Journal of Cases on Information Technology
Volume 22 • Issue 2 • April-June 2020

Business Intelligence Readiness Assessment for a Shopping Mall:
Challenges and Future Directions

Pedro Julian Ramirez-Angulo, Universidad de la Costa, Barranquilla, Colombia
https://orcid.org/0000-0003-2461-7673

Rosa Alexandra Chaparro Guevara, Universitaria Agustiniana, Bogotá, Colombia
https://orcid.org/0000-0002-6238-9432

ABSTRACT

This case takes place at SCC, a recognized shopping mall located in Cali, Colombia. In March 2018, Javier Ortiz, CEO of SCC, contacted a group of researchers to identify the key success factors before the implementation of business intelligence practices. For this, the researcher's group conducted a set of deep semi-structured interviews to establish the current state of processes, people and technologies around business information. With this information, a business intelligence maturity stage model is presented to identify a low level of business intelligence practices, that represents a long list of challenges to be faced by the SCC with a limited budget. This case focuses on how to analyze the business intelligence readiness assessment using exploratory analysis, and seeks to promote the skills and competencies oriented to prioritize actions based on research to improve decision making before a business intelligence implementation project.

KEYWORDS

Assessment, Business Intelligence, Key Success Factors, Readiness

INTRODUCTION

This case study shows how SCC, a Colombian shopping mall, has developed an exploratory analysis to identify business intelligence practices' maturity before the start of the implementation project. The case starts with an organizational background describing the main features of SCC, then establishes the problem with information processes and practices and the way these problems are affecting business performance. SCC contacts a researcher group to get some recommendations about business intelligence readiness. This document shows a literature review for this topic and describes the methodological process and analysis conducted to present a set of proposals for a business intelligence implementation project. The case study ends with a discussion of the priorities to be defined for SCC and a set of critical questions about the future of the project.

ORGANIZATION BACKGROUND

SCC is a shopping mall located in Cali, Colombia. Founded in 1985, SCC is a traditional place for the city and symbolizes a decade of transformation and development. SCC is a firm that belongs to an important Colombian conglomerate of supermarkets and stores and is managed as part of the real estate business of this group. In this way, SCC operates as a lessor and manager of commercial spaces for brands that wish to offer their products and services.

DOI: 10.4018/JCIT.2020040102

SCC is constituted under the horizontal property regime. In this way, SCC is intended to generate profit to be re-invested in the improvement of infrastructure, security, events, and services offered to tenants and visitors. For 2017, SCC reported an operating income of $1,973,868, representing a growth of 11.52% in respect to 2016, with a gross margin of -1.64% and a net margin of 0.4%.

According to the 2017 SCC management report, the shopping mall has an area of 49,569 m^2 distributed across 101 stores. The annual occupation of tenants was 98.2%, representing a growth of 9% compared with 2016. SCC also encourages the leasing of common areas for shows and corporate events, but these activities constitute less than 7% of SCC's annual revenue, while 93% of revenues are obtained from administrative fees paid by tenants (see appendix 1). The marketing activities of SCC are based on the Colombian consumption cycle, which is centered on specific seasons and in a familiar concept . The shopping mall highlights activities focused on each family member per stage in the impulse traffic of potential buyers for their tenants' brands. As an example, the Colombian Mother's Day is in May, so SCC promotes activities specifically focused on mothers, and tenants promote products and services in their stores with special offers for this segment.

SCC also develops some social activities designed to promote sports, care for the elderly or children, and youth entertainment. These activities are proposed as a way to reflect SCC's social corporate responsibility based on the commitment of the brand with the city and to ensure the positioning of the tenants' stores. On a monthly average basis, about 190,000 vehicles (cars and motorcycles) enter the shopping mall. Thanks to SCC's location in the city, the shopping mall is a point of reference and meeting for people traveling through different means of public transport. Nevertheless, there is no estimate of the number of persons who circulate in the mall, and less information exists on the profiles or the frequency of visits of these people. At the organizational and structural level, the shopping center is managed by a board of directors composed of representatives of the conglomerate to which SCC belongs, tenants and managers of SCC. This board delegates the execution to a manager, who assigns activities to three departments: maintenance and operations, administrative and accounting, and commercial and marketing. The shopping center counts 23 direct employees. Some critical functions for the organization, such as technological, legal, or human resources, are carried out from the business conglomerate to which SCC belongs in a completely centralized manner.

With this, SCC focuses its strategic planning on two main axes. First, the most critical aspect of investing is related to infrastructure maintenance, which represents 58% of the investment budget for 2018. The shopping mall requires urgent interventions in walls, floors, and ceilings, considering that no new constructions or profound adjustments have been made since its opening. The second axis considered in planning is related to technology and marketing. SCC managers recognized that lack of information is a crucial issue to be treated because of its difficult implications on decision-making and effects on commercial activities. The importance of adequate technological development to improve relationships with tenants, visitors, and the conglomerate has been widely discussed in SCC in recent years. Usually, small budgets and lack of control in technological management, including other business priorities, have delayed the required investments in this topic.

