

Research article

The mediating role of the intellectual capital in the relationship between organizational agility practices and innovation performance study by the role of intellectual capital in Tunisian SMEs

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Abstract

Organizational agility is inevitably one of the most successful concepts in the field of management research as its stakes are decisive for organizations. One of the most frequent arguments is that it represents a lever for performance, particularly which is derived from innovation. Here, the question of intellectual capital also emerges as a theme that touches on this relationship. This study aims to conceptualize this link by suggesting that the organizational agility practices impact intellectual capital, thus producing higher innovation performance. We have empirically tested this model on the basis of a survey carried out in 110 Tunisian companies, using structural equation modeling via the (PLS) approach. The results highlight a partial mediating effect of the intellectual capital on this relationship. The study also reveals that agile practices particularly focused on strategic orientation, cooperation and the development of human resources which have a positive impact on innovation performance. Furthermore, customer orientation practices do not lead to the development of intellectual capital, as those of cooperation. The implications drawn from these results point in the direction of better taking into account by companies of the foundations of these agile practices to achieve competitive gains by innovating.

Key words: Organizational agility, intellectual capital, innovation, performance.

1. Introduction

Due to the highly restrictive conditions of the 21st century, the search for performance is now linked to the ability of organizations to generate results and benefits that derive from innovative processes. Urged by the imperatives of competitiveness, innovation is of increasing interest because it is inherent in the need to imagine and put into practice alternative solutions to products, processes and procedures. However, to achieve such a performance, the adoption of agile managerial practices is decisive in order to be able to provide adequate responses to the prerogatives of responsiveness, adaptability and flexibility that are required of any organization in the face of hostilities and unforeseeable changes of the environment.

Indeed, in view of its presupposed benefits in terms of rapid adaptation and with dexterity to the opportunities and threats of the environment (Tallon and Pinsonneault, 2011; Appelbaum et al., 2017), the notion of organizational agility is experiencing a real development and it is approached from different perspectives: as an antecedent, as an end in itself or as having effects (Tallon et al., 2019) particularly on performance (Bhatt et al., 2010; Chakravarty et al., 2013; Chen et al., 2014; Roberts and Grover, 2012; Swafford et al., 2008; Tallon and Pinsonneault, 2011; Vickery et al., 2010).

However, the performance resulting from innovation is also linked to intellectual capital since any form of innovation is the product of knowledge generated by the people who create and shape it (Ben Slimene S, 2020; Ben Slimene Sand Lakhil L, 2021). As such, the positive influence of intellectual capital on different dimensions of performance is often demonstrated (Ahangar, 2011; Celenza and Rossi, 2012). Likewise, many studies have shown the explanatory power of intellectual capital on the production of innovative strategies (Leitner, 2011), on the improvement of innovative performance through a joint improvement of structural and relational capital (Kianto, 2017), on the production of innovation and financial and commercial performance (Menor et al., 2007), on the capacities of radical and incremental innovations (Subramaniam and Youndt, 2005); and on the innovative performance via the human dimension of intellectual capital (Wu, 2007).

Without standing the variety of these studies, the dynamic linking agile practices considered as

antecedents to improved innovation performance remains to be explored. And, it is precisely the insufficiency of research on agile practices and intellectual capital as real catalysts for the performance resulting from innovation and specifically to the context of Tunisian SMEs that feeds our ambition.

Therefore it is a question of seeing to what extent organizational agility practices are relevant in the development of the intellectual capital of Tunisian SMEs and to what extent this intellectual capital in turn leads to increased performance through innovation.

To do this, we specified a conceptual model in which the key practices characterizing an agile organization which are identified and borrowed from the work of Charbonnier (2011). These include human resource development practices that contribute to the development of different aspects of human resource knowledge, cooperative practices that support the development of knowledge-based behaviors, strategic orientation that reflects an orientation towards intangible assets generating value and customer orientation that impacts knowledge for better external and internal relationships with customers. We have also exposed the foundations of intellectual capital and suggested a positive effect relationship according to which the capitalization of relational, human and structural knowledge would be at the origin of better performance derived from innovative processes.

In order to empirically explore the scope of these causal relationships in the Tunisian context, we conducted a study among 110 Tunisian SMEs by the structural equation modeling method using the (PLS) approach. Our results provide important insights into the relationship of certain organizational agility practices that directly stimulate performance achievement through innovation, which leads to a number of useful implications for management research.

2. Theoretical conceptual framework

The relationships that we propose to study are established on the basis of three main concepts: organizational agility practices, intellectual capital, and innovation performance. Thus, these concepts will be the subject of a brief description and will be

presented succinctly as variables forming three types of relations.

2.1- Relationship between intellectual capital and innovation performance

The transition to the economy knowledge and the proliferation of information technologies strongly accentuate the need for companies to invest in intangible assets in order to find new avenues of innovation and growth. This is all the more true as knowledge-based intellectual resources transcend other forms of financial resources in creating value and increasing the competitiveness of companies (Chen et al, 2005; Dalkir, 2005). The capacity for innovation is now considered a cornerstone of performance (Mention, 2012) because it is recognized as a key factor in productivity and economic growth (Griffith et al., 2006) and the question of its measurement has been the subject of several studies since the 1990s (Muller et al, 2017), focusing specifically on the internal factors of processes or activities that make it possible to stimulate it (Igartua and Albors, 2011).

Here, the attention is focused on the spillover effects of the intellectual capital which being closely linked to innovation. In fact, by the intellectual capital, Lev (2001) refers to investments primarily based on intangible assets, Harrison and Sullivan (2000) mean knowledge that can be converted into profit. Abdullah and Sofian (2012) refer to the body of intangible knowledge used by the company to create value, a competitive advantage and to improve performance.

