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The Company's Intellectual Capital: Interaction and Value Creation Case of Tunisian Companies

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Abstract

The gap between the value of the company in the accounting and financial books and its real market value is growing more and more. This difference represents the effect of intellectual capital that arises in the company in various forms. His cleavage in three types is the most widely used: human capital, organizational capital and customer capital. These different forms of intellectual capital are related to one another and to the financial structure of the company. They correspond to the realization of employees' knowledge skills with their effects on the structure of the company and on creating value for it. In addition, the value is not produced by only one component of intellectual capital, but by their interaction. Our study is to determine a synthesis model explaining these relationships. It does not intend to measure intangible capital of the company (financial and accounting approach), but to determine existing relationships within the intangible assets, on the one hand, and the creation of value for the firm of the other side. We agree, therefore, the qualitative approach and strategic management of intellectual capital.

Introduction

The company is confronted with an increasingly keen competition in new productive capacities and distinctive competencies. Reactivity, creativity, anticipation, being with the listening of the customer, improvement of quality, reduction of the costs and the deadlines for reply… are the current requirements of the competing environment.

Certainly, we cannot be unaware of the sales turnover, the benefit and the results. They are the ultimate measurement of success and the starting point of any measurement of value of the company. But, there are other factors which influence the value and the competitive advantage of a company which rests of less in less on the only financial assets and traditional accountants.

Indeed, the difference between what the company is worth on the countable and financial level and its actual value on the market grows hollow moreover. This variation explains the existence of the intellectual capital, we can provide a total value of this capital in the form of goodwill but without specifying its distribution on the various assets which make it up. The value is not in a particular asset, it comes from the creation of a whole number of assets accompanied by a strategy which connects them together.

Thus we try in our work to answer the following problems:

- **Which is the impact of the various relations which exist between the components of the intellectual capital on the value creation of the company?**
Our study does not intend to measure the intellectual capital of the company (financial and accountant approach), but to determine the relations which exist inside this capital, on a side, and with the value creation of the

company on other side. We join, by consequent, the qualitative and strategic approach of the management of the intellectual capital. Our prime objective is thus to determine the various interactions which exist between the components of the intellectual capital and their effects on value creation of the company. And we seek to test these various relations in the Tunisian context.

The objective of our work is not to generalize the results but rather to identify and test the relations and the bonds between the variables brought by the literature.

The context of investigation is being the Tunisian companies which are located in a market in continuous change which is directed more and more towards a knowledge economy. From where, we seek to test these various relations in the particular context of the Tunisian companies.

In order to meet these various aims, we could not treat in this work all the aspects which relate to IC and the value creation since they are very numerous and it is difficult to encircle them all. We had to adopt certain points of view of authors in order to determine the maximum of information and elements.

Short history of the notion of the intellectual capital

The notion of intellectual started to have of the importance with the theory of resources. Indeed, this theory sees the company not through its activities on the market of the product but like a single combination of tangible and intangible resources (Wernefelt, 1984). The performance of the company is a function of the effective and efficient use of these tangible and intangible resources. It creates value to be started from a combination of resources.

Since, several authors started to be interested in the intangible resources of the company.

The theory of the knowledge appeared about the 90s focused on knowledge as the most determining source of the firm (Nonaka and takeuchi 1995).

At the same time, the ICM gathering (intellectual capital management gathering) gathered the representatives of 12 companies. They agreed on the definition: "IC is a knowledge which can be converted into profit". And since the studies on IC did not cease evolving:

Ricceri (2008) presented a classification of the studies carried out on IC in two types:

• A first approach "*stock approach*" consists in calculating the volume of the intellectual assets held by an organization. It is a rather financial approach (Roos, 1997; Roos *et al*., 1998).

• Second approach "*flow approach*" is more qualitative and which relates to the performance evaluation (value creation: internal and external) related to the intellectual capital and supports the piloting of this performance.

The studies which were interested in the analysis of flows are very important. They are based mainly on the scorecard made of indicators of IC: (the pioneers are the balanced scorecard (Kaplan and Norton, 1992), the monitor of the intangible assets (Sveiby, 1997) and the Scandinavian approach which led to the development of the navigator of Skandia (Edvinsson and Malone, 1997).

