Business perception and knowledge management for using virtual reality in emerging countries

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Abstract– The objective of this research was to determine the relationship between business perception and knowledge management for the use of virtual reality in companies in emerging countries. An applied methodology with a quantitative approach was used, at a correlational level and as a data collection instrument, a questionnaire was applied for each variable. The result of the study allowed us to identify a positive relationship between both variables. The conclusion of the study indicates that when there is a favorable business perception for the use of virtual reality, knowledge management will be a less complex and more optimal process for companies.

Keywords-- Business perception, knowledge management, virtual reality, emerging countries.

I. INTRODUCTION

Technological progress in recent years has made it possible to generate strategic tools and allies in the business world, such is the case of virtual reality, which according to the World Economic Forum has been considered an emerging technology in the last decade [1]. Likewise, Ipsos concluded that in the countries of Turkey, Hungary and Peru there is more than 90% familiarity with the concept and its use, and added that its application is becoming evident in the areas of medicine, business, among others [2].

Its use in the business world has already had a strong presence as in the case of Audi, Sony and L'Oreal companies [3], even the European Regional Development Fund has indicated that SMEs are the most benefited with the integration of this technology within their different processes such as marketing, internal learning, training, product improvement, achieving cost reduction, improving the competitive advantage or differentiator of the company, achieving efficiency in the value chain and improving decision making [4].

This leads different companies to start converting the knowledge generated about the use of technologies such as virtual reality into assets. This process, knowledge management, generates sustainability over time and continuously improves the value proposition that companies generate in the market, being a crucial factor for the sustainability in the industry [5].

In the context of emerging countries, Peru has been one of the nations to generate strategic agreements with partner countries with the intention of sharing information and knowledge seeking efficiency, business growth of members and generate competitive advantages between the parties [6]. Another initiative in this area is the strategic alliance between Colombia and Kenya who shared information oriented to the local production processes of coffee growers in the country with the objective of enhancing the role of SMEs through technology and knowledge [7]. This suggests that there are emerging countries that are already working with the intention of managing knowledge between companies and countries, converting the information into assets that are subsequently used to apply them through strategic actions favoring the generation of value and business development.

Another particular case is that of Mexico, in which less than 40% of companies, in a study conducted by Concanaco Servytur Mexico, had developed efforts to implement technological tools within their production processes, where the highest percentage was made up of SMEs [8], highlighting those cases in which technological means were incorporated, but the expected results were not obtained, causing negative perceptions in the companies studied. From the above it can be understood that there is a lack of knowledge management about the advantages offered by technologies for companies in Mexico, which can only generate delays and disadvantages against the competition in the local and international market, generating frustration when the proposed expectations are not met.

Although knowledge management initiatives have been developed for the use of technological tools such as virtual reality, there are still countries that do not put this management into practice, which leads them to lose opportunities by not taking advantage of the technology. Therefore, the general problem of the research was: What is the relationship between business perception and knowledge management for the use of virtual reality in emerging countries, having as specific problems 1) What is the relationship between business perception and innovation performance for the use of virtual reality in emerging countries? 2) What is the relationship between business perception and innovation orientation for the use of virtual reality in emerging countries, 3) What is the relationship between business perception and external knowledge acquisition for the use of virtual reality in emerging

countries, 4) What is the relationship between business perception and internal knowledge sharing for the use of virtual reality in emerging countries?

Likewise, the importance of the research is justified by the fact that knowledge management can allow companies located in emerging countries, especially SMEs, to generate actions for the incorporation of technologies by optimally managing existing internal and external knowledge, maximizing their benefits. On the other hand, the contribution of the study from the theoretical point of view lies in the selection of authors and conceptual frameworks that contribute to a better understanding of the variables and makes available the theoretical approach used by the authors for the research. Likewise, the fact of supporting the variables in theory and then decomposing them and generating an instrument that allows the measurement of these variables in a specific environment, allows the theory to be subjected to practical contexts in the framework of the research and this strengthens the validity of the theory and concepts that have been handled in this document.

The general objective was to determine the relationship between business perception and knowledge management for the use of virtual reality in emerging countries, and the specific objectives were: 1) to determine the relationship between business perception and innovation performance for the use of virtual reality in emerging countries; 2) to determine the relationship between business perception and innovation orientation for the use of virtual reality in emerging countries; 3) to determine the relationship between business perception and external knowledge for the use of virtual reality in emerging countries; and 4) to determine the relationship between business perception and internal knowledge sharing for the use of virtual reality in emerging countries.

