



# Improving Project Management Practice Through the Development of a Business Case: A Local Administration Case Study

Fernando Martins<sup>(✉)</sup>, Pedro Ribeiro, and Francisco Duarte

Information Systems Department, ALGORITMI Research Centre,  
School of Engineering, University of Minho, Guimarães, Portugal  
fernandorui@outlook.com,  
{pmgar, francisco.duarte}@dsi.uminho.pt

**Abstract.** The identification and implementation of the best practices of project management are preponderant and decisive factors for the success of the companies, regardless of their area of intervention. This highlight arose from the need for companies to respond quickly, efficiently and in an integrated manner to the challenges that an ever-changing environment offers.

In a public transportation company, the challenges should focus on project management improvement initiatives, considering their organizational context and the low level of organizational maturity existing in project management.

The purpose of the research was to develop a solution of a Business Case template that was intended to be integrated into the life cycle of project management of the company under study, transversal to all the areas of knowledge described by PMBoK, having several inputs provided by PRINCE2 and BABOK.

The purpose of the research work was to develop a solution to justify initiatives that lead to projects and ensure a correct management throughout the life cycle of each project.

**Keywords:** Business case · Project management practice  
Project management improving initiatives  
Integrated project management processes

## 1 Introduction

Project Management (PM) has had a great recognition in industries and organizations to achieve a higher success rate.

The projects of Information Technologies (IT) and Information Systems (IS) have emerged with high frequency, because of the technological evolution that offers new opportunities and challenges to the cities. These has led cities to integrate the most modern technology in order to sustain its development, whether economic or political [1].

This situation makes it necessary to implement good practices of PM in order to increase the success rate of these same projects, which is around 29% [2].

However, the simple implementation of any PM approach is not a solution, it has already been recognized that PM varies from one context to the other, and several limitations are also identified in the recommended approaches [3].

One of the important steps in PM is its start-up, which is being ignored most of the time, so presenting a solid Business Case (BC) increases the probability of obtaining the leadership engagement and the resources needed to start and implement successful projects [4].

## 2 Case Study

All companies have different scopes. Some exist in business contexts related to industry or commerce activities, others are public entities and there is still room for those that do not have any profit objective.

Despite this distinction in their scope they all have internal structures, which represent their mission, vision and strategy that serve as a foundation for all the objectives of these same companies.

Transportes Urbanos de Braga (TUB) is a company located in Braga, Portugal, that operates in the urban passenger transport sector, being certified by the Portuguese standard that regulates Research, Development and Innovation, NP4457:2007 [5].

This company is heir to a long tradition, but its ambition leads them to make future every present day through its dynamic image and continuity, looking for Integrated Urban Mobility that encompasses pedestrian paths, cycle paths and integration between the various modes of transport.

### 2.1 Strategy for Projects

As a benchmark company with a high impact on society, it is worth mentioning that TUB has been heavily involved in the search for more economical solutions over the last few years and that they guarantee significant reductions in their negative impact on the environment.

TUB have sought to position Braga as a city capable of responding to the latest challenges in terms of transport and mobility, so they see innovation, research and development as critical factors for their activity because of their certification.

