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MEASUREMENT OF KNOWLEDGE AND INNOVATION FOR BANKS, HOTELS AND HEALTH COMPANIES IN ARGENTINA AND COLOMBIA

ABSTRACT

In this paper the Knowledge and Innovation (K&I) Measurement Scorecard is applied along with other instruments such as expert interviews and document analysis to determine the level of innovation and knowledge created from an intentional sample of companies from Argentina and Colombia in the health, financial and tourism sectors.

The results show in the hotels studied a lack of culture oriented to innovation and collaboration, and a lack of development of Human Capital. Banks must integrate the advances of Internet, and business intelligence (BI), to get a better knowledge of the client and guide the offer of services to ultra-segmented sectors.

Health companies need to seek greater efficiency and generate innovations in conjunction with public and private health systems, laboratories, and diagnostic centers.

KEYWORDS

Banks, Health companies, Hotels, Measurement, Innovation, Knowledge, Business Intelligence

INTRODUCTION

The present research sought to determine the level of innovation and knowledge generated at companies of Argentina and Colombia in the health sectors (private centers), financial (banks) and tourism (four and five star hotels).

The Knowledge and Innovation (K&I) measurement scorecard was applied, which is made up of 53 indicators, using a Likert scale of 1 to 5, carrying out a multiple case study, the main objective being to determine the degree of situation in which these organizations are in relation to the Innovation and Knowledge management processes.

The K&I scorecard was drawn from the Kaplan and Norton Balance Scorecard (1992), the Intellect Club Model (Euroforum 1998), the Intangible Asset Monitor (Bontis 2001 and Sveiby 2001) the Decision Support Systems (O'Brien, 2006) and Ubiparipović & Đurković (2011).

The scorecard prepared by the research team was validated by experts and previously applied to 34 companies in the productive sectors of: ICTs, Mining and Life Sciences in Argentina, Colombia and Peru (De Arteche, Welsh, Santucci, Castro, and Zambrano, 2017). It is composed of 53 indicators distributed in four perspectives (financial, internal processes, customers and learning and growth). They include traditional accounting information, information about intellectual capital and Business Intelligence (BI).

The research assessed the status of the institutions in relation to the integration of their business processes and their value chain, and to face the challenges of the future shaped by the presence of Business Intelligence (BI) and new information technologies. Also the K&I measurement allowed identifying the strategies they have for the innovation of products and services, and their application results, as well as the drivers of innovation in the organization and learning processes.

The research question was: How can companies, the entire sector, and the Latin America region as a whole benefit from the application of a K&I measuring instrument that measures the tangible and intangible aspects for the achievement of innovation and value chain strategies?

CONCEPTUAL FRAMEWORK

Knowledge and Innovation

Innovation is a critical need for organizations, since it adds value and gives sustainability to competitive advantage. Organizations must innovate in order to increase their performance and also as a primary way of creating value (de Waal, Maritz and Shield, 2010).

In this paper innovation is defined as in Godin (2004), which surpasses and integrates others such as in Baregheh, Rowley & Sambrook (2009), Wang, Guidice & Tansky (2010). Godin proposes to consider innovation as both the activities and the results; it considers both the invention and the adoption as ways to innovate, and takes into account the innovation when applied in products, services (of companies or non-commercial institutions) and practices (management, procedures and methods).

It is now important to understand how organizations can measure the contribution of innovation in the results contained in traditional financial statements.

Models and indicators to measure knowledge and innovation. The measurement of the nonlinear

There are several models focused on measuring intangibles and innovations such as the Intellect Club model (Euroforum 1998) which shows a series of indicators (categorized as Human, Structural, Relational, Organizational and Process and Innovation Capital) that can be measured qualitatively or quantitatively. Other models include the well-known Balance Scorecard (BSC) and its different measurement complements, such as the Kaplan and Norton Strategic Map (1992) and the so-called Intangible Asset Monitor (Sveiby 2001), which presents a series of monetary and non-monetary indicators that broadly describe the value of intangible assets.

Finally we can find more detailed and quantitative models such as IMP3ROVE (https://www.improve-innovation.eu/), which is a benchmarking tool that is supplied online by managers and consultants who are trained for this purpose, and on these measurements the "gold standards" on which the level of innovation is measured are constructed. Measurements are made on the following dimensions: Innovation Strategy, Innovation and Culture Organization, Life Cycle of Innovation Processes, Driving Factors, and Innovation Results.

