

Strategic Choice in Knowledge-based Organizations: The Case of the Electronic Industries in Algeria

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Abstract This study aims to find the strategic choice approaches in enterprises that must have a high knowledge and competence, and find the various controls and dimensions that define various strategic choices in these enterprises as knowledge-based organizations. To reach this aim, we have selected the electronic industries in Algeria as a case study, based on the data of 120 questionnaires distributed to a group of managers, especially to a sample of senior leaders of the enterprises of this strategic sector. According to the hypothetical-deductive approach we have proposed and tested a theoretical model (Linking strategic choice approaches and characteristics of knowledge-based organizations) in reality expressed with some organizations' managers' views using Partial least squares of Structural Equation Modeling (PLS-SEM). The study concluded that the characteristics of knowledge-based organizations have a significant impact on the strategic choice of these enterprises, with a path coefficient heading towards 1:0.607, this emphasizes the need to invest these characteristics to develop an effective strategic choices in a highly competitive environment.

Keywords: *strategic choice, knowledge-based organizations, electronic industries, Structural Equation Modeling (SEM), Partial Least Squares (PLS)*

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1. Introduction

There is an ambiguity when studying Knowledge-based Organizations, because the characteristics of these types of organizations are intertwined with the characteristics of other organizations, such as knowledge organization, learning organization, intelligent organization.... However, the unique character of these organizations is that they depend on a high degree of knowledge in order to achieve survival and continuity in their activities.

The smart phones and tablets industry for example, the global success of Samsung and iPad in this industry was not coincidence. But their experiences and competences as learning organizations, and the reliance of high and accurate knowledge, enabled them to develop and choose appropriate strategies that enabled them to succeed in any market around the world.

Like these organizations, the Algerian enterprises that are active in such industries and electronic industries in particular, are seeking to develop their experiences, competences, and knowledges for formulating their strategies, which empowering them to remain in competition with these giant organizations (Samsung and iPad examples). From here the problem of this study is illustrated.

1.1. Problem Statement

The electronic industries in Algeria have perceived a great development in terms of goals, results achieved, and

the enterprises that have a great degree of technology, knowledge, and competence. This is what brands a high competition in this sector; so the electronic enterprises are facing to the challenge of developing effective competitive strategies, drawing on their organizational learning and knowledge characteristics.

Thus showing the importance of the problem of this study or research paper, which relates to the determination of the Algerian enterprises characteristics, which are active in the electronic industries as knowledge-based organizations, and the estimate of the impact and the inspiration of these characteristics on various strategic choices that lead these types of enterprises?

1.2. Related Works

There are two kinds of previous related works that are involved to this study: those which are concerned with the strategic management in the knowledge-based organizations and those which are concerned with the strategic management in electronics industry.

For the first works, Alvarenga Neto, Souza, Barbosa, and Neves [1] could make a qualitative study, to discuss the problem of the implanting effective knowledge management processes in world-class organizations, through the results and prepositions of research conducted in the period 2001-2007. This study has concluded that the quadripartite organizational architecture (their starting point as follows: strategy, structure, processes and people) proposed as a model for knowledge-based organizations

can be fused towards a model of analysis for future research.

