Universidade do Minho
Escola de Engenharia

Ana Carolina da Cunha Cerqueira

Success Canvas® in Practice

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Success Canvas® in Practice

Master Thesis
Integrated Master's in Engineering and Management
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Prof. Dr. João Eduardo Quintela Alves de Sousa Varajão

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DIREITOS DE AUTOR E CONDIÇÕES DE UTILIZAÇÃO DO TRABALHO POR TERCEIROS

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STATEMENT OF INTEGRITY

I hereby declare having conducted this academic work with integrity. I confirm that I have not used plagiarism or any form of undue use of information or falsification of results along the process leading to its elaboration.

I further declare that I have fully acknowledged the Code of Ethical Conduct of the University of Minho.

RESUMO

Os *canvas* têm sido reconhecidos como instrumentos de grande utilidade no contexto da gestão. Sendo caracterizados como ferramentas de gestão visuais, permitem identificar aspetos relevantes numa determinada área de aplicação. Estes instrumentos são frequentemente estruturados em caixas temáticas, com a intenção de orientar o utilizador na recolha e análise de informações cruciais a fim de atingir um objetivo, assim como melhorar o desempenho com transparência. No âmbito da gestão de projetos de Sistemas de Informação, são escassos os estudos focados no uso de *canvas* como instrumentos de gestão, especificamente quando nos referimos ao sucesso de projetos. O Success Canvas® ou Project Management Success Map®, trata-se de uma exceção, dado que visa capturar a definição de sucesso dentro de um projeto, enfatizando os diversos aspetos relevantes como, por exemplo, os critérios de avaliação do sucesso, os benefícios esperados e os fatores de sucesso.

Devido à falta de literatura e à ambiguidade envolvente no conceito de sucesso, especialmente referente à gestão de projetos, existe assim uma oportunidade para explorar este tópico, refletindo sobre o estado de arte atual em relação aos *canvas* existentes na área de Sistemas de Informação, e os resultados que estes têm apresentado na prática, de modo a caracterizar o contributo que o Success Canvas® pode representar no exercício de gestão de projetos.

Para a realização do estudo, foi adotada a metodologia *multiple case study*.

Este estudo contribuiu para a avaliação benefícios da utilização prática do Success Canvas®, expandindo a literatura e o corpo de conhecimento da área.

PALAVRAS-CHAVE

Canvas, Gestão de Projetos, Gestão do Sucesso, Project Management Success Map®, Sistemas de Informação, Success Canvas®, Sucesso, Sucesso na Gestão de Projeto

ABSTRACT

In the past few years, canvas has been proved to be a valuable tool. Canvas are management tools characterized by presenting a visual template, that can be customized and applied according to a specific target, creating, or documenting theoretical structures to serve as support for addressing design problems or identifying relevant aspects in the context of an area. These frameworks are often systematized into conceptual boxes with the intent of guiding the user to gather and analyze critical information to achieve their objective and improve performance with transparency.

In the Information Systems project management field, there are scarce studies that focus on practical cases using canvas as management tools, specifically examining project success.

The Success Canvas® or Project Management Success Map®, is an exception since it captures the definition of success in a project and what is meaningful to accomplish it, considering, for example, the criteria for evaluating success, expected benefits, and success factors.

Due to the lack of literature surrounding canvas and the ambiguous concept of success, especially when followed by project management, there is an opportunity to explore this topic by studying on the current state of the art regarding existing canvas in the information systems field, as well as the results that they have been showing in practice, to characterize the contribution of the Success Canvas® to improve project management.

To conduct this study, it was adopted a Multiple Case Study methodology.

This study contributes with new insights on the benefits of the practical usage of the Success Canvas®, as well as expanding the current literature.

KEYWORDS

Canvas, Information Systems, Project Management, Project Management Success, Project Management Success Map®, Success, Success Canvas®, Success Management

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ACRONYMS

The following acronyms are used in the present dissertation.

IS	Information Systems
PM	Project Management
BMC	Business Model Canvas
AISeL	Association for Information Systems Electronic Library
WoS	Web of Science
PSA	Project Success Analysis
ISTP	Information Systems and Technologies Projects
ISM	Information Systems Management

1. INTRODUCTION

This chapter gives a comprehensive context of the study undertaken. First and foremost, it presents the background of the research by delving into the context of information systems project management and its related success, as well as a brief presentation of canvas as management tools. The motives and reasons that led to this study, are clarified for a better comprehensive understanding of the research purpose. Afterward, the research question is addressed, the investigation method briefly described, and finally, the thesis structure is outlined.

1.1. Background to the Research

The Information Systems field is characterized by relentless technological change and innovation. Countless new topics emerge every year for which valuable insights can be achieved through case research, and the Project Management area within Information Systems is no exception.

Project Management (PM) is crucial for the development of successful projects. According to Munns *et al.* (1996), Project Management is fundamental to handle unusual or complex activities. Project Management success intends mainly the successful realization of the project scope, time, cost, and stakeholders' satisfaction (Varajão & Trigo, 2016) , and it is also related to the success of the deliverables of the project, even though these two components combined can be portrayed as project success. The success of a project is a rather ambiguous concept and characterizing a set of methods and practices of PM evaluation is far from being a straightforward and elementary task. Therefore, the importance of this dissertation focusing on the efficacy of the Success Canvas® (Varajão, 2016-2020) as a PM tool, since there is a lack of studies regarding this instrument.

Van Capelleveen *et al*. (2019) states that canvas is a visual template that helps create or documenting conceptual structures to serve as support for addressing design problems. The most notorious canvas is the Business Model Canvas by Osterwalder and Pigneur (2010) and visualizes an organization's value propositions and contextual aspects in one image, which supports the generation of a shared language both in theory and in practice.

While Osterwalder's canvas is focused on capture the business logic of an organization, the goal of the Success Canvas® (Varajão, 2016-2020) is to capture the definition of success in a project and what is significant in order to accomplish it, emphasizing the criteria for evaluating success, expected benefits, and success factors. According to Varajão (2018), "it is an excellent tool to create the basis for implementing Success Management projects".

1.2. Motivation

Beyond the lack of literature related to the practical use of canvas/frameworks regarding the definition of project management success, it is clear the difficulty in evaluating it, not exclusively due to the ambiguous concept of success, but also due to the different and unique characteristics of which project and different forms to access the success of the project management and the project itself.

In the past few years, the projects have become more complex and with unprecedented characteristics, becoming the complex task of defining project management success even more complicated. As a result, the use of tools to evaluate the success should take into consideration the uniqueness of which project are demanded, being this the Success Canvas® (Varajão, 2016-2020) purpose. Due to the lack of studies showing and discussing its practical usefulness, there is an opportunity to explore this topic.

For the current dissertation, it is proposed to carry out a reflective and experimental study about the Success Canvas® (Varajão, 2016-2020) in the context of Information Systems projects. As a major contribution of this dissertation is expected the clarification of this technique and concepts in this area of work, answering the following question: What are the main benefits of using Success Canvas® (Varajão, 2016-2020) in Information Systems Project Management?

1.3. Work Purpose and Synthesis of the Research Methodology

Considering that the aim of this dissertation is to present the results obtained in the practical case studies where the Success Canvas® (Varajão, 2016-2020) was applied. This will not only provide insights on the usefulness of the canvas, as well as supplement the lack of literature regarding success management practices in Information Systems.

Regarding methodological approaches, the present dissertation follows the Multiple Case Study strategy to capture the knowledge of practitioners and professionals in the Information Systems field that has used the Success Canvas® (Varajão, 2016-2020).

Being a qualitative method of research, the Case Study can be described according to Benbasat (1984), Bonoma (1985), Kaplan (1985) and Yin (1984), as an examination of a phenomenon in its natural setting, employing multiple methods of data collection to gather information from one or a few entities (people, groups, or organizations). Benbasat, Goldstein, and Mead (1987) define the Case Study approach as a viable Information Systems research strategy, not just because it allows to learn about the state of art of the system and can generate theories from practice, but also because it is a method that can provide answers like “how” and “why” to the researcher, than can make him understand the nature and complexity of the study taking place. This choice can also be justified since the Case Study Methodology can be portrayed as an appropriate way to research an area in which few previous studies have been made, just like the theme of this dissertation (Benbasat et al., 1987).

According to Yin (2009), it is more suitable to analyze multiple cases, preferentially originating from multiple investigators and sources. This can cultivate divergent perspectives and a cross-case analysis that can allow the researcher to achieve more robust conclusions and findings.

As a start point, in a Multiple Case Study approach according to Yin (2009) (represented in the Figure 1), firstly it is necessary to Define & Design. The first step of this stage, Develop Theory, does not apply to the context of this dissertation since the theory is already matured and established, instead it will be necessary to make an extensive review of the existing literature to provide a better understanding of the phenomenon present in the study. In this stage, it is also necessary to select the cases that will be the target of the study.