The general hypothesis of the research is that there is a positive relationship between business perception and knowledge management for the use of virtual reality in emerging countries, and the specific hypotheses are: 1) there is a positive relationship between business perception and innovation performance for the use of virtual reality in emerging countries; 2) there is a positive relationship between business perception and innovation orientation for the use of virtual reality in emerging countries; 3) there is a positive relationship between business perception and external knowledge for the use of virtual reality in emerging countries; and 4) there is a positive relationship between business perception and internal knowledge sharing for the use of virtual reality in emerging countries. The hypotheses were constructed given the correlational nature of the research, so that working with them implies the need in quantitative terms to determine the type of relationship that these variables have, assuming at first that this association is positive, but subsequently it must be verified with the processing and interpretation of the results obtained.

II. THEORETICAL FRAMEWORK

Business perception, is the cognitive process carried out by the individual in order to understand and interpret the context in which he/she lives, being this oriented to the business environment [9], likewise, Afifah and Mustofa indicated that this variable contemplates the point of view of the business actors on a certain situation, whether it is the incorporation of new tools or technologies in the business sector, or some other fact that is related to their business activities [10]. One of the first theories on business perception was the model proposed by Davis, the Technology Acceptance Model (TAM) [11]. The author proposes, through the study and analysis of the users' intention to use, to measure the perception from the point of view of the collaborators on the use of new technological tools in a business context, as well as the implementation of new systems or processes in the activities developed by the company. This analysis contemplates the concepts of perceived ease of use and perceived usefulness by the employees (users), which together allow explaining how willing the users are to implement a new technology in their work environment.

Similarly, the Unified Theory of Acceptance and Use of Technology (UTAUT) [12]. Based on Davis' theory mentioned above, they incorporate new elements of study such as the environment in which users operate, their expectations and their level of performance in relation to the new tool in order to connect the variable with those factors that may predominate in users when faced with new systems or tools.

On the other hand, show a different picture about business perception since the authors take as pillars two fundamental processes: stereotyping, where in a business environment stigma of the stimuli with which one interacts are created; and selective perception where stimuli are perceived according to what one believes discarding the opposite to it. These two aspects become predominant when studying and identifying the perception and behavior of employees in new situations and incorporation of new tools [13].

Knowledge management is the procedure that seeks to convert information or knowledge generated in a structured way into a company's asset in order to generate competitive improvements within the organization and generate value [14]. One of the most relevant models is that of deliberate knowledge management of innovation for SMEs, which according to others authors, allows studying the variable in a particular way in SMEs, incorporating innovation in the company both at the commercial level (sale of goods and services of the company itself) and at the operational level (improvement and incorporation of new production processes and/or value chain), being able to be measured through performance and orientation towards innovation, and the exchange and acquisition of knowledge [15].

Similarly, Cegarra and Martinez, highlight knowledge as a strategic resource within the company allowing it to generate competitive advantage and sustainable innovation granting

benefits in growth while reducing costs, time and risks [16]. The authors establish that there are three fundamental pillars of knowledge management in a global way with a strategic approach: intellectual capital, representing the intangible elements of the organization that allow to generate, measure and identify the background of knowledge creation; knowledge management, representing how the process of generating and disseminating knowledge among the members of the company is directed; and organizational learning, being one of the most important aspects in this management, through it the incorporation of knowledge is favored thanks to the routines implemented at all organizational levels.

Others authors proposed a new model oriented to business innovation based on four aspects: on the growth of knowledge in use and organizational potential; on the acceptance of change since knowledge is constantly updated; on its practical use in reality allowing to find strategic solutions to more specific problems or problems of the same magnitude; and that knowledge is based on multidisciplinary relationships since it is through interaction that the data is shared with whomever it is needed [17].

For the purposes of this research, it was decided to work with the Technology Acceptance Model and the Deliberate Knowledge Management Model for innovation in SMEs for the variables business perception and knowledge management, respectively. This is because the Technology Acceptance Model allows studying the perception, within a business environment, on the use of new technology in the organization's collaborators; on the other hand, the Deliberate Knowledge Management Model is the most appropriate to use in an SME, besides facilitating a complete study by considering all areas of a company to analyze the variable, being able to connect the use of technology with its elements.

III. METHODOLOGY

The study was applied in that it was developed on the basis of existing theories; it was quantitative in its approach, since it proceeded to provide a scientific response to the research problem by means of statistical instruments and a numerical database, which revolved around determining the relationship between business perception and knowledge management without the intention of establishing relationships of effect or cause in them. In addition to this, the scientific work is of transversal cut because no time ranges were taken, but it was developed during a specific date, the year 2024; and finally, it is of non-experimental design because no modification or alteration was made to the variables under study.

