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Intellectual Capital Profiles: Empirical Evidence of Malaysian Companies

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In the competitive business environment, intellectual capital has been proven as an essential element for firms' survival and competitive advantage. However, one of the challenges in managing intellectual capital is when the managers are not clear that their firms possess valuable resources which could lead to success of new strategies. The study investigates the relationships of the diverse intellectual capital profiles with firms' performance. The study found that most firms in Malaysia concentrate on only one dimension of intellectual capital which is high in human capital only and high in structural capital only. In addition, firms with high level of overall intellectual capital exhibit high firms performance compared to those with lower overall intellectual capital and those which are high in one form of intellectual capital. This implies that the constant interaction and a well-balanced combination of the three intellectual capital construct enable healthy business growth. The findings signify the importance of firms to plan strategies that mobilise the full potential of their intangibles, in particular intellectual capital.

1. Introduction

Intellectual capital is new in Malaysia and its significance as a new wealth of the businesses and nation has yet to be recognized. Nonetheless, the phenomenon of rapid technology advancement coupled with high capital investment in human capital has led to the growing interest and recognition of intellectual capital. However, we cannot assume the perception or receptive on intellectual capital in Malaysia is similar with the Western countries. This is due to the fact that Asian cultures are pluralist and unique. Their norms, beliefs and values on knowledge and the work culture might be distinct from the West due to influence of religion and ethnicity.

1.1 The Problem Statement and Motivation of the Study

One of the challenges in managing intellectual capital is when the top management is unclear that their firms possess valuable resources which could lead to success of new strategies. This is due to the fact that they do not understand the nature and value of intellectual capital, how to create, extract and optimise value and wealth through intellectual capital (Al-Ali 2003). Earlier researchers (Riahi-Belkaoui 2003;

Wang & Chang 2005) proved that intellectual capital is essential in the firm survival and competitive success as there is a significant link between intellectual capital and firm performance. The competitive success of companies depends more on the strategic management of intellectual capital and less on the strategic allocation of physical and

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financial resources. The fact that intellectual capital reinforces firm future value understanding on how differences in intellectual capital profile drives the firms performance is imperative.

The human capital theorists (Schultz 1961; Youndt, Subramaniam & Snell 2004) argue that the growth in employee's skills, knowledge and competency can most likely transform into enhancement of a firm performance. Earlier researchers (Wright, McMahan & Williams 1994; Khandekar & Sharma 2005) proved that human resource capability was a significant predictor to sustained competitive advantage. However, the intellectual capital researchers (Bontis 1998; Reed 2000; Youndt 1998) claim that constant interplay among the three individual capital offer the firms with sustain competitive advantage, rather than individual capital solely.

In addition, Youndt et al. (2004) highlight that if intellectual capital components are treated as individually, the whole concept of intellectual capital might be lost. Youndt et al. (2004) suggest that examination of multi-dimensional nature of intellectual capital is important to assist in understanding how intellectual capital develops and drives performance.

Previous studies have investigated the relationship between intellectual capital and firms performance. Limited studies have examined the impact of differing intellectual capital profiles on firms performance. Consequently, the current research examines from perspective of Malaysian public listed companies whether companies which are high in overall intellectual capital perform better than companies which are only high in certain profile of intellectual capital, such as high in human capital or relational capital or structural capital only. The findings are important to guide firm in the investment decisions in the course of developing stocks of intellectual capital which drives firm performance.

1.2 Objectives of the Study

To summarise, the study aims to achieve the following objectives:

1. To examine the various intellectual capital profiles of Malaysian public listed companies.
2. To investigate the relationships of the diverse intellectual capital profiles with firms performance.

1.3 Significance of Research

The findings on the associations of the intellectual capital profiles with firms performance may help the managers in making investments decision and hence improve the corporate strategic planning. It will also assist in enhancing the long term strategic focus and short term operational capabilities. The result offers some analysis or guide to the managers on understanding the types of investments that assist companies to develop the entire stock of intellectual capital and their impact on performance (Youndt et al.

2004). On the whole, firms and nations will benefit from better understanding and managing of their intangible assets (Fernstrom, Pike & Roos 2004).

The remainder of this paper is organised as follows. Section 2 presents the literature review and hypotheses development. The next section, Section 3 details the research design of the study. This is followed by Section 4 which presents the findings and discussion of the results. The last section concludes the research and offers limitation and future direction of the study.