### 2.2 TUB Projects

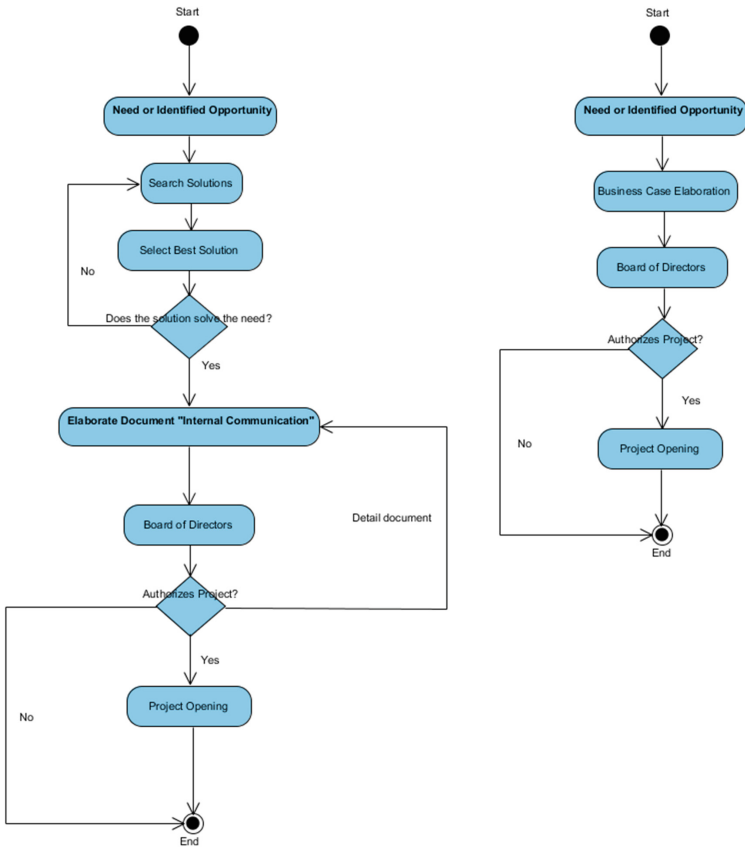
The fuel for all the TUB projects is its mission to offer mobility and comfort solutions in the region, satisfying and surprising the expectations of the involved partners [6], which justifies its constant search to create new means and mechanisms to serve its customers, recognizing the importance and value of information and making it available to anyone.

### 2.3 Motivation

One of the great difficulties identified is precisely the absence of standard documents and processes. By default, the project owner to justify a project does not use a document that identifies the necessary requirements for the board of directors support their decision-making process.

As such, and using the current process, there is the mistake of spending more time on project justification than what would be ideal.

The process that represents the beginning of the life cycle of a project can be described as follows, and is represented in the Fig. 1 the “as is” as present (left) and the “to be” as the desired process (right).



**Fig. 1.** Procedure for the start of a project

When identifying a need or opportunity it is necessary to create or identify a solution and then select the one that best suits this issue. If the solution demonstrates that it can solve the identified situation, the owner must fill an internal document explaining the need.

The main weakness of this process lies in this phase because this document will be filled according to what its author deems pertinent and valid and then submitted to the board of directors.

With the requirements obtained through several contact points (iterative approach) [7, 8], because of the involvement of several employees, the following process was defined as desirable:

- **Problem:** when identifying a problem or opportunity, all its characteristics and impacts must be identified with the organization.
- **Idea:** subsequently, a list of requirements that may lead to the resolution of the previously identified situation must be elaborated.
- **Solution:** the identification of one or more solutions must be performed to solve the difficulty or opportunity felt.
- **Proposal:** fill in a document that translates the difficulty or opportunity so that it can be introduced into the organization.
- **Authorisation:** with the proposal, the administration should take the decision making that should be one of three possibilities: do something, do the minimum or do nothing.

The workflow is simplified and ensures that decision making is better sustained, ensuring better engagement by all stakeholders at different levels of the company.

Thus, with the introduction of a structured document, which is the Business Case Template, 30% of the complexity is reduced thanks to process uniformity and documentary support.

### 3 Business Case

According to the International Institute of Business Analysis (IIBA) [9], the BC is a tool that provides the justification for a particular solution, based on the benefits to be gained when compared to the cost, effort and several other considerations made

IIBA [9] further indicates that it must capture all the reasoning necessary to achieve change and is often presented as a formal document.

Observing and analysing the business for improvement is only part of the process of identifying the benefits. It is also necessary to develop a BC to justify the level of investment and ensure that all risks are identified. One of the key elements of the BC is the identification and quantification of benefits guaranteed by change [9].

To facilitate its implementation and versatility, this should not be a complex document, it can be the catalyst for several different change initiatives and follow the whole life cycle of a project as seen in the Fig. 2.

