The Mediating Effects of Sensemaking and Measurement on the Intellectual Capital and Performance Linkage

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Abstract: Intellectual capital can be a major factor that can aid Caribbean policy makers as the region transitions from its agricultural based economy to service based economies with tourism being the largest contributor to GDP. This paper adds to the extant literature by providing literature on IC within the Caribbean and the tourism industry. Additionally, while the research has emphasized defining and measuring IC and its components, and their impact on firm's performance theoretical questions remain concerning the synergistic, dynamic and contextual nature of IC. In addition, the use of sensemaking to provide the foundation for understanding the interaction of the IC components and firm's performance will further enhance the IC literature. This paper reports on the development and testing of a theoretical model concerning the mediating effects of measurement of IC and sensemaking on the components of IC and performance linkage. This quantitative study used structural equation modeling (SEM) to test the model and structural relationships among the components of IC and performance mediated by sensemaking and measurement of IC. Independent variables used in the model were HC, RC and SC; with sensemaking and measurement of IC being the mediating variables and performance, a composite scale measuring managers' perception on relative changes of their performance of financial and non-financial measures, being the dependent variable. The study shows that HC, RC and SC are related to sensemaking, that measurement of IC is associated with performance, that measurement of IC mediates the relationships between RC and performance and SC and performance, and it validates the relationship between HC and performance.

Keywords: Caribbean, intellectual capital, sensemaking, SEM, hospitality

1. Introduction

The Caribbean has been transitioning from agricultural based economies to economies based on services, with tourism being the largest contributor to GDP. It can be argued that intellectual capital can be a major factor that can aid in this transition. In today's knowledge-based economy three important factors in an organisation are human capital (HC), relational capital (RC) and structural capital (SC) which are the elements that constitute intellectual capital (IC). Proponents of IC research suggest that it is the leveraging of the three components of IC that allow an organisation to create and sustain a competitive advantage. This "intangible" or "new" economy that has emerged has resulted in a change from tangible assets being the major driver of performance to intangibles playing a key role in that performance. The intangibles, such as employee competencies, technical and administrative infrastructure and organizational processes will all influence the entity's performance. The Human Resource, Marketing and Information Systems fraternities have each argued of the relationship between their component and firm's performance. Given these approaches, it is understandable why current IC researchers, have either examined the independent relationships existing between each IC component and performance, or have proposed that one component is more important than another (Riahi-Belkaoui, 2003; Youndt and Snell 2004). This has compounded the problem of valuing IC in organizations. Many corporate leaders are left without an understanding of the importance of IC to organizational effectiveness, whereas, they understand the importance of the tangible and financial assets.

Thus, while progress has been made, the research in IC from a geographical perspective has focused to a large extent on developed countries and few studies have been presented on developing countries with Malaysia (Tayles et al., 2007) and Sri Lanka (Abeyesekera 2008) being the exceptions. The IC research has also focused on high-tech and knowledge based industries and to some extent the financial services sector using Pulic's (2000) VAIC methodology (Kamath, 2008; Goh, 2005; Shui, 2006; Mavridis and Kyrmizoglon, 2005). In terms of the hospitality industry, only three studies have been conducted thus far, Anton et al, (2005), Engstrom et al, (2003) and Erickson and McCall (2008). In addition, there is a considerable degree of concern that despite the progress taking place with regard to the design of more effective performance measurement systems, hotels are still focusing on more traditional forms of performance measures. This paper will be of considerable interest to policy

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makers and practitioners in the Caribbean and within the hospitality industry. It has also been argued the political economy of industrialized countries tends to be implicitly assumed in social accounting research, this may result in unique insights that might reside in the local/regional context being suppressed. Since no work on IC has been conducted in small microstates like the Caribbean exploring this issue, one will make explicit the peculiarities of the Caribbean region. Therefore, locating the research in the Caribbean hospitality industry, this study contributes to the extant IC literature and practice within the hospitality industry.

Additionally, sensemaking is used to provide the foundation for understanding how the three IC components interact. Accordingly this paper, which is part of a larger study that investigated the characteristics and significance placed on the various components of IC and the measurement of IC in the Caribbean hospitality industry, reports on the development and testing of a theoretical model concerning the mediating effects of measurement of IC and sensemaking on the components of IC and performance linkage.

2. Literature review

Intellectual Capital represents the resources of an organisation that have been formalized, captured and leveraged to create assets of a higher value (Bontis 1999, Sveiby 1997). The first stage in the development of IC literature focused on the presentation of models and the development of frameworks, while the second stage focused on the impact of IC on the behaviour of markets (Petty and Guthrie 2000). The debate continues pertaining to defining IC and this lack of consensus on an agreed taxonomy of IC has resulted the research being mixed or poorly defined. However, in seeking to develop a definition of IC a deconstruction of the concept has resulted in three components, human capital, relational capital and structural capital forming the conceptual framework. This classification is consistent with Sveiby (1997) who divided intellectual capital into three areas, namely, employee competence, internal structure and external structure, Stewart's (1997) human capital, structural capital and customer capital, and Edvinsson's (1997) human capital and structural capital subdivided into organisational capital and customer capital.

