



Managing the “Intangibles”: Business and Entrepreneurship Perspectives in a Global Context

Coordinators

By

C. Jayachandran, Gian Luca Gregori

Referred of the Society for Global Business and Economic Development

Managing the “Intangibles”: Business and Entrepreneurship Perspectives in a Global Context

Università Politecnica delle Marche, Economics Faculty “Giorgio Fuà”

ISBN 978-88-907795-7-2

**Intellectual Capital as a determinant of Competitiveness: SMEs Manufacturing Industry in
Guadalajara, Mexico**

Jose Sanchez-Gutierrez, jsanchez@cucea.udg.mx

Elsa Georgina Gonzalez-Urbe, guribe@cucea.udg.mx

Silvio Genaro Hernandez-Coton, sghernandez@cucea.udg.mx

Marketing & International Business Department, University of Guadalajara, Mexico

Intellectual Capital as a determinant of Competitiveness: SMEs Manufacturing Industry in Guadalajara, Mexico

Abstract

The main purpose of this research is to analyse how the intellectual capital have the effects on the competitiveness in the SME's manufacturing located in Guadalajara, Mexico.

To determine the variables involved in this research, were analysed for the intellectual capital: the obtained information, intellectual capital developed and learning and feedback; and the competitiveness with other three factors: Financial Performance, Costs Reduction and Technology Use. The questionnaire was designed considering the competitiveness as dependant variable, and as independent variable the intellectual capital. Using the Likert scale in order to determine the degree of agreement or disagreement, and the survey was applied to 420 SME's. After this, it was applied questionnaires and demonstrated his validity. The results were analysed using confirmatory factor analysis (CFA), Cronbach's alpha and subsequently structural equation models (SEM).

Keywords: Intellectual Capital, Competitiveness, SMEs

Introduction

In a modern economy the process of entrepreneurship would be promoted not only by material background but also by immaterial (Mačerinskienė & Aleknavičiūtė, 2011), this condition is dictated by the changes in the organizational environment, companies require create value, but also consumers from implementing an organizational culture based on the desires and needs of customers, generating company loyalty (Atalay & Anafarta, 2011), those resources could make the difference between a competitive company or a noncompetitive company; actually innovation is the critical enabler for organizational value creation and sustainable competitive advantage (Chen & Huang, 2009), but the main obstacle for innovation is the low interest that organizations give to create the correct intellectual capital.

More than ever, intellectual capital must be viewed in organizations as a resource that despite its intangibility is on par with the tangible resources of the organization (Bounfour, 2003; Ross, et al., 2005), unlike any other resource, intellectual capital might be used to build a competitive strategy for international markets, becoming a significant source of values for modern companies (Szymura-Tyc, 2009) increasing their efficiency and effectiveness using tangible resources.

Theoretical framework

The traditional factors of production, labor, land and capital, are eclipsed into organizational distribution by the knowledge economy and intellectual capital, converting those non tangible resources into the most valuable factors of company competitiveness (Kavida, 2009); according to Majid, Lodhi and Rohra (2009), may competitive companies around the globe adopted Intellectual Capital as a strategy complement to increase their success improving the productivity and the efficiency in all senses.

Steward (1994) defined Intellectual Capital as the total stocks of collective knowledge, information, technologies, experience, organization learning, team communication systems and customer relations that are able to create values for a firm. IC includes intangible assets, capabilities and knowledge, which allow the development of basic processes of organizations, enabling the achievement of competitive advantages (Martin de Castro, 2011; Delgado, 2011; López, 2011; Navas, 2011).

Intellectual capital is becoming one of the important commercial assets of the 21st century is a way of describing a company's intangible assets that are vital for company success (Barsky & Marchant, 2000), for Bogdam, Balint and Farcas (2011), intellectual capital can be defined as knowledge that can be converted into a

value for organizations, in other words, intellectual capital is the sum of all knowledge that an organization is able to leverage in the process of conducting environmental management to gain competitive advantage (López-Gamero, et. al., 2011). Intellectual capital is knowledge that is valuable to an organization, is reusable and manageable (Singer, 2003).

Relational capital is defined as the set of relationships the company has with the environment. This type of capital is important because it provides an external evaluation of the market; provides information on trends and interests that show the agents of their environment, the relational capital is critical to make decisions, managers need to know how their investment in intellectual capital elements are linked to the performance of their companies (Wu, Tsai, Ceng & Lai, 2006).