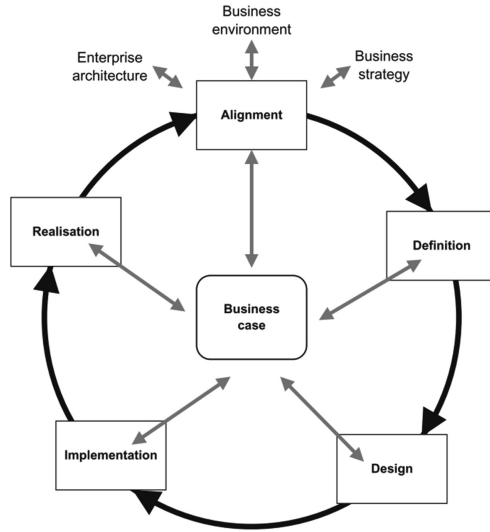


Fig. 2. Business case change lifecycle [10, p. 4]

### 3.1 Business Case Application in the Life Cycle of a Project

To develop a BC template, both BABOK Guide [9] and Prince 2 [11] were used as a major influencers.

The BC is one of the techniques present in BABOK in order to promote and sustain organizational change [9]. BC covers a series of areas that aim to respond to that purpose, having a description and several constituent elements and considerations of use.

The BC in PRINCE2 is one of 7 themes that represents the key aspects that needs to be addressed in PM [11].

This artefact is developed at the beginning of the project and updated throughout it, it should be formally reviewed at various times, such as decision moments or at the end of each phase of the project.

With the understanding of all existing processes, it is possible to develop a Business Case Template that provides all the necessary information from a business point of view that allows determining the feasibility and obtaining the necessary commitment with it to achieve success [12].

According to the BABOK® Guide, the BC is not only a justification for an investment to deliver a proposed solution, it must consist of the benefits, costs and risks associated with the investment.

Thus, the BC should be composed of [9]:

- Why the project is being carried out;
- Problem statement/definition;
- Recommended solutions;
- What are the benefits to the various stakeholders (i.e. organization, project team and client);

The Rational Unified Process (RUP) [12] and the BABOK® Guide [9] indicate that the BC should be carried out in the preparatory phases for the project. The RUP approach defines BC as part of the Inception.

Inception’s main objective is to obtain the agreement between all the stakeholders in the objectives of the project life cycle. This phase is particularly important for new efforts, where there are several business risks and requirements that must be addressed before the project can proceed [12].

Considering the dynamics and relationship present in the BC and the projects, it was considered valid that the defined template would be structured according to the principles present in the RUP, PRINCE2 and BABOK® Guide, so through the RUP it is possible to introduce a time point where the BC is necessary, and with PRINCE2 and BABOK® Guide we define the requirements necessary to create the artefact in question, with the complexity required for the document and its importance [9, 11, 12].

### 3.2 Requirements

The characteristics of a BC differ between the BABOK® Guide and PRINCE2, as can be seen in Table 1 [9, 11, 12] and from that, according to the requirements also imposed by standard NP4457:2007 [5], the requirements for the Business Case Template TUB are defined in Table 1.

**Table 1.** Business case content

<b>BABOK® Guide</b>	<b>PRINCE2</b>	<b>Template Business Case TUB</b>
Scope	Reasons	Introduction / Justification
Description	Actions to take	Scope, Purpose and Purpose
Need	Do nothing	Objectives and Expected Results
Desired Results	Do something	Definitions / Acronyms and Abbreviations
Alternatives	Do the minimum	Inputs
Scope	Expected benefits	Solution Description #
Viability	Consequences	Expected Benefits
Assumptions, Risks and Constraints	Costs	Consequences
Financial Analysis and Valuation	Time scale	Risks
Recommended solution	Risks	Time
Usage Consideration	Investment valuation	Costs
Forces and Limitations	Program part	Investment Evaluation
	Consulting / External Support	Program
		Consulting / External Support
		Deliberation

### 3.3 Phases of a Project Lifecycle

Certain that the contribution of the employees is determinant for the accomplishment of the objectives of the public entities, the requirements defined for a BC model and considering the process defined for the use of the same, several iterations were then made in the construction of a valid model.

When designing a first proposal for a Business Case Template, it became clear that it is necessary to define the process and the desired project life cycle initially.