A firm's human capital is not a physical asset of the organisation measured by the number of employees but it relates to employees' education, skills, training, experience, attitudes about life and business, genetic inheritance and values (Edvinsson and Malone 1997; Hutson 1993, Roos and Roos 1997, Litschker et al., 2006). The relational capital component of IC resides in social relations and networks (Tsai and Ghosal 1998). According to Cohen and Kaimenakis (2007) relational capital represents the potential an organisation has due to extraneous intangible assets. IC researchers refer to relational capital as either relationships existing between employees and external economic actors (Edvinsson and Malone, 1997; Stewart, 1997), or relationships existing among employees and other departments within the organisation (Tsai and Ghoshal 1998). The third attribute of IC is structural capital, another multi-dimensional construct. This embodies both tangible and intangible, static and dynamic aspects, as well as firm-specific attributes. Structural capital includes all the non-human storehouses of knowledge in organisations, such as databases, organisational charts, process manuals, strategies, routines, and anything whose value to the company is higher than its tangible value (Bontis, 1999; Roos et al. 1997). The concept of SC also incorporates the organisational structure, legal parameters, patents, trademarks, culture, manual systems, research and development, software systems, and informal ways of doing things (Edvinsson and Malone, 1997; Nelson and Winter, 1982). SC has been argued as being responsible for the company's renewal and value creating processes.

The literature has thus emphasized the direct link of these individual components or the composite of IC on a firm's performance. The human resource management literature asserts that human capital is one of the major factors contributing to the continued success of organisations, studies such as Huselid et al (1997); Becker and Huselid (1998) and Khandekar and Sharma (2005) found relationships between HR management effectiveness and organisational performance. The marketing fraternity joins with the IC advocates in purporting that there is a relationship between relational capital and performance. Narver and Slater (1990) empirical study has shown the RC element of market orientation positively affects performance. Other empirical studies affirming the findings that the RC element of market orientation positively affects performance were Jaworski and Kohli (1993) and Greenly (1995). The SC developed in organisations through their information systems and management processes also leverage an organisation's performance. Huang and Liu (2005) found that innovation capital has a non-linear relationship with firm performance. Chen et al. (2005) in their

study found that IC has a positive impact on market value and financial performance. Wang and Chang (2005) showed that the IC components affected performance directly, with the exception of human capital which influences performance indirectly through the other IC components.

A process that illustrates how organisations can routinely integrate the three intellectual capital components is sensemaking. This concept of sensemaking is defined by Weick (1995) as a process of making sense and assigning meaning to events in the environment, by applying stored knowledge, experience, values and beliefs to new situations in an effort to understand them. Thomas, Clark and Gioia (1993, p.240) describe sensemaking as "the reciprocal interaction of information seeking, meaning ascription, and action". Sensemaking occurs in organisations when members confront events, issues and actions that are surprising or confusing (Gioia and Thomas, 1996, Maitlas, 2005) and use a process of social construction in their attempt to interpret and explain sets of cues from their environment (Weick, 1995).Theoretically, the more competent an organisation's workforce (HC) well developed and highly effective its repositories of codified knowledge (SC) and opportunities for engaging in social networks (RC), individuals will be able to more effectively make sense of events within it. Penrose (1959) asserts that a firm be viewed as "a collection of individuals who have had experience in working together, for only in this way can 'teamwork' be developed" (1959: 46), which would suggest a relationship between human capital and sensemaking. Shariq (1998) argues that, in order to make sense or create understanding, humans bring prior knowledge and context to the information and without the human context the information by itself will have no meaning. The structural capital and the relational capital in a firm can be enhanced by its relationship with sensemaking in that there are many aspects to the learning embedded in such shared experience. This includes the specific meanings and understandings subtly and extensively negotiated in the course of social interaction. It is therefore posited that there is a relationship among the components of IC and sensemaking.

A review of the literature relating to sensemaking and performance clearly demonstrates a relationship between the two variables. Thomas, Clark and Gioia (1993) tested the relative strength of the direct and indirect paths between sensemaking activities of scanning, interpretation and action on performance. They found that the performance measures used in the study were significantly related to the sensemaking processes. Young's (2005) study found a positive association between a firm's value as measured by Tobin's Q and Top Management Team's (TMT) social capital where such TMT members hold prominent directorships in other prestigious firms. Therefore it is posited that there is a relationship among the components of IC and sensemaking.