In addition Nedelea & Păun [2] have discussed the problem of importance of the strategic management in the modern economy. They have identified the strategic management process in five critical components: (defining the business and establishing a strategic mission, setting strategic objectives, formulating a strategy to achieve the target objectives, implementing and executing the strategic plan, evaluating performance and reformulating the strategic plan), they also define the importance of this process in the knowledge-based economy, especially in achieving a sustainable competitive advantage and to be the leader in market with superior levels of performance. For their part, Scarso & Bolisani [3] have investigated such topic in the case of Knowledge Intensive Business Services (KIBS) firms, namely companies whose main function is to connect external knowledge sources, to the individual needs of customers. They have analyzed the results of survey involving twenty-one computer service companies located in the Northeast of Italy, and they have concluded a new framework allows rereading the classic strategic models (Porter's competitive strategies, Ansoff's product/market strategic matrix, value chain of Porter) under a new light, namely by focusing on the knowledge assets, in order to generate the different competitive strategies in a knowledge-intensive sector. Nicolescu [4], for his part, has discussed the problem of specificity of knowledge based strategies, and demonstrated the methodology of developing the knowledge-based organization's strategy, their vectors as well as priority factors in developing and implementing the knowledge-based strategies (protecting and developing the intellectual capital, enhancing learning, obtaining and promoting of innovation, improving performance). Chelcheh & Bosra [5] have treated the problematic of aligning knowledge management with the organization's strategies, also made an analysis of the general framework of knowledge strategy development (Basic factors and important issues in developing a knowledge strategy and knowledge strategy process), this process is the activities that respond to business strategy, the business case and the knowledge areas, allows organizations to adapt to the changes in business strategies, business environments, and social and scientific changes. As for Chu, Krishna Kumar, and Khosla [6] who have addressed the problem of importance of the communities of practice, in driving knowledge management in multinational knowledge based enterprises. They have conducted a practical study in this regard throughout the Confirmatory Factor Analysis (CFA) and the Structural Equation Modeling (SEM) of data of 120 questionnaires distributed for knowledge workers across difference research and development (R&D) teams in knowledge-based company selected as case study. The results of path analysis between three personality traits (Openness to experience, conscientiousness, agreeableness) and four business strategies (Induced innovation, promoted responsiveness, Increased core competency, enhanced work efficiency), explains that there are a significant relationships between the various traits and strategies.

For the second works relating to strategic management in electronic industries, Hubenthal & Burr [7] have

discussed the problem of realizing sustained competitive success for consumer electronics industry leaders through the new competitive strategies. They have provided a new competitive strategy to dominate in the market of electronics industry, which is a Structured Innovation (a core competency to achieve competitiveness by solving problems faced by the company when respond to changes and variations of expectations of the consumer electronics industry leader). Further Schiller [8] has treated the problem of assessing upgrading strategies of firms from emerging economies based on the perspectives of global value chains and regional innovation systems. He has concluded that strategies based on organizational innovation have produced the most promising results, after doing the empirical section analyses of three qualitative case studies of large electronics firms from Hong Kong. Uusitalo [9] has discussed the problem of improving efficiency and quality of performance in a mid-sized electronics manufacturing company by creating economically and technically competitive operating management system. He also makes a qualitative analysis, in-depth interviews and workshops, and concluded that the strategy of expansion or continuous development of business processes can facilitate adaptation to changes in the environment, which is crucial for companies that hope to maintain their viability, especially companies that are active in the electronics industry.

So far appears what our study enhances compared with the related works, it represents a practical study provides a theoretical framework that explains the process and approach of strategic choice, as well as the factors influencing them in organizations with its specificities (knowledge-based organizations). This framework is then tested using the Structural Equation Modeling (SEM) of data obtained from the leaders of some organizations active in electronic industries in Algeria.

1.3. Conceptual Framework

Based on the theoretical concepts and the results generated by the related works, we can define the conceptual framework as shown in Figure 1.

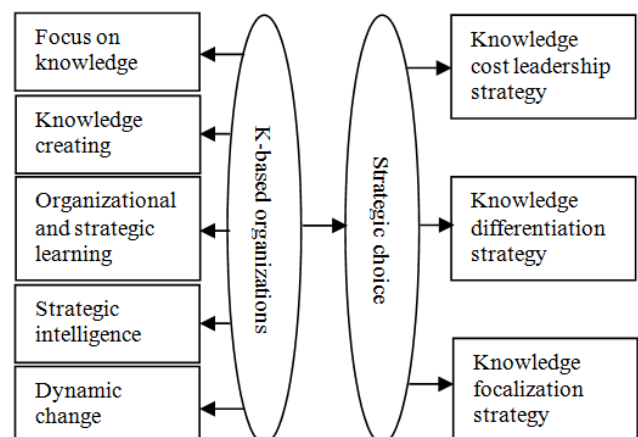


Figure 1. Conceptual framework

Comparing this model with the basics of structural equation modeling using partial least squares, we can indicate that there are two basic models in the conceptual framework of the study. First, the measurement model