In addition, the intellectual capital is a concept commonly approached in a multidimensional way and declined in three types of human assets, structural or organizational and relational (Mention, 2012; Subramaniam and Youndt, 2005) by reference to the first categorization of Edvinsson and Malone (1997). Human capital is often recognized as the most generative intangible component of intellectual capital because it is formed by the skills, knowledge, experiences and capacities of the employees who carry it (Roslender and Fincham, 2004), the structural capital includes all the systems, structures and processes that make it possible to manage knowledge and coordinate it (Lacoursière et al, 2014), as for relational capital, it designates the capital of relations

that govern between internal and external actors of organization (Evraert-Bardinet, 2017).

Therefore, as Zerenler (2008) argues, the higher the intellectual capital of a company, the more it has distinctive skills that generate managerial, operational and innovation efficiency. In other words, intellectual capital can be seen as a fertile ground for the organization to cultivate in order to achieve innovation performance.

2.2. Effect of organizational agility practices on the development of intellectual capital and on the performance of innovation

In the plethora of definitions devoted to the concept of agility, many authors equate it with the ability to adapt quickly to market changes (Barrand, 2006; Breu et al., 2001; Kassim and Zain, 2004), others define it as the ability of an organization to prosper despite the difficult constraints of a strong competition and competitiveness (Charbonnier, 2011; Joroff, et al., 2003). It is also a term often associated with proactivity and perceived as the capacity to exploit change as an opportunity (Doz and Kosonen, 2007; Jamrog et al, 2006) and as a source of innovation (Dyer and Shafer, 2003).

Despite the variety of meanings given to agility, some of its characteristics seem to be unanimous. Indeed, as attested by the first theoretical model of Shafer (1997) on the subject, the companies qualified as agile are those which have the capacity to anticipate market changes, the capacity to respond quickly and sometimes even improvised but sustained through strategic scan (Ben Slimene and Lakhal, 2021) of these markets, and learning capacities and knowledge capitalization by adjustments and permanent adaptation to the imperatives dictated by the strategy (Ben Slimene, 2020). Furthermore, in order to acquire these capacities, each organization is called upon to work to ensure continuous adaptability between its resources and the requirements dictated by the dynamic and changing environment. To this end, it becomes important for any organization to specify the organizational practices which are able to grant it capacities for agility and to define the types of behaviors and orientations likely to favor the formation of an intellectual capital which able to develop, create, innovate and perform.

To define the practices that support organizational agility, we have endorsed the work of Charbonnier (2009, 2011). Strongly inspired by the work of Shafer (1997) and his disciples, the author develops a measurement scale by which he validates four practices supporting organizational agility, namely: human resources development, cooperation, strategic orientation and customer orientation. All of its practices will be described below, describing their possible effects on intellectual capital, and on innovation as a performance asset.

2.2.1 Effect of human resource development practices on intellectual capital and on innovation performance

In practices aimed at enhancing human resources, Charbonnier (2009) associates three determining dimensions to organizational agility which relate in particular to the evaluation and recognition of individual performance, to participation in decision-making processes, to the development of skills and knowledge sharing. Thus, agility is obtained under the conditions of adopting a participatory management mode and it is more important to measure than practices of accountability, knowledge sharing and performance recognition are put into practice. The process of creativity is thus boosted through the release of potential leading to the formation and development of the intellectual capital of the company.

2.2.2 Effect of cooperation practices on intellectual capital and innovation performance

Cooperation practices are understood according to Charbonnier (2011) through the prism of the two types of internal and external cooperation relations. The essence of the importance of this practice can be attributed to its role in improving responsiveness and innovation capacities (Shafer et al, 2001, Sanchez and Nagi, 2001). Internally, it is synonymous with permanent communication between work teams in structures that operate transversally and in the project world. Externally, the practice of cooperation refers to strengthening exchanges with the company's external partners in order to exploit the opportunities that arise on time and adequately.

2.2.3 Effect of strategic orientation practices on intellectual capital and innovation performance

By identifying the practices of strategic orientations as determinants in the definition of organizational agility, Charbonnier (2009) suggests that these practices are supposed to provide three types of responses necessary to the needs of: developing proactivity, encouraging responsiveness and communicate the strategic vision of the organization. The three strategic dimensions defined are intended to stimulate a strategic vision and to increase the potential for reactivity and proactivity and also to the capitalization of an important intellectual asset for the organization.

In this regard, Lacoursière et al. (2014) argue that to be able to innovate, SMEs must have an absorptive capacity which beyond the acquisition of new knowledge which facilitates its transformation and exploitation.

Furthermore, according to Pavlou and El Sawy (2011), this absorption capacity is dependent on the strategic capacities that organizations have to achieve performance through the innovation of intellectual capital. This includes ensuring alignment between the tools and practices of strategic orientation and intellectual capital which gains to be able to respond in time and adequately to the imperatives of change and adaptation. In this sense, strategic agility is conceived as a combination of several dynamic capacities (Ahammad et al., 2021)

2.2.4 Effect of customer orientation practices on intellectual capital and innovation performance

According to Charbonnier (2009), practices concerning customer orientation revolve around three dimensions relating to the customer knowledge and satisfaction, the anticipation of customer developments and the individualization of the proposed offer. For agility purposes, customer orientation is becoming a privileged activity as the company becomes able to offer a differential offer in the light of an in-depth knowledge of customers, their expectations and their future aspirations. It is therefore about adopting practices that strengthen the relationship with customers. This requires constant monitoring and collection of information on any

changes affecting the market in order to be able to create added value in the eyes of the customer.