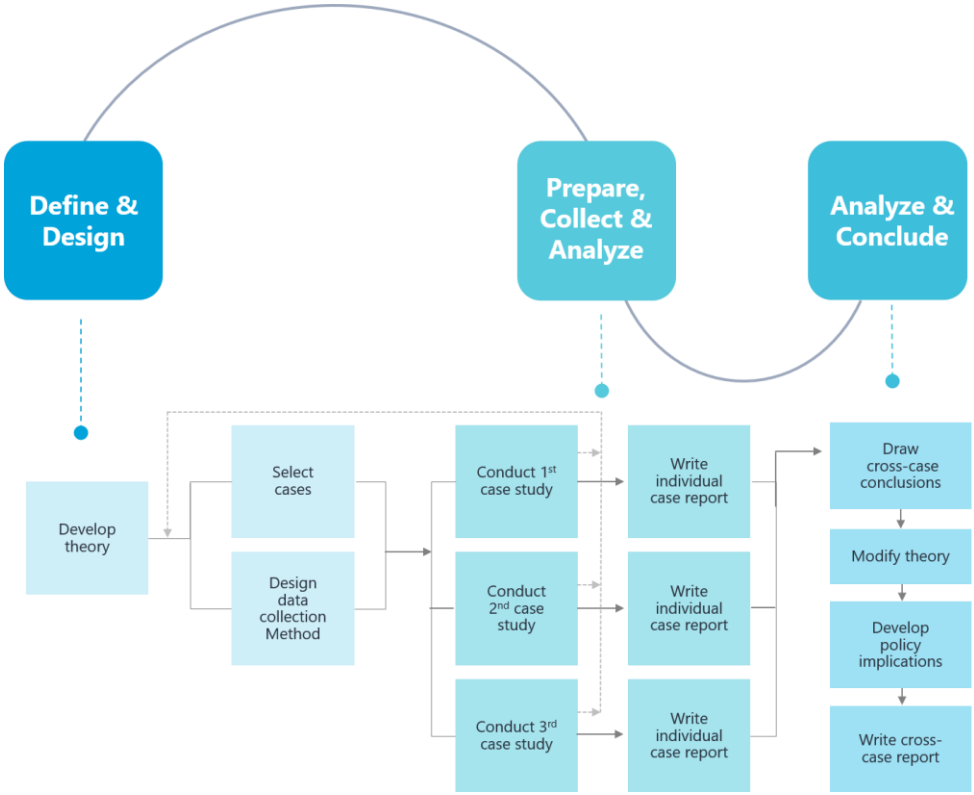

Figure 1-Multiple Case Study approach

Source: Adapted from Yin (2009)

In the Prepare, Collect & Analyze phase, it is carried out the analysis of the data within the cases previously selected, allowing an increased gain of understanding on the phenomenon.

By the last phase, Analyze & Conclude, it is expected a confirmed, extended, and sharpened discussion on the findings, becoming this step a crucial one, since its focus is to refine the conclusions. This occurs through systematical comparison between the case studies and the originated ideas, so that accumulating evidence from diverse sources converges. The research methodology is detailed in chapter 3.

1.4. Significance of the Research

As expressed previously, there is a gap explaining and analyzing project management success practices, particularly when using canvas as a management tool to support success management. Being the aim of this study help filling that literature gap, this research represents an opportunity to provide a practical study on how the Success Canvas®

(Varajão, 2016-2020) can influence and assist project managers, in the Information Systems field. The significance of this research reflects the following:

- Expose the main benefits of using Success Canvas® in Information Systems Project Management.
- Contribute to sharing a common understanding of how Project Management frameworks/canvas can assist Information Systems project managers in defining and evaluating success.
- Offering a multiple case study guide to upcoming users and researchers of the Success Canvas®.

1.5. Document Structure

The current dissertation is composed of five themed chapters.

Initially, the first chapter gives a brief overview of the research problem, context, and importance of the study, research question, objectives, and methodology.

The second chapter introduces the literature review relevant for this study, divided into six subchapters presenting the main topics, opening with the concept of project management, followed by the extensive review of the concept of success, management tools and techniques, canvas, and ending with a critical analysis of the related literature regarding the Success Canvas® (Varajão, 2016-2020).

The third chapter is concerned with the research methodology adopted to perform the study.

The fourth chapter starts by introducing the case studies, followed by an extensive review of each one and their respective findings, concluding with a discussion about the results.

Finally, the fifth and last chapter is concerned with the conclusions obtained in this study, contribution to theory and limitations and future work endeavors.

2. LITERATURE REVIEW

This chapter provides the review of the main concepts relevant to this dissertation. These concepts are imperative for a better understanding of the topic in question.

Starting with an overview of the concept of project management, followed by a review of the perception of success, project success and project management success. Thus, the third subchapter focuses on project management tools and techniques, giving the theoretical introduction to the fourth subchapter, the presentation of canvas as management tools. In the fifth chapter, it is explained the Success Canvas® (Varajão, 2016-2020), as well as its recommended process for application. In the final chapter, a critical reflection on the state of art is presented.

2.1. Overview of Project Management

2.1.1. Definition of Project and Information Systems Projects

A project, independent of the area of work that is referred to, it is often characterized as a set of tasks that has as objective the attainment of a goal with specific results. As noted by Munns and Bjeirmi (1996), it can be considered the achievement of a specific objective, which involves a series of activities and tend to be of a long-term nature.

After analyzing past and present definitions for the term project, Fraser and Turner (2002) adopted their own definition as a "temporary management environment, endeavor created, undertaken in order to achieve specific objectives(s) relating to the overall goals of the parent organization". Varajão *et al.* (2014), on the other hand, stress out the innovative factor in the definition, pointing out that a project is based on the development of something different from what is being produced. Considering Jurina *et al.* (2013) perspective, most of the definitions for project have similarities and a common base, they can be concise as "a goal-oriented, time-limited and unique process, always introducing something new, having particular complexity, limited budget, certain legal and organizational status, content which is determined by the product or the result of the project, its own structure, and temporarily available resources".

For the current dissertation and likewise many other studies, projects will be considered unique, however, it is undeniable that equal aspects and characteristics can be found in

different projects, but not as a whole since the purpose of developing a project is to establish something distinct from what already exists.

To define information systems projects, it is essential that the concept of information systems is clear and well understood. As affirmed by Varajão (2018), IS are decisive for the "development of virtually any human organization. Information systems combine technology, people, processes and business resources to facilitate data acquirement, processing, storage and dissemination, to obtain knowledge within an organization (Varajão, 2018). The information systems area has been suffering from a persistent technological transformation and innovation, shifting in the last years from a technological perspective to management and organizational point of view, being more concerned by the way that organizations interact with innovation (Benbasat et al., 1987).

To improve organizational information systems, projects are the principal course of action for structuring the activities and resources needed, being information systems projects defined as a temporary effort to achieve a unique output. This outcome can adopt various forms, such as commercial applications or consultant assignments (Varajão, 2018). IS projects can be defined as projects where information systems are developed, refined, expanded, and taking into action. According to Ross (2003), IS projects can be messy, complex, uncertain, subject to changing and highly constrained in their access to resources. Varajão (2018) distinct information systems projects defining them as a "socio-technical undertakings" with the aim of organizational improvement and consequent accomplishment of business benefits.

2.1.2. Project Management and Information Systems Project Management

The current relevance and influence of projects have been proceeded by an increment in the academic investigations, education and guidance on project management perceptions and theory (Anantatmula & Rad, 2018). Described as a formal managerial discipline (A. Shenhar, 2001), project management is the application of knowledge, skills, tools, and techniques to project activities to meet project requirements according to the Project Management Institute (2000). PM can provide organizations with the resources to achieve efficiency, effectiveness, and competitiveness in an everchanging, complex, and unpredictable environment (Ika, 2009). It can also be designated as a segment of the general

management within an organization and, in consonance with Jurina *et al.* (2013) it is responsible for the execution of projects deriving from business strategies, guiding their implementation until their conclusion.

In their studies, Munns and Bjeirmi (1996) make an overlap between the definitions of project and project management, being the second described as a process of controlling the achievement of the project objectives by applying a collection of tools and techniques. Additionally, it is said that project management is within the context of the short-term life of project development and delivery. These two concepts come hand-in-hand since project management is not possible without a project itself, even though the distinction between the two is not precise, the authors believe that clearing the differentiation will bring a higher possibility of project success.

Initiating, planning, executing, controlling and closing are the processes groups described by the Project Management Institute as crucial in order for project management to be accomplished. This area of study has been established for decades, gaining ground in the past few years as a management discipline essential to achieve successful projects, and as reported by Patanakul *et al.* (2010), helping institutions achieve their business results.

Information Systems's project management has become apparent in the last forty years, being recently recognized as an imperative area of study, clarifying the reason why Fraser (2002) expresses that IS project management and managers are generally compared unfavorably with professionals from other areas considering the lower reported project success rates.

Project Management in Information Systems originated from the need for organization, being clear that larger projects demand specialist know-how to maintain the participants of the project aligned with the plan and budget established (Sankey, 2010).