These scorecards explain the performance of the company based on financial and non-financial indicators. The objective of this approach is to understand the intellectual resources and to manage them in order to create value for the company and its stakeholders. According to Ricceri (2008), this approach belongs to the second wave of the KM analyzed by Mouritsen and Larsen' S (2005) which lays the stress more on the notion of IC: the composition, the application and the development of the knowledge resources and which provides the corporate value creation. It is why we join this approach in our analysis.

The decomposition of the intellectual capital

There is no unanimity concerning the decomposition of IC but we can start by the one given by OECD in 1999:

IC is composed of:

- **Human capital (HC)**: relate to the men of the company, the whole of their tacit knowledge. "Knowledge which the employees take with them when they leave the company" Meritum 2002.

- **Structural capital (SC)**: "all that remains when the employees go home"

(Edvinsson, 2000). It gathers the customer capital CC or relational capital RC "relations with the customers and the external partners of the company" and the organizational capital OC "the systems of organization, technologies of information"

From where the recourse to a division of IC in three components: HC, OC and CC. This decomposition seems to be the consensus object between several authors (Sveiby, 1997; Stewart, 1997; Bontis, 2001). But the decomposition of each capital still differs from an author to another.

Table 1: Different Classifications of Intellectual Capital

Authors	Year	Classification of the immaterial capital
Brooking	1996	Human capital Structural capital: (infrastructure, intellectual property) Credits of the market
Edvinsson and Malone	1997	Human capital Structural capital
Sveiby	1997	Competences individual Internal structure External structure
Roos	1997	Human capital Organisational capital Renewable capital Relational capital
Stewart	1997	Human capital Structural capital Capital customers
Bontis et al.	2000	Human capital Structural capital Relational capital
MERITUM	2002	Human capital Structural capital Capital customers
Calvalcanti	2006	Human capital Structural capital Capital customers Authorized capital

The Relation between the Intellectual Capital and the Value Creation

The various forms of IC are related the ones to the others and with the financial structure of the company. They correspond to the concretization

of the knowledge of the employees in competences having their effects on the structure of the company and in source of value for it. Moreover, the value is not produced by one only of the components of IC but by their interaction.

Also, even if the organization is rather strong in one or two of these components, if third weak or is badly managed, it does not have the possibility of converting its intellectual capital into value for the company.

For Sullivan (2000), IC gets for the company two types of value:

- The first most direct: the cash-flows: IC creates innovation which is converted into profit.
- The second is less direct: the company uses its IC to have a strategic position.

Relation CI-CREAT VAL was treated by several models:

We can quote:
- The dynamic model of knowledge creation of Nonaka and Takeuchi (1995) which presents two types of tacit knowledge (represented by HC) and explicit (represented by SC)

- The way of the value deduces from the work of Pierrat and Martory (1996) which represents the passage of HC where the value creation is done, towards OC where is done its materialization towards the CC which represents its recipient: in other words the passage of the value of an IC purely human, around a structural IC to an identified IC since the value will be felt or identified on the level of the customers.

- The platform of the value of Edvinsson and Malone (1997) which represents the value creation by the zone of intersection of the three forms of IC: HC, OC and CC.

- The two roles of IC identified by Sullivan (2000): the value creation carried out by the HC and the extraction of value carried out by the SC, where even the passage of tacit knowledge to explicit knowledge.

The Synthesis model
The analysis of the literature made us conclude that IC is made of three components HC, OC and CC. They are in continuous interaction and have an effect on value creation of the company.

The various studies on the intellectual capital show that the financial capital of the company and in particular the various investments in intangible has an effect on the relationship between the intellectual capital and the value creation of the company (Roos, 1998). Sullivan (2000) also insists on the importance of the internal context of the company on this relation. Consequently, we consider in the continuation to determine the effect of these two variables on the relation intellectual capital – value creation. That's why, we added to the model two moderating variables which can have an effect on the various relations of the model:

- The financial capital taken in the form of investment in the various intellectual forms of the company

- The internal context of the company (vision, strategy, strengths and weaknesses.)