which expresses the outer model of exogenous variables: the dimensions of knowledge-based organizations (represented by elements that refer the arrows to the left of figure), and strategic choice (expressed by elements that refer the arrows to the right of figure). Second, the structural model or inner model this linking latent variables (Knowledge-based organizations and strategic choice). As regards, the methods and methodological procedures used for testing this model in reality of consumer electronic industries in Algeria, comes to be explained in the following item.

2. Literature Review

2.1. Knowledge-based Organizations: Definitions and Characteristics

According to Liebowitz & Beckman [10] Knowledge-based organization is an entity that realizes the importance of its knowledge, internal and external to the organization, and applies techniques to maximize the use of this knowledge to its employees, shareholders, and customers. This is what makes them linked to a many different concepts which are: knowledge creating organization, learning organization, intelligent organization, and hypertext organization. [11]

Based on these notions we can deduced the several characteristics which translate the reality of knowledge-based organization, including: i) knowledge considered a key strategic asset, ii) applies and implements the processes of knowledge management (from creation to diffusion), iii) flexible organization to respond changes of their environment, iv) disposes of knowledge employees, v) places emphasis on education and organizational learning, vi) efficient, innovative and proactive organization to continue in the market, vii) favoring the transaction and exchange of knowledge when they move from a context to another, viii) has a strong and open corporate culture, ix) flexible structure and process-oriented, x) customer focused, xi) uses information technologies and information systems, xii) promotes business intelligence. These characteristics are also defined by: Wickramasinghe & Von Lubitz [12], Xiong & Lee [13], Martina, Hana and Jifi [14], Baets [15], Geisler & Wickramasinghe [16].

Furthermore, concerning the environment as a variable which determines the reality of knowledge-based organizations, and affects directly the strategic choice process, Geisler and Wickramasinghe [16] cited the current key environmental attributes of these organizations, which are: i) high volatility, ii) globalization, iii) increased outsourcing, iv) decline of role of manufacturing, v) emergence of enterprise information systems, vi) increased role and capabilities of communication and computing technologies. We are wondering whether these characteristics reflect the nature of the organizations that are active in the electronic industries or not.

2.2. Electronics Industry Enterprises as Knowledge-based Organizations

As a specific sector, the electronic enterprises require a high degree of knowledge assets or immaterial investments.

So it's an industry that displays all the characteristics of a global industry, such as indicated by Mourdoukoutas [17]: i) a high degree of integration, ii) rapid product obsolescence, iii) a high degree of imitation, iv) intense competition, v) price and profit gyrations.

In this regard, consumer electronics enterprises must: i) be highly competitive and deal with serious price and product lifecycles erosions, ii) constantly create better business models (opportunity) and constantly improve business and manufacturing processes (cost reduction), iii) quickly transition to new platform and technologies (opportunity) and counter rapid market penetration by copycats products (cost reduction), iv) produce innovative products and position them well at the correct time to meet real market needs (opportunity) and Be agile – react quickly and not be too proud to do what must be done, even if that is not 'their usual way'; adopt superb change management skills (cost reduction). [7]

These characteristics and specifications approves that the consumer electronics enterprises are a knowledge-based organizations and must be well. Now we wonder about the strategic choice approach in these enterprises.