Thus, mapping the process that starts in identifying a need that originates a project becomes a vital issue for the preparation of the Business Case Template and the entire remaining life cycle of projects.

Considering the characteristics of the template to be developed and the requirements that it must have, we also analysed the internal process groups that belong to the life cycle of a project, creating a workflow and the way in which these, in ideal situations, relate and precede activities among them (Fig. 3).

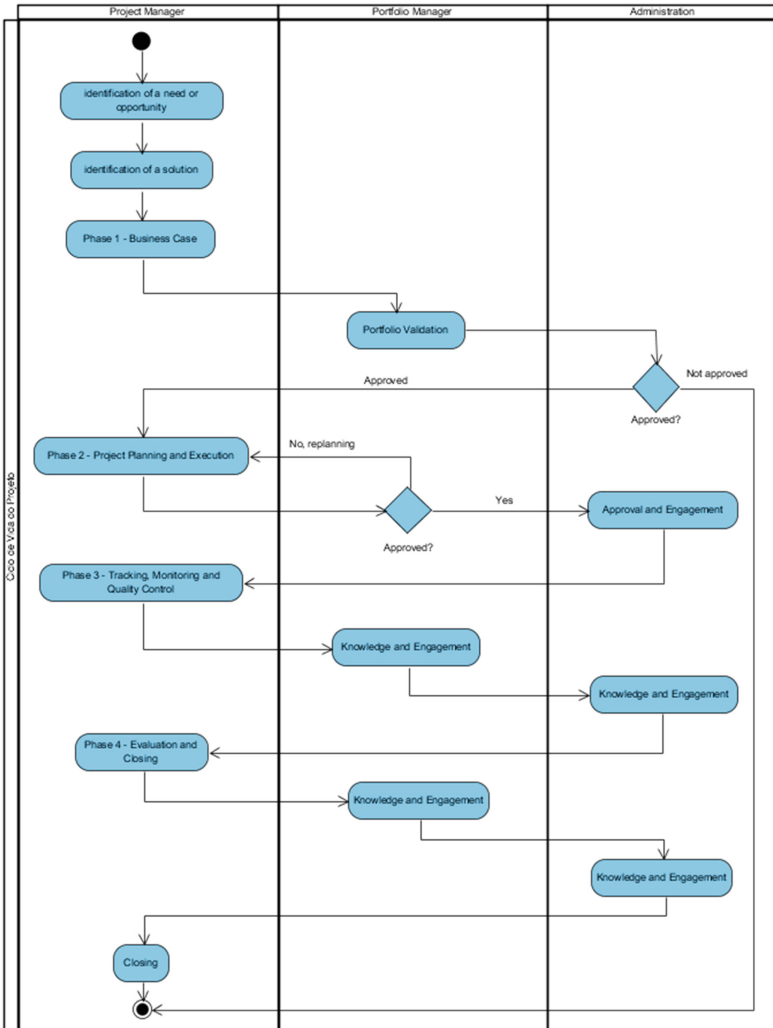


Fig. 3. Phases of a project lifecycle

### 3.4 Tools and Techniques

For those organizations that perform well, it is necessary to set in motion a set of mechanisms that do not have an instantaneous effect or act if they are used in isolation [13].

Thus, in order to create some control guidelines we used the tools and techniques present on the standards PMBoK [14] and PRINCE2 [11] to implement and customize the BC template in order to facilitate all the management of a project life cycle.

In this way, the Business Case Template will have the following tools and techniques:

This covers the whole life cycle of a project divided by the 4 phases that interact with the different areas of PMBoK knowledge (Table 2).

**Table 2.** Tools and techniques of the business case template

	Opening Statement	Project Management Plan	Scope Management	Categorization of Project Typology	Time management	Cost management	Quality Management	Matrix of Responsibilities	Stakeholders	Skills Management	Risk Management	Lessons Learned
Business Case Pre-Project	x	x	x	x	x	x			x		x	
Planning and Execution of the Project		x						x	x	x		
Follow up Monitoring and Quality control	x	x					x		x			
Evaluation and Closure							x		x			x

### 3.5 Business Case Template

Having defined the life cycle process of a project, requirements and tools to be incorporated, thus ensuring a thorough understanding of it, it is now possible to define what a Business Case Template should address.