Measurement of intellectual capital has spawned a large number of articles in various academic streams of literature. Measurement has always been important for organizations in that they use it to assess their performance in areas, such as, growth, profits, quality improvement, customer satisfaction, sales and efficiency. Kaplan and Norton (1996) support the use of measurement in organisations and argue that financial measures have been used since ancient Babylon to measure growth, and during the industrial revolution financial measures were used as tools for monitoring efficiency. A plethora of literature has been published in support of methods for measuring and managing IC. Sveiby (2005) has identified 34 such measurement techniques. However, the validity of these measurement systems has been challenged. Pike and Roos (2004) have argued that completeness, distinctness, independence, agreeability and commensurability should be present in any model proposing to measure business performance. The challenge for IC is the interrelatedness of its components, which would affect the measurement characteristics of distinctness and independence. Pike and Roos (2004) study revealed that a number of the IC measurement models did not meet the tenets of measurement theory identified. In addition, M'Pherson and Pike (2001) had earlier asserted that IC is a composite of the scales of human capital and structural capital and these scales are not commensurate with financial capital which is reported in the ratio scale. They concluded that to combine intangible elements of intellectual capital with financial capital to derive an organisation's value would be difficult.

In assessing the validity of measurement in the IC arena, one can examine its ability to affect behaviour rather than to represent properties of objects in numerical terms. Flamholtz (1980) asserted that the purpose of measurement in organisations is to influence people behaviour. He argues that measurement is intended to perform certain predefined psychological functions through its process and its output. The output function, which is the numbers produced by the act of measurement, is used as an input signal to facilitate decisions and actions, the process function on the other hand,

serves as a catalyst for systematic planning, establishes an operational criterion, and motivates the decision-makers. In support of Flamholtz's (1980) notion of the dual role of measurement, the measurement of IC can be approached from an internal focus where the issues raised about behavoiural changes due to the process of measurement will be addressed or from an external focus which requires that the properties outlined in the scientific approach to measurement being adhered to. Research pertaining to the scientific approach to measurement of IC which is appropriate for those measures that have an external focus has attracted a fleeting glance in the literature, whereas the behavioural implication of measurement of IC has not received any attention.

3. Methodology

A quantitative approach was used to assess the significance placed on IC and the impact of IC on performance in the hospitality industry in the Caribbean. A number of variables were identified to test the hypothesized relationships as depicted in Figure 1. Using the tripartite model for the classification of IC, the three independent variables were human capital, relational capital and structural capital. The dependent variable was performance, a composite scale measuring managers' perception on relative changes of their performance of financial and non-financial measures, and the mediating variables were sensemaking and measurement of IC.