SETTING THE STAGE

In March 2018, Javier Ortiz, Chief Executive Officer of SCC, contacted a group of researchers in business intelligence from the university where he earned a Master's in Marketing. Mainly, Mr. Ortiz has two motivations in reaching out to the researchers' group: first, the 2018 budget for SCC has assigned low economic resources to develop a study that recommends a project to renew the current Information Systems (CRM & ERP) and dynamize the use of data for decision-making purposes. Second, the financial results of Q1 in 2018 showed a severe drop in SCC's accomplishment of its commercial goals.

Ortiz believes the lack of information to make more attractive offers to potential tenants about the profile of visitors at the shopping mall is affecting the selling goals. In the first meeting with the group of researchers, Ortiz shares a summary of the current state of SCC mall and his worries about the goals and results. After this, the researchers ask some exploratory questions about information management and financial results.

As a first step, researchers convince Ortiz to use the limited budget to create an in-depth proposal to transform the information management in SCC, rather than investing in a new CRM and ERP and acquiring information from secondary sources. With this, researchers take this information and propose to elaborate a document that includes a broader scope of the problems with a common goal: identifying the current business intelligence maturity stage to introduce a project that will change SCC's way of interacting with its stakeholders.

Three weeks later, a second meeting was conducted. The group of researchers took control and presented some definitions to establish a common language between SCC and the group. The first proposal was to consider an adjustment to the organizational structure design, associating this design with the concept of information processes. Information processes are defined as a systematic practice that allows the organization to solve problems through tasks where information is an essential resource for the definition of norms, objectives, hierarchy, and objectives and for obtaining results .

One way to articulate the concept of information processes toward business practices related to information management is through the concept of business intelligence. Business intelligence is understood as the ability acquired by organizations to capture data, process it as information, and turn it into knowledge (Alavi & Leidner, 2001; Moss & Atre, 2003; Surma, 2011). Business intelligence activities require a set of skills that involve information technologies but also include business processes, organizational culture, and people (Kanwal, Singh, & Samalia, 2017; Negash, 2004; Pearlson, Saunders, & Galletta, 2016; Schwalbe, 2015).

After this consensus, the researchers' group presented a methodological design oriented to obtain information to establish what are the technological, process, and people's critical factors to consider before the acquisition of a software solution, based on Kanwal, Singh, & Samalia (2017) suggestions. The main reasons presented for this were that business intelligence had been approached from organizations as a predominantly technological issue (Chen, Chiang, & Storey, 2012; Larson & Chang, 2016). Although the importance of the technological component is evident, this has led companies to start the process of developing business intelligence practices with substantial investments in software, hardware, databases, and communications networks. Additional to this is conducting in parallel some analysis of the degree of people's readiness, their cultural interactions, or a definition of processes that facilitate the achievement of the project (Hung, Huang, Lin, Chen, & Tarn, 2016). Thus, business intelligence has been undertaken as a technological investment, responding more to a trend or fashion theme or to similar actions developed by other competing organizations (Khan, Amin, & Lambrou, 2010; Scholz et al., 2010).

Researchers' groups have presented other elements of context in the business intelligence implementation processes. Gartner (2016) shows that organizations recognize that data volume is increasing thanks to the development of the internet and the availability of unstructured data sources (such as texts, audio, or videos). However, firms also know that they do not have the resources, capacity, or ability to process high volumes of information in a short time. This situation is aggravated to the extent that entrepreneurs believe that investments made at the technological level, primarily to store and ensure the quality and privacy of data, are not amortized due to the difficulty of not having processes, people, and technologies suitable for use .

At this point, Ortiz was feeling comfortable with the proposal, but he needed to solve two questions that were bothering him. The first question was related to the results expected by the business from this project: setting a goal for the current year. How many times would it take to implement successful business intelligence? The second question related to the success rate of the future project: what is the probability of failure to implement a business intelligence project?

As researchers have indicated, one factor that constitutes an essential barrier at the moment in which a company decides to undertake a business intelligence project is the high rate of widespread disappointment associated with initiatives of this type, which, according to some sources, is close to 80% of projects that report failures or results even lower than expected (Gartner, 2017; Pearlson et al., 2016).

Consequently, the process of implementing business intelligence addressed in literature focuses on five stages: (1) analysis, (2) design, (3) development, (4) distribution, and (5) evaluation . Each of the stages involves a process of successive steps where, at the end of each stage, recursive reviews are done on the status of the implementation. In other words, the implementation process is based on the logic of permanent review and, being a substantially linear process, and it is a process whose implementation takes approximately between 18 and 24 months . The time factor for the implementation constitutes one of the barriers for organizations to decide to undertake a process of this nature.

Other factors, such as the urgency in obtaining short-term management results and the commitment required in terms of human talent and the demand for financial resources for this type of project implies that organizations perceive the implementation of business intelligence as a process of high difficulty and risk (Hung et al., 2016; Khan et al., 2010).

For these reasons, the researchers' group proposes that this project must be focused in the first stage of the implementation process (analysis), oriented to diagnose the current state of business intelligence practices before an implementation design. The project was named the Business Intelligence Readiness Assessment. With this, Mr. Ortiz proposed to interview stakeholders, review documents, and analyze the technologies, processes, and people at SCC to make an extended proposal to the board of directors with an ambitious long-term goal, creating a new data-based strategic business unit that diversifies the income sources of SCC and allows the managing of all information required to improve the business processes.

