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Publisher: Routledge

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The Service Industries Journal

Publication details, including instructions for authors and subscription information:

<http://www.tandfonline.com/loi/fsij20>

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Published online: 03 May 2013.

To cite this article: Sara Arancibia Carvajal & Angel Fernández Nogales (2013): How to support the management of intangibles, The Service Industries Journal, DOI:10.1080/02642069.2013.778250

To link to this article: <http://dx.doi.org/10.1080/02642069.2013.778250>

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How to support the management of intangibles

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(Received 8 April 2011; final version received 10 May 2012)

The main objective of this work is the application of the concept of intellectual capital to management for business development and innovation. Concretely, we propose strengthening the 'Intellectus' model of intellectual capital by combining it with a multicriteria methodology called the 'analytic hierarchy process'. The proposed methodology seeks to facilitate decision making by managers in focusing actions and resources to innovate and improve the value of their services to their clients. In particular, an application was made to the banking service sector in Chile, to identify the intangibles of greater importance in loyalty-building of clients. We identified technological capital, human capital and business capital as the intangibles with the highest priorities.

Keywords: analytic hierarchy process; intellectual capital; Intellectus model; loyalty-building

Introduction

In recent decades the economies of most industrialized countries have been transformed into what is termed knowledge-based economies, characterized by the decreased importance of tangible assets in favor of intangible assets in creating value, recognizing the latter as key to explaining economic growth (Cañibano & Sanchez, 2008; European Commission, 2005).

In this sense, intangibles have emerged with force, since they are based on specific knowledge of the organization and are capable of providing competitive differentiation in many sectors (Teece, 1998).

Drucker (1993) affirmed that one of the most important challenges for a firm or organization in the knowledge-based society is the systematic construction of tools and practices to manage change, allowing ongoing improvements and innovations and the development of new applications. Knowledge management has emerged as the motor of innovation (Alegre Vidal, 2004).

Bueno (2003) defined knowledge management as the function that plans, coordinates and controls knowledge flows in the firm in relation to its activities and its environment with the aim of creating essential competencies.

Given the importance of knowledge management as the motor of innovation, there is a need to generate tools to support managers in evaluating and strategically directing relevant knowledge (Kristandl & Bontis, 2007).

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Bueno, Salmador, and Merino (2008) noted that every strategic objective formulated by the firm requires intangible resources, whether already existing or to be acquired, which in their management achieve different degrees of relevance in relation to other intangibles. In this sense, while intellectual capital models provide a scheme for organizations to clearly define what intangibles they have, these models lack mathematical support to establish which intangibles are the most relevant to achieve planned objectives.

Consequently, the main objective of the proposal is to offer a strengthened tool by integrating two methodologies to assign priorities to distinct intangibles according to the importance assigned to them by the decision making agents in the organization.

The methodologies to be considered are the intellectual capital model, *Intellectus*, and the multicriteria methodology, the *analytic hierarchy process* (AHP), which allows for synthesizing priorities for the distinct components of the proposed model, supported by the exact sciences. The proposal was applied to the banking sector, in particular, a bank in Chile with wide coverage throughout the country, in which we sought to establish the intangibles of greatest importance to achieve the strategic objective of 'building the loyalty of clients with current accounts', considering the experience and knowledge of the persons in charge of this matter.

The application of the methodology seeks to determine:

- The intangible factors the company considers relevant in responding to clients to achieve its strategic and innovative objectives.
- A scale of priorities that supports decision making by better focusing actions and resources.

The work is structured into the following sections. The first section provides background in relation to the proposed methodologies. The following section presents the concrete methodology and the results obtained in the Chilean banking sector. Finally, the last section presents the conclusions and proposes future lines of research.

Background

Intellectual capital is one of the main factors in creating value and sustainable competitive advantages for the organization. The fundamental idea is that value is generated by facilitating knowledge flows within the organization. The resulting knowledge becomes value in the form of human, structural or relational capital (Cabrita, Landeiro, & Bontis, 2007; Cuganesan, 2005; Georgopoulos, 2005). Diverse studies have shown the influence of intellectual capital in obtaining competitive advantage, understood as the result of innovation in the firm. As well, the capacity of an organization to innovate depends on knowledge and the intangibles it possesses as well as its capacity to manage and deploy them (Hipp, Tether, & Miles, 2000; Kassa, 2009; Martín de Castro, Alama, Navas, & López, 2009; Subramaniam & Youndt, 2005).