2. Literature Review and Hypotheses Development

2.1 Definition of Intellectual Capital

Scholars of intellectual capital have collectively define intellectual capital as firm sum of knowledge (Stewart 1997; Ward 2000; Tayles 2004; Youndt et al. 2004). Stewart (1997) describes intellectual capital as the knowledge, information, intellectual property and experience that can be put to create wealth. On a similar viewpoint, Ward (2000) expresses that intellectual capital as the sum of an enterprise collective knowledge, experience, skills, competences, and ability to acquire more. Tayles (2004) considers intellectual capital as the total stock of human capital or 'knowledge-based equity' that a company possesses which a firm is able to leverage in the process of conducting business to gain competitive advantage (Youndt et al. 2004).

Youndt (1998) expresses that a firm intellectual capital is the "aggregate stocks and flows of its potentially useful skills, knowledge and information"(p. 15). Intellectual capital does not simply comprise employees' knowledge and skill (stocks), but also include the entire firm processes, procedures and information base (stocks). In addition intellectual capital involves the capacity to progress and leverage or control knowledge (flows). Moreover, intellectual capital according to Shakina and Barajas (2012) has the capacity to increase the effectiveness of other resources including tangible assets that flow benefits in the future. This is because, intellectual capital gives the opportunities to organisations to create new capabilities and improve the organisational performance by enhancing teamwork, strengthening expertise of employment, making comprehensive recruitment and remuneration systems (Ahmadi et al. 2011).

Most definitions of intellectual capital described above compose of three interrelated elements ('tripartite model"). Intellectual capital is the sum of customer capital , structural capital and human capital (Mayo 2000; Dzinkowski 2000; Stewart 2002; Al-Ali 2003). Human capital is the foundation of intellectual capital (Chen et al. 2004; Ahmadi et al. 2011) and does not only comprise tangible physical assets of the firms such as the number of employees in the firm (Reed 2000) but also include the intangible element which originates from competence, attitude and intellectual agility (Roos et al. 1997). Therefore, human capital constitutes the skills and knowledge of employees which could be further developed through trainings (Joshi et al. 2010) that could express the organisation's value (Alipour 2012).

Structural capital conversely, comprises supportive infrastructure of human capital (Edvinsson & Malone 1997), a good working system (which includes information system, operation process) and good corporate culture. Structural capital which also consists of innovation and improvement processes is perceived as the critical link that enables intellectual capital to reach its fullest potential. Structural capital is defined as knowledge which stays in the firm at the end of the working day which includes processes, information systems, databases etc. The current study adopts the Skandia's definition for structural capital. The structural capital (referred as organisational capital in the Skandia) comprises innovation capital and process capital (Edvinsson & Malone 1997).

Relationships have been defined by Bontis et al. (2000) under customer capital, relationship capital (Tseng & Goo 2005). Customer capital includes customer relations, feedback, and input as to the product, service, suggestions, experience and tacit knowledge. It is concerned with the networking of associates which include loyalty and satisfaction of these associates with the firm. Thus, creating and developing client satisfaction, loyalty and longevity have become the main concern in relational capital (Martins et al. 2010). It is because organizations are considered as systems that are dependent on their relations with their environment, not on their own (Ahmadi et al. 2011). Relational capital is defined as resources associated to the external relationships embedded in customers, suppliers, the government or related industry associations. Customer is defined broadly to include suppliers, distributors, and other players such as the government or related industry associations who can contribute to the value chain (Al-Ali 2003; Bontis et al. 1999).

A number of research was conducted in Malaysia (Bontis et al. 2000; Hamzah & Selamat 2009; Tayles et al. 2007; Ting & Lean 2009) to explore the relationship between intellectual capital and companies performance. Bontis et al. (2000) investigated the inter-relationship among human capital, customer capital, structural capital and business performance for the service and non-service Malaysian industries. The investigation on the inter-relationships is important to observe the synergistic effect among the intellectual capital components and their link to performance. The results of the study indicated that regardless of industries, there is a positive relationship between human capital and customer capital. These studies however, only focused on the effect of intellectual capital components towards firms performance and did not highlight on the influence of intellectual capital profiles in relation to performance.