Moreover, the best thing is that the diagnosis costs SCC nothing besides the access to sources of information, such as business documents and interviews, that focus on the future development of a methodology for evaluating the business intelligence readiness of organizations. Mr. Ortiz was undoubtedly feeling happy and optimistic about the expected results of this stage, which took less than two months.

CASE DESCRIPTION

Based on the critical issues presented in the previous section, the researchers have proposed a list of questions to establish the development of business intelligence practices at SCC. These questions have been systematized to be applied in semi-structured interviews with the managers and employees of the shopping mall, as suggested by Van Campenhoudt, Marquet, and Quivy (2017) and Bell, Bryman, and Harley (2018).

In this sense, this methodology corresponds to an exploratory stage developed with a protocol that starts with an initial set of three in-depth interviews that were conducted with people in charge of roles directly related to the implementation of business intelligence. These are (1) administrative director, (2) director of information technologies, and (3) director of marketing and sales. The consideration of these roles corresponds to a classification by people, technologies, and processes suggested by Pee and Kankanhalli (2009) and Kanwal, Singh and Samalia proposals, where the interviewees answer questions about three dimensions based on their knowledge of the organization.

The script, interview protocol, and answers obtained were transcribed and analyzed using hermeneutic analysis software (Atlas TI), were categories have been considered as emerging of the responses received from interviewees, but then grouped using the proposed framework (Bell, Bryman, & Harley, 2018). For the development of the interviews, a script was established consisting of the aspects presented in Table 1.

Then, the results obtained in the first stage were evaluated with a second set of interviews, also with an exploratory methodology, tending to validate impressions on non-managerial employees. Nine semi-structured interviews were applied that aimed to know some complementary aspects of the three dimensions, seeking to investigate the potential of the implementation of business intelligence practices (Van Campenhoudt, Marquet, & Quivy, 2017). Finally, twelve semistructured interviews were compiled to know the impressions of the diverse actors related to the organization (Bell, Bryman, & Harley, 2018*)*. The results of these interviews were transcribed and analyzed by the researcher's group using specialized software for the qualitative analysis of hermeneutical information units (Atlas TI). Figure 1 shows an extended description of the methodological process carried out in this project.

As proposed in some frameworks on the evaluation of critical success factors (Olszak & Ziemba, 2003; Yeoh & Koronios, 2010), the incidence of each element in the current state of the evaluated organization was considered, but, unlike what happened in these sources, the information of interest for this case was focused on the opinions, interests, reasons, and attitudes of the interviewees with these aspects.

The analysis of the information obtained considered the interrelationships between the dimensions of people, processes, and technologies. Although analysis of each dimension allows a description of the generalities of the organization so analyzed, it is in the interaction between dimensions that the opportunities, strengths, threats, and weaknesses are evident before the implementation process.