As a by-product of the need to generate new tools to appraise and manage intangibles, a series of models have emerged for measuring the intellectual capital of organizations (Alama, Martín de Castro, & López, 2006; Ding & Li, 2010). Among these are notably Skandia Navigator (Edvinsson, 1997), Technology Broker (Brooking, 1996) and the *Intellectus* model (Euroforum, 1998). All have a common base that considers two perspectives: one internal centered on employees and the organization, while the other integrates external relationships (clients, suppliers, share holders, partners, administrations, etc.).

Bueno et al. (2008) studied the temporal trajectory of intellectual capital. Considering the evolution of the concept, and with the aim of creating a generalized conceptual base,

the authors proposed the following definition of intellectual capital: the accumulation of knowledge that creates value in an organization, composed of a set of intangible assets capable of generating competitive advantages.

Intellectus model

The Intellectus model emerged from the consensus among public and private agents at the Intellectus Forum on Knowledge and Innovation, sponsored by the University Research Institute (IADE) of the Universidad Autónoma de Madrid (Bueno et al., 2008). It was validated at the time by close to 40 international experts and released through the document *Intellectus 5* (Bueno, 2003). The Intellectus model is cited as the Spanish reference model in the Ricardis Report of the European Commission (2005). As a recognized model with broad diffusion in the Spanish-speaking world and considering its applications, we used the Intellectus model in this study as the base model of intellectual capital to be integrated with the AHP multicriteria methodology.

The Intellectus model of intellectual capital includes the relevant intangibles for an organization, aligned with the integral management approach (Bueno et al., 2008).

The advantage of this structure is its flexibility to adapt to the needs of the organization. The methodology is clear, concise and ordered, which allows for a simple understanding for grouping intangibles, defined as:

- Components: grouping intangible assets in function of their explanatory value.
- Elements: homogenous groups of intangible assets of each component of intellectual capital, based on the business or organizational type.
- Variables: intangible assets of an element of intellectual capital.
- Indicators: measurement or data-collection instruments that serve to know the state and evolution of the representative variables of intangible assets.

However, the Intellectus model does not establish how to assign weight to the diverse intangibles (in a non-arbitrary manner). This is one of the most relevant contributions of Saaty's multicriteria methodology.

The AHP

Thomas Saaty proposed an effective method for group decision making, the AHP, which establishes a hierarchy of relative importance among intangible resources that need to be managed to reach a strategic objective and add value to the firm (Saaty, 2000).

In general terms, the AHP is a method for breaking down complex structures into their components and ordering these components or variables into a hierarchical structure. As well, it assigns numeric values to judgments (subjective) of the relative importance of each component and, finally, it synthesizes these judgments to determine which of the variables has the highest priority (Saaty, 2005).

The construction of the hierarchy is an interactive process of a working group. It requires the participation of different professionals to reach consensus among judgments representing diverse experiences. Once the hierarchy is constructed, it is necessary to verify that it complies with the four axioms of the AHP methodology proposed by Saaty (2000): reciprocity, homogeneity, dependence and expectations.

Saaty's AHP methodology not only serves to assign weightings to the different criteria of the hierarchical structure, but also to select, evaluate and prioritize alternatives, such as projects, actions and products. The study of Asonitis and Kostagiolas (2010) presents an analytic hierarchy approach for intellectual capital using three categories: human,

organizational and relational capital in relation to the objective of improving library performance. Moreover, Dong-Young and Vinod (2009) present a framework for prioritizing intellectual capital indicators as well as suggesting key improvement areas by using the Delphi approach and AHP.

The methodology proposed in this study allows for assigning weightings to each level of the structure of the Intellectus model, thus supporting the process of managing intellectual capital.

We do not propose to identify all the intangibles that give value to the organization, but rather to identify the intangibles the organization possesses or should possess for a strategic objective, and to assign priorities to reach identified objectives that should be aligned with the mission and vision of the organization.

Proposed methodology

Integration of the Intellectus and AHP models

The proposal consists of integrating the two methodologies, strengthening them to support the management of the intellectual capital of a firm, such that the intangibles the firm has or should have for a given objective are identified as well as the priority of each intangible to more effectively focus actions and resources to achieve strategic objectives.

To verify that the Intellectus model can be adapted to the AHP methodology, three basic principals have to be met (together with ensuring that they comply with the four axioms of the AHP methodology): construction of hierarchies, establishment of priorities and logical consistency.

In particular, if we apply the Intellectus model to an AHP structure, we obtain the structure shown in Figure 1, where we observe that the components correspond to the strategic criteria, the subcomponents to the sub-criteria, and the elements and variables to more specific sub-criteria, until the terminal sub-criteria.