2.2 The Development of Hypothesis

The knowledge-management approach highlights that the close interaction and a well-balanced combination of the three intellectual capital component enables value creation from business activities and anticipation of business growth (Hermans & Kauranen 2005). This statement is supported by Bontis (1998) that a constant interplay among human, structural and customer capital must be present in order for an organisation to leverage off its knowledge base. Isolated stocks of knowledge that reside in the employees' minds which are never codified into organisational knowledge will never positively affect business performance. Furthermore, if a company has ample human capital represented by labour with a high level of expertise, the value creation is not

guaranteed if production or marketing processes are not well organized or customers are not reached (Hermans & Kauranen 2005). Studies have proven the importance of significant interdependency between intellectual capital in creating firms values (Bontis et al. 2000; Bollen et al. 2005; Engstrom et al. 2003).

Earlier researchers have posited an independent relationship between intellectual capital components and firm performance (Lado & Wilson 1994; Youndt 1998). However, Bontis (1998); Reed (2000); Youndt et al. (2004) argued that the interaction among the intellectual capital components offer the firm with a sustainable competitive advantage rather than the individual component used independently. The empirical results of Bontis (1998) implied that a constant interplay among human, structural and customer capital is required in order for a firm to leverage off its knowledge base. There exist interrelated associations between the three domains of intellectual capital which finally influenced their relationship with firm performance. This means that human capital will reach its potential with the support of structural capital and customer capital (Bollen et al. 2005). Johnson (1999) as cited by Tseng and Goo (2005) suggested that human capital affects organisational capital and innovation capital (in this study referred as structural capital). In turn, organisational capital and innovation capital strengthen the relationship capital (customers capital). In Youndt et al. (2004), the research revealed that the high overall intellectual capital profile firms outperformed the low overall intellectual capital profile firms in respect of financial returns (ROA and ROE) and Tobin's q.

Therefore, treating each of intellectual capital component individually does not explicitly acknowledge the potential of coexistence among the differing types of intellectual capital (Youndt et al. 2004). There actually exist synergistic effects among the intellectual capital components in aggregate which will increase firms performance (Bontis 1998; Youndt et al. 2004; Wang & Chang 2005).

Consequently,

Hypothesis 1: Firms with higher level of overall intellectual capital will exhibit higher firms' performance as compared to those with lower overall intellectual capital level.

Hypothesis 1(a): Firms with higher level of overall intellectual capital will exhibit higher firms performance as compared to firms with higher intellectual capital level in human capital only and;

Hypothesis 1(b): Firms with higher level of overall intellectual capital will exhibit higher firms performance as compared firms with higher intellectual capital level in structural capital only.

3. Research Design

3.1 Sample and Companies Profiles

Sample of the study covers the companies listed on the main and second board of Bursa Malaysia and MESDAQ Trade. A total of 1,424 questionnaires were distributed to

the persons most knowledgeable in the firm on the area of human resources, accounting/ finance, business development including the marketing and corporate division and the firm processes which incorporates the research and innovation activities. Apart from adapting questionnaire items from established intellectual capital and established organization culture research, the questionnaire items were built based on the information gathered from the two focused group interviews. One hundred and fifty five (155) questionnaires were returned. However, for the purpose of the current study only one hundred and forty four (144) questionnaires can be used for further analyses, which resulted in a response rate of 10%.

As shown in Table 1, looking from the sector per se, based on the total respondents of 155 questionnaires received, high participation was received from the industrial product sector (31.6%) and MESDAQ companies (31%). The rest of the participation was received from consumers product (14.2%), trading services (11.0%), technology (7.1%) and finance (5.1%).

High participation from the MESDAQ firms gave the impression of high awareness on the intellectual capital issues in this sector. This is not surprising as the companies are heavily involved in the knowledge development, technological advancement, innovative activities, research and development.

Table 1: Companies Profiles According to Sectors

Sectors	No.	%
Industrial Product	49	31.6
MESDAQ	48	31.0
Consumers Product	22	14.2
Trading Services	17	11.0
Technology	11	7.1
Finance	8	5.1
Total	155	100.0

Further, the companies profiles are discussed based on the number of full time employees and the organisation years. Table 2 indicates that in terms of number of full time employees, 25.5% of the total respondents employ less than 100 full-time employees, 16.7% use full-time employees within 100 to 249 employees, 13.5% employ full time employees within 250 to 499, 18.6% employ full time employees within 500 to 999, whereas 20.5% use full time employees within 1000 to 4999 and 5.2% employ full time employees of 5000 and above.