O'Brien (2006) with the famous Decision Support System (DSS) presents this tool as strategic umbrella of Business Intelligence (BI): concepts, objectives and characteristics. And Ubiparipović & Đurković (2011), which proposes a BI structure that supports processes and their respective integration.

These models formed the basis of the K&I Scorecard to be applied in companies, which is integrated by different perspectives which contain both traditional accounting indicators and others that are considered relevant when measuring the results obtained by companies as to knowledge and innovation.

RESEARCH METHODOLOGY

This research was carried out from a qualitative paradigm and it is a descriptive research with study of emblematic cases. It was considered pertinent to carry out a case study of companies from each sector studied (Yin 2011): banking, health and hotels. The following criteria were used to define the companies studied: importance in the market, size, location, innovations made, among others. The K&I Scorecard was applied, and interviews and analysis of information were made available on the companies' websites.

On the whole, the instruments gave internal validity and reliability to the results because the interviews with the managers complemented the surveys and the sector situation studies at the national and regional levels. In this way, the "saturation" of the data was achieved, which allowed the discovery of the relationships that define the sectors under study in terms of measurement of innovation, business impact, market knowledge and socio-historical, political determinations -economic and cultural. It is important to remember that the case study does not follow the statistical logic, that is, it is not governed by the principle of the sample representativeness.

The K&I Scorecard consisted of 53 items categorized in the following dimensions: Financial, Internal, Customer, and Learning and Growth Perspective. The maximum score was 265, with the cut-off point 166 being equal to 3. The survey responses were qualified under a Likert scale (1 little 5 much) for their measurements.

The in-depth interviews allowed obtaining more information in an integrated manner on the study situation of the organizations. It also allowed a better understanding of the interrelationships between the indicators, which later enriched the analysis (Egg, 1995).

Figure 1: Measurement scorecard of K&I

VARIABLE + IDEAL VALUE		INDICATOR
FINANCIAL PERSPECTIVE: 40	**IMPROVING COST STRUCTURE: 25**	1.Increased productivity strategy: reduced costs, reduced expenses, improved processes
		2. % New products , improved products and services
		3. Is the rate of unit cost reduction per person or products? How does each process or activity contribute to the final value of the product or service?
	MAKE USE OF ASSETS: 10	4. Change in % of income from products / services from the time of development and life cycle. IRR
		5. ROCE by category of key assets and utilization rate
	BETTER VALUE FOR CUSTOMERS :	6. Pursued Strategy: growth, cost, differentiation, quality, speed of sales
		7. How seek to expand opportunities

	15	8. Actions holding to enhance customer value
INTERNAL PERSPECTIVE: 55	**OPERATIONS MANAGEMENT PROCESSES: 5**	9. Have programs that facilitate business management deals, production, and distribution and risk management? SAP , CRM, or other such
	INFORMATION MANAGEMENT PROCESSES: 15	10. Management feasibility and utility: Interactions and type of decisions
		11. Interorganizational communication
		12. Business report creation ability
	CUSTOMER MANAGEMENT PROCESSES: 5	13. Have management system for customer selection, acquisition, retention and growth of the type of CRM? How does apply it? How does it perform customer segmentation?
	INNOVATION PROCESSES: 30	14.How do you identify opportunities to innovate
		15.Which was the last product designed and developed by the company
		16. Was it on demand? How was the launch?
		17.The % of time you devote to developing new products
		18. The % of investment on environmental projects
		19. New of new or renewed certificates
CUSTOMER PERSPECTIVE: 55	**PRODUCT LEADERSHIP: 10**	20. What is the % of income from sales of new products
		21. What is the % of new products divided by the training of each employee involved in the development
	COMPLETE SOLUTIONS: 40	22. Level of customer satisfaction
		23. Continuous learning process in search of better businesses for customers
		24. Number of projects in the pipeline
		25. Disruptive innovations
		26. Have you developed own brands
		27. How do you think the brand is positioned in the market or brands
		28. Expenses for brand generation
		29. Investments in perception research
	CLOSURE SYSTEM: 5	30. Are you happy with the market share resulting from new products and services
LEARNING AND GROWTH PERSPECTIVE (K & I): 115	**Culture , Leadership, and INNOVATION: 40**	31. How would you define the culture of the organization in terms of values, beliefs, ideas for improvements, new products, and new services? Consider how you work to generate knowledge and innovation
		32, Conflict areas, Ethics code
		33. Range and limitation of norms
		34. In three characteristics, broadly describe the prevailing style of leadership? Does it encourage participation, sharing and collaboration among people? Illustrate
		35. To what extent are working knowledge and innovation generated in teamwork? How many teams is there that are permanent?
		36. How many impacting own innovative ideas have emerged in the last 3 years, and were they provided by R&D or team work?
		37. How many impacting innovative ideas have emerged in the last 3 years that were provided by third parties?
		38. How many impacting joint innovative ideas have emerged in the last 3 years, and were they provided by R&D or team work?
	ORGANIZATIONAL CAPITAL: 10	39. How the organizational structure is more horizontal than flattering when making decisions
		40. Do the people have access to the information they need to work?
	INFORMATION CAPITAL: 15	41. What payroll amount of people that integrates the company is dedicated to generating innovation?