2.2. Review of the Concept of Success

2.2.1. Definition of Success and Project Success

Success is a goal that all organizations aim to achieve, the accomplishment of a purpose, a satisfactory outcome. Therefore this definition can vary according to multiple factors and every individual has his own view of success, and what it implies. As observed by Fraser

(2002), success is a convoluted phenomenon that may fluctuate depending on the context and type of measurement deployed.

An explicit elucidation of what really means success in the context of a project is essential, since this subject is encircled in ambiguity and vagueness. As alleged previously, success is defined as an accomplishment of a goal, a favorable outcome, but what can be affirmed about project success? In this research, it is certain that all definitions come across a common ground, that assess project success as an achievement of the project goal. However this is correct and accurate, it is also not sufficient, since various authors have different perspectives of what project success is and what are the measures that can be applied to quantify it.

According to Varajão (2018), the definition of project success is complex and may vary according to the diverse perceptions on success, the characteristics and peculiarity of the project itself, and other components that require a management process during the course of the project. Most authors emphasize that project success can be perceived differently according to the project stakeholders (Varajão *et al. (2018)*, Anantatmula *et al.* (2018), Foote and Halawi (2016), Barclay (2008)). Anantatmula *et al.* (2018) share the same vision as the previous authors, providing a more detailed definition and adding that the concept of project success fluctuates throughout the project life cycle. For them, the purpose of project success is to deliver some type of value to all parts involved, such as key stakeholders, clients, end-users and project team members. On another perspective, Ika (2009) adopts a more traditional approach by focusing project success on the classical constraints, stating that a successful project is the one that complies with time, cost and quality, but also standing out that projects that have been delivered by these measures may also been considered failures. Fraser's (2002) definition for project success includes a combination of project outputs, being the classical time, cost and quality referred previously, and project outcomes, such as client satisfaction. In a similar perspective, Patanakul *et al.* (2010), based in their literature review specified that the most frequent dimensions taken into consideration in project success are internal aspects such as time, cost and performance, customer-related factors being specified as satisfaction, actual usage, and benefits, and finally, organizational related factors, like financial, market and benefits. Baccarini (1999) established the classical definition of project success as a combination of project management success and product success. Project management success concentrates on

the way that the project process was established and the successful achievement of cost, time and quality, and project success is defined by handling the effects of the project's final product (Baccarini, 1999). Consequently, in this framework project management has a serious impact on project success. With Baccarini's logical framework, project success becomes expressed in simplistic terms.

2.2.2. Success in Information Systems Projects

Information System project success has been presented as a flourishing area in management, reveling a significant interest in the last twenty years considering the high impact on organizational change and effectiveness (Guo, 2019). Most authors state that IS project success, likewise project success in general, has different definitions to different persons, according to the perspective of the value of the project as stated by Barclay (2008). Therefore, the definition will be certainly complex and needs to cover the different perspectives involved.

As seen in numerous studies, the typical measures that evaluate IT and IS project success are mainly focused on project cost, time, risk and quality (Guo, 2019). As observed by Guo (2019), product and client satisfaction have been proved as critical effects on project success. User satisfaction, on-time, within-budget conclusion, achievement of system prerequisites, system quality, project team satisfaction, system usage, and net system benefits are also a few examples (Delone & McLean(1992), Espinosa *et. al*, (2006)). Being this the most accepted, stated and traditional approach to IS success, the W. H. DeLone, McLean, E. R. (1992) Success Model showed in Figure 2, proved that there is not just one success measure, but many that can be found in the main components that the authors found relevant, being these categories interdependent and interrelated, delineating a holist and integrated vision of IS success (Hoang, 2013). W. H. DeLone, McLean, E. R. (1992) also defended that the success of an IS is influenced by the use of the intended users, as Tha (2019) indicates that it is fatal to an organization if the expected users fail to adopt and operate the system.

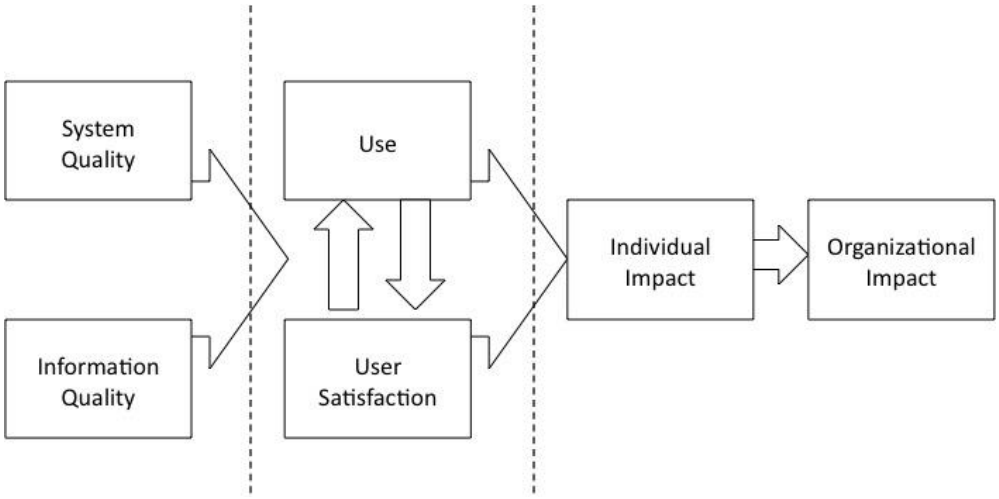

Figure 2- IS Success Model

Source: DeLone and McLean (1992)

As defended previously, the IS area is growing rapidly in the last twenty years, therefore the IS Success Model presented in 1992 had to suffer an improvement based on the changes that occurred throughout the years. Complementary to "system quality" and "information quality" was added the "service quality" to the main dimensions, since W. H. DeLone and McLean (2003) believe that each dimension needs to be measured independently to avoid affecting the next categories, "use" and "user satisfaction". A division was made in the "use" dimension since a struggle was found interpreting this definition, so W. H. DeLone and McLean (2003) came up with "intention of use" as an alternative since it represents as attitude and "use" indicates a behavior. Like the original model, "user satisfaction" and "use" have an interrelation relationship since the first will contribute to an expanded "intention to use" and consequently "use". The dimensions "individual impact" and "organization impact" presented in 1992 were combined into "net benefits", the authors describe this dimension as "the most important success measures". Being defined as crucial, it is important to stand out that they cannot be evaluated without "system quality" and "information quality" measurements (W. H. DeLone & McLean, 2003). As established by Foote and Halawi (2016), the "information quality" performed by the IS will be correlated with "user satisfaction" and the "net benefits" measures for the organization.

A modified version of the Updated IS Success Model by DeLone and McLean was presented in 2016 with two additional changes, as seen in Figure 3. The authors decided to replace "net benefits" with the concept "net impacts", to acknowledge the occurrence of both positive and negative results since positive outcomes can drive to more "use" and a greater

"user satisfaction" and negative outcomes lead to the opposite. DeLone and McLean (2016) also addressed the demand for feedback arrows starting from "use" and "user satisfaction" to "system quality", "information quality" and "service quality". This additional update was necessary due to the increased system use, which will eventually lead to problems and consequently improvements and changes. These updates and maintenances are described as the "evolving process of the life cycle of the system".

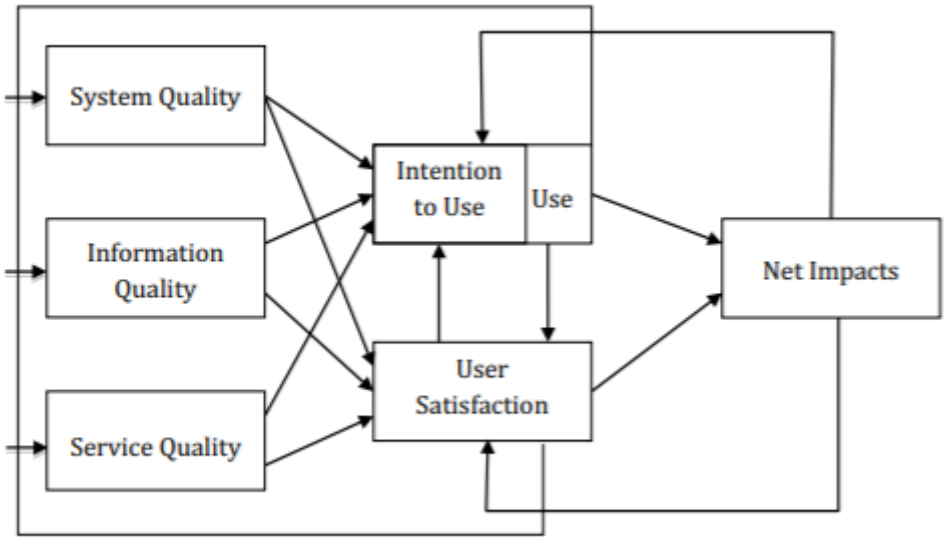

Figure 3- Updated IS Success Model

Source: DeLone and McLean (2003) (modified in 2016)

Another perspective on assessing the success of IS projects is presented by Varajão (2018), establishing diversified facets of success. The author defined tree fundamental moments linked to the common IS project life cycle, the "EX ANTE", "PROJECT" and "EX POST", being the first related with the definition and approval for the project execution. The "PROJECT" moment illustrates the establishment, planning, execution, supervision and control and closure of the IS project. Subsequently, the final moment expresses the stage where the deliverables go live.