To construct the hierarchy considering the Intellectus model as the base, it is essential to keep in mind that the global objective of the hierarchy is to identify the intangibles necessary to achieve a strategic objective for the enterprise, for example 'to identify the intangibles necessary to build client loyalty to the bank'. The following level of hierarchy is composed of the strategic criteria, that is to say, those components or factors necessary to achieve the global objective, which in this case are Human Capital, Structural Capital and Relational Capital, where each brings together a homogenous group of intangibles. Each criterion is

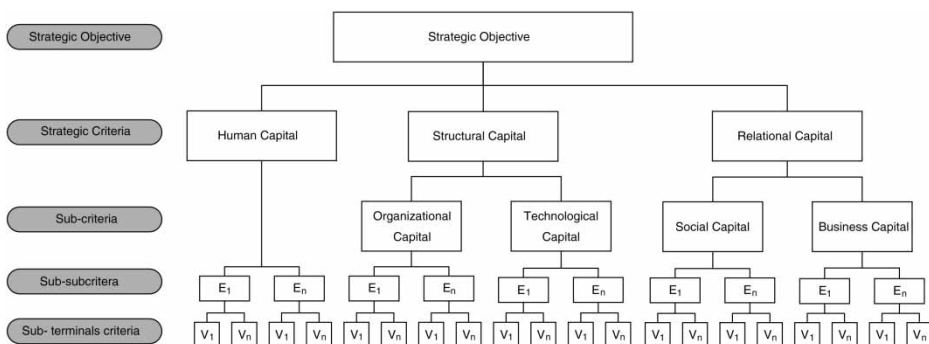


Figure 1. Hierarchical structure applying the Intellectus model.

Source: Authors.

broken down into sub-criteria, repeating the structure of the Intellectus Model and taking care to meet the axioms of the AHP, which can be seen in detail in Saaty (2000). In this manner, Human Capital is disaggregated into the sub-criteria: 'values', 'attitudes' and 'capacities' of staff (these sub-criteria are suggested by the Intellectus Model).

Based on this hierarchy, priorities are established among the elements by making pair-wise comparisons, that is, comparing the elements in pairs in relation to a given criterion.

Once the matrix is completed, the exercise becomes a problem of vectors and their values.

$$A \times w = \lambda \times w,$$

where A is the pair-wise comparison matrix, w the eigenvector that represents the ranking or order of priority, λ the maximum eigenvalue that represents a measurement of the consistency of the judgments. The main eigenvector represents the synthesis of the expert judgments, obtaining the priorities of the criteria or sub-criteria that make up the matrix, considering a tolerable level of inconsistency.

In calculating the priorities for each level of the hierarchical structure it should be clear that there are local and global priorities. The local priorities are derived from the opinions with respect to a single criterion (a synthesis that is appreciated in the resulting vector). For their part, the global priorities are derived from multiplying the local priority obtained and the priority of the parent criterion. They show how the parent criterion distributes its weight among the offspring criteria (or sub-criteria).

The third principal of the AHP is logical consistency, which is related to the degree of dispersion of the judgments of the actors.

The AHP measures the global consistency of the judgments through an index termed the consistency ratio, which can be seen in detail in Saaty (2000), and which in general cannot exceed 10%.

In synthesis, to make the structure of the Intellectus model compatible with the structure of the AHP, it was necessary to check that the AHP axioms are met. The final structure was also validated by the expert group through fulfillment of the axiom of expectations. Notably, the common characteristics of the Intellectus model and the AHP methodology allow for obtaining a complementary tool for managing the intangibles of an organization. These characteristics are:

- Participation of a working team that includes decision makers;
- Structures aligned with the strategy and, consequently, the strategic objectives of the organization;
- Flexibility in the structures to adapt to the needs of the organization;
- Clear and ordered methodologies;
- Methodologies are analytical in character and dynamic over time;
- A diversity of variables is considered, both quantitative and qualitative.

The entire process should be well documented, without allowing for ambiguity in the interpretation of the concepts involved (Saaty, 2000).

Application to innovation and client loyalty-building

The loyalty-building of clients

A fundamental aspect of innovation in the banking sector is adjusting services to the new needs of clients. A bank is innovative if it develops mechanisms to be up-to-date operationally and to motivate its clients. The bank has to continually innovate and update

aspects that influence loyalty. Loyalty-building is a priority in all industries, in particular in banking, where it is indispensable to maintain participation and profitability.