In fact, customer orientation involves a set of activities and behaviors aimed at acquiring information about customers. Such guidance is not just about collecting market information; it is also about transforming that information into useful knowledge. Since this information which relates to the customer must be converted into knowledge capital, a customer orientation can be considered to generate learning and innovation capacities (Racela, 2014).

3. Development of the research model

We started with the idea with agile companies that values its resources, ensures their cooperation, which the market and strategy oriented is able to be performed by innovating. This idea is argued by the fact that a company that implements these practices grants itself the qualities of adaptability and responsiveness that are essential for innovation. Indeed, this idea is also correct in numerous studies which have validated the positive effect of organizational agility on the performance produced by innovation. These include the work of Ravichandran (2017), Puriwat and Hoonsopon (2021) and Tallon and Pinsonneault (2011) who assert that organizational agility is an appropriate solution and particularly suited to turbulent environments for regaining performance. In fact, the recognition of agility as a source of performance is no longer in doubt (Issor, 2017; Muller et al, 2017).

In addition, Bhatti et al. (2021) envision it as a facilitator of innovation, as do Kumar et al. (2017) who recognize it as a driver for process innovation.

In light of the above, we postulate that organizational agility practices can positively influence innovation performance and we formulate a first hypothesis (H1) which describes this relationship by stating that:

H-1. Organizational agility practices positively influence the performance of innovation.

The effect of each of these practices supporting agility as we have specified above, are related to: the development of human resources, strategic orientation, cooperation and customer orientation will

be reflected in the sub-hypotheses (H-1.1 to H-1.4) as follows:

H-1.1 Human resource development practices positively influence the innovation performance

H-1.2 Cooperation valuation practices positively influence the performance of innovation

H-1.3 The valuation practices of strategic orientation positively influence the performance of innovation

H-1.4 Customer orientation valuation practices positively influence the performance of innovation

On another aspect, practices that allow internal and external cooperation are likely to increase mutual exchanges between the company personal and therefore improve their relational capital. Likewise, the practices of strategic orientation which call for the development of proactivity, responsiveness and the sharing of a strategic vision of the organization lead to the acquisition of knowledge through continuous monitoring and anticipation. The constant evolution of the markets. An orientation towards the market also obliges to carry out systematic studies in order to provide elements of understanding this market, its needs and to bring the appropriate solutions.

In fact, we also assume, like Day (2003), that a customer orientation reflects the ability of the company to safeguard and maintain close relationships with customers by sharing this information to transform them into useful knowledge for the business, creativity and innovation (Day, 2003)

This suggests that organizational agility practices could directly affect intellectual capital, hence our second hypothesis (H-2) that:

H-2. Organizational agility practices positively influence the intellectual capital.

The effect of the different practices supporting agility taken separately will be the subject of a second body of the sub-hypotheses (H-2.1 to H-2.4) which described as follows:

H-2.1 Human resource development practices positively influence the intellectual capital

H-2.2 Cooperation valuation practices positively influence the intellectual capital

H-2.3 The valuation practices of strategic orientation positively influence the intellectual capital

H-2.4 Customer orientation valuation practices positively influence the intellectual capital

In another vein, and as attested by Bratti et al, (2020) innovation business models depend significantly on the knowledge absorption capacity, agility and vigilance of the top management. For example, human capital is an important determinant of innovation (De Winne and Sels 2010). In fact, we maintain that the practices of organizational agility, through the positive influence they exert on the formation of intellectual capital, lead to a subsequent influence of the latter on the performance of innovation.

All of these foundations lead us to consider the role of intellectual capital in the relationship between

organizational agility practices and innovation performance. To this end, we formulate the third hypothesis (H-3):

H-3. Intellectual capital positively mediates the relationship between organizational agility practices and innovation performance

Thus, on the basis of the theoretical foundations which previously described, the conceptual model to which we end up is formed of three hypothetical relationships integrating the three variables: organizational agility practices (PAO), intellectual capital (CI), and innovation performance (PI) as shown in Figure 1.