The current research defines small size category as company having less than 500 employees, whilst larger scale refers to that of having more than 5,000 employees. Majority of the MESDAQ companies in the sample which is, 91.6%, and 43.8% of the trading services companies are in small size category in terms of the number of employees. Meanwhile 25% of the trading services companies employ larger scale of full-time employees. Majority of the technology (72.7%), industrial product (51%), consumers' product companies (63.6%) and finance companies (55.6%) in the sample

employ human resources in medium scale within 500 to 4,999 personnel. Majority of consumers' product companies (59.1%), utilise employees around 1,000 to 4,999 workforces.

Table 2: Industry Sectors and Number of Full Time Employees

	No. of full time employees												
Industry	< 100		100-249		250-499		500-999		1000-4999		> 5000		Total
	no	%	no	%	no	%	no	%	no	%	no	%	
MESDAQ	30	62.5	10	20.8	4	8.3	3	6.3	1	2.1	-	-	48
Technology	-	-	1	9.1	2	18.2	6	54.5	2	18.2	-	-	11
Industrial Product	7	14.3	8	16.3	8	16.3	14	28.6	11	22.4	1	2.0	49
Consumers Product	1	4.5	3	13.6	2	9.1	1	4.5	13	59.1	2	9.1	22
Finance	-	-	2	22.2	1	11.1	3	33.4	2	22.2	1	11.1	9
Trading Services	1	6.3	2	12.5	4	25.0	2	12.5	3	18.8	4	25.0	16
Total	39	25.5	26	16.7	21	13.5	29	18.6	32	20.5	8	5.2	155

Table 3 presents the sample firms data in terms of the organisation age. Within the sample firms, 39.1% has been established for more than 25 years. Majority of the finance companies (77.8%), 47.4% of consumers' product companies, 45.5% of the technology, 55.6% of the industrial product and 40.0% of trading services companies have been established for more than 25 years. For MESDAQ companies, majority of the companies (65.9%) have been in operation for more than 10 years and are mainly (22.7%) within the range of 10 to 14 years.

Table 3: Industry Sectors and Organisation Age

	Organisation age												
Industry	<5 years		5 to 9 years		10 to 14 years		15 to 19 years		20 to 24 years		>25 years		Total
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.
MESDAQ	6	13.6	9	20.5	10	22.7	6	13.6	9	20.5	4	9.1	44
Technology	-	-	-	-	3	27.3	-	-	3	27.3	5	45.5	11
Industrial Product	-	-	2	4.4	8	17.8	4	8.9	6	13.3	25	55.6	45
Consumers Product	1	5.3	1	5.3	2	10.5	2	10.5	4	21.1	9	47.4	19
Finance	-	-	-	-	-	-	-	-	2	22.2	7	77.8	9
Trading Services	-	-	-	-	2	13.3	3	20.0	4	26.7	6	40.0	15
Total	7	4.9	12	8.4	25	17.5	15	10.5	28	19.6	56	39.1	143

3.2 Independent Variable

The research defines intellectual capital comprises three construct i.e. human capital, structural capital and relational capital. The measurement of each intellectual capital

construct was adapted from past empirical intellectual capital research (Youndt 1998; Reed 2000). In addition, some new measurement items were included to further capture the fundamental nature of intellectual capital. The independent variables are measured based on managers' perception on the intellectual capital level in the organisation. Forty two statements pertaining to intellectual capital (fourteen for each dimension) are included in the questionnaire to which respondents are required to indicate the extent of agreement from strongly disagree (1) to strongly agree (7). Table 4 indicates the measurement items of human capital, relational capital and structural capital.