As

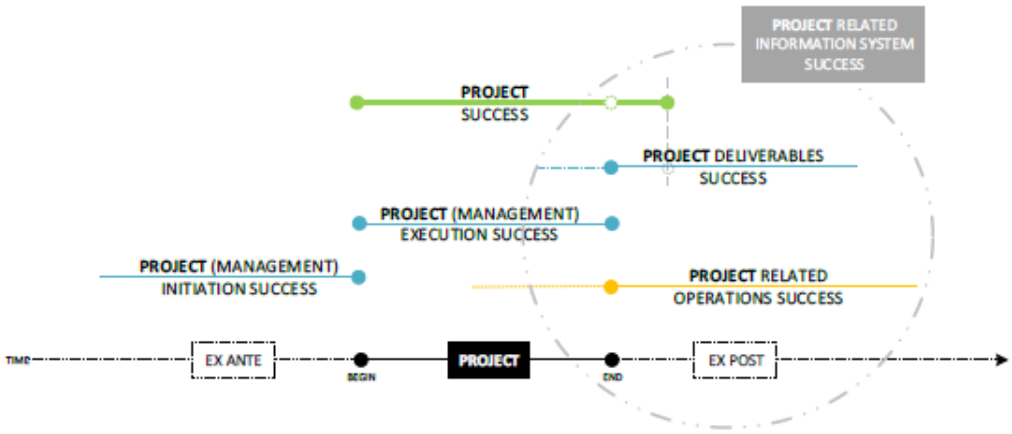

Figure 4- Project related information system success

Source: Varajão (2018)

shown in Figure 4, the assessment of the success of the IS project has various facets as defined by Varajão (2018), the first one is "project (management) initiation success" and it is described as the phase where the project is established as well as its resources, that will impact and influence the execution of the project. Next, it follows the "project (management) execution success", where measures like scope, cost, time, quality, and customer satisfaction will be set, and consequently dictate the success of the execution of the project. "Project success" facet, will be assessed as the project management success alongside with "project deliverables success" and "project related operations success".

Once the success in IS projects is defined, it is important to express that even though there is a considerable amount of theoretical background to achieve successful projects, this research found that most authors argue about a large number of IS projects that fail and therefore do not manage to achieve their business goals (Tha, 2019). Papke-Shields and Boyer-Wright (2017) explain that recently there has been showing signals of improvement when it comes to IS project success rate, but also indicate that most projects still fail, quoting McKinsey and Company (2012) clarifying that most projects "run 45 percent over budget and 7 percent over time, while delivering 56 percent less value than predicted". Pan *et al.* (2008) enumerate some of the factors that may cause these failures, such as poor management, unrealistic expectations, the inadequacy of resources, uncooperative customers, political rivalry and failure in meeting the planned target.

2.2.3. Project Success Factors and Criteria

In project management, the search for project success factors appeared around the 1960s. This research usually diverges between two categories, project success criteria or dimensions, and critical success factors. Although most studies do not clearly distinguish these two notions, the confusion between them is a real subject and needs to be clarified. Project success criteria are defined by a set of standards to define and determine project success, as the accomplishment of the project budget. Success factors are defined by conditions, circumstances, and events that influence project results and therefore success (Ika, 2009), like having a motivated project team.

The predominant and typical combination of criteria applied in order to measure the success of a project involves time, cost, quality and functionality (Savolainen, Ahonen, & Richardson, 2012), even though it is affirmed by multiple authors that is inconceivable to develop a list of success criteria that will be appropriated to all the needs of every project. As explained by Ika (2009), success criteria and success factors cannot be applied as a "one size fits all" approach, since they may vary from one project to another, due to the uniqueness and complexity that every project comprehends. This view is shared by multiple authors, like Shenhar *et al.* (2002) declaring that distinct factors must be applied according to the type of the project, adopting a "project-specific approach" so it is more accurate to determine the possible roots of project success or failure. It is also relevant to clarify the fact that project success factors need to be adjusted according to the phase of the project (Anantatmula & Rad, 2018).

When it comes to IS project success, user satisfaction and system use are some of the most prevalent, trivial and accepted measures (W. H. DeLone and McLean (2003), Tha (2019)). User satisfaction specifies how the intended users feel that the system meets their expectations, needs, and demands. System use describes how much the system is used, which frequency and to what purpose. Tha (2019) accentuates that user involvement is described as a critical success factor, being able to collect information about the end-users and their background of the use of the system, in order to achieve greater user satisfaction and system usage. This involvement should be implemented throughout the lyfe cycle of the project, in order to avoid misconceptions of the system requirements, scope, and objectives, and to be able to battle one of the most frequent causes of project failure, meeting end-user expectations. W. H. DeLone and McLean (2003) also emphasized "net

benefits" as a vital dimension to measure success, since the main target of any organization is to generate benefits to the business. Organizations convinced that will deliver successful projects usually have a clear vision on benefits when it comes to evaluating project outcomes (Hoang, 2013).

2.2.4. Project Management Success

Project Management is fundamental in order to conduct and achieve success in projects. Primarily, it is important to state that the analyzed literature does not objectively outline project management success. In the project management field, it does not exist an "absolute success" but instead a "perceived success of a project" (Ika, 2009). Commonly understood as being a part of project success, project management success may lead to it, but it is not absolutely accurate since successful project management may lead to project failure and vice versa (Gray and Ulbrich (2017), (Munns & Bjeirmi, 1996). As stated by Savolainen *et al.* (2012), project success and project management success should not be assessed as a whole but as interlinked measures, since their distinction should be expressed as "the operation was a success, but the patient died", as Savolainen *et al.* cited Jugdey and Müller (2005).

For the context of this literature review, a separation between project management success and project success is indispensable, considering that the latest is influenced by the project management process (Varajão *et al.,* 2014). As discussed before, success is an ambiguous concept especially in the project management area, even though project management success is considered quantifiable by traditional measures of performance such as time, cost and quality. Inevitably, the accomplishment of successful project management as been wrongly linked with the final results of the project itself (Munns & Bjeirmi, 1996). Project management success concentrates on the way that the project process was established and the successful achievement of cost, time and quality as seen before, and project success is defined by handling the effects of the project's final product (Baccarini, 1999). In order to measure project management success, it usually is taken into consideration project performance and crossed with the pre-determined objectives, as stated by most authors. Concluding, the definition of project management success as the project management definition itself, a complicated task that is usually marked by uncertainty and doubt.

2.3. Overview of Management Tools and Techniques

In the management area, the definition of Management Tools and Techniques is well established and aims to the enhancement of organizational performance. Managers are considered the ones that have the power to decide the course of an organization and the decision-makers that often confront complex and varied problems. To overcome such obstacles, the use of tools and techniques is required as far as to identify, analyze and resolve these problems, and to interpret and assess information (Shahin, 2010). As defined by McQuarter *et al.* (1995), the definition of tools and techniques can be expressed by practical methods, skills, mechanisms or means that can be utilized to specific tasks. Their appliance is necessary in order to promote improvements within an organization. Shahin (2010) differentiates tools from techniques, being the first expressed as a device that involves an explicit role. Techniques are described as having a broader application and can be considered as a collection of tools, involving more complexity and training to be applied. Project management framework's purpose is to provide and increase organizational value. In order to achieve that, project managers naturally resort to management tools and techniques to provide guidance alongside the various activities in the course of the project. As acknowledged by Varajão (2016) and Patanakul *et al.* (2010), the fitting usage of project management tools and techniques should enhance project management performance and consequently project success.

The question for project managers is what project management tools and techniques (PMTT) should be used and when in order to drive to a successful project and better performance. Patanakul *et al.* (2010) in their study focused on this question, by delivering accurate information about the use of PMMT, based on a survey with hundreds of project managers. It was discovered that numerous PMMT are specialized to adopt in a certain stage of the project life, but only some of these tools and techniques improve the success of a project. The authors also define PMTT as methodical methods and practices utilized by project managers to achieve specific project management outputs, making clear that distinct PMMT should be applied according to the project phase's characteristics.

2.4. Canvas

This chapter provides the literature review of canvas as management tools, particularly, it focuses on the research that has been conducted for the categorization of the existing canvas, and the definition of the Project Management Success Map®, or just Success Canvas® (Varajão, 2016-2020). The challenges for this dissertation will be obtained from this section of the literature review. They will support the reasons why is relevant to study the Success Canvas® (Varajão, 2016-2020) usage in practice.