2.3. Strategic Choice Approach in Electronic Enterprises as Knowledge-based Organizations

A classical model of strategic analysis recognized by the researchers and specialists, practitioners and experts of this field, is the LCAG model proposed by: Learned, Christensen, Andrews and Guth in USA. [18] This model based on SWOT (strengths, weaknesses, opportunities, and threats) analysis of Humphrey. [19] Well it is a traditional, especially as he is incompatible with the chaos theory [20], that characterize the knowledge economy and environment of knowledge-based organizations.

In the light of the knowledge-based economy, there are other factors that affect the strategic analysis and strategic choice approach, other than the outputs of SWOT matrix.

On one side, in electronic enterprises as Knowledge-based organizations, it can be considered that the concepts linked to these kinds of organizations, as factors affecting the strategic analysis and choice, defined by Neagu [11]: i) focus on knowledge (feature of knowledge-based organizations), ii) knowledge creating which is embodied in new technology and products (feature of knowledge creating organizations), iii) organizational and strategic learning (feature of learning organizations), iv) strategic intelligence (feature of intelligent organizations), and v) dynamic change between the various context (feature of hypertext organizations).

On the other side, the strategic analysis of internal and external environment, framed to the environmental attributes of knowledge-based organizations, defined by Wickramasinghe [16].

With regard to strategic choice process and strategic options in this kind of organizations, there is what is known as the knowledge strategy. Choo & Bontis [21] have implied this concept by the knowledge-based strategy, that is, competitive strategy built around a firm's intellectual resources and capabilities. Based on the Porter's model of competitive strategy [22], there are three basic strategies in this way of knowledge: i) knowledge

cost leadership strategy, ii) knowledge differentiation strategy and iii) knowledge focalization strategy, as have determined by Scarso & Bolisani [3].

3. Research Methods

In this item, we must first prove the sampling techniques and how to retract a sample, and then the statistical methods used for testing conceptual framework of the study.

3.1. Sampling Techniques

The questionnaire of this study is addressed to the managers of the consumer electronic enterprises in Algeria; this is what constitutes the study population.

The sample selection is subject to several controls. First, the necessity of the scientific and the statistical principles for the sampling techniques. Second, the need to direct the questionnaires to the managers who understands the strategic aspects especially that our study relates to these aspects. And third, the necessity to choose a good location for applied study (The state of Bordj Bou Arreridj is the capital of electronic industries in Algeria).

Depending on these three controls, 120 questionnaires were distributed and collected (in collaboration with the HR managers of all enterprises) to a sample of senior leaders (Who have an extensive knowledge of their enterprise and have a direct relations with the strategic planning process) of consumer electronic enterprises in the electronic capital or the state of Bordj Bou Arreridj. This is known as purposive sampling (Also called judgment sampling, is the deliberate choice of an informant due to the qualities the informant possesses. It is a nonrandom technique that does not need underlying theories or a set number of informants. Simply put, the researcher decides what needs to be known and sets out to find people who can and are willing to provide the information by virtue of knowledge or experience) [23].

3.2. Statistical Methods

With a view to test the conceptual framework of study the partial least squares (PLS) method is adopted for the structural equation modeling (SEM), PLS-SEM becomes a good alternative when the following situations are encountered [24]: i) no assumptions about data distribution, ii) Sample size is small, iii) Applications have little available theory, iv) Predictive accuracy is

paramount, v) Correct model specification cannot be ensured. The data of our study according to the sampling techniques are all consistent with these five situations.

After retrieving all distributed questionnaires (120 questionnaires) for the senior leaders of electronic enterprises in Bordj Bou Arreridj; where the response rate was 100%, due to the help of HR managers of these enterprises to distribute and collect all 120 questionnaires.

We have entered the data in the SPSS and exported to the SmartPLS₃, this program allows access to the outputs about: i) statistics about the reliability and validity, ii) descriptive statistics useful to know respondents trends (mean, standard deviation...), and iii) statistics to test the conceptual model, especially the path coefficient.

Founded on the analysis of these statistics, it was reached the accuracy of the conceptual model and its arrangement with the reality (which presupposes the existence of an effect of the knowledge-based organization's characteristics on strategic choice of electronic enterprises).