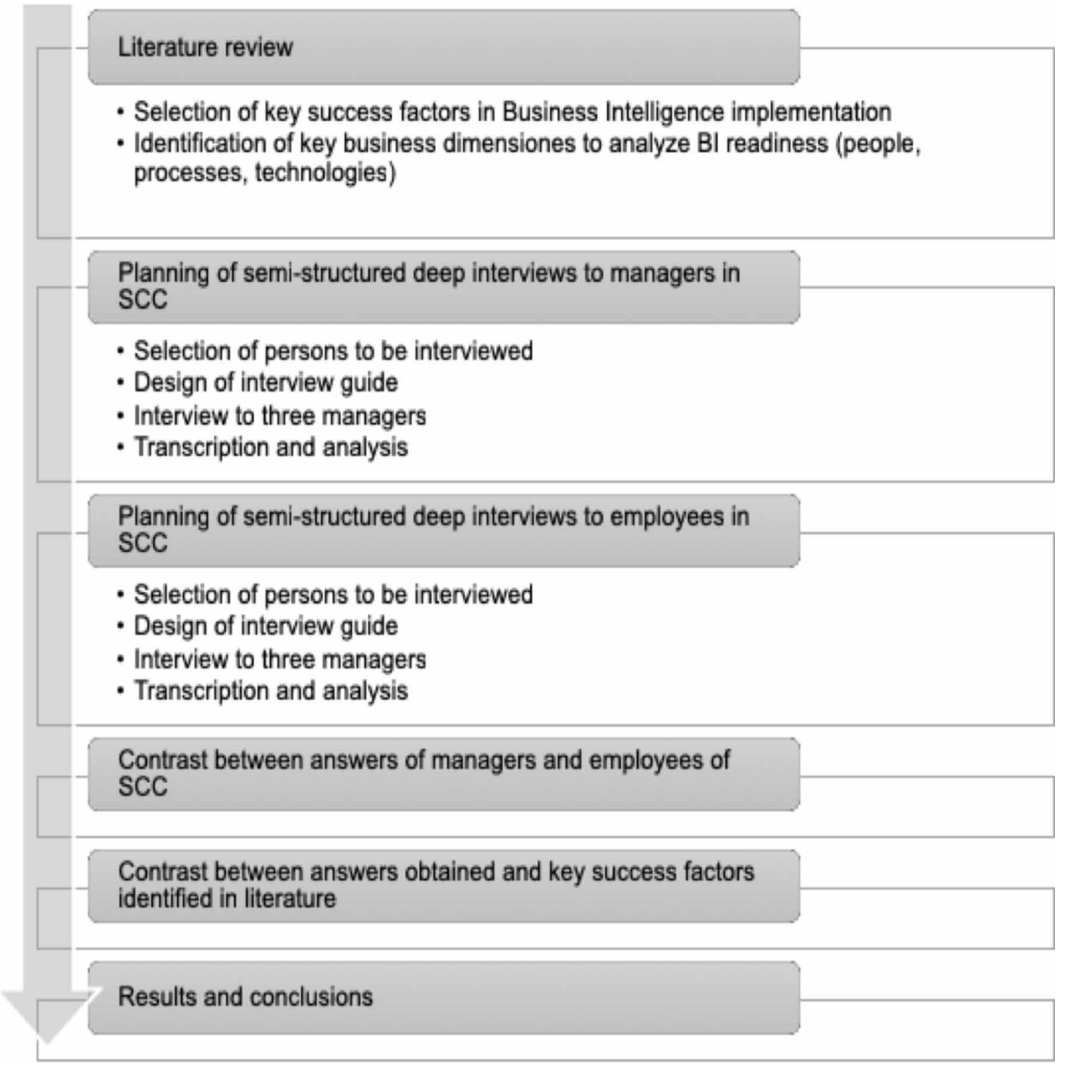
People-Processes Dimensions Interaction

The most outstanding of the elements appreciated in the interaction between the dimensions of people and processes are linked to the need to establish a procedural guide that allows greater coherence and better communication between people's requirements and information processes. For the interviewees, this is a fundamental step toward building an information culture since it allows them

Table 1. Critical dimensions and factors in evaluating Business Intelligence Readiness based in Pee & Kankanhalli (2009), & Kanwal, Singh & Samalia (2017)

	Key related factors		
Dimensions	**People**	**Processes**	**Technologies**
People	Personal behavior Group behavior Organizational culture Skills and competences Internal and external relationships Organizational goals	Norms and procedures Information culture Teamwork Defined roles and responsibilities Efficiently distributed information Training and change management	IT adoption People readiness to new IT IT impact on people Beliefs about iT in job IT usage in job IT in job efficiency
Processes	Norms and procedures Information culture Teamwork Defined roles and responsibilities Efficiently distributed information Training and change management	Shared information Collaborative job practices Information processes Training policies Corporative strategy	Data quality and quantity Automatized reports Data capture standardized Enough IT resources supporting business processes Continuous training in IT
Technologies	IT adoption People readiness to new IT IT Impact on people Beliefs about IT in the job IT usage in job IT in job efficiency	Data quality and quantity Automatized reports Data capture standardized Enough IT resources supporting business processes Continuous training in IT	IT infrastructure Databases Information systems integration Information security and privacy Monitoring and alert systems Automatization Technical support

Figure 1. Methodological process protocol based in (Van Campenhoudt, Marquet, & Quivy, 2017; Bell, Bryman, & Harley, 2018)



to take advantage of the positive values of the organizational culture, such as charisma, the sense of belonging, and the commitment of the collaborators at SCC. As a result of these tasks, it is expected that the implementation of business intelligence practices will be oriented so that the participants will gain an understanding of the business's behavior; this will allow them to operate more from knowledge and less from intuition.

With this, the interviewees must also be willing to be trained in whatever is required to improve the performance of their tasks. The perceived benefits are higher than the risks if they consider that this will not only help them direct their time toward more critical and strategic tasks but could also enable them to perform in the future in other organizations with more advanced information cultures.

Among the risks that have been mentioned are aspects such as having to work in out-of-business hours or the lack of capacity to access information from anywhere. Another issue has been said based on a hypothetical situation where the business intelligence practices are not used to propose and develop actions that improve business performance but could be used to intensify the supervision,

converting business intelligence in an exhaustive and undesired mechanism for control (see detailed results in Appendix 2).

People-Technologies Dimensions Interaction

The relationship between people and technologies manifests itself in several ways through the methodology used. The low rates of use of information technologies for the development of their daily work activities contrast with the high willingness to use information technologies, as well as the perceived benefits of them. However, at a general level, the interviewees agree that SCC is an organization that has appropriately invested in technology. The right investment in technologies is a critical factor in maintaining the willingness of the organization to keep up with the current dynamics of the market. Nevertheless, interviewees also emphasize that there are still opportunities to take advantage of information technologies starting from the integration of SCC information systems, accompanied by more training and policies defined by the managers.

Interviewed employees agree that they demand the implementation of practices and tools of business intelligence in their daily tasks since they perceive that these can bring great job and organizational benefits and could improve their efficiency. This group also considers that the available business information must be excellent in quantity and quality, but this information is not available and accessible to all since they sometimes feel that their actions when they do not have information go against what is expected of managers, tenants, and visitors. This description is an opportunity for improvement that must be exploited urgently, so SCC must prioritize to identify practices of information management for this industry, which, if not implemented, could result in negative results for SCC in the future.