Human Capital propose subcomponents such as the ability of employees or their satisfaction (Kaplan & Norton, 1996). Structural capital comprises all investments made to improve the experience and quality of the organization. Relational capital is included as well as culture (Saint Onge, 1996) organizational processes, intellectual property (Brooking, 1998) and customers or partners (Knight, 1999), and the intellectual capital as an intelligent and entrepreneurial organization, is in cash flow generation and competitiveness of its tangible assets (McDougall, 2005).

Fineman, Giza, Nahed, Lee & Hovda (2005), have suggested that intellectual capital is actually comprised two basic forms explicit knowledge and tacit knowledge, then, arriving to the knowledge economy has seen a decline in the relative importance of tangible resources, and demanded a paradigm shift to rely on knowledge and intellectual capital (Bontis, 1998; Guthrie, 2001).

This model could be used to increase the competitiveness into some industries that are references for the countries, in the case of Mexico, manufacturing industry is one of the most important industrial branch, just because provides commodities for national and international consumption; basically Intellectual Capital should be implanted and measured by a model that Veltri, Bronzetti and Sicoli (2011), design for the enterprises, considering market capitalization, Return to assets, Direct intellectual capital and scorecard. This intellectual capital measurement shows a pattern where a row within the organization processes must be planned in any of the four categories considered, besides that its effectiveness will be verifiable, writable and modified depending on the time and actions taken under different circumstances.

Competitiveness shows the ability to design, produce and commercialize superior products than those offered by the competition, is considered synonym of success, accomplishment of the objectives of the Enterprise (Bidu, Sala, Pantea, 2008). Chadee, Raman, Michailova (2011), define competitiveness as the ability to maintain and grow the business on a sustainable foundation. The sustainable growth can be determined as the most important method to evaluate the competitiveness (Bhattacharaya, Momaya, Iyer, 2009). It is generally recognized that the continuing competitiveness and economic growth are essential factors to sustain the standard of living and welfare (Balkytė, Tvaronavičienė, 2010).

Competitiveness is a different way of saying productivity, taking in consideration the rate of growth of a company in relation to other, (Krugman, 1994). The studies made by Krugman affirm that the best way of defining competitiveness is with the competitiveness-productivity relation, in which each of the companies fulfill their objectives, establishing standards in a certain period of time, as well as the growth in comparison to the others. Pucar (2012) also agrees that the only way to create a competitive advantage is through intellectual capital, arguing that the intellectual capital perspective can be a base for accelerated economic growth and development.

Tseng & Yeong-Jia, (2005) affirms that competitive success of an organization relates to the way in which tangible and intangible resources are managed. The intangible assets or intellectual capital includes structural human capital and clients. It plays an important role in competitiveness of a company and can increase profit. (Hazlina, Zubaidah, 2008).

The organizations that are constantly in an innovation process, are the first to stand out and show unlike any other, companies that innovate constantly is because they know the market needs are changing and they look forward to penetrate it, innovation is an essential factor for competitiveness, but it is also important to include internal factors such as technology and management, and external factors such as market structure and product position in the market, establishing that these factors are the ones that give an added value to the company (Gao, Liu, Song, Zheng, 2013).