4. Results of Empirical Study

We can view and analyze the results of PLS-SEM, through the following three items: indicators of reliability and validity, main statistical indicators, and PLS-SEM results.

4.1. Indicators of Reliability and Validity

The following table shows the most important indicators of reliability and validity of the outer model, which represents the exogenous variables or the dimensions of study variables.

The results of reflective model illustrates that all loading values of the outer model are at an acceptable level, which reflects the consistency of these dimensions in meaning of study variables, this confirms by the indicator of internal consistency or composite reliability that exceeds the lowest acceptable level or 0.7, for knowledge-based organizations and strategic choice. The Average Variance Extracted (AVE) or the convergent validity values are superior to the acceptable level of 0.5, so convergent validity is confirmed. The multicollinearity test value (Vif) is less than 5 which indicates the lack of multi-linear problem. Thus, confirmed the reliability and validity of the proposed model of study and the results of PLS-SEM which is illustrated in the following items.

Table 1. Results Summary for Reflective Outer Models

Latent variables	Dim.	Loading	Composite Reliability	AVE	Vif
Knowledge-based organizations	FK	0.835	0.905	0.658	0.000
	KC	0.813			
	OSL	0.816			
	SI	0.913			
	DC	0.656			
strategic choice	CLKS	0.722	0.814	0.594	1.000
	DKS	0.817			
	FKS	0.771			

Table 2. Descriptive statistics indicators

Questions		Mean	σ	Excess Kurtosis	Skewness
1	The Enterprise give the importance of investing in knowledge more than material investment	3.433	1.116	-1.38	-0.013
2	Knowledge is a source of innovations and successes in your enterprise	3.033	1.366	-1.021	-0.021
Dim. of focus on knowledge		3.233	1.181	-1.228	-0.058
3	The enterprise renovate technology in a creative way	2.925	1.156	-0.81	0.181
4	The enterprise offering new and creative products continuously	3.608	1.113	-1.371	-0.056
Dim. of knowledge creating		3.267	1.043	-1.276	0.192
5	Your enterprise benefit from their previous experiences in new projects	3.508	0.931	-0.836	-0.37
6	Your enterprise benefit from the strategic knowledge stored to counter the competitors	2.917	1.525	-1.474	-0.015
Dim. of Organizational and strategic learning		3.212	1.156	-1.19	-0.096
7	The enterprise use knowledge intelligently to survive in the market	3.225	1.405	-1.128	-0.39
8	The enterprise use knowledge intelligently to formulate a unique competitive strategies	3.217	1.205	-1.14	-0.022
Dim. of strategic intelligence		3.221	0.995	-0.341	-0.365
9	The enterprise changed its strategy in the short and simultaneous periods	3.175	1.327	-1.068	-0.067
10	The enterprise change rapidly to response the competitors changes	3.142	1.128	-0.923	-0.001
Dim. of dynamic change		3.158	1.164	-1.304	0.011
11	Your enterprise is seeking a HR and knowledge energies at a lower cost	3.358	1.303	-1.046	-0.257
12	Your enterprise is seeking to convert external knowledge to internal knowledge at a lower cost	3.292	1.227	-0.757	-0.439
Dim. of knowledge cost leadership strategy		3.325	1.121	-0.764	-0.371
13	Your enterprise have a distinctive knowledge compared to its competitors	3.058	1.368	-1.175	-0.087
14	Your enterprise have a HR distinct compared to its competitors	3.458	1.175	-0.996	-0.273
Dim. of knowledge differentiation strategy		3.258	0.868	0.327	-0.357
15	Your enterprise focuses on specific knowledge to produce special products (such as smart watch ...)	3.133	1.329	-1.029	-0.184
16	Your enterprise focuses on specific knowledge to access the special markets (such as the mobile phone market...)	2.967	1.322	-1.15	0.04
Dim. of knowledge focalization strategy		3.05	1.239	-1.234	0.14

4.2. Main Statistical Indicators

The Table 2 provides the most important descriptive statistical data for the results of distributed questionnaires to a sample of managers in consumer electronic enterprises in Algeria.

