwise comparisons between group means reveals that the Intellectual capital on Innovation capability as significantly more interactive by mediating variable organizational motivation. There is a relationship between Intellectual capital and Innovation capability after controlling for condition, such that the organizational motivation had a significantly more positive on innovation capability about the value, $b = 0.738$, $p < 0.000$. This establishes that M is related to Y, holding X constant.

The relative indirect effects are estimated as products of coefficients and are interpreted similarly to the direct effects, and the SPSS and AMOS to generate bootstrap confidence intervals for inference. The relative indirect effect for the first contrast comparing any intellectual capital to the control condition is the contrast for organizational motivation multiplied by the effect of interactivity on innovation capability independent of intellectual capital, $b = 0.738$. Thus, $ab = (0.815)(0.738) = 0.601$. Intellectual capital results in a more favourable innovation capability by 0.822 units as a result of greater innovation capability in the intellectual capital (from the sign of a), which in turn leads to a more favorable innovation capability (from the sign of b) A

95% bias-corrected bootstrap confidence interval for this relative indirect effect as 0.601. This indirect effect is statistically different from zero, indicating that these intellectual capitals indirectly influence innovation capability through organizational motivation.

Thus, independent of the effect of organizational motivation on innovation capability, any intellectual capital yields innovation are 0.738 units more favourable toward the motivation on average relative to no intellectual capital. Furthermore, intellectual capital yields attitudes that are 0.815 units more favourable on average. Tests of significance available in standard regression output can be used for inference about these relative direct effects.

The relative total effects, c was estimated using equation or by adding the corresponding relative direct and indirect effects. These relative total effects of intellectual capital on innovation capability quantify the mean difference in innovation toward the motivation for intellectual capital relative to intellectual capital. Observe that these relative total effects partition perfectly into the relative direct and indirect effects: $c = c' + ab = 0.822 + 0.601 = 1.423$ more favourable on average (with a 95%). The result is the relative indirect effects of intellectual capital on innovation capability through organizational motivation.

Table 2: Regression statistics and Model summary

<i>Variables</i>	<i>M1</i>	<i>M2</i>	<i>M3</i>	<i>M4</i>	<i>M5</i>	<i>M6</i>
IC	0.822** (0.000)	0.815** (0.000)		0.657** (0.000)	0.641** (0.000)	-0.460 (0.818)
OM		<i>a</i>	0.738** (0.000)	0.202 (0.090)	0.210 (0.087)	-0.805 (0.801)
Och					0.023 (0.767)	-1.337 (0.544)
IC x Och						2.215 (0.502)
IC x OM						1.883 (0.712)
OM x Och						1.985 (0.668)
IC x OM x Och						-2.958 (0.635)
InC	<i>a</i>		<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>
β	0.731	-0.084	1.626	0.745	0.694	4.703
R^2	0.671	0.665	0.545	0.689	0.690	0.695
F	141.605	134.769	81.326	74.330	48.909	20.205
Sig	0.000**	0.000**	0.000**	0.000**	0.000**	0.000**

α -(Constant) dependent variable, **Correlation is significant at the 0.01 level (2-tailed)

Source: Survey data

Therefore, the estimated correlation relationships are consistent with theoretical presumptions. The evidence shows that Apparel Industry has benefited from intellectual capital in innovation capability. More precisely, focusing on the Apparel Industry of Sri Lanka, we estimate model that mediated and moderated by organizational motivation and organizational characteristics respectively on intellectual capital and innovation capability. In addition to the direct affect mentioned above, organizational motivation influences total affect to innovation capability.

These results are, in some way, confirmed by other recent empirical studies. Concerning the greater importance intellectual capital compared to that of innovation capability efforts, as our results show, in these industries, the capability of innovation seems indeed to be more important. The estimates of the parameters seem to confirm that intellectual capital and innovation capability efforts are enormously important to the Apparel Industry of Sri Lanka. In addition, the indirect effect of intellectual capital, through motivation, emerges here as critical denoting the importance of having a reasonably higher stock of intellectual capital to enable a firm to reap the benefits of its innovation capability efforts.

The objective of this study was to examine theoretically and empirically the relationship of the intellectual capital on the Innovation capability and mediating effect of organizational motivation and moderating by organizational characteristics of the Apparel Industry in Sri Lanka. The empirical results of the study showed that the intellectual capital have positive significant relationship mediated and moderated by the organizational motivation and organizational characteristics on Innovation capability of Apparel Industry in Sri Lanka. Previous studies also supported the findings of this research study such as Bontis et al., (2000), Cabrera and Vaz (2005), Goh (2005), Shaari et al., (2010) and Khalique et al., (2011). The result shows that the employed intellectual capital have vital contribution to achieve the innovation capability.

5. Conclusion

The main purpose of study was to find out the impact relationship of intellectual capital with the Innovation capability and this impact result was mediated and moderated by organizational motivation and organizational characteristics of Apparel Industry in Sri Lanka. Generally, the study concludes that intellectual capital is a very important factor for the success of the organizations in a knowledge based economy. The intellectual capital, has showed positive relationship with innovation capability. On the basis of findings the study suggests that the intellectual capital can play a significant role and organizational motivation was mediating, and organizational characteristics was moderating to enhancing the innovation capability of Apparel Industry in Sri Lanka.

Organizational motivation is the fundamental factor driving businesses to be innovative and ultimately to be more productive. Motivation in the domestic economy helps and forces sometimes the firms expand internationally. Competition keeps the firms to be responsive, flexible, and innovative. Organizational motivation factors such as reputation status, low cost, market share and government support are very important and influence on firm innovation and performance. At the same time, organizational characteristics like size, age, awards winner, and union present are very influence factor on innovation capability.

The findings of the study will be helpful to practitioners, policy makers and top level managers to understand the concept and role of intellectual capital in depth. Therefore, this study will be a milestone for practitioners to explore their intellectual capital in more appropriate way. The researches would like to suggest future researchers to extend the sample size for all sectors and more generalized results.

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