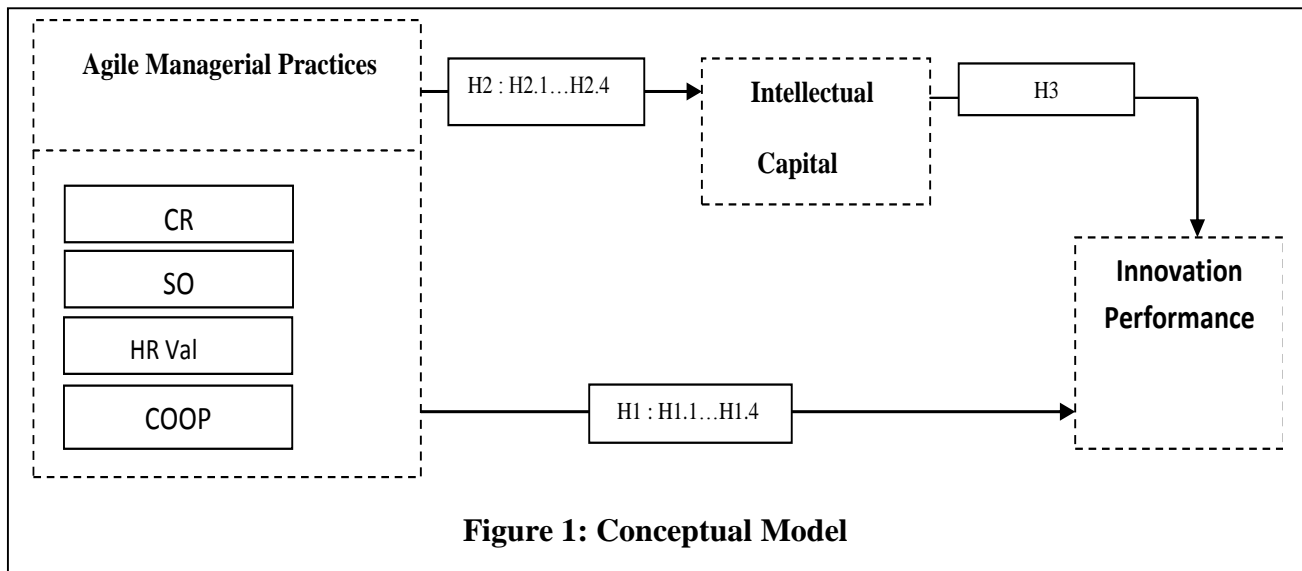


Figure 1: Conceptual Model

4. Methodology

Due to the many advantages it presents and particularly for its consistency with our problematic, we have chosen the PLS approach which, as mentioned Fernandes (2012), allows us to overcome the technical difficulties of sample size to allow the management researcher to focus on his research object. Moreover, in addition to the advantages linked to size and its confirmatory vocation, the PLS approach also has the advantage of a predictive vocation insofar as it makes it possible to reveal

relationships not initially evaluated (Croutsche, 2002; Hsieh et al., 2006).

Also, we recall that our problem is exploratory in nature and that the theoretically established relations are approximate. It is in this sense that the PLS approach offers us the possibility of statistically testing several theoretically predetermined causal relationships between explanatory and explained latent variables and between latent variables and their measurement indicators.

The preliminary exploratory study of the model is conducted by IBMSPSS statistics 23 using the

principal components analysis (PCA) with varimax rotation to eliminate non-significant items (with outer-loading < 0.4). The confirmation study of the model justifies whether the conceptual research model was valid and reliable. The paper discusses the results from the analysis of the measurement model and assesses the structural model.

4.1 Research Design and Data Collection

The research design is composed of four main phases. During the first phase some investigations are conducted to pre-select a set of companies, considering innovation and Organizational Agile Practices in their strategies. The majority of these companies belong to information technology sector and other technology-based sectors. The initial list of companies indicated 80 firms (source: Industry Promotion Agency, Economic guide, published by the Tunisian National Institute of Statistics and the databases of several Tunisian technoparks).

The second phase is questionnaire building (exploratory phase, content validity and questionnaire pretest). Exploratory research adopted a guide for the interviews (open questions) to 10 top managers of various companies in the technology-based sector. The objective is to have a state-of-the-art of the Organizational Agile Practices in Tunisia and to collect notes in order to refine the items of the questionnaire (questionnaire pretest). We also consulted experts and professionals about model constructs and questionnaire items (content validity). The third phase consists of the administration of the final version of the questionnaire and launch of the survey. The final list of the collected questionnaires totals 110 respondents. The last phase concerns the test of the measurement and structural models.

4.2 Settings

The choice of technology-based sectors in the context of Tunisia was guided by the willingness to guarantee the technological and organizational development dependence companies and then a higher chance to assume agile managerial practices adoption. Furthermore, firms belonging to these sectors are strongly focused on intangible factors (Leitner, 2005) which underline intellectual capital. Our choice is guided by the importance of IC in this type of sector

(Johnson et al., 2002, Najjar et al, 2020). Also, firms in the advanced technology sector should absolutely innovate to sustain their competitive edge and thus they are more likely to adopt Organizational Agile Practices.

4.3 Sample and Participants

Our final sample was categorized as follows: Electrical and electronic industry (15 firms, 37.5%) Telecommunications sector (13 firms, 32.5%); and Computer services and engineering (12 firms, 30%). The majority of companies are SME (31 firms, 77.5%). Only nine firms (22.5%) are considered large companies. The questionnaire was distributed to 110 respondents (36% women and 64% men). The respondents were top managers in the organizations, who were better informed than simple executives: top informatics managers (25%), top logistics managers (12%), R&D department managers (40%), project managers (10%), and others (13%). The mode of the administration of the questionnaire was by phone and using face-to-face interviews.

4.4 Measures

The adopted items are drawn from the literature of Organizational Agile Practices (OAP) and IC topics (kianto, 2017). The IC has three dimensions (human capital, structural capital, and relational capital) as justified by the literature and on the basis of the work of kianto (2017) which offers an adequate measurement scale of IC for technology-intensive firms,

The items of Organizational Agile Practices (OAP) constructs are drawn from the work of Charbonnier (2009). As for the final results, the questionnaire consists of 85 items assessed by the Likert scale of five points reflecting a respondent's preferences.

5. Results

The descriptive statistics are conducted by IBM-SPSS statistics 23. The mean and the standard deviation are calculated for all latent constructs which are: Organizational Agile Practices (3.59; 1.30),

intellectual capital (3.53; 1.43), and innovation performance (3.48; 1.45).

5.1 Test of the Measurement Model (Reliability and Validity of the Latent Constructs)

Goal	Criterion	Index	Acceptance threshold
Evaluation of the measurement model	Reliability	Cronbach's alpha	> 0,7
		Indicator reliability	Loadings > 0,7
	Convergent validity	Average Variance Extracted	AVE > 0,5
	Discriminant validity	Fornell-Larcker criterion Cross-loadings	AVE > squared correlations of other latent variables

Convergent validity refers to the criterion for assessing the convergence of constructs. It is verified when the statements on a scale are sufficiently correlated with the construct they are measuring. In other words, it consists in evaluating the percentage of variance shared by variables supposed to be related. Convergent validity is demonstrated by Fornell and

Larcker (1981) through the AVE (Average Variance Extracted) indicator, which must be greater than 0.5. If the variance explaining the construct is below 0.5, Fernandes (2012) recommends removing the item and considering it inappropriate for the measurement of the latent variable to which it is attached.