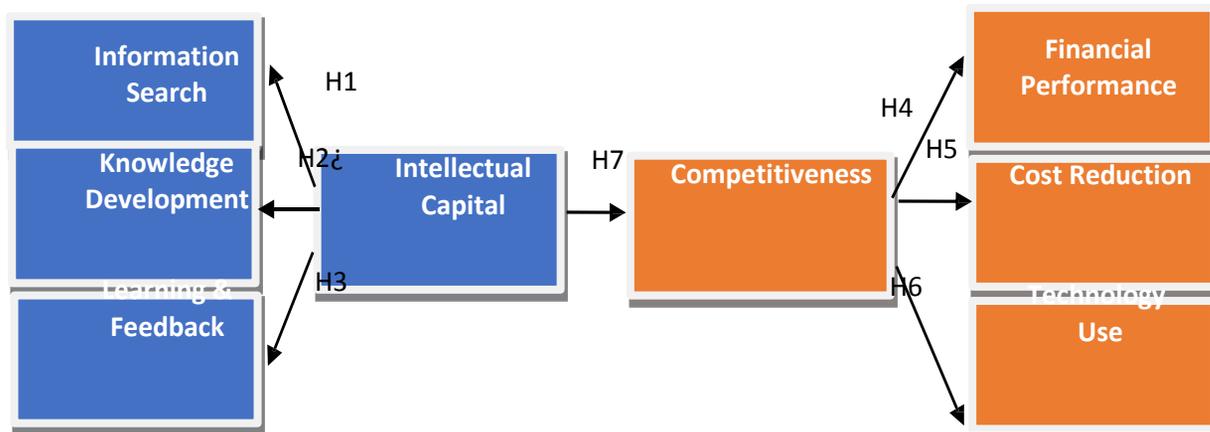


FIG. 1: THEORETICAL MODEL RELATING INTELLECTUAL CAPITAL AND COMPETITIVENESS
Source: own

Methodology

The surveys were applied in 418 SME's of manufacturing industry in the city of Guadalajara, Mexico, during July and August 2013.

Also, there are seven hypotheses that will contribute to this research:

H1: Higher level of new information, higher level of intellectual capital.

H2: Higher level of knowledge development, higher level of intellectual capital.

H3: Higher level of learning and feedback, higher level of intellectual capital.

H4: Higher level of financial performance, higher level of business competitiveness.

H5: Higher level of cost reduction, greater level of business competitiveness.

H6: Higher level of technology use, greater level of business competitiveness.

H7: Higher level of intellectual capital development, higher level of business competitiveness.

Similarly, to measure the level of competitiveness were considered the three factors proposed by Buckley *et al.* (1988): 1) *financial performance*, 2) *costs reduction*, and 3) *technology use*, all of these, measured by a scale of 6 items. All the items of the three factors are built by a level Likert type of 5 positions, with 1 = completely in disagreement to 5 = completely agree as limits.

To assess the reliability and validity of scales measuring of the level of intellectual capital and business competitiveness, a Confirmatory Factorial analysis (CFA) with the method of maximum likelihood and EQS 6.1 software (Bentler, 2005;) Brown, 2006; (Byrne, 2006).

Rates of statistical adjustment that were considered were the NFI, NNFI, IFC and RMSEA (Bentler & Bonnet, 1980;) Byrne, 1989; Bentler, 1990; Hair et al., 1995; Chau, 1997; (Heck, 1998).

Analysis and Discussion

The results of the Confirmatory Factorial Analysis (CFA) are presented in table 1 and shown that the measurement model provides a good fit of the data. As evidence of the convergent validity, the CFA indicates that all items of the related factors are significant ($p < 0.01$), which provides evidence of reliability and justifies the internal reliability of the scale of the business competitiveness (Nunally & Bernstein 1994); (Hair et al., 1995) show in table 1.

TABLE 1: INTERNAL CONSISTENCY AND CONVERGENT VALIDITY OF THE THEORETICAL MODEL

Variable	Indicator	Factor Loading	Robust T- Value	Cronbach's Alpha	CRI	VEI
	CIB1	0.685***	1.000 ^a			
Information search (F1)	CIB2	0.774***	7.486	0.866	0.862	0.535
	CIB3	0.712***	7.288			
	CIB4	0.850***	7.551			
	CIB5	0.699***	6.197			
Knowledge development (F2)	CIC1	0.851***	1.000 ^a	0.772	0.791	0.543
	CIC2	0.690***	10.421			
Learning and feedback (F3)	CIC3	0.715***	10.922	0.839	0.867	0.649
	CIA6	0.728***	1.000 ^a			
	CIA7	0.877***	9.865			
Intellectual Capital	CIA8	0.793***	9.634	0.844	0.864	0.651
	F1	0.692***	5.103			
	F2	0.976***	8.091			
	F3	0.698***	5.314			
Financial Performance (F4)	FP3	0.766***	1.000 ^a	0.892	0.893	0.669
	FP4	0.866***	17.150			
	FP5	0.880***	16.332			
Cost Reduction (F5)	PC3	0.933***	1.000 ^a	0.946	0.940	0.788
	PC4	0.963***	43.253			
	PC5	0.871***	27.893			
	PC6	0.755***	19.778			
Technology Use (F6)	TE3	0.842***	1.000 ^a	0.779	0.797	0.623
	TE4	0.792***	13.449			
	TE6	0.604***	10.542			
	E4	0.787***	5.237			
Competitiveness	F5	0.767***	5.223	0.824	0.822	0.615
	F6	0.763***	5.218			