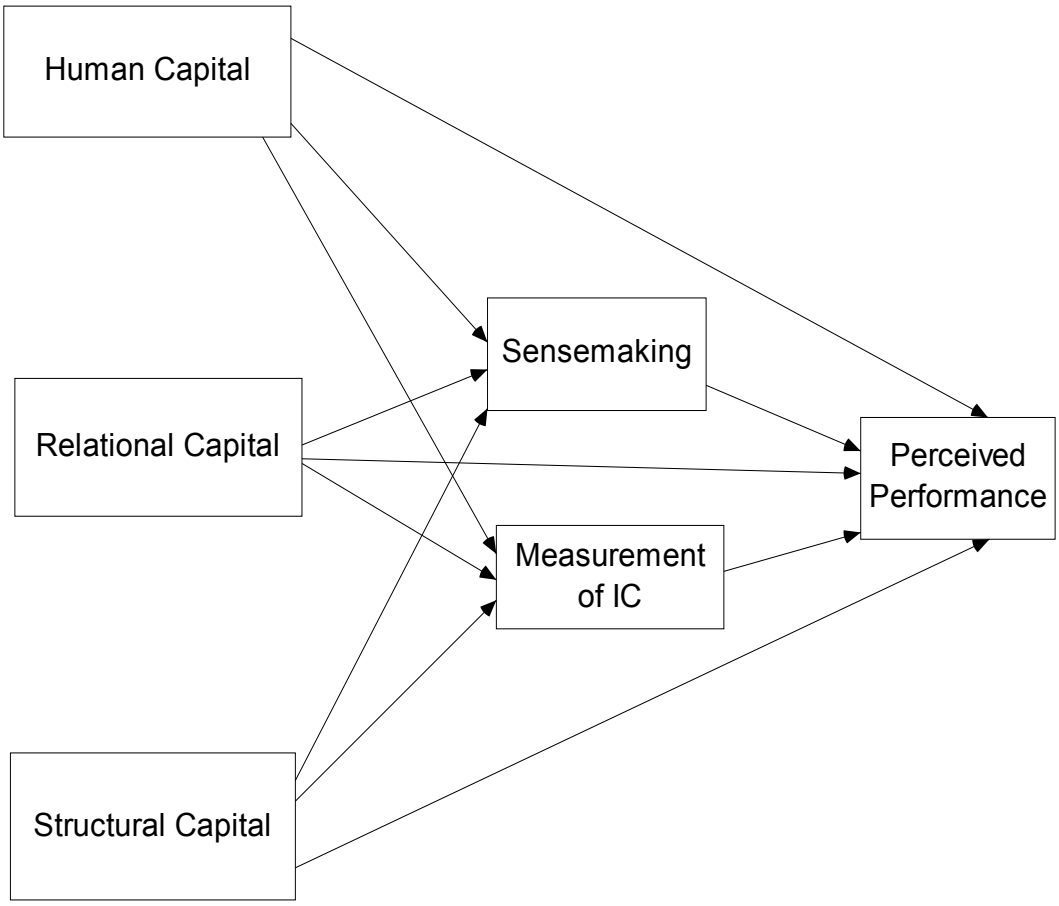

Figure 1: The hypothesized model

A survey, which comprised a seven point Likert scale questionnaire, was used as the data collection method. Empirical studies in IC were the primary source for obtaining survey items for each of the components. Additional items were sourced from empirical studies in strategic human resource management and strategic marketing management to complement insights from the IC research. The human capital construct was measured with 16 items, relational capital construct with 17 items and structural capital construct with 15 items, all modified for the hospitality industry. These items were drawn from empirical studies by Bontis (1998), Han et al (1998), Youndt and Snell (2004), Reed et al (2006), and Huang, Luther et al. (2007). The mediating variable of sensemaking was measured with eight items drawn from empirical studies by Thomas and McDaniel (1990), and Gioia and Thomas (1996). The second mediating variable Measurement of IC contained 13 items drawn from the work of Brander-Brown and McDowell (1995), Sveiby (1997) and Stewart (1997). The items used to measure

these mediating variables are described in Appendix 1. The dependent variable performance was assessed by 14 items, guided by the work of Brander Brown and McDonnell (1995), Fitzgerald and Moon (1996) and Bontis (1997). The survey instrument was piloted to a mixture of academics and professionals within the hospitality industry. The results of the pilot process were used to revise the questionnaire.

The telephone directories of the various territories within the Caribbean were used to provide the sampling frame. This provided a comprehensive list of all types of accommodations within the study area. The websites of the Caribbean Tourism Organisation (CTO) and the Caribbean Hotel Association were used to provide information on the number of rooms for each property identified in the sampling frame. The result of this activity provided a sampling frame of 1,291 properties. The list was reduced to 429 properties by excluding guesthouses and properties with less than 40 rooms.

Given the demographics and geography of the Caribbean, a local resident was used as the conduit for the distribution and return of the questionnaires from the 429 properties within the fifteen territories. The initial posting resulted in 46 questionnaires being returned. Follow up processes were implemented which resulted in 184 completed questionnaires which represented a 42 percent return rate. Non response bias was evaluated using Lambert and Harrington (1990) approach by conducting t-tests on twenty randomly selected survey items using thirty early respondents and thirty late respondents. The t-tests revealed no significant difference among the twenty survey items tested. These results do not rule out non-response bias, but suggest that non-response may not be a problem.

The data analysis approach consisted of both univariate and multivariate analysis techniques. The univariate analysis explored each variable in the data set separately to examine the range of values, measures of central tendency, measures of dispersion, skewness and kurtosis, and missing values to identify any major issues with the data set. The multivariate analysis techniques used were Confirmatory Factor Analysis (CFA) and Structural Equation Modeling (SEM). The confirmatory factor analysis (CFA) was performed through AMOSv7. The data were entered in AMOSv7 by using AMOS graphics to draw a path diagram identifying the observed and latent variables and the associated error terms. The bootstrapping ML option was used to estimate the model.

Several researchers argued the presence of three factors underlying the IC construct (Saint-Onge 1996; Bassi 1997; Stewart 1997; Sveiby 1997; Bontis 1998). In addition, the resource-based view interaction thesis posits that one component of IC can leverage the value of knowledge in the other components to such an extent that the relation of each component to the firm's performance is contingent on the knowledge value of the other components. Therefore, the first-order hypothesized structural model consisted of the covariance among the three IC constructs, HC, RC and SC. The IC measurement model consisted of 22 observed variables (indicators), 3 different latent variables being hypothesized and 22 error terms. The hypothesized model assumes that the three factors are correlated but the measurement error variances are not related resulting in zero correlated measurement errors. The mediating variables were also evaluated using CFA to assess the reliability and validity of the scale. The measurement model for the construct of sensemaking consisted of one latent variable, six manifest variables (indicators) and six error terms. The measurement model for the construct of measurement of IC consisted of five indicators, one latent variable and five error terms. The measurement model the dependent variable performance consisted of one latent variable, nine indicators and nine error terms.

SEM was then used to test the hypotheses derived using a partially aggregated model. The structural model consisted of the covariance among the IC constructs of HC, RC and SC; and the correlation among the IC constructs and the other latent variables of measurement of IC, sensemaking and performance. The constructs were measured using multi-item scales consequently a large number of indicators had to be dealt with. As a result; a latent variable model with multiple indicators might not be very helpful, since model complexity in terms of constructs and or indicators might prevent the finding of a model that fits the data. In several empirical studies, it was demonstrated that the use of item parcels as opposed to the individual items resulted in better model and data fit (Bandalos 2002; Bagozzi and Heatherton, 1994). Therefore, since it was not possible to test the measurement model based on the 42 indicators because of the lack of sufficient data to identify the model, item parcelling was used to aggregate manifest variables reducing the 42 indicators to 14 parcels. The measurement model consisted of six latent variables, seven error terms, and six manifest variables.