In particular, with a product and service that is not strongly differentiated, such as current accounts (and where there has been sustained growth of 50% in Chile in the last five years) the challenge is to establish a competitive advantage that is sustainable over the long term and based not only on offering lower commissions but also on strategies to make clients feel satisfied, thus building client loyalty to their current accounts. The current account is a strategic product that allows the bank to make frequent contact with clients through accounts executives, electronic banking services and the continual offer of products.

Consequently, banks have been increasingly concerned with expanding the provision of loyalty-building programs, with the aim that clients feel linked to and committed to the institution, seeking thus to achieve greater loyalty among them.

Firms want to obtain client loyalty mainly because it has been demonstrated that loyal behavior by clients is a determinant of long-term financial performance (Fandos, Sánchez, & Moliner, 2009). This is particularly true of firms in the service sector where increased client loyalty significantly increases the profitability of the firm (Reichheld, 1996).

Oliver (1999) described loyalty as a deep commitment to re-purchase or recommend a product/service consistently in the future, resulting in repeated purchases of the same brand or a set of brands, despite the influence and efforts of the market that has the potential to change this conduct.

Loyalty has been measured in several investigations, showing in the majority of cases that the factors that induce loyalty are perceived quality, image, handling of complaints and satisfaction, among others (Formell, Johnson, Anderson, Cha, & Bryant, 1996; Kristensen, Martensen, & Gronholdt, 2000; Lewis & Soureli, 2006). However, these investigations have dealt with client perceptions, mostly based on surveys of clients and applying structural equation models.

It should be noted that there was a study of the Bank of Colombia (Miguel-Dávila, Cabeza-García, Valdunciel, & Florez, 2010) that considered some factors of intangibles, but employing an exploratory factorial analysis and structural equations. In that study, the intangibles were grouped into factors termed 'human aspects', 'operative aspects' and 'new technologies'. The objective of that study, based on the perceptions of clients, was to determine how these factors indirectly affect client loyalty through the quality of service and satisfaction.

In contrast, the objective of this research is not to measure client loyalty, but rather to determine the intangible factors considered relevant by managers who take decisions on loyalty-building policy.

Although banks in Chile carry out market studies and focus groups every year to know client perceptions, they lack clear internal consensus on the intangibles they offer and which intangibles build client loyalty. In this respect, the following research questions emerge:

- Based on the knowledge of the bank about its clients, what intangible factors are considered relevant to offer clients with current accounts to obtain their loyalty?
- How can priorities be assigned to intangibles identified by the bank that allow it to better focus resources on loyalty-building?

To resolve these questions, we applied the methodology described in the previous section to identify the intangibles that add value to the objective and assign priorities in

a non-arbitrary manner based on the exact sciences. This allows for more effective focusing of strategies and action in pursuit of strategic objectives.

The bank considered for the application of the methodology has broad geographic coverage at the national level and a high level of participation in the market in relation to current account clients. As well, the bank has clients from all socioeconomic levels.

Strategic objective of the model

First, the strategic objective to consider in the hierarchical structure should be aligned with the mission and vision of the organization. The bank selected for the application of the methodology considers ‘building client loyalty’ as one of its strategic objectives. In particular, for the application in this work, we considered ‘building the loyalty of clients with current accounts’ as a strategic objective.

Actors in the process and sampling type

The participants in the decision making process should be selected with care given that this determines the representativeness of the model. In this research, the expert group was composed of seven people from the bank with greater coverage in Chile.

The method to select the expert group was non-probabilistic ‘sampling by criteria’ based on the criteria or judgment of the researchers to select sampling units that represent the research objective. The expert group was composed of managers that take decisions related to focusing resources for building client loyalty and that are characterized by having extensive experience in the areas of client satisfaction, quality of service and building client loyalty with the current account and other banking products.

Several meetings were held with the working team in which the methodology was explained, and the factors that the team members considered important for the objective of obtaining the loyalty of clients with current accounts were discussed, based on their experience and the knowledge they have from previous studies about their clients.

The group meetings with the experts took place at the main branch of the bank (head office) over four months distributed over 16 meetings of approximately an hour and a half each.

The results of market studies and focus groups conducted by the bank over several years were made available to this research, to better understand client perceptions and which intangibles they value in order to secure their permanence as clients. All the aspects of these studies were discussed and analyzed among the expert group.