At the same time, some of the perceived damages of implementing business intelligence practices in SCC are related to the possibility that new tools and processes generate distractions or reduce the quality of human interaction, elements that they consider one of the critical advantages of their organizational culture. Other potential damages are focused on how some employees do not feel adequately prepared for the arrival of this kind of innovation, so they feel overwhelmed by the possibilities that this could involve. (See detailed results in Appendix 3)

Processes-Technologies Dimensions Interaction

Regarding the relationship between technology and processes, the amount of data that the organization generates daily contrasts with the perception of scarcity of information available to track business processes and for decision making. Managers and employees of SCC have emphasized the difficulties in building simple reports and articulating different sources of information. These difficulties constitute a repeated complaint, especially for persons responsible for commercial goals. Some doubts about the reliability of the data and the information presented in reports and analyses also emerge.

Besides, SCC managers who are not directly related to the area of information technologies consider that there is an underutilization of information technology resources that are reflected in the fact that the investments made are neither amortized nor generate value in novel initiatives or the improvement of processes efficiency. The disconnect between technologies and information processes, as described, starts from the multiple entries of data that are not adequately controlled and increases in the predominant culture of paper use. In contrast, employees consider that some information technology resources, like CRM and ERP systems, are poorly designed, do not integrate information, and do not facilitate routine tasks. These systems are perceived as "black boxes" in that people see and generate reports and aggregate data but do not have access to raw data to propose new strategies, models, or tactics.

Concerns are also raised regarding the types of contracting and acquisition of information technologies. Some elements show a lack of knowledge of what was agreed upon between the suppliers. As technology management is a not directly controlled process, SCC does not have policies and rules about technology acquisition or usage, and technological planning is absent. In this way, SCC managers

claim the ability to make decisions in technology management that enable the integration and digital transformation of the firm. Indeed, there are also comments associated with the lack of training and the definition of standards and technical support policies (See detailed results in Appendix 4).

Business Intelligence Maturity Analysis

In the case of the SCC shopping mall, the maturity level of the business intelligence practices could be inferred using literature-proposed models, as presented by Hribar-Rajterič (2010). For this case, Table 2 synthesizes six models of maturity with its description and the SCC features explained by the answers obtained through in-depth interviews (Deng, 2007; Eckerson, 2007; Hagerty, 2006; Kašnik, 2008; Rayner & Schlegel, 2008; Williams & Thomann, 2003).

From business intelligence maturity analysis, it could be inferred that there are a certain willingness and interest of the organization and its members to advance in this aspect. Priority tasks should be carried out in the dimensions of processes and technologies and their corresponding interaction. As this happens in this case, it is feasible that when considering other organizations, other degrees of maturity and dimensions that are more prominent or in a critical situation may be identified.

However, in the case of SCC, the level of maturity usually oscillates between levels 1 and 2 (from basic to basic-intermediate). Another significant learning of the development of the maturity model analysis is oriented to the incorporation of new elements and challenges in the overall development of the project. It is especially important to consider the inclusion of the following phases in the process of implementing business intelligence, such as design, output, and evaluation. Until this result, the project focused only on the initial-conditions analysis phase. However, a holistic vision involves considering the planning of the project, together with the analysis of potential contingent factors that, at a given moment, may entail interventions or changes in the development of the project, even when the result is already underway. The aspects determined in the evaluation and monitoring of the implementation of this type of practice must also be included and considered, both at the literature and practical application levels.

CURRENT CHALLENGES / PROBLEMS FACING THE ORGANIZATION

Some weeks later, the results presented above were presented to Javier Ortiz. On the discussion of the current situation of the company, first of all, it can be detailed that the number of actions susceptible to perform in any of the dimensions should be analyzed. This list of actions represents an additional challenge, consisting of the prioritization of the activities to be carried out intending to implement business intelligence practices. Particular priorities are identified in the transformation of the dynamics of information processes and the technologies to be used by the organization. An initial action involves the construction of a map of processes of capture, integration, analysis, and distribution of information. This map must include a detailed list of reports of recurrent use, a clear definition of the roles related to each type of report, and the proposition of some objectives and indicators of compliance on quality in the description of the established processes.

Also, Ortiz refers to the high grade of informality presented on information-related processes. Users have a high dependence on two specific persons (analysts) to get information who do not generate fast and agile information. Decision-making could be delayed if analysts have to prioritize high-level management requirements or have technical problems with the platforms. It is essential to develop an informational culture where people enhance autonomy for processing and analyzing the information as they need it, which is linked to the review of the technical specifications of information technologies that support business processes. Ortiz also considers it critical to attack the absence of an organizational policy for the standardized capture of data, developing a strategy to diminish paper usage. Some of the SCC business information is still managed in spreadsheets (e.g., Microsoft Excel), which does not allow the control and application of data privacy and security regulations.