Table 4: The measurement items of human capital, relational capital and structural capital

Human capital	Relational capital	Structural capital
Highly skilled (HC1)	Skilled at collaborating (RC1)	Uses patents/ licence to store knowledge (SC1)
Creative (HC2)	Share information and learn from others (RC2)	R&D expenses is higher (SC9)
Widely considered best in our industry (HC3)	Interact and exchange ideas (RC3)	Benefits from the research and development (SC10)
Expert in their particular job (HC4)	Capacity to partner to develop business solutions (RC4)	Unique to the organisation (scunique)
Able to develop new ideas (HC5)	Trust in employees (RC14)	Difficult to buy away (scbuy)
Focus on the quality of service provided (HC6)	Unique to the organisation (rcunique)	Difficult to imitate (scimitate)
Undergo succession training programme (HC7)	Increasingly select our product or services (RC6)	Provide competitive advantage (sccompadv)
Generally satisfied working in the organisation (HC11)	Suppliers constantly do business (RC7)	Support development of ideas (SC7)
Satisfied with the job environment (HC12)	The ratio of steady customers increases (RC8)	Support development innovation activities (SC8)
Satisfied with the evaluation system (HC13)	Generally satisfied with product and services (RC9)	Increasingly reduce costs (SC5)
Satisfied with the remuneration scheme (HC14)	Constant measure of customers satisfaction (RC10)	Increasingly reduce time (SC6)
Loyal to the organisation (HC8)	Satisfied with timeliness of product or service delivery (RC11)	
Maintain good relationships with their peers (HC9)	The ratio of new customers against customers lost increases (RC12)	
Motivated (HC10)		
Provide competitive advantage over competitors (hccompadv)		

3.3 Dependent Variable

The firms performance measures required respondents to compare their firm performance with the performance of the firm competitor based on five dimensions i.e. profitability, quality, sales growth, employee satisfaction and overall performance (Denison & Mishra 1995; Bontis 1998). The performance is measured in seven likert scale from 'not at all well' (1) to 'perfectly well (7) and seven likert scale from 'strongly disagree' (1) to 'strongly agree (7).

3.4 Control Variables

The current study controls size through the number of full time employees (Huang & Liu 2005; Juma & Payne 2004) and age through number of years in operation. Firm size may influence the growth and degree of intellectual capital through increased access to resources and market power. Both age and size have been found to vary with firms performance (Wang & Chang 2005; Juma & Payne 2004).

4. Results and Discussion

4.1 Descriptive Analysis

The descriptive statistics analysis (as shown in Table 5) and the reliability tests indicate that the data used for the study meet the levels of reliability required for significant analysis. In general the overall Cronbach alpha coefficients of intellectual capital and its dimensions (human capital, relational capital and structural capital), and firm effectiveness are above 0.8 which confirm the internal consistency of the scales employed in the research instrument.

Table 5: Descriptive statistics

	Mean	5% Trimmed Mean[1]	Median	Std. Dev.	Skewness	Std. Error	Kurtosis	Std. Error
Human capital	4.9456	4.9434	5.0000	.71167	.023	.201	-.159	.399
Relational capital	5.1296	5.1151	5.0769	.71830	.258	.201	-.073	.399
Structural capital	4.7578	4.7661	4.6923	.74314	.067	.201	-.298	.399
Firms Effectiveness	5.1469	5.1598	5.1818	.84485	-.229	.201	-.342	399
LN Organisation year	2.9430	2.9709	2.9957	.72109	-.536	.206	.368	.408
LN No of employees	5.7413	5.7044	5.9915	1.53288	.174	.206	-.089	.408

4.2 Multicollinearity

Collinearity Diagnostic Test is also applied to examine the existence of multicollinearity problems in the model. A measure of multicollinearity is the variance inflation factor (VIF) (Hair et al. 2006). Pallant (2001) highlights that if the tolerance value is very low, which is near 0, this shows the multiple correlation with other variables is high, which suggests the possibility of multicollinearity . According to Hair et al. (2006), a common cutoff threshold is tolerance value of more than 0.10, which corresponds to a VIF value of less than 10, is the acceptable range of collinearity in regression analysis.

As shown in Table 6, there is no indication of the existence of severe multicollinearity in the relationships between the variables in the model. All of the variables have tolerance values more than 0.10 and the VIFs value of less than 10. Therefore, the results suggest that multicollinearity is not a problem in the model.

Table 6: Collinearity Diagnostic Test

Variables	Tolerance value	VIFs value
Human capital (HC)	.463	2.161
Relational capital (RC)	.367	2.722
Structural capital (SC)	.428	2.338

4.3 Intellectual Capital Profiles

This section highlights the results of Hypothesis 1. The current research posits that firms with high intellectual capital inherently have strong resources which are the sources of sustained competitive advantage, as compared to firms with low intellectual capital or firms which possess high intellectual capital in only human, structural and relational capital. This is due to the fact that firms which possess all the intellectual capital components are endowed with more strength to compete in the business as compared to those which possess only a single intellectual capital resource.