4. Results and dscussion

The results of the CFA in relation to the measurement models for the constructs of human capital, relational capital, structural capital, sensemaking, measurement of IC and performance were assessed for unidimensionality, convergent validity, average variance extracted and discriminant validity. The results revealed that the unstandardized coefficients exceeded twice the respective standard errors for the indicators thus suggesting evidence of convergent validity. Table 1 indicates that the factors have construct validity as construct reliabilities exceeded 0.79, variance extracted in excess of 0.4 and factor loadings in excess of 0.4. All error variances were positive and all critical ratios significant as they exceeded 1.96.

Table 1: Selected results from Amos

Indicator	Variance extracted	Minimum factor loading	Construct reliability	Cronbach's Alpha
HC	0.4836	0.607	0.808	.888
RC	0.4290	0.657	0.812	.888
SC	0.5587	0.624	0.796	.857
Sensemaking	0.5040	0.527	0.964	.838
Measurement of IC	0.4100	0.4916	0.858	.815
Performance	0.6462	0.713	0.966	.944

In relation to the IC components the chi-square difference test was used to assess discriminant validity. Using Anderson and Gerbing (1988) suggested chi-square difference test the results revealed that the X^2 value received from the unconstrained model was lower than the values received in the model where the trait correlations are constrained to unity. This indicated that the traits were not perfectly correlated and discriminant validity was achieved. Table 2 reports the results of the test.

Table 2: Ci-square difference test

RC-SC	Constrained to SC X^2 = 229.87 df = 65	Unconstrained X^2 = 134.59 df = 64
HC-SC	Constrained to HC X^2 = 529.08 df = 104	Unconstrained X^2 = 134.59 df = 64
HC-RC	Constrained to HC X^2 = 306.2 df = 90	Unconstrained X^2 = 162.5 df = 89

The structural models for the IC constructs of HC, RC and SC, the mediating variables of sensemaking and measurement of IC and the dependent variable performance were assessed using selected indices of GFI, IFI, CFI, RMSEA and X^2 presented in table 3.

Table 3: Selected Indices

Indicator	X^2	df	p	GFI	IFI	CFI	RMSEA
Human Capital	46.706	27	.014	.942	.972	.971	.063
Relational Capital	18.104	9	.034	.967	.947	.946	.079
Structural Capital	34.127	14	.002	.947	.975	.975	.089
Intellectual Capital	310.884	206	.000	.906	.944	.944	.054
Sensemaking	43.123	9	.000	.925	.924	.926	.147
Measurement of IC	6.728	5	.242	.984	.991	.991	.044
Performance	111.0	27	.002	.919	.930	.929	.073

The results would indicate that using the chi-square to test the statistical fit of the intellectual capital model would be described as poor (Chi-square 310.884, 206 df, p<.001). However,the subjective indices indicate a reasonably good fit for the model (GFI =.906; CFI = .944; RMSEA = .054). Table 3 indicated that the values for the GFI, IFI, CFI and RMSEA fall within the cut-offs as advocated by Bentler and Bonett (1980) and Bollen (1989). The selected indices for the structural model for sensemaking with the exception of the RMSEA fall within the accepted thresholds. The results of the RMSEA indicate that the structural model lacks an adequate fit, however, the other fit statistics used in assessing a model namely goodness of fit and baseline comparison indicated an acceptable fit and these were all above the required thresholds. The results for the structural models for measurement of IC and performance indicated that the models have an acceptable fit as all indices were within the acceptable thresholds. These results were used in conjunction with correlation analysis the results of which are presented in table 4.

Table 4 shows that all the variables have some form of association with the other variables that will form the model. HC and SC, two of the three independent variables are moderately associated with

perceived performance while RC has a weak but significant relationship with perceived performance. All three independent variables have a significant and strong association with the mediating variable of sensemaking. The variables HC and RC have a weak but significant association with measurement of IC. The two mediating variables of sensemaking and measurement of IC have moderate associations with perceived performance and these associations are significant at the p<.001 level. The results of this analysis indicated that a model to test the mediating roles of sensemaking and measurement of IC in relation to the components of IC and perceived performance could be developed.

Table 4: Pearson's correlation coefficients (N=182)

Variable	HC	SC	RC	SM	ICM	HPP
Human Capital (HC)						
Structural Capital (SC)	.528					
Relational Capital (RC)	.429	.583				
Sensemaking (SM)	.544	.772	.622			
Measurement (ICM)	.225	.489	.252	.348		
Perceived Performance (HPP)	.413	.480	.288	.432	.437	

The correlation statistics are all significant at p<.001.