After multiple meetings and analysis of the information, we proceeded together to create the hierarchical structure, identifying intangibles that the bank offers to its clients that are considered relevant in building client loyalty. After validating the structure among the group of experts and verifying all the corresponding axioms, we proceeded to establish the priorities for each criterion through pair-wise comparisons, as mentioned in the third section.

Construction of the hierarchy

The structure begins with the objective of ‘obtaining the loyalty of clients with current accounts’. For the application, *human capital* is understood as those intangibles grouped into values, attitudes and capacities of bank staff that directly attend to clients with current accounts, such as account executives and customer service staff.

Structural capital is understood as the intangibles that structure the processes needed for efficient service, as well as the technological intangibles that provide direct or indirect service to clients, such as technological platforms. According to this definition, structural capital has been divided into organizational and technological capital (as the Intellectus model establishes), which includes efficiency in processes and in technological platforms.

Finally, relational capital is understood as intangibles related to the social medium, that is, how the bank is seen externally and the image it projects. The definition also considers the relationship with the medium of the business itself, since it takes into account intangibles corresponding to the commercial and communication areas.

Figure 2 shows the complete hierarchical structure created by the expert group, which was validated by verifying that it complied with all the axioms mentioned in the AHP section.

Because a correct application of the methodology requires detailed documentation in relation to the concepts considered in the structure, Tables 1–3 present the definitions of each sub-criterion of the proposed model, which were defined with the experts from the bank, according to the criterion of human capital, structural capital and capital relational, respectively.

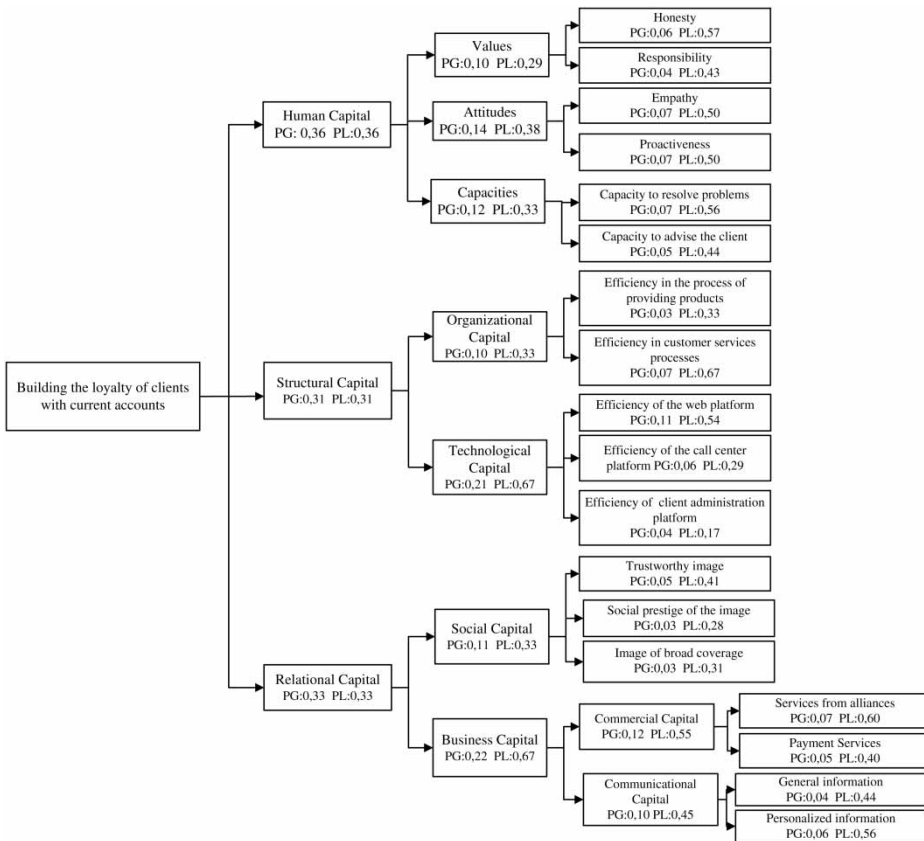


Figure 2. Complete hierarchical structure of the proposed model and local and global priorities of the criteria.

Source: Authors.

It is important to note that to construct the hierarchical structure, we considered the criteria of the Intellectus model, as can be observed in Figure 1, with adaptations according to the objective of the hierarchical structure.

In conjunction with the group of experts (managers from the bank), we defined the sub-criteria of the hierarchical structure. The definitions of the sub-criteria in Table 1 are based on the general literature about human capital regarding values and attitudes (Isaacs, 2000). The definitions of the sub-criteria of capacities are original, based on the experience of experts from the bank. On the other hand, the definitions of sub-criteria in Tables 2

Table 1. Definitions of the sub-criteria of human capital for the proposed model.