On the basis of this model, we defined our assumptions of research in the form of two sets: A first which relates to the relations between the variables of the conceptual model:

1st Set of Hypothesis: Relations between the Variables of the Conceptual Model
H_1: Human capital, organizational capital and customers capital are influenced mutually
H_{1a}: The human capital affects the organizational capital positively
H_{1b}: The human capital affects the customers capital positively.
H_{1c}: The customers capital affects the organizational capital positively.
H_2: The intellectual capital affects positively the value creation of the company:
H_{2a}: The human capital affects the value creation positively.
H_{2b}: The organizational capital affects the value creation positively.
H_{2c}: The customers capital affects the value creation positively.

The second whole of hypothesis relates to the moderating effects on the various relations of the conceptual model

2nd Set of Hypothesis: Moderating Effect on the Various Relations of the Conceptual Model

H3: The financial capital has a moderating effect on the relation intellectual capital-value creation.

H3a: The financial capital has a moderating effect on the relation human capital - value creation.

H3b: The financial capital has a moderating effect on the relation organizational capital-value creation.

H3c: The financial capital has a moderating effect on the relation customers capital - value creation.

H4: The internal context of the company has a moderating effect on the relation intellectual capital - value creation.

H4a: The internal context of the company has a moderating effect on the relation human capital - value creation.

H4b: The internal context of the company has a moderating effect on the relation organizational capital - value creation.

H4c: The internal context of the company has a moderating effect on the relation customers capital - value creation.
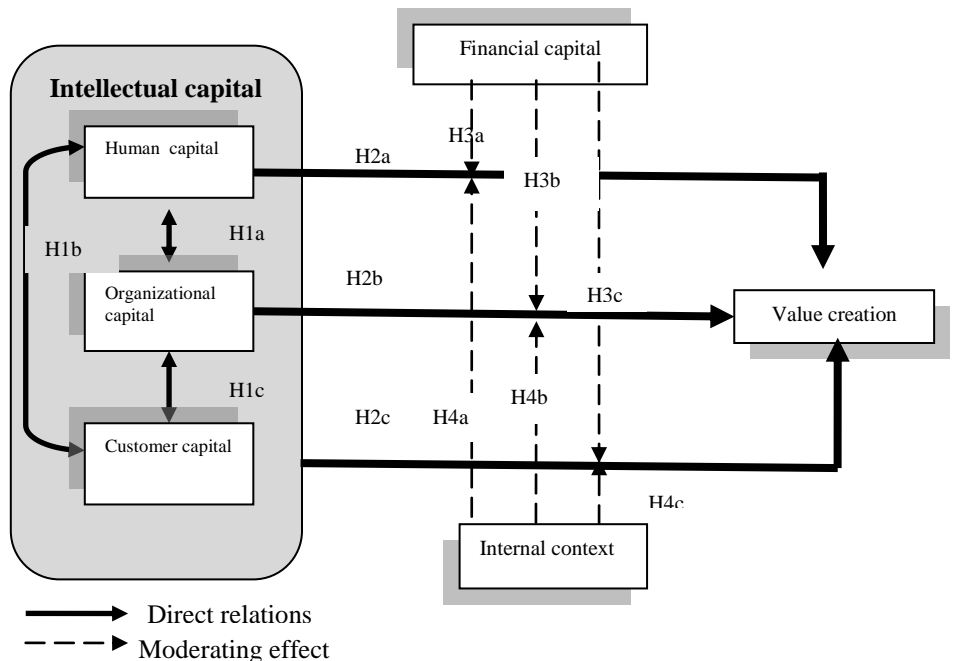

Figure 1: The Synthesis Model

The Analysis method

To test and validate our conceptual model, we chose to use the method of the structural equations while basing ourselves on work of Bontis (2000), Moon and Kym (2006), Martinez Torres (2006), Hsu and Fang (2009). These studies are rather American and Asian and the indicators used are in the majority of the cases not indicated.

This choice is based on the nature of the variables to handle in the model since we cannot affect exact values to them from where the recourse to latent variables not directly observable.