		42. How many in Products & Services with impact were generated in the last two years?
		43. Do you consider the growth drove by innovation was significant? Has it a cascade effect?
	HUMAN CAPITAL: 20	44. What % of the salary of those actively engaged in innovation corresponds to total wages paid
		45. Is wages to performance evaluation used especially on people who are dedicated to innovation?
		46. Is the motivated workforce awarded and motivated to innovate?
		47. To what extent were training and career development actually implemented by employees?
	RELATION CAPITAL: 30	48. Do you generate profits from external networking?
		49. The current management systems favor teamworking with other companies
		50. How many companies are integrated with you?
		51. How many joint projects, agreements, alliances
		52. Participation in organized seminars, training sessions, sport events.
		53. Number of incubators inside the cluster
265		

RESULTS ANALYSIS

Financial services

Challenges facing this sector include the digitization of banking through the confluence of changes in users' behavior, a reduction in the costs of implementing technology platforms and the implementation of innovations in Cloud Computing, Big Data, mobile devices (Barty and Kirk, 2015) and the benefits of Analytics for decision making, allowing better understanding of the customer. The K&I Scorecard was applied to the six entities qualified as among the most important in the sector, with different trajectories, including four foreign capital banks, and two national banks, that will be called B1, B2, B3, B4, B5 and B6 by request of confidentiality.

The application of K&I Scorecard allowed to evaluate the best banks in terms of innovation and knowledge management, which are B4 with 215/265 (national), B3 (international) with 209/265 and B5 (206/265) (international), the rest of the banks (national and one international) are below the cut line (200). It was observed an important difference between national and international banks because the latter have BI systems, digitization and innovation in products that allow them to generate competitive advantages (Ubiparipović; Đurković, 2011).

In the Financial Perspective the reduction of costs was observed through the improvement of processes like in B3 and B5 with 13/15 both. With respect to the Internal Perspective it is the B4 that has the best score with 50/55. Among the practices that lead to this position are: complete systems for customer selection (CRM + BI + Analytics) (Barty and Kirk, 2015) that increase the value per customer and the growth of digital banking customers, in addition to identifying the opportunities to innovate and for the business, other practices that promote it as being CSR and occupational health. From the Customer Perspective the B5 and B4 scored the best 49/60 and 55/60 respectively. Staff involvement in innovation is important from idea generation to implementation, because among other things they receive and document customer feedback through multichannels (Barty and Kirk, 2015). From the Learning Perspective, the B3 with 92/110 and B4 with 87/110 obtained the best scores, which allows us to confirm that having favorable human capital and culture, and a convenient style of leadership and organizational structure, all these encourage innovation. The best culture for innovation is the B5 and the lower the B1.

Health Sector

Within the Health sector in Argentina four private health centers were interviewed. In this sector the company S1 leads in all perspectives. A strong position in terms of culture, leadership in innovation and innovation processes, driven by the company's executives, stands out in the Customer Perspective (60/60) and Learning and Growth Perspectives (85/110), although relational capital still lacks of further development. Nevertheless, as far as relational capital was concerned, it was observed that they have been developing innovation thanks to joint

projects with the Faculty of Medicine of the UBA and also to having sectors committed to innovation, which lead to weekly workshops, and presented papers in international scientific congresses. They have developed tools and techniques for the evaluation of images, for special treatments that make them unique in the country. The medical staff is permanently trained and investments are made in technology which has allowed them to position themselves in a leading position in diagnostic imaging in the country. They have also sent head of sector to specialized management universities for training.