The variables under study were business perception and knowledge management, both analyzed on an ordinal scale.

The population consisted of employees of SMEs in the countries of Mexico, Colombia and Peru, taken as reference countries of those referred to as emerging countries in the continent. For this reason, a non-probabilistic census-type test was used to establish the sample, which consisted of a total of 65 employees of SMEs in Peru, Colombia and Mexico, distributed in 34, 10 and 21 respectively.

Likewise, for the execution of the study and analysis of variables, we proceeded to develop the survey as a data collection technique, and therefore the data collection instrument, which in this case was the questionnaire.

TABLE I
Reliability statistics for business perception

Cronbach's alpha	Number of elements
0.891	17

TABLE II
Reliability statistics for knowledge management

Cronbach's alpha	Number of elements
0.997	25

This instrument was subjected to the development of the pilot test of the questionnaire for the variables business perception and knowledge management, which resulted in a Cronbach's Alpha of 0.891 and 0.977 respectively, as shown in Table 1 and Table 2. These results corroborate that the instruments used have a high reliability and can therefore be used in the study.

IV. RESULTS

In relation to the general objective, Table 3 shows that the correlation between the business perception variable and knowledge management is low positive, with a value of 0.241. This allows us to affirm that the relationship found between the variables under study is direct, but lacks strength, generating the interpretation that when one of them is more developed, the other will also be more developed, but to a lesser extent.

In this sense, the results allow us to accept the general hypothesis of the research, since the relationship is positive, although in low proportion. This can be contextualized as follows: the better the business perception for the use of virtual reality in the companies studied in the emerging countries (Colombia, Mexico and Peru), the more favorable and effective will be the knowledge management that will need to be implemented for the use of virtual reality in the sample studied. Although it is pertinent to point out that this interaction between both variables is weak, since there are other elements to be taken into consideration that, due to the scope and limitations of this study, have not been analyzed, but that may be mediating between the two variables to enhance or affect this relationship. These elements may be linked to resources, organizational culture and other aspects that are necessary for effective knowledge management.

Another factor to take into account is the Sig. (bilateral) obtained from the correlation analysis, which is 0.53, a value that allows us to affirm that the relationship between both variables is not significant, that is, these results cannot be generalized and in other studies that analyze the same

variables, but in different objects of study, the results may very possibly differ considerably. This is due to the nature of the variables, which are highly dependent on other factors such as cultural factors.

TABLE III
Correlation between business perception and knowledge management

Spearman's Rho		Business perception	Knowledge management
Business perception	Correlation coefficient	1,000	,241
	Sig. (bilateral)	.	,053
	N	65	65
Knowledge management	Correlation coefficient	,241	1,000
	Sig. (bilateral)	,053	.
	N	65	65

In relation to the first specific objective, Table 4 shows that the correlation between business perception and the first dimension of knowledge management, performance and innovation was 0.199, demonstrating that there is a low positive relationship between the two; however, the bilateral sig. value of 0.113 shows that this relationship is not significant.

TABLE IV
Correlation between business perception and performance and innovation

Spearman's Rho		Business perception	Performance and Innovation
Business perception	Correlation coefficient	1,000	,199
	Sig. (bilateral)	.	,113
	N	65	65
Performance and Innovation	Correlation coefficient	,199	1,000
	Sig. (bilateral)	,113	.
	N	65	65

According to the second specific objective, Table 5 shows a correlation of 0.225, which suggests that the relationship between business perception and innovation orientation is low positive, in addition to the fact that the bilateral sig. presents a value of 0.071, which reinforces what was found in the general result and again the relationship found is not significant.

TABLE V
Correlation between business perception and innovation orientation

Spearman's Rho		Business perception	Innovation orientation
Business perception	Correlation coefficient	1,000	,225
	Sig. (bilateral)	.	,071
	N	65	65
Innovation orientation	Correlation coefficient	,225	1,000
	Sig. (bilateral)	,071	.
	N	65	65

According to the third specific objective, the relationship between business perception and the third dimension of knowledge management, as shown in Table 6, is low positive, with a value of 0.232, and the bilateral sig. was 0.063, which allows us to state that the relationship is not significant.