Related to the evidence of the discriminant validity, measurement of the scale of the business competitiveness level was through two ways which you can see in more detail in table 2. First, the range of 95% of confidentiality, none of the individual elements of the correlation factors matrix contains the value 1.0 (Anderson & Gerbing, 1988). Second, the variance extracted between each pair of factors is higher than its corresponding VEI (Fornell & Larcker, 1981). Therefore, based on these criteria one can conclude that the different measurements made on the scale show enough evidence of reliability and convergent and discriminant validity. See table 2.

TABLE 2: DISCRIMINANT VALIDITY OF THE THEORETICAL MODEL MEASUREMENT

Variables	Intellectual Capital	Competitiveness
Intellectual Capital	0.658*	0.159
Competitiveness	0.343 - 0.455	0.606*

*These values presented the estimation of the correlation factors with a confidence interval of 95%.

The hypotheses were tested in the theoretical model of innovation and business competitiveness, using the Structural Equations Model (SEM) software EQS 6.1 (Bentler, 2005;) Byrne, 2006; (Brown, 2006).

The nomological validity of the theoretical model was analyzed through the performance of the chi-square test, in which the theoretical model was compared with the measurement model, not finding significant differences (Anderson & Gerbing, 1988;) (Hatcher, 1994). The results of this analysis are presented in table 3.

TABLE 3: RESULTS OF THE THEORETICAL MODEL OF BUSINESS COMPETITIVENESS

Hypothesis	Structural Relationship	Standardized Coefficient	Robust T-Value
H1: Higher level of new information, increase the level of intellectual capital.	Information search. → Int. Cap.	0.226***	5.703
H2: Higher level of knowledge development, increase the level of intellectual capital.	Knowledge develop. → Int. Cap.	0.469***	7.114
H3: Higher level of learning and feedback, increase the level of intellectual capital.	Learning & feedback → Int. Cap.	0.366***	6.500
H4: Higher level of financial performance, greater level of business competitiveness.	Financial Perfor. → Competitiveness	0.571***	11.846
H5: Higher level of cost reduction, greater level of business competitiveness.	Cost Reduction → Competitiveness	0.222***	6.187
H6: Higher level of technology use, greater level of business competitiveness.	Technology use → Competitiveness	0.323***	7.999
H7: Greater level of intellectual capital development, greater level of business competitiveness.	Intel. Capital → Competitiveness	0.299***	0.8.677
<i>S-BX2 (df = 184) = 443.307; p < 0.000; NFI = 0.894; NNFI = 0.918; CFI = 0.934; RMSEA = 0.058</i>			

*** = p < 0.001

The table 3 shown the results obtained of the Structural Equations Model, with regard to the **H1** the results obtained, $\beta = 0.226$, $p < 0.001$, indicate that searching information has significant effects with the intellectual capital in manufacturing firms. As for the hypothesis **H2**, the results obtained, $\beta = 0.469$, $p < 0.001$, suggest that knowledge development also have significant effects in the intellectual capital. En the hypothesis **H3** the results obtained, $\beta = 0.366$, $p < 0.001$, suggest that the learning and feedback also have significant effects in the manufacturing firms.

Also, respect with hypothesis **H4** the results obtained, $\beta = 0.571$, $p < 0.001$, indicate that the financial performance has significant effects on the competitiveness level. In the hypothesis **H5** the results obtained, $\beta = 0.222$, $p < 0.001$), suggest that cost reduction also have significant effects on business competitiveness. The results obtained in the hypothesis **H6**, $\beta = 0.323$, $p < 0.001$, suggest that the technology use also has significant effects on business competitiveness. Finally, the results obtained in the hypothesis **H7**, $\beta = 0.299$, $p < 0.001$, presented that the intellectual capital has significant effects on business competitiveness.

Limitations

The first limitation, the sample considered companies from 20 to 250 workers, excluding the companies from 1 to 10 workers, which representing an important quantity of the total manufacturing SME's, then, for future studies should be important to consider these companies to analyze the effects of intellectual capital in business competitiveness.

A second limitation is that the questionnaire was applied to directors or CEO's level, and the results could differ in functional managers. Therefore, in future studies, it could be important to consider the opinion of customers and suppliers to analyze the results obtained.