According to the table above, we can record several remarks, first that the trend of respondents for each questionnaire dimensions of the study variables (knowledge-based organizations and strategic choice), were about average choice (for the five answers are available: very high, high, average, low, and very low) according to the Means values confined between: 2.6 and 3.4, second that the Standard Deviation is weak for each items and close to the 1, this indicates a lack of difference between respondents to answer the questionnaire questions, third that the values of Excess Kurtosis and Skewness are all moving away from zero, this specifies that the data don't follow a normal distribution. Whatever, these three remarks are not influenced the use of partial least squares method, same as the last doesn't affect this method because it does not require a normal distribution of data, such as specified by Hair et al. [26] Concerning to the correlation coefficients that are one of the most important statistical indicators, the following matrix displays this.

Table 3. Correlation matrix

Dim.		FK	KC	OSL	SI	DC	CLKS	DKS	FKS
FK	R	1							
	Sig	0.000							
KC	R	0.9	1						
	Sig	0.000	0.000						
OSL	R	0.838	0.866	1					
	Sig	0.000	0.000	0.000					
SI	R	0.746	0.652	0.693	1				
	Sig	0.000	0.000	0.000	0.000				
DC	R	0.21	0.211	0.206	0.542	1			
	Sig	0.021	0.020	0.023	0.000	0.000			
CLKS	R	0.122	0.131	0.148	0.477	0.729	1		
	Sig	0.184	0.153	0.106	0.000	0.000	0.000		
DKS	R	0.449	0.439	0.491	0.459	0.285	0.295	1	
	Sig	0.000	0.000	0.000	0.000	0.001	0.001	0.000	
FKS	R	0.132	0.156	0.199	0.299	0.492	0.327	0.559	1
	Sig	0.150	0.088	0.029	0.001	0.000	0.000	0.000	0.000

The above correlation matrix describes that there is a significant correlation between most dimensions, exclude: the relationship between three dimensions of knowledge-based organizations (focus on knowledge FK, knowledge creating KC, organizational and strategic learning OSL) and two dimensions of strategic choice (knowledge cost leadership strategy CLKS, knowledge focalization strategy FKS). This explains in the first part by the absence of the possibility of achieving compatibility between knowledge and knowledge cost leadership strategy, especially that the knowledge acquisition is very difficult and expensive in electronic industries, and in the second part by the difficulty in concentrating on some market segments that require high knowledge in electronic sector. It should be noted that these results cannot judge the validity of conceptual framework, but the indicators of PLS-SEM can judge them.

4.3. PLS-SEM Results

The following figure shows the results of path model and PLS-SEM estimate

The Path model in Figure 2 shows that the coefficient of determination between the latent variables (knowledge-based organizations and strategic choice), is equal to 0.369, this means that the process of strategic choice and drawing of strategic directions in the consumer electronics enterprises in Algeria is ruled and determined by 36.9% of characteristics of these enterprises as knowledge-based

organizations, thus the path coefficient between same variables heading towards 1: 0.607, which indicates the existence of significant impact of knowledge-based organizations dimensions on various strategic choices. The model quality indicators appear in the following table.

As shown in Table 4, all T Values exceeds 1.96, which indicates strong significant of model interactively (as shown by the potential value), and therefore are null model and acceptance of alternative model which assumes the existence of a relationship between the influence and the impact of strategic change and technological change; and therefore the example of rejection. The study compared the default true reality and corresponds with it.