Human capital		
Values	Attitudes	Capacities
Values constitute the base that guides individual and group conduct and behavior	Attitudes are those forms of acting, demonstrations of feelings and thinking that respond to interests and motivations and reflect acceptance of norms or recommendations Attitudes have cognitive (related to knowledge), affective and conductive elements	Capacities are inherent potentials of persons that they can develop over their lifetime They are grounded in the inter-relationship of cognitive, socio-affective and motor processes
<i>Honesty</i> This is the value by which the person chooses to always act truthfully and fairly. Honesty expresses respect for oneself and for others, which generates trust in one's self and by others who are in contact with the honest person	<i>Empathy</i> Empathy is an attitude that refers to the understanding of others. It is to have the capacity to catch the feelings and point of view of other persons and be actively interested by the things that concern them. Empathy is oriented toward service by anticipating, recognizing and satisfying the needs of clients	<i>Capacity to resolve problems</i> This is the capacity to resolve a set of facts or circumstances that obstruct progress toward a determined goal. In this context, we seek to capture the capacity of the personnel to resolve errors in charges, clarify charges made, undetailed matters in the account, and generally any problem that the client complains about or that is detected by the personnel
<i>Responsibility</i> Responsibility is an obligation, whether moral or even legal, to comply with what has been promised. Responsibility has a direct effect on trust. One trusts in responsible persons	<i>Proactiveness</i> Proactiveness is an attitude in which the subject actively assumes control of his/her conduct, which implies taking the initiative in developing creative and daring actions to generate improvements and act promptly when the occasion presents itself	<i>Capacity to advise the client</i> This is the capacity to advise clients in relation to the products they need or wish to obtain. It also refers to indicating to the client the procedures they need to follow in a clear and concise manner. This capacity requires knowledge on the part of personnel, and therefore ongoing upgrading

Source: Authors.

Table 2. Definitions of the sub-criteria of structural capital for the proposed model.

Structural capital	
Organizational capital	Technological capital
This refers to intangibles related to the efficiency of bank processes, both in terms of efficient attention to clients and an efficient response to the request for additional products	This refers to all systems of technological platforms that are necessary and desirable for good customer service
<i>Efficiency in the process of providing products</i> This refers to the promptness and reliability in processes related to providing clients with additional products, that is, agile and reliable procedures that permit giving a prompt response in approving or rejecting requests of the client to obtain a new product, such as credit, assuring privacy about the information	<i>Efficiency of the web platform</i> This refers to offering the client a website platform that provides security, privacy and reliability in all the actions the client can undertake in the webpage, be they transactions, consultations, payments to third parties, etc. As well, this implies providing the user with a reasonable range of actions that they can undertake through the internet
<i>Efficiency in customer service processes</i> This refers to promptness and reliability in processes related to customer service. These consider procedures that ensure reasonable waiting times for clients to be attended by an executive or a cashier and adequate time for direct attention to the client, with clear procedures for the executive or cashier regarding how the client should be attended in each situation	<i>Efficiency of the call center platform</i> This refers to offering clients a call center platform that provides a variety of services, with a reasonable waiting time to access the service and that assures security, privacy and reliability in all the actions that they can undertake by telephone
	<i>Efficiency of the client administration platform</i> This refers to offering the bank personnel a modern system of client administration, with access to information on the client profile and all the areas of the bank that have records on the client, allowing personnel to rapidly review the status of the client's products and the status of requests that required the attention of an executive

Source: Authors.

and 3 are original and based on the experience and knowledge of experts from the bank, which was obtained in discussions between the researchers and expert team.

After obtaining the hierarchical structure, we proceeded to determine the priorities of each criterion.

Establishing priorities and logical consistency

To establish priorities, following discussing the importance of each criterion by levels, the expert group by consensus gave their judgments based on Saaty's scale in the 13 matrixes corresponding to the hierarchical structure (four matrixes from order 3 and nine matrixes from order 2), comparing pairs of criteria from the same level. The resulting priorities were calculated in an Excel program and verified with the program Expert Choice.

Table 3. Definitions of sub-criteria of relational capital for the proposed model.