The process of canvas categorization was made in collaboration with Margarida Sequeira, in her dissertation "Digital Transformation Canvas® in Practice".

2.4.1. Canvas as a Management Tool

During this dissertation, the word canvas will be a constant presence. Van Capelleveen *et al*. (2019) explain that a canvas is a visual template that helps create or documenting conceptual structures to serve as support for addressing design problems. Tranquillo *et al.* (2016) have a similar vision, describing canvas as framework systematized into conceptual boxes with the intent of helping the user to "collect, organize, and understand" critical information in order to achieve their objective.

The most notorious canvas is the Business Model Canvas (BMC) (Figure 5) by Osterwalder and Pigneur (2010) which visualizes an organization's value propositions and contextual aspects in one image, supporting the generation of a shared language both theorical and practical. It is focused on capture the business logic of an organization and has been the base for all the other canvas developed posteriorly. Recently, business models have acquired considerable popularity as conceptual management tools that assist businesses in evaluating and designing value creation and capture (Zolnowski, 2014). Describing the fundamental architecture of a company (Schoormann, 2016), a business model incorporates a set of elements and their connections allowing an interpretation of the business logic present. A business model hands out information about the value that a specific business provides to the customers in order to deliver productive and sustainable revenue streams (Orellano, 2017), as well as information about resources, actors and flows (Schoormann, 2016). The BMC is composed of nine blocks that describe the four essential sectors of business, customers, offer, infrastructure, and financial viability, that display the logic

behind the intention on how it is envisioned to obtain revenue (Osterwalder & Pigneur, 2010).

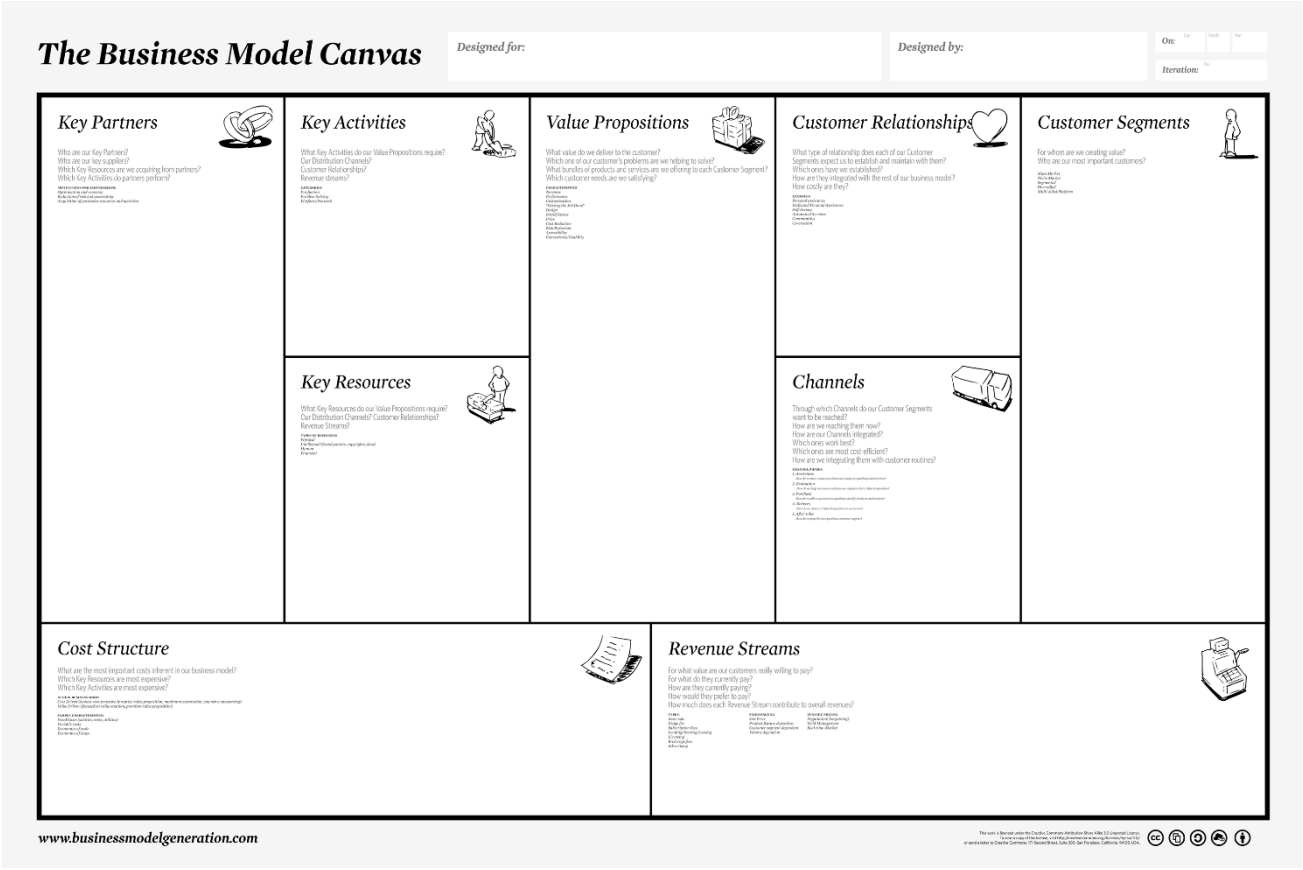

Figure 5- The Business Model Canvas

Source: Osterwalder and Pigneur (2010)

According to Osterwalder et al. (2010), the nine building blocks of the Business Model Canvas are: 1) Customer Segments, represents the various groups of clients (individuals or organizations) that a specific business desires to reach and serve; 2) Value Proposition, describes the products and services that will solve customers' problems and satisfy their needs, creating value; 3) Channels, indicate the way that the business delivers, communicate, distribute and sales value propositions to the customers; 4) Customer Relationships, involves the types of relationships a company establishes and maintains with specific customer segments; 5) Revenue Streams, represents the outcome from the value propositions successfully delivered to each customer segment; 6) Key Resources, are the assets required to provide and distribute the business model, by performing the 7) Key Activities; 8) Key Partnerships, describes the network of suppliers and partners needed in

order to achieve a successful business model; 9) Cost Structure, indicates all the expenses incurred to operate a business model.

After the BMC, numerous others followed its steps, becoming a popular topic of research and development. The Value Proposition Canvas, the Service Model Canvas, and Lean Canvas are some of the most prominent examples of canvas emerging in the following years of the BMC. Tranquillo (2016) states that this recent arising of new canvas is expected since the BMC does not reach all aspects involved in generating and delivering products and services, consequently, some canvas are being developed to assist other areas of business.

2.4.2. State of the Art Regarding Canvas

This review has as a purpose the identification, definition, and cataloging of the existing canvas, due to the broad topic and the variability in methodologies and perspectives in the literature. Accordingly, the following phases were performed: identification of the search restrictions; selection of studies; charting of the data; categorization by area of study and reporting the results. This search was made during January and early February of 2020, in the Scopus and Web of Science catalogs since they are considered some of the most comprehensive extant scientific databases. Alongside, and to cover a wider spectrum of sources, a Google search with the words “Canvas visual template” was performed, having revealed itself crucial to complete this study since the results derived from this search gave rise to additional findings.

The process of literature selection was carried out by two researchers, following the process depicted in Figure 6. The following phases were performed: identification of the search restrictions; search in databases; selection of references; analysis of the references; categorization by area of focus and reporting the results.