The data for the model was entered in AMOSv7 by using AMOS Graphics to draw a path diagram identifying the 14 manifest variables resulting from parceling, 14 error terms associated with the manifest variables, six latent variables of which three were exogenous and three endogenous with the associated error terms. Testing for normality did not reveal any significant skewness or kurtosis for the parceled items. Three models were estimated using the ML estimation technique. The first model, partial mediation model, allowed for both direct and indirect effects of the Intellectual capital components of HC, RC and SC on performance (figure 2). The second model, positioned sensemaking and measurement of IC in fully mediatory role between the IC components and performance by deleting the paths between the IC components and performance. The third model, the direct effects model was derived by deleting the paths between the mediating variables of sensemaking and measurement of IC and performance.

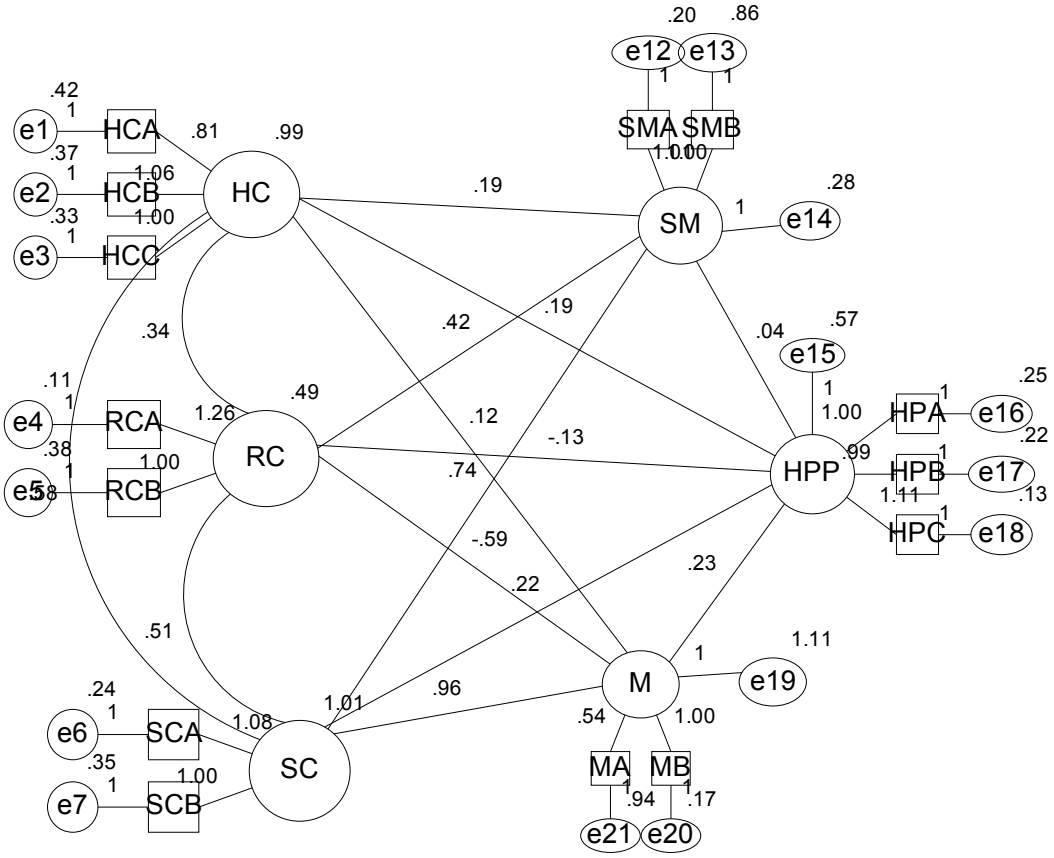

Figure 2: Partial mediation model

An evaluation of the observed X^2 for the structural models indicated that the models statistical fit for the sample data was relatively poor. The p-value of X^2 is sensitive to sample size, therefore the relative chi-square statistic measured by the CMIN/df, can be used (Kline 1998). The values of CMIN/df and other fit indices for the structural models met criteria for acceptable model fit. To evaluate competing nested hypothetical models against each other the X^2 difference test was used (Kline, 1998). The X^2 difference test comparing the full and partial mediation models was non-significant at the $p < 0.05$ level (ΔX^2, 3 d.f. = 5.337) whereas the X^2 difference test between the full mediation and the direct effects models was significant at the $p < 0.05$ level (ΔX^2, 1 d.f. = 6.282). The full mediation model was the preferred model and used to test for mediation based on Hair et al (2006) approach.

The results of the measurement model revealed, the standardized regression weights for the manifest variables exceeded 0.5, positive error variances, and 13 of the 14 critical ratios were significant at the $p<0.001$ level. The unstandardized coefficients were greater than twice their corresponding standard error and the r^2 for 13 of the 14 manifest variables exceeded 0.5. The r^2 for endogenous variables exceeded 0.35 and the standard errors and critical ratios were all significant at the $p<.001$ level. The results of the tests and selected indices for the models are presented in table 5.