In order to examine the H1, the cluster analysis was performed to group the data according to their characteristics. Cluster analysis is a multivariate analysis which classifies its objects (in this case respondent) based on the characteristics they possessed (Hair et al 2006). In this section the respondents are grouped based on their scores on human, relational and structural capital.

Table 7 presents the cluster analysis of intellectual capital profiles based on the perceptions of 144 managers. K-Means Cluster analysis was applied to form the cluster membership (Youndt et al 2004). Cluster 1 and 2 were one-dimensional, with Cluster 1 exhibiting high in human capital and Cluster 2 exhibiting high in structural capital. On the other hand, Cluster 3 and 4 demonstrated high overall intellectual capital and low overall intellectual capital respectively.

Table 7: Cluster analysis of intellectual capital profiles

Dimensions of intellectual capital	Cluster/ intellectual capital profile mean*			
	1	2	3	4
Human Capital	-.13	.07	1.19	-1.20
Relational Capital	-.30	.16	1.23	-.89
Structural Capital	-.62	.47	.94	-.77
Profile name	High in human capital	High in structural capital	High overall intellectual capital	Low overall intellectual capital
n (Total = 144)	52	60	17	15
n (percentage)	36%	42%	12%	10%

* The means of all variables are centred

Box's Test of Equality of Covariance Matrices confirmed that the observed covariance matrices of the dependent variables were equal across groups. This assumption has not been violated at an alpha level of 0.05. Levene's Test of Equality of Error Variances indicated that the error variance of the dependent variable was equal across groups. The multivariate tests of significance revealed that there were significant differences in the dependent variable across intellectual capital profiles. Pillai's Trace Criterion indicate F value = 9.833, sig. at $p < .001$.

The MANOVA tests indicated that intellectual capital profile significantly influence firms performance, $F(3,141) = 31.934$, $p < .001$. No significant main effects were found on the control variables, firm year and number of employees which means neither age nor size exhibited significant differences across the intellectual profiles.

The Bonferroni multiple comparison tests revealed significant pair wise differences as summarised in Table 9. For more detailed results on the mean differences please refer to Table 9.The multiple comparison tests in Table 9 showed that high overall intellectual capital profile (cluster 3) exhibited significantly higher firms performance than the low overall intellectual capital (cluster 4) with significant mean difference of 1.9077, significant at $p < 0.05$.

Table 8: Pair wise investment differences across intellectual capital profiles

Variable	Significant contrasts
Firms performance	High overall intellectual capital > Low overall intellectual capital
	High overall intellectual capital > High human capital
	High overall intellectual capital > High structural capital
	High structural capital > High human capital
	High structural capital > Low overall intellectual capital

Given the significance statistical evidence, the above results provides support for H1 that firm with higher level of overall intellectual capital will exhibit higher firms performance as compared to those with lower overall intellectual capital level.

Further to the above, the following hypotheses were examined.

Hypothesis 1(a): Firms with higher level of overall intellectual capital will exhibit higher firms performance as compared to firms with higher intellectual capital level in human capital only and;

Hypothesis 1(b): Firms with higher level of overall intellectual capital will exhibit higher firms performance as compared to firms with higher intellectual capital level in structural capital only.

The synergistic impact of combination of the three differing type of intellectual capital on firms performance will outperform the effect of individual intellectual capital (human or relational or structural capital) on firms performance. Thus, Bonferroni multiple comparison tests also indicated that the high overall intellectual capital profile (cluster 3) had significantly higher firms performance than the high in human capital profile(cluster 1) with mean difference of 1.5312, significant at $p < 0.05$ and the high in structural capital profile (cluster 2) with mean difference of 0.8413, significant at $p < 0.05$. These provide evidence for H1(a) and H1(b) that firm with higher level of overall intellectual capital will exhibit higher firms performance as compared to firms with higher intellectual capital level in human capital and structural capital only respectively.

Similar tests of analysis revealed that the high structural capital profile (cluster 2) had higher significant firms performance mean differences with the high in human capital profile (cluster 1) and low overall intellectual capital profile (cluster 4). The mean differences were 0.6898 and 1.0664 respectively, significant at $p < 0.05$.