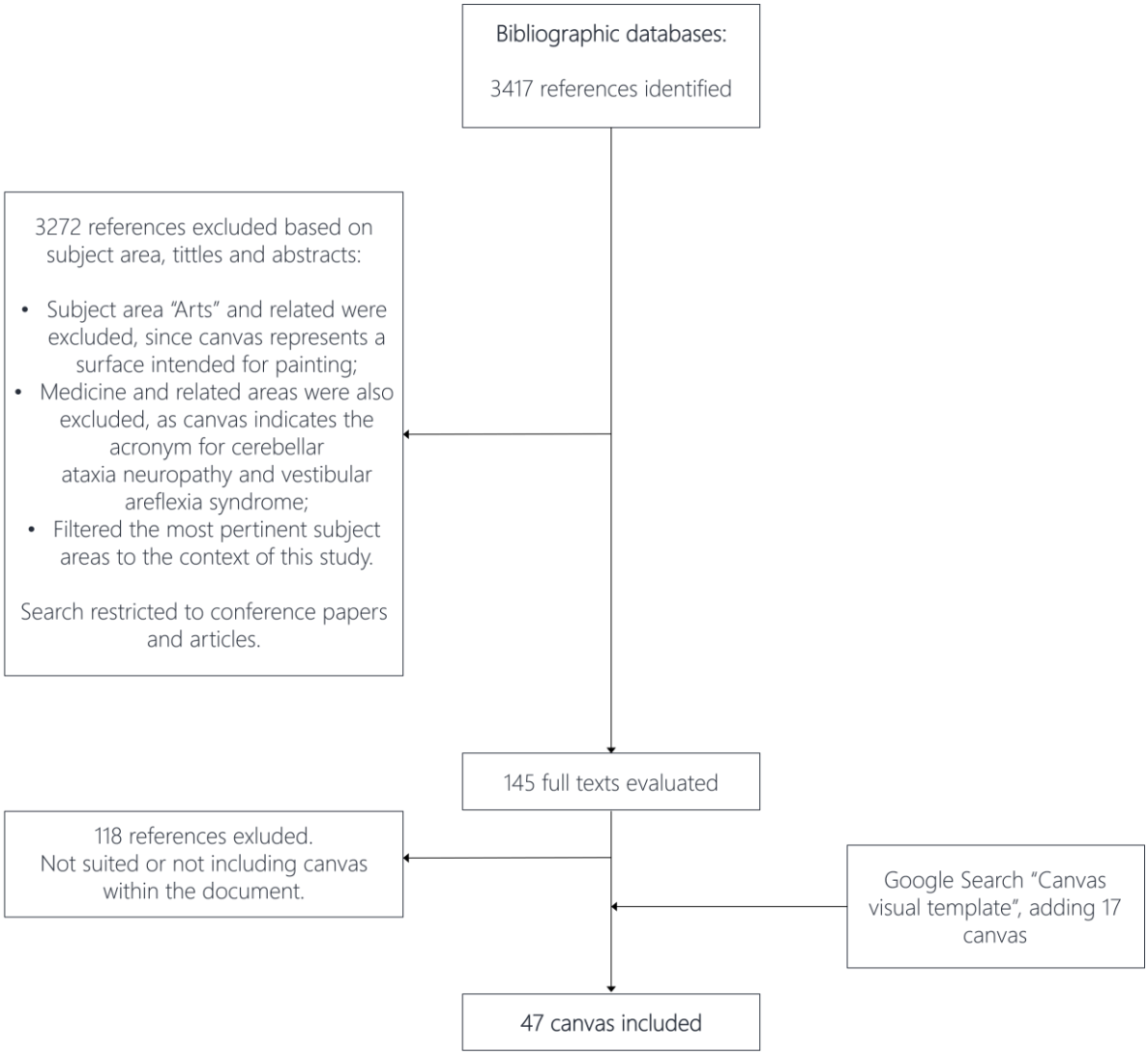

Figure 6- Literature selection process

The search keyword in Web of Science and Scopus was "canvas", and some logical restrictions were applied. Firstly, the subject area Arts was excluded from this search, since canvas in this context represents a surface intended for painting. Medicine was also left out, due to the meaning of the word canvas within this field, which represents the acronym for "Cerebellar Ataxia Neuropathy and Vestibular Areflexia Syndrome". Furthermore, a filter by subject area was applied to include the most relevant fields to the context of this study, including Computer Science; Engineering; Business Management and Accounting; Materials Science; Social Sciences; Economics, Econometrics, and Finance; Mathematics; Multidisciplinary and Undefined. The search was also restricted to conference and journal papers articles. Although it is acknowledged the importance of other sources, the main interest laid in mapping the peer-reviewed literature that identified relevant canvas.

The titles and abstracts of the obtained references were reviewed primarily when a canvas as a tool came into view. One-hundred and forty-five documents were analyzed fully. From this examination, one hundred and eighteen references were discarded since they did not suite this study by not describing canvas as management tools. This analysis revealed forty-seven potentially suitable canvas, that were further organized into sixteen categories: business and economics, strategic management, process management, project management, information systems, information technology, data science, virtual reality, engineering, software engineering, education, ethics, self-empowerment, social media, fashion and other. The results derived from this search are present in Table 1.

Table 1- Categorization of the Existing Canvas

Category	Canvas	Author	Description
Business and Economics	Service Business Model Canvas	Zolnowski (2014)	"Service Business Model Canvas (SBMC) is described as a novel business model approach for service environments."
	The Adapted Business Model Canvas for Peer-to-Peer Sharing and Collaborative Consumption	Plenter (2017)	"The Adapted Canvas for Peer-to-Peer (P2P) Sharing and Collaborative Consumption (SCC) is specifically tailored to the needs of P2P SCC business model development."
	Service Logic Business Model Canvas	Ojasalo and Ojasalo (2018)	"The Service Logic Business Model Canvas is a service logic-oriented framework for business model development. It makes the theory of service-dominant logic tangible and easily applicable in practice and enables service innovation truly based on customer value by ensuring that the customer is in the center of all the elements of a business model."

Table 1- Categorization of the Existing Canvas

Category	Canvas	Author	Description
	The Service-Dominant Strategy Canvas	Lüftenegger (2012)	"The Service-Dominant Strategy Canvas is constructed by integrating current definitions of a Service-Dominant strategy and by confronting them with traditional strategies. The model facilitates the design of Service-Dominant strategies by answering the questions associated with fifteen elements."
	The Lean Canvas	Maurya (2010)	"The Lean Canvas is an adaptation of the Business Model Canvas and it is specially designed for entrepreneurs. The canvas focuses on problems, solutions, key metrics, and competitive advantages."
	Value Proposition Canvas	Osterwalder *et al.* (2014)	"The value proposition canvas is a framework that helps designers ensure that there is a fit between the product-service idea and the market. It gives a detailed look at the relationship between customer segments and value propositions, highlights roles involved, pains and gains and how the service eventually matches the proposition and its pain relievers and gain creators."
	Business Model Canvas	Osterwalder *et al.* (2010)	"The Business Model Canvas is a chart that maps the key things that a business needs to get right to be successful."

Table 1- Categorization of the Existing Canvas

Category	Canvas	Author	Description
	The Operating Model Canvas	Campbell, Gutierrez, and Lancelott (2017)	"Operating Model Canvas describes a tool that managers can use to help them achieve alignment with strategy and with each other. "
	The Startup Canvas	Ciaglia (2016)	Developed to start sketching initial ideas for a business idea. This template aims minimizing waste and maximizing efficiency. It is the first framework created to model startups through twelve blocks that analyze every aspect of the building model and scale up process. The startup canvas approach works in three steps: the business idea, the strategy, the execution.
	The Mission Model Canvas	Osterwalder (2016)	"Developed to consider the planning for nonprofit organizations. In other words, how can we adapt the Business Model Canvas when the primary metrics of success for an organization is not revenue?"
	The Social Business Model Canvas	Tandemic (2019)	"Based on the idea of the Business Model Canvas, this tool helps to develop social businesses – also useful for for-profit businesses."
Strategic Management	Strategic Planning Canvas	Pize (2015)	"The Strategic Planning Canvas (SPCanvas) was created to be a tool to support the development of strategic planning in an interactive and collaborative way, effectively involving stakeholders throughout the process."

Table 1- Categorization of the Existing Canvas

Category	Canvas	Author	Description
	Strategy Model Canvas	Azevedo (2019)	"Strategic tool inspired by the Business Model Canvas, that makes the strategic visualization simpler, using design thinking concepts to stimulate strategic thinking, creating a process which was denominated as Strategic Modeling by its authors."
Process Management	Process Model Canvas	Bjil (2019)	"The Process Model Canvas is a plug-in model and complementary to the Business Model Canvas (BMC). While this model will help you to discover and define your future challenge, the Process Model Canvas (PMC) will help you to make it happen in the organization."
Project Management	Project Strategic Alignment Canvas	Pize (2015)	"The PSACanvas was developed to be an organization support tool for it to prioritize and select projects based on the alignment thereof with the strategic objectives and in the use of the restricted resources of the organization."
	Project Canvas	Thijs (2016)	"Project Canvas is a visual tool that improves communication in project teams and provides a simplified project overview."
	Project Management Change Canvas	Ferreira (2019)	"The Project Management Change Canvas has as main purpose the consideration in an integrated way the diverse areas of project management knowledge in a single evaluation tool. Whenever a design change

Table 1- Categorization of the Existing Canvas

Category	Canvas	Author	Description
			is required it is possible to make a more immediate reflection on the possible impacts caused by the design change, without neglecting any project area."
	Second canvas. New frame to study management of changes as projects.	Lehmann (2010)	The Second Canvas is a new conceptual framework for investigating the management of changes as projects and conducting new research on change and project management.
	Project Management Success Map® / Success Canvas®	Varajão (2016-2020)	"The Project Management Success Map®(or just Success Canvas®) is a one-page overview that layouts what means "success" in your project and what is relevant to achieve it, highlighting success factors, expected benefits, and criteria for evaluating success. It is an excellent tool to create the basis for implementing Success Management in projects."
Information Systems	Design Research Canvas	Nagle (2016)	"The Design Research Canvas has the aim of filling the needs of all IS community members (practitioners and researchers) the first version of the Canvas focuses on data practitioners at an executive level."
	The recommender canvas	Van Capelleveen *et al.* (2019)	"This canvas enables practitioners to create a high-level structured overview of recommender system designs while externalizing the relationships between