Table 5: Model cmparisons

Model	X^2	df	ΔX^2	GFI	TLI	CFI	RMSEA	CMIN/df
Full Mediation	140.345	66		.912	.944	.959	.078	2.126
Partial Mediation	135.008	63	5.337	.915	.943	.960	.079	2.143
Direct Effects	146.636	65	11.628	.909	.937	.955	.083	2.256

In evaluating sensemaking as a mediating variable table 6 presents the standardized path coefficients for the paths between the mediator sensemaking and the components of IC and the dependent variable performance.

Table 6: Standardized path coefficients for Sensemaking

	Standardized path coefficients (given if significant at 0.05 or less)			
	Dependent variable			
Independent Variable	**Step 1** Perceived performance	**Step 2** Sensemaking	**Step 3** Perceived performance	Interpretation
HC	.220 *	.158 *	.197 *	
RC	.250 *	.242 *	-.093 (ns)	
SC	.583 *	.608 *	.229 *	
Mediator				
Sensemaking			.054 (ns)	Significance is not achieved, no form of mediation.

* significant at 0.05 or less ns – not significant

Step 1 – Path coefficients between HC, RC and SC and performance

Step 2 – Path coefficients between HC, RC and SC and sensemaking (mediator)

Step 3 – Path coefficients between HC, RC and SC and performance with sensemaking as mediator

The results indicated significant relationships between the components of IC and sensemaking as well as significant relationships between the components of IC and performance when the sensemaking path is deleted. The beta coefficient linking the construct of RC to sensemaking indicates a moderate relationship that is positive and statistically significant ($p <0.01$ $\beta=0.423$; $t=3.111$). The beta coefficient linking the construct of SC to sensemaking is positive and statistically significant at a p-value < .001 ($\beta=0.738$; $t=6.921$) indicating a strong relationship, whereas a weak but significant relationship exists between HC and sensemaking. The beta coefficient linking the two constructs is ($\beta=0.195$; $t=2.565$; $p <.01$). This overarching result has more important implications in terms of the constituent linkages among the sensemaking component processes. The findings of significant relationships between sensemaking and the IC components is not surprising in that the IC literature has shown that there is a relationship among the IC components (Bontis et al 2000, Chen et

al 2004, Reed et al 2006) and this relationship would be achieved through managers interpreting, understanding and creating sense for themselves based on the IC information.

The beta coefficient linking the sensemaking construct to performance was insignificant, the p-value =0.790 (β=0.042; t=0.267). This does not support the findings of a prior study by Thomas et al (1993) which found links between sensemaking activities and organisational performance. This finding also suggested that sensemaking does not mediate the components of IC with performance.

In evaluating measurement of IC as a mediating variable table 7 presents the standardized path coefficients for the paths between the mediator measurement of IC and the components of IC and the dependent variable performance.

Table 7: Standardized path coefficients for measurement of IC

	Standardized Path coefficients (given if significant at 0.05 or less)			
	Dependent variable			
Independent Variable	Step 1 Perceived performance	Step 2 Measurement of IC	Step 3 Perceived performance	Interpretation
HC	.220 *	.092 (ns)	.197 *	No mediation
RC	.250 *	-.313 *	-.093 (ns)	Full mediation
SC	.583 *	.731 *	.229 *	Partial mediation
Mediator				
Measurement of IC			.318 *	Significance achieved mediation is possible

* significant at 0.05 or less

Step 1 – Path coefficients between HC, RC and SC and performance

Step 2 – Path coefficients between HC, RC and SC and measurement of IC (mediator)

Step 3 – Path coefficients between HC, RC and SC and performance with measurement of IC as mediator

The non-significant path between measurement of IC and HC would indicate that there is no mediatory role of measurement of IC between HC and performance. The non-significant path between RC and performance in step 3, while the paths between RC and measurement of IC in step 2 and between RC and performance in step 1 are significant this would indicate full mediation. In the case of SC and measurement of IC being a mediator, all three paths are significant at the 0.05 or less level together with the standardized path coefficient in step 1 being higher than in step 3 this supports a hypothesis of partial mediation.

HC had a direct positive effect on Performance as the standardized parameter estimate between the two constructs was 0.197 with a critical ratio of 2.124 and a p-value of 0.034. This finding corroborates that of Youndt and Snell (2004) who reported in their study that HC was significantly related to performance (β= 0.211, $p<0.05$) and Wang (2008) who found a significant relationship between HC and the market value of the company. Other researchers found an association between HC and Performance but this influence was indirectly through the other IC components (Wang and Chang 2005; Do Rosario Cabrita and Bontis 2008). SC had a direct positive effect on Performance which supports the literature as Huang and Liu (2005) found that the interaction between innovation capital and IT capital resulted in a positive effect on firm's performance.