Table 2: construct Reliability and Validity

	Cronbach's Alpha	Rho-A	Composite Reliability	Average Variance Extracted (AVE)
Customer Orientation	0.880	0.884	0.926	0.807
HR Development	0.800	0.813	0.881	0.713
Innov Perf	0.824	0.826	0.895	0.739
Intellectual Cap	0.841	0.842	0.926	0.862
Strategic Orient	0.831	0.842	0.922	0.855
Cooperation	0.920	0.921	0.949	0.861

The discriminant validity measure consists in verifying the absence of relations between the concepts which are presumed to be independent. In other words, the statements on a scale are sufficiently distinct from the items measuring other constructs. Concretely, according to Fornell and Larcker (1981), the discriminant validity conditions are verified when

the mean variance is greater than the square of the correlation between each latent variable and the other variables of the model.

Table 3: Loading items

	Customer Orientation	HR Development	D Innov Perf	Intellectual Cap	Strategic Orient	Cooperation
CO_CSC6	0.935					
CO_CSC5	0.900					
CO_IOP4	0.858					
RH_PPD1		0.871				
RH_De1_Res2		0.854				
RH_Val_Crea2		0.806				
Innov_Perf5			0.868			
Innov_Perf2			0.861			
Innov_Perf4			0.851			
SC1				0.932		
SC3				0.926		
OS_ER2					0.935	
OS_ER3					0.914	
Coop_RCE4						0.932
Coop_RCE1						0.926
Coop_RCE5						0.926

The third test is the discriminant validity which implies that ‘every reflective construct must share more variance with its own indicators than with other constructs in the path model (Hair et al., 2017). It is verified when the square root of each construct’s AVE

is higher than its correlations with other constructs (Fornell-Larcker criterion). As mentioned in Table 4, the results demonstrate the discriminant validity of the latent variables.

Table 4: Fornell-Larcker Criterion discriminant validity of the constructs

	Customer Orientation	HR Development	Innov Perf	Intellectual Cap	Strategic Orient	Cooperation
Customer Orientation	0.898					
HR Development	0.833	0.844				
Innov Perf	0.746	0.817	0.860			
Intellectual Cap	0.770	0.771	0.834	0.929		
Strategic Orient	0.793	0.716	0.792	0.860	0.925	
Cooperation	0.878	0.840	0.715	0.761	0.751	0.928

Recently, Hair et al. (2017) use the HTMT criterion to assess discriminant validity in PLS-SEM. The confidence interval of the HTMT statistic should

not include the value 1 for all combinations of constructs (see Table 5).

Table 5: Heterotrait-Monotrait Ratio (HTMT) discriminant validity of constructs

	Customer Orientation	HR Development	Innov Perf	Intellectual Cap	Strategic Orient	Cooperation
Customer Orientation	0.989					
HR Development	0.876	0.986				
Innov Perf	0.894	0.933	0.989			
Intellectual Cap	0.927	0.860	0.964	0.989		
Strategic Orient	0.972	0.981	0.819	0.866	0.857	
Cooperation						

To summarize, we conclude that the PLS outputs support the conditions of reliability and validity of the measurement model.

5.2 Test of Hypotheses of the Structural Model

Fit Quality

The quality of the model was assessed by examining the coefficient of determination (R^2) which

indicates the weight of the link between the independent and dependent variables. To designate a satisfactory model, this indicator must be greater than, or equal to, 0.2 or 0.3 (Chin, 1998). Our R^2 values are 0.791 and 0.790 for the two dependent variables of the model, showing good model quality. A second criterion Q^2 could give us an idea on the prediction relevance of the model. Table 6 confirms that all Q^2 are above zero. Hence, this provides the evidence that the observed values are well reconstructed and that the model has predictive relevance.

Table 6: Predictive Relevance Calculations Q^2

	$Q^2 (=1-SSE/SSO)$
Innovation Performance	0.563
Intellectual Cap	0.665

In addition to evaluating the R^2 values of all endogenous constructs, the change in the R^2 value when a specified exogenous construct is omitted from the model can be used to evaluate whether the omitted construct has a substantive impact on the endogenous constructs (Hair et al., 2017, tharwa et al, 2020). This measure is referred to as the f^2 . The guidelines for assessing f^2 are that values of 0.02, 0.15, and 0.35 respectively represent small, medium, and large

effects of the exogenous latent variable. Effect size values of less than 0.02 indicate that there is no effect (Hair et al., 2017, tharwa et al, 2020). Table 7 shows that the values of f^2 show the importance of human resource development and intellectual capital for the innovation performance. Also the importance of strategic orientation for intellectual capital is felt.

Table: F² calculation

	Innovation Performance	Intellectual Capital
Customer Orientation	0.000	0.001
HR Development	0.283	0.093
Intellectual Cap	0.132	
Strategic Orient	0.062	0.651
Cooperation	0.035	0.006

Path Coefficients and Significance of Direct Relations

The direct relation presented by the research is the one that exists between the Organizational Agile Practices OAP dimensions and Innovation

Performance. In fact, the value of the coefficient is not sufficient to assess the significance of the impact. The t-test is the appropriate technique to reveal the relevance of the path coefficients (see Table 8). Smart-PLS offers the bootstrapping option to evaluate this significance.