Table 1- Categorization of the Existing Canvas

Category	Canvas	Author	Description
			interrelated concepts. The canvas intends to serve as a requirement specification tool to analyze the fundamental questions of recommender system design to a broad audience of software engineers, software project managers, and education institutions. “
Information Technology	The Digital Transformation Canvas	Ivison (2019)	“The Digital Transformation Canvas helps teams to think through the implications of digitalizing data assets: what business processes to focus and for what reason, what data assets need to get digitalized and what technologies to use for it.”
	The Digital Transformation Canvas	Peter (2018)	“The Digital Transformation Canvas plays an important role as its facilities strategy analysis and development based on the seven action fields of transformations, based on previous research by the same author.”
	Business Innovation Canvas	Forrester (2018)	“The Business Innovation Canvas is a framework designed to help reshape your team’s thinking around how your company will use emerging technologies to deliver customer outcomes in new ways.”
	The Digital Strategy Canvas	CognitiveApplications (2017)	“The Digital Strategy Canvas is a means to give your team a quick and easy way to survey all (and only) the important factors of

Table 1- Categorization of the Existing Canvas

Category	Canvas	Author	Description
			your digital strategy on a single sheet."
	Digital Transformation Canvas®	Carvalho and Varajão (2020)	"The Digital Transformation Canvas® is a one-page overview that enables engaging in creative thinking for digital transformation initiatives."
Data Science	Digitalization Canvas	Heberle (2017)	"The Digitalization Canvas represents the results of the approach with the focus on digitalization use cases and user stories, their value proposition and their implementation in concrete projects."
	Data-Enhanced Business Model Canvas	Benta (2017)	"The Data-Enhanced Business Model Canvas helps to better outline the data requirements of business models. The developed process model describes the important phases for generating data-driven business models, it helps to make the data perspective more visible and leads to new ideas. "
	The Machine Learning Canvas	Marin (2019)	"The Machine Learning Canvas works as a communication tool in the design and development of machine learning components into an existing product with remote teams. It can be used to describe the steps that take place in a machine learning project. "
	Big Data Management (BDM) canvas	Hemmje (2017)	"The BDM canvas provides a visual chart that can be used in workshops iteratively to develop strategies for generating value

Table 1- Categorization of the Existing Canvas

Category	Canvas	Author	Description
			from data. It can also be used for project planning and project progress reporting. “
Virtual Reality	Serious Games Design Pattern Canvas	Zavcer (2014)	“The serious games Design Pattern Canvas (DPC) is a visual chart with elements describing a pattern's purpose, mechanics, audience, consequences, collected data, related research, and ethical considerations. DPC helps break larger game design problems into smaller pieces and assist in a bottom-up approach to designing serious games.”
Engineering	The Innovation Canvas	Kline (2013)	“The innovation canvas is a tool for teams to develop integrated product designs and business models. The canvas focuses attention on critical technical, market, resource, and execution issues that can determine the success of a new design or venture. “
	Analytics Canvas	Kuhn (2018)	“The Analytics Canvas is a semi-formal specification technique for describing analytics use cases and the necessary data infrastructure during the early planning and specification of an analytics project.”
	Internet of Things Canvas	Albers (2018)	“The Internet of Things (IoT) canvas constitutes an IoT-specific view on the system model of the reference product. It can be systematically derived from the system model and serves as the

Table 1- Categorization of the Existing Canvas

Category	Canvas	Author	Description
			starting point for product feature ideation. “
Software Engineering	Code Canvas	DeLine (2010)	“The Code Canvas is designed to leverage spatial memory to keep developers oriented and to make it easy to synthesize information.”
	Global Canvas	Smirnova (2014)	“The Global Canvas proposes guidance for companies for setting up global collaborations in the software development domain.”
	The Grade Decision Canvas	Cicchetti (2017)	“The Grade Decision Canvas leverages a dedicated taxonomy, denoted GRADE, meant for establishing the basics of the vocabulary for assessing and choosing architectural assets in the development of software-intensive systems. It serves as a template for practitioners to discuss and document architecture decisions. It also serves to reflect on past decision-making activities devoted to both tentative and concluding decisions in the development of software-intensive systems.”
Education	The MOOC Canvas	Alario-Hoyos, Perez-Sanagustin, Cormier, and Delgado-Kloos (2014)	“The MOOC Canvas defines a conceptual framework for supporting educators in the description and design of MOOCs (Massive Open Online Courses).”

Table 1- Categorization of the Existing Canvas

Category	Canvas	Author	Description
	PBL (Problem-Based Learning) Canvas	Gustavo (2018)	"The goal for the creation of the Problem-Based Learning (PBL) Canvas was to unite the positive characteristics provided by the Canvas technique such as collaboration, holistic vision, communication, and to safely preserve PBL principles through a PBL methodology focused on Computer Science."
	The Curriculum Innovation Canvas	Willness (2017)	"The curriculum innovation canvas provides a human-centered, collaborative, and holistic platform for instructors, curriculum developers, and administrators to engage in innovation and implementation of experiential courses or programs, particularly those that involve community or organizational partnerships. The canvas promotes a creative and fluid approach to curriculum development."
Ethics	The Ethics Canvas	Reijers (2018)	"The Ethics Canvas is a collaborative brainstorming tool that has an overall aim to foster ethically informed technology design by improving the engagement of R&I (research and innovation) practitioners with the ethical impacts of their R&I activities."

Table 1- Categorization of the Existing Canvas

Category	Canvas	Author	Description
Self-empowerment	Personal Canvas	Funck (2018)	"A canvas model that combines design thinking and planning so that you achieve the level of excellence you want for your career and your skills. "
Social Media	3E Social Media Strategy Canvas	Spil (2016)	"The 3E (Enable, Engage and Evaluate) Social Media Strategy Canvas is a new conceptual framework and tool for creating social media strategies, it can serve both as a decision-making tool and as a theoretical framework for comparison."
Fashion	The reDesign canvas	Kozlowski, Searcy, and Bardecki (2018)	"The reDesign canvas represents an original design tool, to support design entrepreneurs in developing sustainable fashion enterprises."
Other	The triple-layered business model canvas	Joyce and Paquin (2016)	"The Triple-Layered Business Model Canvas is a tool for exploring sustainability-oriented business model innovation. It extends the original business model canvas by adding two layers: an environmental layer based on a lifecycle perspective and a social layer based on a stakeholder perspective. "
	Canvas for defining incentive mechanisms	Bezerra (2015)	"This conceptual framework supports the analysis of virtual communities, aiming to facilitate the definition of online incentive mechanisms. It is presented as a canvas with issues to be addressed through a set of

Table 1- Categorization of the Existing Canvas

Category	Canvas	Author	Description
			questions, offering a visual and understandable guide."
	The Positive-Practice Canvas	Klapperich, Laschke, and Hassenzahl (2018)	"The Positive Practice Canvas (PPC) is an interview guide and notepad to gather instances of especially enjoyable and meaningful practices. The PPC pre-structures interviews in a way so that designers not trained in conducting qualitative research are enabled to gather systematic information about practices in line with the given theoretical underpinning."

2.5. Success Canvas® / Project Management Success Map®

The Project Management Success Map®, or Success Canvas® (Varajão, 2016-2020), represents the focus of the current dissertation. Currently counting with three versions, the first form of the Success Canvas® was developed by Varajão in 2016 within the Department of Information Systems of the University of Minho.

Likewise, the BMC, the Success Canvas® is an only page view with nine distinct blocks, of what means success for a specific project. The goal is to capture the definition of success in a project, and what is important to accomplish it, emphasizing the criteria for evaluating success, expected benefits, and success factors. According to Varajão (2016-2020), the author of the Success Canvas®, "it is an excellent tool to create the basis for implementing success management projects".

This framework is divided into three moments of the project life cycle, the "EX ANTE", "PROJECT" and "EX POST". These three stages were also seen previously in this dissertation when the same author-defined diversified facets of success when describing the success of IS projects (Varajão, 2018).