Therefore, the proposed model will be composed of:

#### Cover Sheet

Inserted in the initiative of standardizing and customizing the PM processes to the organizational context, a cover page was then introduced to the template in order to offer various information through a brief consultation (Table 3).

Information is more than a production factor, it is the resource that allows the effective combination of other means in order to optimize the organization’s performance [13] and thus ensure that several units of the company provide inputs.

This way it is related to filling the fields according to the assigned responsibility.



**Table 3.** Business Case - Cover Sheet

Field	Responsibility	Description
<PROJECT NAME>	Author/Project Manager	Short designation of the project
<PROJECT MANAGER>	Author/Project Manager	Responsible for creating the idea and later managing the project
<DEPARTMENT>	Author/Project Manager	Department responsible for creating the idea and later managing the project
Project < PROJECT REFERENCE>	Portfolio Manager	Indication of the internal reference of the project given out by the Portfolio Manager
Type of Project: < ProjectType>	Management and Inspection Systems Manager	Definition of the type of Project
IDI type: < IDItype>	Management and Inspection Systems Manager	Definition of IDI type
Starting Date: <AAAA/MM/DD>	Author/Project Manager	Creation date of idea

**Business Case/Pre-project**

A BC provides the justification for a solution, based on the benefits to be gained when compared to the cost, effort and other considerations made [9].

Not to mention that the standard NP4457:2007 [5] follows a PDCA approach, following guidelines for continuous improvement, the document created has the necessary elasticity to follow the entire project life cycle.

This group involves the entire initial phase that originates the creation of a project, through the introduction to the problem it intends to solve, identifying the scope, objectives and referencing documents that support this need (Table 4).

**Table 4.** Business case - business case/pre-project

Business Case document field	Description
1. Introduction	Identification and description of the difficulty or opportunity identified Receives inputs from: PMBoK - Integration Management, Scope Management
2. Scope/Purpose/Purpose	The questions that must be answered in this field are: What is the scope and purpose for the project in question? What is its purpose? Receives inputs from: BABOK® Guide/PRINCE2/PMBok - Integration Management, Scope Management
2.1 Objectives and Expected Results	The solution must have clear and identified objectives so that a solution can be evaluated against these requirements Receives inputs from: BABOK® Guide/PRINCE2

*(continued)*

**Table 4.** (continued)

Business Case document field	Description
2.2 Definitions/Acronyms and Abbreviations	A list of definitions, acronyms and abbreviations must be drawn up here so that any external actor understands the document Receives inputs from: NP4456: 2007
2.3 Inputs	Any internal and external reference to the company and that ground the solution should be referenced here as attachments. Receives inputs from: PMBoK - Scope Management
3. Description of Solution # 1, # 2 ...	Description of the solution that seeks to solve identified problems or withdraw value from an identified opportunity. The listing is from the most successful to the most unsuccessful. Considering the possibility of more than one solution the document allows to duplicate the page and automatic increase of the number of the solution. Receives inputs from: BABOK® Guide/PRINCE2/PMBoK - Scope Management
3.1 Expected benefits	The benefits identified after the implementation of the solution and which must be in accordance with the objectives and requirements initially identified. Receives inputs from: PRINCE2
3.2 Consequences	The consequences represent positive and negative aspects that result from the solution beyond those initially identified as necessary. The consequences can be tangible as intangible. Receives inputs from: PRINCE2
3.3 Risks	Identified risks that should be the subject of a more detailed management plan to avoid them or reduce their impact Receives inputs from: BABOK® Guide/PRINCE2/PMBoK - Risk Management
4. Time	The estimated time for completion of the project should be mentioned here and should be detailed in terms of activities and include milestones Receives inputs from: PRINCE2/PMBoK - Time Management
5. Costs	Estimated costs for the project, which may be financial, human or other resources Receives inputs from: BABOK® Guide/PRINCE2/PMBoK - Cost Management
5.1 Investment Assessment	Relation between the investment and the anticipated gains, which may be financial or other gains (i.e., distinction, notoriety, etc.) Receives inputs from: BABOK® Guide/PMBoK - Cost Management
6. Program	Identification of the program in which this project is inserted. It may not be included in programs; this input must always be given by the Portfolio Manager