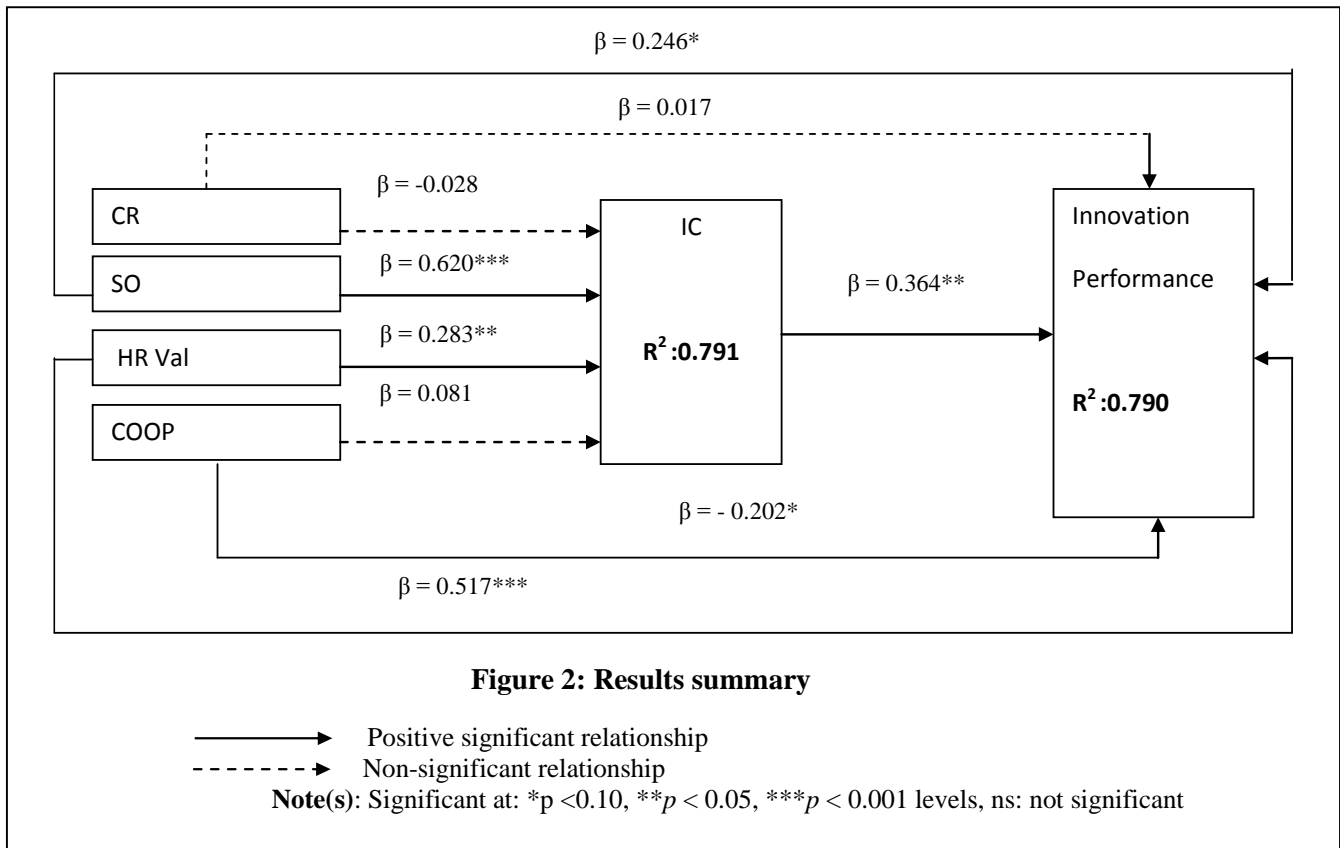
Table 8: t-test of the Path coefficients after bootstrapping (resampling: 5000)

	T Statistics (O/STDEV)	P Values
Customer Orientation → Innov_Perf	0.180	0.858
Customer Orientation → Intellectual Cap	0.258	0.796
HR Development → Innov_Perf	4.743	0.000
HR Development → Intellectual Cap	1.999	0.046
Intellectual Cap → Innov_Perf	3.032	0.003
Strategic Orient → Innov_Perf	2.145	0.032
Strategic Orient → Intellectual Cap	7.716	0.000
Cooperation → Innov_Perf	1.726	0.085
Cooperation → Intellectual Cap	0.727	0.467

Hypotheses Verification

The research findings assume that 79.1.6% of Intellectual Capital is explained by exogenous variables of the model (dimensions of Organizational Agile Practices) while 79% of Innovation performance is predicted by IC and OAP dimensions. Moreover, OAP explains innovation Performance with two major dimensions which Strategic Orientation and Human

Resource HR Development (which present significant path coefficients). However, IC is explained significantly by Strategic Orientation and Human Resource HR Development and Cooperation. In fact, the t-test reveals the significance of these theoretical articulations. The summary of the results is shown in Figure 2, which discloses that the hypotheses H1.1, H1.2, H1.3, H2.1, H2.3 and H3 are confirmed and the others are rejected based on the significance test.



6. Discussion

Our results confirm that the fundamental thesis that organizational agility practices positively impact the innovation performance (Bhatti et al. 2021; Kumar et al., 2017; Puriwat and Hoonsopon, 2021). These results are also in agreement with those of Zerenler (2008) who recognizes the positive effect of the different types of intellectual capital on innovation performance.