No significant mean difference found with the high human capital (cluster 1) profile and low overall intellectual capital profile (cluster 4). Given the significance statistical evidence, the results indicate that H1(a) and H1(b) are supported.

Table 9: Multiple Comparisons of mean difference between the IC profiles Bonferroni

Dependent Variable	(I) Cluster Number of Case	(J) Cluster Number of Case	Mean Difference (I-J)	Std. Error	Sig.
Firm year	High in human capital	High in structural capital	.1047	.14019	1.000
		High in overall IC	.0380	.20548	1.000
		Low in overall IC	.0676	.22985	1.000
	High in structural capital	High in human capital	-.1047	.14019	1.000
		High in overall IC	-.0667	.20270	1.000
		Low in overall IC	-.0371	.22737	1.000
	High in overall IC	High in human capital	-.0380	.20548	1.000
		High in structural capital	.0667	.20270	1.000

	Low in overall IC	Low in overall IC	.0296	.27252	1.000
		High in human capital	-.0676	.22985	1.000
		High in structural capital	.0371	.22737	1.000
		High in overall IC	-.0296	.27252	1.000
No of employees	High in human capital	High in structural capital	-.2018	.30397	1.000
		High in overall IC	.7768	.44554	.502
		Low in overall IC	.0134	.49839	1.000
	High in structural capital	High in human capital	.2018	.30397	1.000
		High in overall IC	.9785	.43952	.166
	High in overall IC	Low in overall IC	.2151	.49301	1.000
		High in human capital	-.7768	.44554	.502
		High in structural capital	-.9785	.43952	.166
	Low in overall IC	Low in overall IC	-.7634	.59091	1.000
		High in human capital	-.0134	.49839	1.000
		High in structural capital	-.2151	.49301	1.000
		High in overall IC	.7634	.59091	1.000
Firms performance	High in human capital	High in structural capital	-.6898(*)	.12689	.000
		High in overall IC	-1.5312(*)	.18599	.000
		Low in overall IC	.3766	.20804	.436
	High in structural capital	High in human capital	.6898(*)	.12689	.000
		High in overall IC	-.8413(*)	.18347	.000
		Low in overall IC	1.0664(*)	.20580	.000
	High in overall IC	High in human capital	1.5312(*)	.18599	.000
		High in structural capital	.8413(*)	.18347	.000
		Low in overall IC	1.9077(*)	.24667	.000
	Low in overall IC	High in human capital	-.3766	.20804	.436
		High in structural capital	-1.0664(*)	.20580	.000
		High in overall IC	-1.9077(*)	.24667	.000

Based on observed means.

* The mean difference is significant at the .05 level.

4.4 Discussion of Results

The cluster analysis results produced four intellectual capital profiles from our sample. The clusters comprised two groups which were one-dimensional, high in human capital (cluster 1) and high in structural capital (cluster 2). The other two groups demonstrated multi-dimensional, high in overall intellectual capital (cluster 3) and high in low in overall intellectual capital (cluster 4). No profile was generated on high in relational capital. No profile was formed in this feature as generally all the companies in the sample indicated high relational capital. This was reflected in the descriptive statistics results where relational capital dimension had high mean score (see Table 5).

It is interesting to note that only twelve percent of the companies exhibited high levels of overall intellectual capital (human, relational and structural capital). Majority companies in our samples exhibited high level of structural capital and high level of human capital which was forty two percent and thirty six percent respectively. Only ten percent of the companies demonstrated low level of overall intellectual capital. Similar to Youndt et al. (2004), the authors found that less than a quarter of the samples in their study exhibited high intellectual capital profile. The development of multi- dimensional of intellectual capital may be viewed as very difficult and complex task. Some firms may viewed that developing differing types of intellectual capital as and redundant as such that each of the individual capital can be a substitute of the other Youndt et al. (2004). Per se, reasonably small percentages of companies ever reach high level of all types of intellectual capital.

The results of the study convey that majority of listed companies in Malaysia are interested to develop only two forms of intellectual capital or dual dimension. Since relational capital is highly available in any firms, the dual dimension profiles are in the form of relational capital and human capital or the combination of relational capital and structural capital. The results also reveal that intellectual capital awareness is quite high in Malaysian listed companies as only small number of companies having low level of intellectual capital. The companies are aware of the need to develop firm knowledge which in turn will create capital in terms of human, relational and structural.