(continued)

**Table 4.** (continued)

Business Case document field	Description
7. Consulting/External Support	Does the project require the contracting of an external service or consultancy? If yes, which one Receives inputs from: NP4457: 2007
8. Resolution	Deliberation made by the administration that after analysis of the document must decide: Do something, Do the minimum or Do nothing Receives inputs from: PRINCE2/BABOK® Guide
9. Signature	Digital signature of the board of directors

The document requires the identification of at least one solution, although it is ideal to identify other solutions [9]. Furthermore, it is necessary to identify the expected benefits, which must at least cover the mentioned requirements expected results, consequences and risks, whether positive or negative.

To complete the triangle that determines the success of the projects, instructions are still given regarding time and cost.

**Project Planning and Execution**

This process group involves, in coordination with all the functional areas of the organization, to make an initial planning of the preparation of the work to deliver all the work packages, defined in requirements and activities of the project.

Our planning is done according to the needs of the project to establish procedures and processes to support PM.

At this moment, the planning and execution of the entire project is initiated, in which all the elements of the project team, stakeholders, identification of the competencies that the project team members must have, the definition and implementation of project specifications and the identification and definition of other activities that must be carried out throughout the project Table 5.

**Table 5.** Business case - planning and execution

Document Field Project Planning and Execution	Description
10. Stakeholders	Identification of all Stakeholders, whether internal or external, such as elements of the project team. Receives inputs from: PMBoK - Stakeholder Management
11. Skills	The identification of competencies is of vital importance for the reduction of the risk of the project and for the attribution of responsibilities within the project. This may lead to other activities aimed at

(continued)

**Table 5.** (continued)

Document Field Project Planning and Execution	Description
	reducing the impact of the absence of certain skills, for example through training Receives inputs from: NP4457: 2007/PMBok - Human Resource Management, Stakeholder Management
12. Definition and Implementation of Project Specifications	The solution must have clear and identified objectives so that a solution can be evaluated against these requirements Receives inputs from: NP4457: 2007/PMBok - Integration Management, Human Resource Management, Stakeholder Management and Procurement Management
13. Other activities	A list of all the activities required to start the project and all the activities that take place along the project, including training, marketing, conferences, interviews, etc., must be drawn up Receives inputs from: NP4456: 2007/PMBok - Human Resources Management, Stakeholder Management and Procurement Management
14. Involvement and Commitment	Completion of this field by the Project Manager, Portfolio Manager and Administration ensures that all parties are involved and committed to the planning and execution of the project Receives inputs from: NP4456: 2007/PMBok - Stakeholder Management

### **Tracking, Monitoring and Quality Control Cover Sheet**

The Tracking, Monitoring and Quality Control process group involves activities of (Table 6):

- Monitoring of activities and control: evaluates if all the activities are within the deadline and the cost, constantly evaluating this real progress with the estimate. Depending on the complexity of the project, it may be carried out either in the document itself or through an accompanying document allowing traceability.
- Quality Control: controls the quality of all deliverables and/or identified requirements through milestones created in project planning.

### **Evaluation and Closing**

This group mentions all the work needed to be done to complete the management of the project thus closing it.