On the other hand, our data, which conform to a causal model mediated by intellectual capital, shows that the latter only partially mediates this relationship. In fact, the two practical variables of strategic orientation and development of human resources have a significant and positive relationship with the performance variable of innovation and positively impact the intellectual capital. This finding is in agreement with those of Breu et al (2001), Dyer and Shafer (2003) and Sherehiey et al. (2007) recognizing the importance of human resources in agility tooling.

Likewise, this result broadly matches that of Barczak and Wilemon (2003) for whom practices intended to enhance the experience, professional skills, and creative potential of employees which have a positive effect on performance in terms of innovation, 'where the obligation to initiate the necessary measures in favor of a judicious combination of human capital formed by the skills, knowledge and the accumulated experience. Similarly, strategic agility has a positive impact on the creation of new markets through the effect of permanent renewal and through innovation. This positive effect is recognized by many authors (Clauss et al., 2020; Doz and Kosonen, 2010). In addition, it is justified by the fact that capacity building in innovation requires a shared strategic vision and investment in activities that stimulate anticipation, proactivity and flexibility, in other words the necessary characteristics for innovation are oriented towards the concrete needs of the market.

On the other hand, and unlike studies which consider that a strengthened customer relationship

increases innovation skills rather than inhibiting them (Racela, 2014), our results do not validate the hypothesis in which Innovation performance can thrive as a result of customer focus, or intellectual capital. In fact, as Racela (2014) argues, the relationship between customer focus and innovation is in general rather complex. As Im and Workman (2004) discovered, customer orientation negatively influences product innovations and has no influence on innovations in marketing programs. Although these studies suggest that customer orientation can be unfavorable to new product ideas, the influence of strategic orientation is still significant on other activities and innovative processes of the company.

Beyond the theoretical aspects provided by this study, we suggest some important practical implications. First, its implications concern Tunisian companies looking for a reaped performance from innovation. These companies must reinforce the positive effect of intellectual capital on the performance of innovation by consolidating agile practices around human resources and strategy. Second, although cooperative practices do not affect intellectual capital, they work in favor of innovation performance. Finally, this practice should be maintained by intensifying the exchange relations outside and inside the organization.

7. Conclusion

We started from an exploration of the notion of organizational agility, by shedding light on the different practices that give meaning to its vocation as an effective solution to the complexity of the environment. At the same time, we felt that agile practices lead organizations to improve performance, which is measured nowadays by the capacity for innovation. Furthermore, in this relationship, we also felt that intellectual capital plays a mediating role in this relationship. Our results have indeed served to underline the importance of this role, given that we must make the most of intellectual capital for the generation and then the transformation of creative solutions into innovation. Thus, the impact in terms of performance is materialized by the originality of the innovations produced.

In addition, the study also provided a recommendation as to the practices to be valued by the organization to improve its agility potential and which

relate mainly to human resources and strategic direction. Thus, companies must understand that if the implementation of certain agile practices at the level of the organization can generate more ideas to differentiate, change and be competitive, it is due to its active intellectual capital to intangible structural, human and relational resources that these practices can lead to superior innovative performance.

References

- AhammadM.F., Basu, S., Munjal, S., Clegg, J. &Shoham O.B., 2021.Strategic agility, environmental uncertainties and international performance: the perspective of Indian firms. *Journal of World Business*, Vol. 56, pp. 1-13
- Ahangar R. G., 2011. The relationship between intellectual capital and financial performance: An empirical investigation into an Iranian company. *African Journal of Business Management*, vol. 5, p. 88-95.
- Abdullah D.F.&Sofian, S., 2012.The Relationship between Intellectual Capital and Corporate Performance.*Procedia - Social and Behavioral Sciences* , Vol.40, pp. 537 – 541.
- Ben Slimene S., 2020.Why the enactment of an environmental scanning project fails? case study of tunisian industrial companies.*International Journal of Advanced Research*8(10), 967-981
- Ben Slimene S. &Lakhal, L., 2021. The contingencies of setting up an effective business intelligence system: the case of tunisian industrial companies.*International Journal of Advanced Research*9(11), 1052-1065
- Bhatt G., Emdad A., Roberts N. & Grover V., 2010. Building and leveraging information in dynamic environments: The role of IT infrastructure flexibility as enabler of organizational responsiveness and competitive advantage. *Information and Management* 47 (7), 341-349.
- Bhatti S-H., Santoro G., khan J. &Rizzato F., 2020. Antecedents and consequences of business model innovation in the IT industry. *Journal of Business Research*:389-400.
- Bhatti,S.H., Santoro G., Sarwar. A. and PellicelliA.C., 2021.Internal and external antecedents of open innovation adoption in IT organisations: insights from an emerging market”, *Journal of Knowledge Management*, Vol. 25 No. 7, pp. 1726-1744.
- Breu K., Hemingway C.J., Strathern M., & Bridger D., 2001.Workforce agility: The new employee strategy for the knowledge economy. *Journal of InformationTechnology*, 17(1), 21-31.
- Charbonnier-Voirin A., 2010. La dimension humaine de l'entreprise agile : le rôle du management des ressources humaines sur la performance au travail dans un contexte d'agilité. Editions universitaires européennes. p.617.
- Charbonnier-Voirin, A., 2011. Développement et test partiel des propriétés psychométriques d'une échelle de mesure de l'agilité organisationnelle. *Management*, 14(2), p. 118-154. (7)
- Chakravarty A., Grewal R. &Sambamurthy V., 2013. Information technology competencies, organizational agility, and firm