Finally, it is important to go beyond the technical results and discuss in greater depth: what effects should be in SME manufacturing if a more quantitative scale is used to measure the business competitiveness? What results would be in SME manufacturing if applies a more sophisticated model for the measurement of business competitiveness? What specific activities of the financial performance, the reduction of costs and the use of technology are those that most affect business competitiveness? These and other questions that may arise can be answered in future research.

Conclusions

This research has shown that SME's manufacturing in Guadalajara, have a good correlation between the dependent variable competitiveness with the independent variable intellectual capital, and the results expressed in this study appear to be consistent with the relation of factors technology use, costs and financial performance with the variable competitiveness, and also the factors information search, knowledge development, and learning and feedback are related with the variable intellectual capital.

These SME's are in a transformation process of administrative schemes, with a more cognitive and sustainable system, being conscious to create and generate new information, increasing knowledge development and learning and feedback knowledge in all the organization.

References

- [1] Abadi, H., & Tavakoli, N., (2011). Determining the level of Influencing of Intellectual capital Efficiency on Brand Value of the Companies Accepted in Tehran Stock Market. *Interdisciplinary Journal of Contemporary Research in Business*, 3(4), 911-918.
- [2] Ahmadi, F., Habibi, F., & Khodamoradi, A., (2011). The role of Intellectual Capital on improvement performance of agricultural bank in Iran. *Interdisciplinary Journal Of Contemporary Research In Business*, 3(3), 1116-1124.
- [3] Arenas, T., Lavanderos, L., (2008). Intellectual capital: object or process. *Journal of Intellectual capital*, 9(1), 77-85.
- [4] Atalay, M. & Anafarta, N. (2011). Enhancing Innovation Through Intellectual Capital: A Theoretical Overview. *Journal of Modern Accounting & Auditing*. 7(2), 202-210.
- [5] Bodgdam, V., Balint, J. & Farcas, M. (2011). Intellectual capital reporting and disclosure in the annual reports of romanian manufacturing listed companies – theoretical framework. *Annals of the University of Oradea, Economic Science Series*, 1(1), 275-283.
- [6] Byrne, B. (2006), *Structural Equation Modeling with EQS, basic concepts, applications, and programming*, 2th edition, London: LEA Publishers.
- [7] Chung-Chu, L., (2011). Developing Measures of Intellectual Capital for the Venture Capital Industry in Taiwan. *Managing Global Transitions: International Research Journal*, 9(1), 81-100.
- [8] Fornell, C. and Larcker, D. (1981), “Evaluating structural equation models with unobservable variables and measurement error”, *Journal of Marketing Research*, 1(18), 39-50.
- [9] Kavida, V. (2009). Intellectual Capital: a Strategic Management Perspective. *IUP Journal of Knowledge Management*. 7(5/6), 55-69.
- [10] Lopez-Gamero, M., Zaragoza-Saenz, P., Claver-Cortés, E. & Molina-Azorin, J. (2011). Sustainable Development and Intangibles: Building Sustainable Intellectual Capital. *Business Strategy & the Environment*, 20(1), 18-37.
- [11] Lopez Salazar, A., Contreras Soto, R., & Espinosa Mosqueda, R., (2012). The Impact of Financial Decisions and Strategy on Small Business Competitiveness. *Global Journal of Business Research*, 6(2), 93-103.
- [12] Mačerinskienė, I. & Aleknavičiūtė, G. (2011). The evaluation of intellectual capital influence on entrepreneurship. *Economics and Management*, 16(1), 558-566.
- [13] Nahapiet j and Ghoshal S (1998), Social Capital, Intellectual Capital, and the Organizational Advantage. *The Academy of Managanent Review*, 23(2), 242-266.
- [14] Sofian, S., Rasid, S.Z.A., Mehri, M., (2011). Moderating effect of intellectual capital on relevance of earnings and cost of equity relationships: review of contemporary literature. *Journal of Applied Sciences Research*, 7(9), 1633-1639.
- [15] Szymura-Tyc, M. (2009). The role of marketing intellectual capital in creating competitive advantage in the international market - theoretical assumptions and empirical evidence of polish firms competing in the European markets. *Journal of Economics & Management*, 6(1), 161-186.

Note: “Contact author for the list of references”