**Table 6.** Business case - tracking, monitoring and quality control

Document field Tracking, Monitoring and Quality Control	Description
15. Tracking, Monitoring and Quality Control	<p>All the documents that are used to monitor the project, monitor and control the quality of the project are referenced here. The documents should be schedules, minutes or progress reports, monitoring of costs incurred, milestones, etc.</p> <p>Receives inputs from: NP4457: 2007/PMBoK - Integration Management, Scope Management, Time Management, Cost Management, Communications Management, Human Resource Management, Stakeholder Management</p>
16. Assessing the Need for a New Project Plan	<p>The evaluation of the need for a new version of the project plan considers input issues such as:</p> <ul style="list-style-type: none"> <li>• Are there changes in the overall project duration?</li> <li>• Are there changes in the project objectives?</li> <li>• Are there increases in project costs?</li> </ul> <p>Receives inputs from: PMBoK - Integration Management, Scope Management, Time Management, Cost Management, Stakeholder Management</p>
17. Involvement and Engagement	<p>The completion of this field by the Project Manager, Portfolio Manager and Administration ensures that all parties are involved and committed to Monitoring, Monitoring and Quality Control</p> <p>Receives inputs from: NP4456: 2007/PMBoK - Stakeholder Management</p>

It includes the analysis of project performance in its transversality, the identification of at least two lessons learned and the formalization of project closure (Table 7).

This Business Case Template was validated after being tested during the “Connected BUS” project.

“Connected BUS” was a project between TUB and IBM Portugal that aimed to provide buses (18 years of average age) with communication skills.

Managing an IT or IS project entails confronting complexity [15] and this offered a great test to the Business Case Template TUB, helping to achieve the robustness and flexibility required to every PM.

The Business Case Template is a document that will accompany the entire project lifecycle, considering that, according to PRINCE2 [11], the BC should always be updated throughout the project, being a vital component of management of the entire project life cycle, and thus it becomes valid that this is the main document used during that life cycle.

**Table 7.** Business case - evaluation and closure

Document Field	Description
Evaluation and Closure	
18. Compliance Requirements	<p>When starting the project closure, it is necessary to evaluate the degree of compliance with the general objectives and requirements identified. This should consider:</p> <ul style="list-style-type: none"> <li>• Degree of achievement of the general objectives;</li> <li>• Competitive advantages and benefits achieved;</li> <li>• Protection and exploitation of results;</li> <li>• Definition of means and dissemination of results;</li> <li>• Compliance with deadlines and activities;</li> <li>• Compliance with the budget;</li> <li>• Project replanning.</li> </ul> <p>Receives inputs from: NP4457: 2007, PMBoK - Integration Management, Scope Management, Cost Management, Human Resource Management, Procurement Management, Time Management, Communications Management</p>
19. Lessons Learned	<p>Project closure only takes place after lessons learned have been documented. This field is of great importance as it assesses opportunities identified throughout the project and that can be used to start new projects and/or projects underway</p> <p>Receives inputs from: PMBoK - Integration Management</p>
20. Project Closure	<p>The completion of this field by the Project Manager, Portfolio Manager and Administration, concludes the project management by closing it</p> <p>Receives inputs from: NP4456: 2007/PMBoK - Stakeholder Management</p>

## 4 Conclusions

This research was carried out with the intention of containing a practical and useful contribution that would guarantee the creation of value in the company.

It is intended to offer PM professionals, particularly in local management companies, such as the company where the study was conducted, to offer processes and instructions on how to improve PM practices in organizations with a low level of management maturity of projects, using a BC model.

As Hobbs states [16], “PM is the skill of moving from ideas to results and, as such, is applicable to every significant initiative we are given or come up with ourselves. Today, individuals, organizations and nations need more than ever a PM skill in the world that values individual and collective initiative above just about any other attribute”.

As such, and to think about PM, it is first necessary to identify the best management practices of existing projects in general and how it is done in a public management environment.

The need to develop a business case model led to an understanding of the whole business. A business analysis approach was used to ensure that all projects were substantiated.

Thus, with a defined BC model, which would still support the management of the whole life cycle of a project in this, it was possible all this management with the introduction of various tools and techniques.

The development of this proposal focused on the fulfilment of all the requirements imposed by the norm NP4457:2007 [5], by the internal processes in force, people and organizational knowledge.

The proposed model follows inputs from PMBoK and PRINCE2, however, and as Bell [17] indicates, these methodologies are different but have several complementary elements.

The proposal was inserted into the integrated management system, thus validating the result of several months of work.

In the long run, and considering the maturation of GP practices, the main objective is the standardization of integrated GP processes with the integrated management system of TUB and other local administration companies.

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