Neither firm year (proxy for age) nor number of employees (proxy for size) exhibited significant differences across the intellectual capital profiles. The interpretation of the results is that intellectual capital does not develop or progress due to age and size. The firm knowledge development is not bound significantly by time or history. All level of companies whether old or new, large or small have a competitive advantage in establishing intellectual capital (Youndt et al. 2004).

With relevant to firms performance, the high overall intellectual capital outperformed the rest of the intellectual capital profiles. The mean difference between the high overall intellectual capital profile with low overall intellectual capital profile was significant and the highest as compared to the rest of other profiles. The next highest mean difference was between the high overall intellectual capital profile with high human capital profile and the least mean difference was with high structural capital profile. This shows

companies which are balance in human, relational and structural capital are perceived to performed better in terms of financial and market performance.

The result of the study also noted that the firms performance mean difference between the high structural capital profile than the human capital profile was significant. The analysis indicates that the mean of companies high in structural capital was higher. The results emphasize that companies which high in structural capital outperformed those which high in human capital. This leads to understanding that high investment in human capital will not lead to competitive advantage than high investment in structural capital. The interpretation was supported by the analysis that there was no significant performance mean difference between companies high in human capital and those low in overall intellectual capital. This emphasizes that there is no value added difference in having high investment in human capital than having low investment in overall intellectual capital.

5. Conclusion

The cluster analysis results produced four intellectual capital profiles which comprised two groups which were one-dimensional (named as high in human capital and high in relational capital) and two groups which were multi-dimensional (named as high in overall intellectual capital and low in overall intellectual capital).Only a small percentages of companies exhibited high in overall intellectual capital profiles. This finding is consistent with Youndt et al. (2004). The results implied that developing differing type of intellectual capital is viewed as a complex task or redundant as each component of intellectual capital can be substituted with another (Youndt et al. 2004).

The high overall intellectual capital profile outperformed the others in terms of firms performance which indicate that companies which are balance in human, relational and structural capital perform better in terms of financial and market performance. Thus it recommended that companies possess a balance intellectual capital model which consist of world class infrastructure, highly educated and skilled workforce couple with local and global contacts. This also confirms the resource based theory which recognises that the manipulation of human and intangible resources as dynamic and will create added value over time (Coates & McDermott 2002). Thus, also consistent with the knowledge-management approach which highlights that the constant interaction and a well balanced combination of the three intellectual capital construct enables healthy business growth (Hermans & Kauranen 2005). Youndt et al. (2004) argues that rather than the individual component used independently, the interaction among the intellectual capital components offer the organisation with a sustainable competitive advantage.

Companies which were high in structural capital also outperformed those which were high in human capital. This may lead to the impression that investment in structural capital offers more advantages as compared to investment in human capital.

Nevertheless, Malaysia which is in its transformation process to k-economy requires investments in the knowledge infrastructure. In knowledge based economy, to be a

developed nation and maintain the developed status, high quality human capital is a priority. To be more competitive, workforce must be more knowledgeable, adaptable and proficient. Thus, Government of Malaysia, realising the urgency, has identified the development of human capital, upgrading the mentality and intellectual capacity of its people as one of the main agenda under the Ninth Malaysia Plan (Badawi 2001, 2006) and the New Economic Model 2010.

6. Limitations of the Study

With the aim to capture global picture on organisation intellectual capital, the survey captured information from managers of various departments being human resource, finance and accounting, sales and marketing, production and manufacturing, research and development and information technology. However, for certain organisation only a single response was received. This could lead to biasness in describing intellectual capital in their company.

7. Future Directions

The current research has taken consideration to test performance based on perceptual measures. In studying the intellectual capital profiles and their relationships between with performance, future research should also consider measuring intellectual capital using objective measures or accounting values to overcome problem of biasness in perceptual measures. For example to measure human capital using training expense/employee; average years of service, number of managers, time in training and employee turnover (Edvinsson & Malone 1997).

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Endnotes

1. To obtain 5% Trimmed Mean, SPSS removes the top and bottom 5% of the cases and recalculated the new mean. This is to check on the extreme scores (Pallant, 2001)

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