Relational capital	
<i>Social capital</i>	<i>Business capital</i>
This corresponds to the intangibles related to the images the bank projects externally, that is to say, how the bank is viewed by the external environment	This refers to intangibles related to the area of the business itself, in this case the current account product
<i>Trustworthy image</i> This refers to the image that is projected externally in terms of being a bank that can be trusted, that appears stable in the market and keeps its promises	<i>Commercial capital</i> This refers to intangibles related to services through alliances or agreements of automatic payments, payment services of different types for client accounts. The model considers the commercial aspects related to alliances and agreements that, according to the group of experts, are highly valued by clients, such as special discounts and the possibility of making automatic payments that are discounted from their current accounts
<i>Social prestige of the image</i> This refers to the image that the bank projects externally in terms of being concerned as an institution about the social area. This is shown through sponsoring events beneficial to disadvantaged groups and supporting cultural events directed at the community	<i>Services from alliances</i> This corresponds to relationships with external firms in other business areas that form alliances with the bank, allowing it to offer services to clients, such as special discounts in some stores, movie and live theaters, etc. If the client also has an associated product, such as a credit card, the client can accumulate points that they can exchange for preferential promotions, such as national or international trips
<i>Image of broad coverage</i> This is the image that the bank projects externally in terms of having a presence through branches in different regions and in the majority of the provinces in Chile	<i>Payment services</i> This refers to a relationship with a service firm that, through an agreement with the bank, allows clients to make automatic payments from their accounts
	<i>Communicational capital</i> This corresponds to intangibles related to areas of information in terms of both general information that the bank offers clients and personalized information that reaches the client by some means
	<i>General information</i> This refers to the intangible that the bank offers in relation to providing the client with general information by different means: television, radio, and announcements in branches about products or general information relating to the bank

(Continued)

Table 3. Continued.

Relational capital	
<i>Social capital</i>	<i>Business capital</i>
	Personalized information This corresponds to the intangible that the bank offers in relation to providing clients with personalized information, such as up-to-date and timely information about the status of their current accounts or personalized offers such as pre-approved credit. Generally the information is sent via internet and to clients' homes

Source: Authors.

Human capital obtained the highest weighting, as shown in Figure 2, reaching 0.36 of priority among the three components, followed by relational capital with a third of priority and finally structural capital with 0.31 of priority. The consistency reached a value of 0.00532, which is very acceptable for a matrix on the order of 3. We continued in this way with each level of the hierarchical structure obtaining all the priorities of the structure, as can be observed in Figure 2.

Analysis of the results

While all the criteria considered in the structure of the model are relevant for bank management, not all of them have the same importance for achieving the objective. Figure 2 shows the local and global priorities synthesized from the judgments of the experts. It can be noted that for each strategic criterion sub-criteria assume greater importance. Thus, from Human Capital, the sub-criterion Attitudes assumes greater importance in building client loyalty, being of equal importance to the empathy and proactiveness of staff. Similarly, from Structural Capital, the sub-criterion of Technological Capital assumes greater importance, where the efficiency of the web platform takes greater priority, and finally it is observed that of Relational Capital, the sub-criterion business capital is more relevant, where commercial capital has greater priority compared with communicational capital (Figure 2).

However, to take decisions about where to focus resources, we should consider the terminal criteria that assume the main global priorities.

Observing all the global priorities of the terminal criteria together (Figure 2), it can be concluded that the intangibles of greater importance, according to the internal point of view, are the efficiency of the web platform, with a priority of 0.11 and then, with a priority of 0.7, intangibles related to efficiency in client services, empathy, proactiveness, the capacity to resolve problems and services in alliances. This implies that managers should focus resources on strengthening these intangibles, for example by making ongoing improvements in the web platform that provides on-line service to clients, conducting upgrading courses or workshops for staff that attend clients, emphasizing the development of the intangibles of desired attitudes and capacities to resolve problems and promoting the development of more efficient procedures in services to achieve, for example, more reasonable waiting times and greater facility in client attention. In relation to commercial capital, it is very important to create alliances with other enterprises that allow providing clients with promotions and offerings of interest that make them feel increasingly satisfied and consequently more committed to the bank.

According to the results obtained in the bank where the application was made, managers reflected on the possible actions that should be implemented to strengthen their intangibles and together took the decision to implement the following actions to improve customer services and thus improve customer services and strengthen their competitive advantage:

- Monitor technological change to be attentive to opportunities to improve technological capital and offer up-to-date technology to clients.
- Encourage and train staff, giving recognition to outstanding employees to strengthen intangibles associated with human capital.
- Negotiate with other firms, creating networks and alliances to provide new services to their clients (that their competitors still do not offer) so as to improve the value of the service it offers to clients, strengthening intangibles in relation to relational capital.
- Transfer knowledge within the organization and implement new ways to simplify procedures of client services and information, to strengthen the intangibles of organizational and communicational capital.