TABLE VI
Correlation between business perception and external knowledge acquisition

Spearman's Rho		Business perception	Acquisition of external knowledge
Business perception	Correlation coefficient	1,000	,232
	Sig. (bilateral)	.	,063
	N	65	65
Acquisition of external knowledge	Correlation coefficient	,232	1,000
	Sig. (bilateral)	,063	.
	N	65	65

Continuing with the fourth specific objective, Table 7 shows a low positive relationship between business perception and internal knowledge sharing with a correlation of 0.234, besides not being significant with a bilateral sig. value of 0.060.

TABLE VII
Correlation between business perception and internal knowledge sharing

Spearman's Rho		Business perception	Internal knowledge sharing
Business perception	Correlation coefficient	1,000	,234
	Sig. (bilateral)	.	,060
	N	65	65
Internal knowledge sharing	Correlation coefficient	,234	1,000
	Sig. (bilateral)	,060	.
	N	65	65

In this sense, according to the results expressed in terms of each objective, the specific hypotheses of the research can be accepted, since the relationship in each case analyzed is positive, although in a low proportion. This can be contextualized as follows:

a) Specific Objective 1: The better the business perception of the use of virtual reality in the companies studied in the emerging countries (Colombia, Mexico and Peru), the more favorable and effective will be the performance and innovation required for the use of virtual reality in the sample studied. Although it is pertinent to point out that this interaction between both variables is weak.

b) Specific Objective 2: The better the business perception of the use of virtual reality in the companies studied in the emerging countries

(Colombia, Mexico and Peru), the more favorable will be the orientation towards innovation that will be needed for the use of virtual reality in the sample studied. Although it should be pointed out that this interaction between the two variables is weak.

c) Specific Objective 3: The better the business perception of the use of virtual reality in the companies studied in the emerging countries (Colombia, Mexico and Peru), the more favorable and effective will be the acquisition of the external knowledge that will be needed for the use of virtual reality in the sample studied. Although it is pertinent to point out that this interaction between both variables is weak.

d) Specific Objective 4: The better the business perception of the use of virtual reality in the companies studied in the emerging countries (Colombia, Mexico and Peru), the more favorable and effective will be the exchange of internal knowledge that will need to be developed for the use of virtual reality in the sample studied. Although it is pertinent to point out that this interaction between both variables is weak.

V. Discussion

The results obtained allow us to accept the general hypothesis of the research since it was found that there is a positive relationship between both variables; the more the business perception for the use of virtual reality is developed in emerging countries, the more the knowledge management for the use of virtual reality will be developed in these countries. It should be noted that this relationship is not significant, i.e. it is a relationship of low intensity between the variables of the study; business perception is not significantly related to knowledge management.

These results are corroborated by the correlation of the first variable with each of the dimensions of the second variable, since each result shows that business perception is not significantly related to the knowledge management dimensions, however, this relationship is still positive so both variables develop in the same direction.

This allows us to understand that the business perception for the use of virtual reality is not so closely related to knowledge management for the use of virtual reality that companies in emerging countries can generate. Thus, although the employees of SMEs in the emerging countries studied have a good perception towards the use of virtual reality in the different activities carried out by the company, this perception has a minimal association with the knowledge management that is executed within the company. This is related to various authors who pointed out that knowledge management, especially in SMEs, is not only associated with the perception as such, but also with other aspects such as the company's own

organization, the pre-existing internal knowledge, the willingness to innovate by the company in general, among other aspects, thereby seeking to increase the benefits for the company through the increase and improvement of existing knowledge. With the above mentioned, business innovation could be achieved by making use of technological tools such as virtual reality [18] [19] [15]

VI. Conclusions

The final conclusion is that the general and specific objectives of the research were achieved by finding a positive relationship between the variables under study; however, it should be emphasized that this relationship is low. It should be noted that the present research was limited by the research time, population, sample and other external aspects that can be addressed by future studies.

Similarly, it can be said that the better the business perception of the use of virtual reality, the more favorable and effective knowledge management in the companies (studied) in emerging countries will be, although in a low proportion, due to other factors that may be mediating between the two variables, such as the cultural aspect and the resources available to the companies. However, it is proven that the business perception that each collaborator in the company has about the use of virtual reality is an aspect to take into account and that can facilitate to some extent the task of introducing this type of technology in the organization, accompanied by an adequate and relevant management of knowledge.

Although the development of this study is based on the quantitative approach, it is suggested that future research encompass different approaches, such as qualitative, to address the problem presented from another angle.

Finally, it is recommended that future studies investigate those external factors that may be related to the behavior of the variables studied, giving a deeper insight into the research topic addressed in this study.

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