5. Conclusion

5.1. Results and Discussion

Finally, we can be concluded that the process of strategic choice is subject to the features of organizations, especially the characteristics of knowledge based organizations which are: focus on knowledge, knowledge creating, organizational and strategic learning, strategic intelligence, and dynamic change. These five characteristics, direct the strategic choices of the organizations towards three different strategies: knowledge cost leadership strategy, knowledge differentiation strategy, and knowledge focalization strategy.

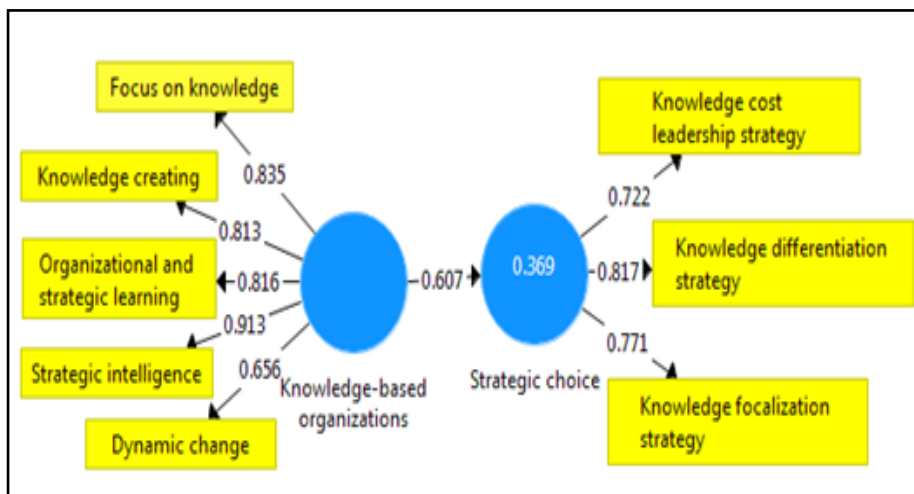


Figure 2. Path model and PLS-SEM estimate

Table 4. Results of PLS-SEM

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
Dynamic change <- Knowledge-based organizations	0.6558	0.6612	0.0575	11.3957	0.0000
Focus on knowledge <- Knowledge-based organizations	0.8354	0.8248	0.0681	12.2615	0.0000
Knowledge cost _leadership strategy <- Strategic choice	0.7219	0.7263	0.0579	12.4639	0.0000
Knowledge creating <- Knowledge-based organizations	0.8128	0.8033	0.0675	12.0370	0.0000
Knowledge differentiation _strategy <- Strategic choice	0.8168	0.8081	0.0547	14.9392	0.0000
Knowledge focalization _strategy <- Strategic choice	0.7710	0.7648	0.0566	13.6255	0.0000
Organizational and _strategic learning <- Knowledge-based organizations	0.8160	0.8061	0.0698	11.6928	0.0000
Strategic intelligence <- Knowledge-based organizations	0.9129	0.9096	0.0270	33.8669	0.0000

According to the views of 120 senior leaders of the electronic enterprises, activist in the capital of electronics "Bordj Bou Arreridj", the strategic choice is subject really to the characteristics of these enterprises, as knowledge-based organizations, this is confirmed by the path coefficient which equaled 0.607 in figure 02 showing the path model of conceptual framework.

In contrast, there is consistency between the results of the correlation matrix and the results of PLS-SEM, to confirm this effect between the knowledge-based organization's characteristics and strategic choice in electronic enterprises. Based on these results we can offer the following suggestions.

5.2. Suggestions and Propositions

Considering the Algerian enterprises that are active in the electronic industries as knowledge based organizations, needs to invest their characteristics in chosen the optimal strategy, which ensures the survival and the continuity in a highly competitive market.

Therefore, these enterprises in the challenge to develop their knowledge bases, through the human capital investment, relying on the human competences in the development of their strategies in a rapidly changing environment.

Also, these enterprises must be selected as their leaders according to the competences and knowledge, not according to the years of experience because the nature of their activities and the strategic option process in the enterprise need to more and more knowledge.

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