There is a signification association between the construct of Measurement of IC and the constructs RC and SC, but the association between HC and Measurement of IC is not significant. This finding partly supports the literature as a prior study indicated significant relationships between the assertion of performance measures captured in IC and the respective IC components of SC (0.608), RC (0.502) and HC (0.512) Tayles et al (2007). Further analysis revealed that RC does not directly affect performance as the standardized parameter estimate between the two constructs is negative (0.126) with a critical ratio of -0.753 and a p-value 0.451. This finding does not corroborate the majority of other empirical studies that tested the direct affect of RC on Performance and found a positive and

statistical significant association between the two constructs (Youndt and Snell 2004; Wang and Chang 2005; Wang 2008). Additionally, Do Rosario Cabrita and Bontis (2008) using the same performance measure reported a positive and statistical significant association (β =0.291; t=4.578; p<0.001) between the two constructs in relation to the Portuguese Financial Industry.

The SEM results also revealed an indirect relationship between the SC construct and Performance mediated by Measurement of IC. This finding supports that of Widener (2006) who developed a SEM linking SC to Performance mediated by employee and operational measures; and found that SC was indirectly associated with performance through the employee and operational measures. The direct effects model the path coefficient between the two constructs has a standardized parameter estimate of 0.229 that is positive, with a critical ratio of 1.105 and p-value=0.269. This insignificant direct effect between SC and performance implies that internal organisational systems, repositories of knowledge, routines and procedures, and the information systems designed to capture, store and disseminate the organizational explicit knowledge do not appear to impact directly on the performance of the hotels in the Caribbean. This finding which is similar to that of Cleary (2009) does not corroborate other empirical studies (Bontis et al 2000; Ordonez de Pablos 2002; Do Rosario Cabrita and Landeira Vaz 2006).

The results indicated that the path coefficient between measurement of IC and performance was 0.229, which was statistically significant ($p < .01$). This implied a modest but significant relationship between the measurement of IC and performance. This finding corroborates a number of other empirical studies that referred to performance measures (Van der Stede et al., 2006; Olson and Slater, 2002; Hoque and James, 2000; Lingle and Schiemann, 1996 and Hyvonen, 2007). Widener (2006) argues that firms that establish a performance measurement system that provide top managers with critical information pertaining to its resources and capability will positively affect their performance.

5. Conclusion

This research sought to examine the impact of IC on firm performance mediated by measurement of IC and sensemaking in the Caribbean. While a rich source of theoretical and normative research exists, the paucity of empirical research on the topic in developing countries created the catalyst and provided few leads on how to operationalise the constructs of the components of IC in order to study their impacts. The results achieved found theoretical support, adding a degree of validation to the methods adopted. Some unexpected results were also investigated, finding viable explanations in the interaction effects between the main variables. The study provided a unique framework, model, survey instruments and empirical analysis to measure relationships among the constructs of HC, RC, SC, measurement of IC, sensemaking and performance. Empirical results of the current study provide evidence that HC impacted directly on performance; RC and SC impacted indirectly on performance being mediated by measurement of IC; and HC, RC and SC have a positive and significant relationship with sensemaking.

The empirical findings have provided additional precision to the underlying theories. This study provided an 'all-in-one' model and methodology for testing relationships among the components of IC, sensemaking, measurement of IC and performance. The uniqueness of this study rests in the fact that it offers a methodology for examining a new combination of constructs arranged in a specific pattern. These ideas and contributions are special, since a newly developed model was added to the IC literature, in that, this study provided a model indicating how IC can be leveraged to have a significant impact on performance. These findings show that hotels can build this strategic capability by management effectively deploying practices which facilitate the interaction and interrelationships among the three components of IC.

Appendix 1

Sense-making Scale

SM1	One or two members of the team dominate the decision making	#
SM2	In the hotel there is free and open exchange of idea among members of the team	
SM3	Decision making in this hotel is participative	
SM4	Committees, cross functional teams, task groups are regularly formed to deal with strategic issues.	
SM5	All members of the management team participate in strategic decision making on a regular basis	

SM6	Decision making in the hotel is interactive	
SM7	When faced with a problem/situation I use my previous experience to solve the problem	#
SM8	Written rules and procedures are followed when addressing issues	

Items removed after CFA due to factor loadings below 0.5

Measurement of IC Scale

M1	We have greatly reduced the time it takes to resolve a customer problem	#
M2	Our hotel has a high turnover of Tour companies and other travel affiliates	#
M3	The time it takes to go through a process (check-in/out, booking, cleaning, serving) has been decreasing over the years.	#
M4	Our hotel tracks the number of hours of training for each employee	#
M5	Customer satisfaction	
M6	Employee satisfaction	#
M7	Customer complaints	
M8	Customer retention	
M9	Employee training	
M10	Market share	
M11	We take action in the organisation because we know that we are being evaluated	#
M12	The ratio of revenue earn per employee in the hotel has been increasing over the past two years	#
M13	We quite often use “mystery guests” to evaluate our customer service	#

Items removed after CFA due to factor loadings below 0.5

Items 5 – 10 were measured using a seven point Likert Scale where respondents were asked “In your assessment, what is the extent to which the following are measured in your hotel? Please use the scale [Infrequently = 1, very frequently = 7]”. The other items were assessed using a seven point Likert scale using 7 for strongly agreed and 1 strongly disagreed.

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