Table 2. Business intelligence maturity based on Hribar-Rajterič (2010)

Name of model	Author(s)	Level identified for SCC	Description
Business Intelligence Maturity Model	Williams & Thomann (2003)	Second (Stage 2)	Everyday use of information is conducted in the same unstructured way as before the Data Warehouse was introduced. Benefits of the Data Warehouse are visible in the form of faster and in time to access to information. Demands for information are focused on questioning "what" business users want to access and are usually in the form of data elements, which are passed from end-users to the IT department.
TDWI BI maturity model	Eckerson (2007)	Infant (stage 1B)	In the Infant phase, a company is faced with numerous partial data sources called Spreadmarts. Eckerson (2004) defines Spreadmarts as spreadsheets or desktop databases which are used as a replacement for regional data warehouses. Each of them contains a specific set of data, metrics, and rules with a small or no correlation at all between each other, operational reports or analytical systems. Fragmented data sources are producing conflicting views on business information. They undermine the effective decision-making process supported by strategic goals and prevent a clean and consistent view of all events in the company.
Gartner's maturity model for BI and PM	Rayner & Schlegel (2008)	Unaware (stage 1)	This maturity level is often described in the literature as "information anarchy" whose indicators are inconsistent data; incorrect and inconsistent data interpretation and constant changes are struggling to fulfill individual or departmental information needs. Usage of spreadsheets is high, while the use of reporting tools is limited. A company does not have defined metrics for performance management. A company is not devoted to and does not understand the importance of the BI and PM. Information management is left to the IT department, which is also responsible for reporting. Funding comes from the IT budget and is charged to a cost center.
AMR research BI / PM maturity model V2	Hagerty (2006)	Reacting (level 1)	Most projects are tactical and deal with the improvement of access to operational data, reducing reporting periods/delays and increasing visibility, efficiency and success of individual departments. Data delivery is maintained on the department level and historical events. The organization depends on desktop tools and "ad-hoc" queries performed by individuals with very little or no consolidation at all.
Business Intelligence Maturity hierarchy	Deng (2007)	Data (stage 1)	An organization at this level collects, cleanses, standardizes, and keeps data from different sources consistent. The goal at this stage is to establish integrated, clean, and high-quality data. Data quality is a starting point for introducing DW and BI.
Infrastructure Optimization Maturity Model	Kasnik (2008)	APIO Class - Basic	The APIO class focuses on making better business decisions through the delivery of higher quality data needed by employees to make decisions on all levels of business.

Regulatory requirements received Ortiz's special attention: the fact that SCC does not manage legal issues directly is a good reason for a priority review of this topic.

In the people dimension, Ortiz believes that organizational culture, change readiness, as well as individual skills and competencies are critical factors for taking advantage of successful business intelligence implementation at SCC. Nevertheless, Ortiz is worried about the people's perceptions of a lack of precision and quality information being provided for these systems. A priority action to take in this regard is to review the contractual conditions of ERP and CRM providers to seek opportunities before a potential renovation. Amendments to these contracts should include extensive training, integration possibilities, and user-based design.

Ortiz also believes that technology decisions are probably of less priority until the definitions of the information process become evident. Any technological implementation project has a high probability of failure if the processes are not adequately defined. People will be critical of making a more natural transition process. Ortiz has a clear insight into the horizon for SCC: passed from an organization where information was not the main issue to an organization based on data that provides information for internal and external usage oriented to maximize the value and improve the business performance.

This activity execution already supposes a scenario of conditions with signs of improvement to avoid the potential failure of the business intelligence project. However, although the project could start after these actions, it is also a priority to incorporate a change management and training program into the action plan. This program should be framed in the use of a favorable working environment, organizational culture, and the willingness of users to train in new practices and processes as well as the use of new technologies to improve work efficiency.

Ortiz considers that this business intelligence readiness assessment analysis also must be complemented with the inclusion of other aspects, such as project management, the competitive environment of the organization, or the element of financial resources available for implementation, which is aligned to suggestions from Villamarín-García and Díaz Pinzón . On the other hand, the literature regarding Business Intelligence suggests considering additional potential dimensions to have a complete view of business as a way to avoid the possible failure of the project. For example, this case is supported in the traditional framework of People, Process, and Technologies proposed by Pee & Kankanhalli (2009); other dimensions that could contribute to give a broader scope of business intelligence readiness have not been included. Additional aspects that must be covered could be the type of products, firm activity and size, and management styles, among others.

Besides, some aspects of project management must be considered. Project management practices must be involved to improve the probabilities to get a successful implementation. As a first step, SCC should consider setting a realistic goal based on the stage of business intelligence maturity that they will try to achieve. If they decide to give a jump between two or three levels of maturity, this will probably imply a big project with significant money investments and higher potential risks.

Regardless, the business intelligence implementation project must include technical and behavioral issues to be developed. In technical issues, SCC could start by benchmarking technological providers while developing processes reengineering for simplifying the information processes. In behavioral issues, SCC should start with change management and training programs that enable people's readiness for the business intelligence implementation project success, and then for productive daily tasks across business information management.

Many important questions remain after the business intelligence readiness assessment: How will SCC proceed regarding the business intelligence project? How will Mr. Ortiz prioritize the tasks to be realized before starting the acquisition of technological tools? Is SCC actively prepared to assume the changes that the implementation of evolved business intelligence practices requires? What is the kind of project needed to evolve the business intelligence maturity stage to a higher level?

REFERENCES

Alavi, M., & Leidner, D. E. (2001). Knowledge Management and Knowledge Management Systems: Conceptual Foundations and Research Issues. *The Mississippi Quarterly*, *25*(1), 107–136. doi:10.2307/3250961

Bell, E., Bryman, A., & Harley, B. (2018). *Business research methods*. Oxford university press.