Likewise, the company S4 is also focused on innovation. It is a family business, which has given a turn in its management in the last 10 years, leading to a better positioning, seeking to be a benchmark in the rehabilitation medicine sector. The family members working there are professionals with specialization in management and rehabilitation in particular. The staff of professionals is continuously trained both at home and abroad. They are investing in innovation such as infant rehabilitation with modern techniques acquired in the USA. They are starting to improve Customer and Learning and Growth Perspectives.

The other two companies S2 and S3 show the need to increase within the Perspective of Learning and Growth, also significantly improve culture and innovation-oriented leadership, and the human and relational capital. It was also observed from the results in the Customer Perspective they need to improve the processes integration.

Hotel sector

The hotel sector together with the tourism sector have an accelerated growth, even surpassing the speed of growth of the global economy, with a projection of 3.9% per year for the period 2015-2025 (WTTC, 2015).

The field work showed a clear leadership position of the HA2 hotel, this is strongly influenced by scores on Customer and Learning and Growth Perspectives. It is followed by the HA1 and HA3 hotels, with an important score in the Financial and in Learning and Growth perspectives.

The case of the HA2 is a family business that was awarded to a five-star hotel, also awarded by the Touristic Hotels Association, and received awards for the sustainable leadership by the Institute of Business Social Responsibility and the Argentinean-British Chamber of Commerce. It is a case that has had international repercussions since it has been the object of study of the main schools of Business from the US, Spain and France. In the financial aspect, they have been managed with own funds what sometimes has limited them in the times of development of new ideas.

All the members of the family work in the hotel and although they have university studies they were trained for the management function. The differentiating factor is the innovation and the innovative mentality and a set of values that are sustained by all the members of the hotel.

CONCLUSIONS

We can affirm that the instrument developed for the measurement of Innovation and Knowledge allowed obtaining information on the state of the four perspectives included in the Scorecard. The results of its application by measuring by approximation allowed determining the level of innovation for each company of the sectors studied.

In all sectors studied, it was found that national capital organizations in general from Latin America require a greater effort to make innovation. However, the limitations they have on the use of BI for big data, analytics, and others, could be observed to be compensated with good results in the perspective of learning and growth: good use of human capital, developed relational capital, oriented culture to innovation and a leadership that encourages all of the above.

Among the main conclusions is that most of the hotels studied lack robust structures and information systems, properly integrated to enable them to improve the value chain of the business. Likewise, the partial or total absence of these information technologies makes it difficult to achieve a comprehensive understanding of the client's needs, due to the lack of traceability of their behavior and lack of platforms that enable them to make timely decisions in real time as seen in the analysis of results. As lessons learned the use of big data and analytics will enable companies to improve their management due to better knowledge of the customer.

For banks, the ones studied are innovative because:

A. They integrate Internet, BI, ADA developments in the sector or other technologies (disruptive innovation) with traditional financial services to increase the use of digital media in clients very active in platforms (eg via PC, Smart TV or mobile).

B. They better understand the customer and guide the offer of services and products to ultra-segmented sectors thanks to an increasingly integrated management (deep visualizations based on data from external and internal sources in real time).

C. They orient the service distribution strategy towards the multi-channel of digital operations, since they are fundamental for clients to make decisions and implement transactions (from transfers or payments to the acquisition of products in real time).

D. They develop a corporate culture leveraged in principles of continuous improvement, where both the quality of the product and the service are fundamental to manage the excellence in the client's experience.

E. They use the K&I Scorecard to approximate the most important business perspectives and to improve the intensive use of your intellectual capital.

From the results of the empirical study it also arises that Argentine national banks would have to speed up the use of computer technology, a lack that is reflected in the results of the financial and client perspectives. This is because they are not using the new trends in information systems that do use more developed countries, as has been observed in Asian countries, who in turn get new customers from younger generations. Also, another positive externality could be to extend these services to the base of the pyramid. Innovation through digitization will enable them to offer and bring better products to more demanding customers.

With regard to the lessons learned from the health sector, in national companies, more work should be done in conjunction among public and private health systems, laboratories and diagnostic centers in order to generate more efficiency and being able to create collective innovations.

Taking into account what has been said in the previous sectors in terms of customer and process aspects, it should also be considered in the health sector, which is key factor to the development of countries.

In addition, there are multiple problems that need to be enhanced by the use of information technologies to improve the performance of the health service. It is critical to generate health services with high added value and the appropriate cost.

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