The method of the structural equations is a statistical approach to test assumptions on the relations between variables observed and latent. It represents one linear model which includes and generalizes the traditional linear methods (factor analyses and linear regression). The FCA (factor correspondence analysis) is used to measure the latent variables and produces a model of measurement of these variables. On the other hand, the regressions are intended to

test the effects supposed between the variables, they produce a model of causal relations called system of linear structural relations.

The synthesis of the various relations between the variables of the model can be analyzed by the measurement model and the structural model.

- The Structural model
The structural model of our research represents the linear relations which can exist between the value creation of the company (dependent variable) and the three explanatory variables of the model to knowing: the human capital, the organizational capital, the capital customers.

- The Measurement model
The model of measurement is under part of the complete model including the relations between the manifest and latent variables.

Being given the nature of the variables and the method of analysis chosen, we used scales of measurement which we defined according to the literature and who can be used in a total or partial way.

We supposed a multidimensionality of the various variables which make IC.

- ☐ Variable: human capital: three-dimensional variable: "competence", "attitudes" and "intellectual agility" or "capacities". (Roos *et al*., (1998) and Sveiby (1997))
- ☐ Variable: organizational capital: Two-dimensional variable: "innovation capital" and "process capital". (Stewart (1997))
- ☐ Variable capital customers: Two-dimensional variable: "relations with the customers" and "relations with the other partners of the company"

With this intention we used the technique of the investigation containing a survey on a sample of 144 Tunisian companies which adhered to the upgrade program. The choice of this population is due to the importance given especially to the various intangible investments in this upgrade program in order to reinforce the competitiveness of the companies on the local and international market.

The analyses were carried out by two software (SPSS 15.0) and (AMOS 7.0).

The analysis result

The results found in the principal component analysis (PCA) and the factor correspondence analysis (FCA) check the three-dimensionality of the CH variable and two-dimensionality DC, But, cancel the two-dimensionality of the variable CO consequently we completed the work with a one-dimensional variable CO.

The PCA analyses and FCA thus followed affirmed the validity and the reliability of the various scales of measurement selected.

The coefficients alpha of Cronbach and rho of Joreskog are all higher than 0.7 this which justifies a reliability and an internal coherence of the various scales of measurement.

The test of the structural model gave a significant coefficient of adjustment. The endogenous variable value creation is well explained by the exogenous variables of the model.

It comes out from these results that **the H_1 hypothesis is validated**. Indeed, all the relations between exogenous variables are significant and positive. The analysis of the covariance and coefficients of correlation between the three variables carries out us to accept the H_1 hypothesis according to which the human capital, the organizational capital and the customer's capital are influenced mutually. Moreover, all the relations are positive with the threshold of 1%, we validate consequently under hypothesis H_{1a}, H_{1b} and H_{1c}.

In the same way, **the hypothesis H_2 is validated**. Indeed, the relations between the exogenous variables and the endogenous variable value creation are all significant and positive with the threshold of 1%. The intellectual capital positively influences the value creation of the company. This is explained by the validation of under hypothesis H_{2a}, H_{2b} and H_{2c}.

Concerning the effects of moderation, only the effect of the CF on the relations of the model

was checked. The financings of the various forms from intellectual on the level of the company do nothing but improve the effect of the various components of IC on value creation. The effect of the internal context of the company was not checked. That east can be due to the context of investigation since the companies of our sample are from different sectors.

Conclusion

The use of the method of the structural equations allowed us:

- to handle latent variables not directly observable;
- to validate our scales of measurement;
- to consider our total model;
- to determine the direction of the various existing relations between the variables of the model;
- to justify the moderating effect of the "financial capital" in our model.

The model of synthesis is limited to three explanatory variables (human capital, organizational capital and customers capital), a variable to be explained (value creation) and a moderating variable (financial capital).

Thus, the most important conclusions of this work are:

- Various synergies which exist between the components of IC are at the origin of the corporate value creation.
- Human capital is the source of this value creation; nevertheless, without good structures and good relations well established between the company and its market this value creation will not take place.

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