Chen, H., Chiang, R. H. L., & Storey, V. C. (2012). Business intelligence and analytics: From big data to big impact. *The Mississippi Quarterly*, *36*(4).

Deng, R. (2007). Business intelligence maturity hierarchy: A new perspective from knowledge management. *Information & Management*, 23.

Eckerson, W. W. (2007). *Beyond the Basics: Accelerating BI Maturity, TDWI Monograph Series*. Seattle, WA: The Data Warehousing Institute.

Galbraith, J. R. (2007). Designing Complex Organizations. *Addison-Wesley series on organization development*.

Gangadharan, G. R., & Swami, S. N. (2004, June). Business intelligence systems: design and implementation strategies. *Proceedings of the 26th International Conference on Information Technology Interfaces* (pp. 139-144). IEEE.

Gartner. (2016). How to Implement a Modern Business Intelligence and Analytics Platform.

Gartner. (2017). Worldwide Business Intelligence and Analytics Market to Reach $18.3 Billion in 2017.

Hagerty, J. (2006). *AMR research's business intelligence/performance management maturity model. Version 2*. Gartner.

Hribar Rajterič, I. (2010). Overview of business intelligence maturity models. Management. *Journal of Contemporary Management Issues*, *15*(1), 47–67.

Hung, S.-Y., Huang, Y.-W., Lin, C.-C., Chen, K., & Tarn, J. M. (2016). Factors Influencing Business Intelligence Systems Implementation Success in the Enterprises. In PACIS (p. 297). Academic Press.

Kanwal, S., Singh, G., & Samalia, H. V. (2017). The Role of Organizational Culture and Process-Structure in Marketing Intelligence: Perspective of IT Professionals. *Journal of Cases on Information Technology*, *19*(1), 60–78. doi:10.4018/JCIT.2017010106

Kašnik, A. (2008). *Model optimization infrastructure*. Ljubljana: Internal Material of ZRSZ.

Khan, A. M. A., Amin, N., & Lambrou, N. (2010). Drivers and barriers to business intelligence adoption: A case of Pakistan. *Proceedings of the European and Mediterranean Conference on Information Systems (EMCIS2010)*, Abu Dhabi, UAE (pp. 1–23). Academic Press.

Larson, D., & Chang, V. (2016). A review and future direction of agile, business intelligence, analytics and data science. *International Journal of Information Management*, *36*(5), 700–710. doi:10.1016/j.ijinfomgt.2016.04.013

Moss, L. T., & Atre, S. (2003). *Business intelligence roadmap: the complete project lifecycle for decision-support applications*. Addison-Wesley Professional.

Negash, S. (2004). Business intelligence. *Communications of the Association for Information Systems*, *13*(1), 54.

Olszak, C. M., & Ziemba, E. (2003). *Business intelligence as a key to management of an enterprise. Proceedings of informing science and IT education conference* (pp. 855–863). Academic Press; . doi:10.28945/2672

Olszak, C. M., & Ziemba, E. (2007). Approach to building and implementing business intelligence systems. Interdisciplinary Journal of Information, Knowledge, and Management, 2(1), 135–148. 10.28945/105

Pearlson, K. E., Saunders, C. S., & Galletta, D. F. (2016). *Managing and Using Information Systems, Binder Ready Version: A Strategic Approach*. John Wiley & Sons.

Pee, L. G., & Kankanhalli, A. (2009). A model of organizational knowledge management maturity based on people, process, and technology. *Journal of Information & Knowledge Management*, *8*(2), 79–99. doi:10.1142/S0219649209002270

RADDAR. (2016). Incertidumbre 2016: ¿Por qué consumimos como consumimos los colombianos? *Presented at the ANDI - Cámara de Comercio de Bogotá.* Academic Press.

Rayner, N., & Schlegel, K. (2008). *Maturity model overview for business intelligence and performance management*. Gartner.

Scholz, P., Schieder, C., Kurze, C., Gluchowski, P., & Böhringer, M. (2010). *Benefits and Challenges of Business Intelligence Adoption in Small and Medium-Sized Enterprises*. ECIS.

Schwalbe, K. (2015). *Information technology project management*. Cengage Learning.

Surma, J. (2011). Business intelligence: making decisions through data analytics. Business Expert Press. 10.4128/9781606491867

Van Campenhoudt, L., Marquet, J., & Quivy, R. (2017). Manuel de recherche en sciences sociales-5e éd. Dunod.

Villamarín-García, J. M., & Díaz-Pinzón, B. H. (2017). Key success factors to business intelligence solution implementation. *Journal of Intelligence Studies in Business*, *7*(1).

Williams, N., & Thomann, J. (2003). *BI Maturity and ROI: How Does Your Organization Measure Up?* Decision Path.

Yeoh, W., & Koronios, A. (2010). Critical success factors for business intelligence systems. *Journal of Computer Information Systems*, *50*(3), 23–32.