- performance: Enabling and facilitating roles. *Information Systems Research* 24 (4), 976-997.
- Chen, M.-C., Cheng S.-J. & Hwang Y., 2005. An Empirical Investigation of the Relationship between Intellectual Capital and Firms' Market Value and Financial Performance", *Journal of Intellectual Capital*, Vol. 6 No. 2, 159-179.
- Chen Y., Wang Y., Nevo S., Jin J., Wang L. & Chow W.S., 2014. IT capability and organizational performance: The roles of business process agility and environmental factors. *European Journal of Information Systems* 23 (3), 326-342
- Celenza D., & Rossi F., 2012. The Relationship between Intellectual Capital and Stock Market Performance: Empirical Evidence from Italy", *Journal of Modern Accounting and Auditing*, Vol. 8 No. 11, 1729-1741.
- Clauss T., Kraus S., Kallinger F.L., Bican P., Brem, A. & Kailer N., 2020. Organizational ambidexterity and competitive advantage: the role of strategic agility in the exploration/exploitation paradox", *Journal of Innovation and Knowledge*, forthcoming
- Day G.S., 2003. Creating a customer-relating capability. *MIT Sloan Management Review*, 44(3), 77– 82.
- De Winne S. & Sels L., 2010. Interrelationships between human capital, HRM and innovation in Belgian start-ups aiming at an innovation strategy, *The International Journal of Human Resource Management*, 21:11, 1863-1883.
- Doz Y.L. & Kosonen M., 2010. Embedding strategic agility: a leadership agenda for accelerating business model renewal", *Long Range Planning*, Vol. 43, pp. 370-382.
- Dyer L. & Shafer R.A., 2003. Dynamic organizations: Achieving marketplace and organizational agility with people. Working Paper, Cornell University.
- Evraert-Bardinet F., 2017. Capital intellectuel, gouvernance et facteurs institutionnels. *Accountability, Responsabilités et Comptabilités*, May, Poitiers, France. pp.cd-rom. fihal-01907521.
- Edvinsson L. & Sullivan P., 1996. Profiting from Intellectual Capital: Learning from Leading Companies", *Journal of Intellectual Capital*, Vol 1, No. 1, pp 33-46.
- Griffith R., Huergo E., Mairesse J. & Peters B., 2006. Innovation and Productivity Across Four European countries. *Oxford Review of Economic Policy*, 22 (4), 483-498.
- Issor Z., 2017. La performance de l'entreprise : un concept complexe aux multiples dimensions ». *Projectics / Proyéctica / Projectique*, 17(2), 93.
- Lacoursière R., Raymond L. Fabi Bruno et al., 2014. Capital intellectuel, capacités stratégiques et innovation de produit. Étude des configurations de PMI », *Revue française de gestion*, 1 (238), p. 87-100.
- Leitner K. H., 2011. The effect of intellectual capital on product innovativeness in SMEs. *International Journal of Technology Management*, 53(1), 1–18.
- Lev B., 2001. *Intangibles: management, measurement and reporting*. Brookings Institution Press, Washington.
- Jamrog J. J., McCann J. E., Lee J. M., Morrison C. L., Selsky J.W., & Vickers M., 2006. *Agility and resilience in the face of continuous change: A global study of current Trends and future possibilities 2006-2016*. New York: American Management Association.
- Mention A-L., 2012. Intellectual Capital, Innovation and Performance: a Systematic Review of the Literature. **Business and Economic Research**, [S.l.], v. 2, n. 1, 2162-4860.
- Menor L. J., Kristal M.M., & Rosenzweig E.D., 2007. Examining the influence of operational intellectual capital on capabilities and performance. *Manufacturing & Service Operations Management*, 9(4), 559–578.
- Puriwat W. & Hoonsopon D., 2021. Cultivating product innovation performance through creativity: the impact of organizational agility and flexibility under technological turbulence, *Journal of Manufacturing Technology Management*, ahead-of-print (ahead-of-print) DOI:10.1108/JMTM-10-2020-0420.
- Racela O-C., 2014. Customer orientation, innovation competencies, and firm performance: A proposed conceptual model. *Social and Behavioral Sciences*. 148/16 – 23
- Roberts N., Grover V., 2012. Leveraging information technology infrastructure to facilitate a firm's customer agility and competitive activity: An empirical investigation. *Journal of Management Information Systems* 28 (4), 231-270.
- Roslender R. & Fincham R., 2004. Intellectual capital accounting in the UK: a field study perspective. *Accounting, auditing and accountability Journal*, 17(2), 178-209.
- Shafer R. A., Dyer L., Kilty J., Amos J. & Ericksen, J., 2001. Crafting a human resources strategy to foster organizational agility: A case study. *Human Resource Management*, vol. 40, n°3, p. 197–211.
- Subramaniam, M., & Youndt, M. A., 2005. The influence of intellectual capital on the types of innovative capabilities. *Academy of Management Journal*, 48(3), 450–463.
- Swafford P.M., Ghosh S., & Murthy N., 2008. Achieving supply chain agility through IT integration and flexibility. *International Journal of Production Economics* 116 (2), 288-297.
- Tallon P.P., Queiroz M., Coltman T. & Sharma R., 2019. *Information Technology and the Search for Organizational Agility: A Systematic Review with Future Research Possibilities*. *The Journal of Strategic Information Systems*, 28 (2).
- Tallon P.P. & Pinsonneault A., 2011. Competing perspectives on the link between strategic information technology alignment and organizational agility: Insights from a mediation model. *MIS Quarterly* 35 (2), 463-486.
- Vickery S., Droge C., Setia P., & Sambamurthy V., 2010. Supply chain information technologies and organisational initiatives: Complementary versus independent effects on agility and firm performance. *International Journal of Production Research* 48 (23), 7025-7042.