In this context, there is extensive research (Cainelli, Evangelista, & Savona, 2004; Sundbo, 1997) about service firms that initiate innovations, resulting in the growth and development of the service industry and the economy (Elche & González, 2008).

This view is supported by several studies that show a positive relationship between the management of intellectual capital and the innovative performance or creation of value by firms (Kamath, 2010; Pineda, Torres, Resenos, & Ortega, 2009; Santos-Rodrigues, Figueroa, & Fernández, 2010; Zerenler, Burak, & Sezgin, 2008).

Conclusions

There is a wide variety of intellectual capital models to identify and organize the intangibles of an organization. However, there are no tools supported by the exact sciences that allow for assigning priorities or weight to the intangibles required to reach strategic objectives.

Our proposal to integrate the multicriteria AHP into a model for measuring and managing intellectual capital, termed *Intellectus*, allows for weighing the different intangible assets that an organization possesses or should possess to achieve a strategic objective. This leads to focusing actions more effectively in pursuit of the formulated strategic objectives, in this way supporting the management of intellectual capital.

The advantages offered by the proposal are:

- It provides a tool to maintain the level of innovation required from firms in the current market.
- It facilitates the identification of the most relevant intangible to meet a specific strategic objective.
- It allows for using intangible assets more efficiently.
- Through the priorities of intangibles, it allows detecting the indicators associated with the intangibles that are the most relevant to measure the intellectual capital corresponding to a strategic objective.
- It assigns weightings based on a methodology grounded in the exact sciences that verifies the consistency of judgments.

- The methodology can be applied to any economic sector, in particular the service sector, to identify and establish priorities of the intangibles that the firm considers relevant to offer to a client to achieve a strategic objective.

The application described in this work has shown how the Intellectus model can be complemented with Saaty's multicriteria AHP methodology as a tool to support the management of intangibles, considering 'obtaining the loyalty of clients with current accounts' as a strategic objective in a Chilean bank. This empirical study can be considered an exploratory study that can be used as a relevant background in future research.

The experience proved very satisfactory for the bank by providing a methodology that will support decision makers in the area of loyalty-building in organizing a hierarchy of intangibles they offer or should offer to clients. Achieving consensus in rating each of the criteria of the structure allows for focusing actions on those aspects of greater importance as well as providing the possibility of designing future indicators for each terminal intangible in the hierarchy. Another result of this experience is the generation of a participatory working climate, in which dialogue was established in the team. This proved very enriching for working in a more coordinated manner. It also allowed the working group to become conscious of the aspects that should improve in the provision of intangibles to succeed in building client loyalty and that this process should be ongoing to continue improving the value of services offered to clients, which is indispensable for innovation.

In this sense, the results of the model allow managers to take actions that positively affect the innovative potential of the firm, strengthening its competitive advantages and creating value for its clients.

Among the limitations, it is important to stress that the application was made with only one bank and for only one strategic objective. The application seeks to show an example of the application of the methodology. However, this methodology has a potential of applications, such as generating an index to know the level of intangibles that an organization possesses to achieve an objective.

In this sense, future research could complement the present study by proposing indicators (under the type absolute measurement of AHP) to measure the terminal intangibles of the loyalty-building model and formulate a general index of the level of intangibles that the bank has to build client loyalty, which allow for comparison to an ideal standard or goal that the bank establishes as well as allowing for follow-up of the evolution of intangibles over time.

Another aspect of great interest would be to contrast the results obtained to the perceptions of clients and determine if the priorities from the internal view of the bank are in line with what clients consider really important for maintaining their loyalty to the bank.

Another interesting line to consider for future research is to use the proposed methodology to prioritize actions, that is, to generate a ranking of actions to improve the level of intangibles that an organization possesses for a determined strategic objective.

Fuzzy AHP can be applied to this problem, as considered by Bozbura, Beskesea, and Kahraman (2007) who proposed a fuzzy AHP framework to weigh the human capital indicators. While fuzzy AHP requires cumbersome computations, it is a more systematic method than others and is more capable of capturing an individual appraisal of ambiguity when complex multi-attribute decision making problems are considered (Bozburaa & Beskesea, 2007; Bozburaa, Beskesea, & Kahraman, 2007).

Finally, the possibility remains open of applying the proposed methodology to other sectors and firms where innovation is an ongoing requirement to remain in the market.

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