APPENDIX A

Table 3. SCC's Income statement accounts summary in US$ Dollars

	2017	2016	Var (%)
Operating revenues	$ 1.973.869	$ 1.769.914	11,52%
Operating expenses	$ 2.006.300	$ 1.682.157	19,27%
Gross profit	-$ 32.431	$ 87.757	-136,96%
Net profit	$ 7.827	$ 109.729	-92,87%

APPENDIX B

Table 4. Interaction between people-processes

Key factor	Analysis	Commentary
Norms and procedures	The absence of formal norms and procedures generates problems of coherence between actions and results, and also communication problems	"Recent arrival of new employees difficulties processes by the lack of a standardize guide of functions and roles"
Information culture	There is not an information culture, but the organization has intentions and willingness to create it. Is important to solve the problem of the concentration of information only on high-levels.	"No, we do not have enough information culture, but we can develop it with the right training processes." "We do not have information culture because data and information are concentrated in two or three persons. A daily battle is to solve urgent problems based on intuition more than information."
Teamwork	Given the information' concentration and the low number of employees, opportunities for teamwork are scarce, and each person makes just his/her work using what they consider the most convenient ways	"We do not make standardized reports because each employee has different needs, and this is not organized and planned."
Roles and responsibilities	There is a definition of responsibilities but the lack of teamwork build a barrier for the processes efficiency because each SCC member do his job as they think must be done	"When a new boss arrives and change our job practices and routines, people react with blocking"
Efficient deployment of information	Concentration of information implies that only managers and CEO could have exclusive access to business information. Other members have to support delays and frequent mistakes	"To do reports for my daily job could expense near of four hours of my week." "When reports are depending on me, and I do not have CEO requirements, I can deliver it in two or three hours approx."
Training and change management	SCC managers and employees show enough willingness and openness to conduct training and change management activities	"This is a great place to work. I am sure that I want to learn more to perform my job, but sometimes we do not have enough time for this"

APPENDIX C

Table 5. Interaction between people-technologies

Key factor	Analysis	Commentary
IT adoption	A small group of employees are intensive users of IT	"Just 40% of employees make daily usage of ERP and CRM information systems." "CRM is difficult to use, and information does not look reliable." "ERP is easy-to-use but frequently is down or blocked."
People's readiness to IT	Potential users of IT show high interest in learning and using for daily job routines	"I remain updated about last technological developments to incorporate in my daily life."
IT impact on people.	Potential users of IT consider that impact is positive but could be better if IT resources are more accesible and equitable.	"She (her boss) gives me the information that I require to do my job, but frequently this information is outdated." "I think if CRM could be better, I would use it frequently, but is a "black box" and is not trustable."
Usage of technology in job	Interviewees considers technologies as distractor of strategical activities for SCC. Poorly managed implementations could diminish the quality of the relationships between SCC, tenant's and visitors	"Technologies could help to do my best job even if they are not used to control my personal life." "I feel open to using business technologies only in my office and in job hours."
IT as a source of information	Predominant way for seeking information are managers, no the information systems	"CRM shows outdated information. Frequently, I prefer to ask my boss or colleague if they have more recent data to do my job."
IT as a source of efficiency	Information technologies are perceived as a source of efficiency when information has high quality and is updated	"Sometimes I have solved problems quickly with the usage of ERP reports, but this is not frequent."

APPENDIX D.

Table 6. Interaction between processes-technologies

Key factor	Analysis	Commentary
Data quantity vs. Information quality	Interviewees consider SCC has high amounts of data. Nevertheless, there is no consensus about the quality or accessibility to data. Information processed is considered not wholly reliable and detailed for decision making	"CRM campaigns are not measurable. I am sure that we could get much information, but the tool is poorly designed." "There is no way to extract information directly from information systems."
Report's automatization	Processes are not automatized, and paper culture is predominant	"We use Excel as an efficient way to know when and how making a call or renew a contract" "All business information is supported in an in-house archive printed paper-based."
Data capture practices	SCC makes an important number of events where collects data, but there is not a defined protocol to analyze quality, veracity, and privacy of information	"If I want to extract or filter a database for making a marketing campaign I don't have a manner of knowing if a customer has been contacted previously"
IT supports business processes	SCC has progressed in improving the IT infrastructure, but the lack of control and management in IT resource generates problematic situations for manage relationships with tenants and visitors	"Five years ago, we did not have a way to get information about business performance." "We can access historical information of business in our CRM and ERP, but just if it is based on aggregated data." "When a potential tenant arrives and wants to know the profile of our visitors, we give them estimates, but not 100% certainly information."
IT policies and norms	There is a lack of definition of support services. The employees' contract is the only document which emphasizes in responsibilities about the usage of information and technologies.	"When I have a problem with technologies, I call to Andres (IT support representative) and he takes a lot of time to came to my office."
IT training	SCC invests on training but is in other topics far of technology or data management	"In my first day at SCC, my boss gives me a username and a password for accessing to the ERP, no more" "I just can remember one or two meetings of training in IT in my 12 years here in the company."

PERMISSION NOTE

All names provided in this case have been replaced for a pseudonym to ensure confidentiality.

Pedro Julian Ramirez Angulo is professor at Universidad de la Costa in Barranquilla, Colombia.. He earned his PhD from National University of Colombia in Bogotá. His research interests include Business Intelligence, E-commerce, and Customer Relationship Management.

Rosa Alexandra Chaparro Guevara is a professor of marketing and innovation at Universitaria Agustiniana in Bogotá, Colombia. She earned a M.Sc in Innovation Management from Technological University of Bolivar in Cartagena. Her research interests includes innovation management in marketing, consumer behavior and quantitative methods.