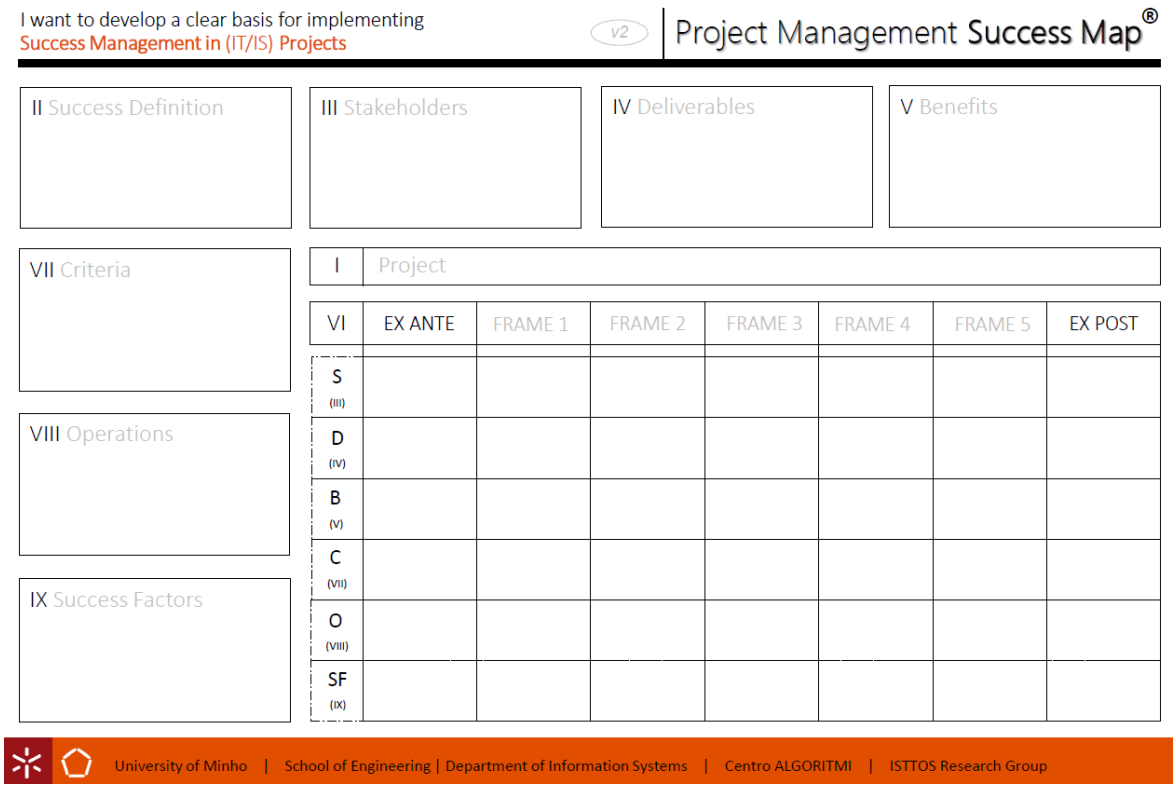

Figure 7- Success Canvas®/ Project Management Success Map®

Source: Varajão (2016-2020)

In order to implement the Success Canvas® (Varajão, 2016-2020), the author recommends the process represented in Figure 8, as a good approach to organize the activities. Varajão (2016-2020), structured and enumerated this canvas into nine decisive steps, being the first the identification of the project itself. Afterwards, it is important to determine the definition of success in the context of the project, once it may fluctuate according to multiple factors and perspectives, an explicit clarification of what represents success in the context of the project is essential. The third stage is the identification of the main stakeholders, since they represent the interested parts in the project outcome. These stakeholders in an IS project are commonly project managers, executives, sponsors, members of the project team, customers, and end-users. In the fourth and fifth sections, the identification of the deliverables and the expected benefits of the project are taken into consideration, respectively. The next step is focused on the identification of the major moments, or as the author defined "time frames", where the user of the canvas can fill out a table to better understanding how those moments relate to the success of the project. When talking about success, one of the main topics that come into the conversation is the criteria for measuring

that success and that is what the seventh phase is all about. As argued formerly, and confirmed by Ika (2009), it is unimaginable establishing a list for success criteria that will fit all the needs for every project due to they can vary according to the complexity and uniqueness that each project envisions, becoming this one of the most important elements for determining the project success. Around phase eight, it is determined the relationship with the external operations that influence the success of the project in question. It is common that projects require to outsource services and operations, that cannot be totally controlled, therefore some aspects can fail and it is important to identify possible dependencies and repercussions. The final step is to identify the success factors for the project, defined as conditions, circumstances, and events that influence project results and therefore success (Ika, 2009).

Once the nine blocks are completed, it is time to go back to the sixth and for each time frame, it is intended for the user to correspond the aspects determined previously in the stakeholders (III), deliverables (IV), benefits (V), success criteria (VII), operations (VIII) and success factors (IX) elements. Afterward, the user should analyze the canvas and its results and determine if the success management in the project is implemented accordingly to the objectives of the project. Later into this dissertation, we will observe how this framework is taken into practice, in order to better perceived its true power when defining the success of a project.

Figure 8- Success Canvas ® Roadmap

Source: Adapted from Varajão (2016-2020)

2.6. Critical Analysis of the State of the Art

The usage of canvas as management tools directly focused on project success was observed as a new and emerging topic in this literature review.

Within the Project Management field of study, only three canvas were found, but none of them considered the project success as a major topic. Nonetheless, and since the research for similar canvas did not present any practical results, project management frameworks to evaluate project success were also considered, to obtain more robust insights on the current state of the art, keeping in mind that they cannot be directly compared since they represent different types of management tools. Consequently, three success-oriented frameworks were analyzed and are following presented, with some similarities with the Success Canvas ® (Varajão, 2016-2020), concerning the final goal.

Starting with the Model for Measuring IS Project Success by Guo (2019), which defines three constructs that actively effect IS project success: Project Management Process, Project Outcomes, and Contextual Factors. Project management process, as described by the author, is a tool do aid project managers obtain success by identifying project performance criteria to obtain a better control through its lifecycle, likewise the phase VII of the Success Canvas ® (Varajão, 2016-2020) that also identifies the criteria for evaluating success. This construct solely cannot assure project success, therefore the need for two more. Project outcomes and contextual factors can additionally affect the success through the guidance of the project manager that needs to analyze these three constructs when evaluating the project's success. Coinciding with the IV stage of the Success Canvas® (Varajão, 2016-2020), the project outcomes construct identifies the deliverables of the project. Finally, the contextual factors construct has some similarities with the IX stage of the canvas where the success factors are identified.

Figure 9- Model for Measuring IS Project Success

Source: Adapted from Guo (2019)

The Project Success Analysis (PSA) framework (Quelopana, 2018), alongside the Success Canvas® (Varajão, 2016-2020), provides a clear vision of what is meant by Information Systems Project Success. This framework is positioned on the various definitions of success, organized into levels to achieve an appropriate understanding by all project stakeholders. Four levels are considered in the PSA framework: Project Success (Level I), Criteria (Level II), Factors (Level III), and Lifecycle (Level IV). In the first level, it is possible to obtain a clear vision of the relation between Project Success, Project Management Success, and Product Success. The canvas just defines the term success to the project taken into consideration, not defining the success type. Level II of the PSA reflects success criteria (phase VII of the Success Canvas®), and level III corresponds to the factors that allow meeting the corresponding criteria (phase IX of the Success Canvas®). The last level of the PSA framework includes the project life cycle affecting factors since not all of them are equally relevant at different stages of a project. The Success Canvas® (Varajão, 2016-2020) also highlights this level. However, this is not exclusive to the success factors, but to every aspect identified in previous stages since different aspects are important through different project time frames.

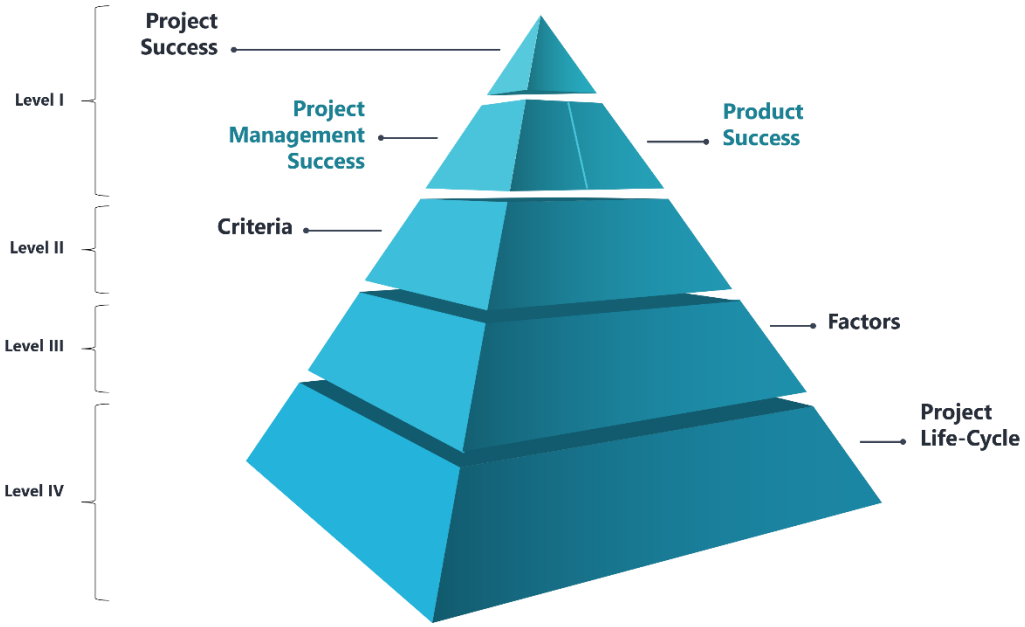

Figure 10- Project Success Analysis Framework

Source: Adapted from Quelopana (2018)

Hoang *et al.* (2013) conceived the framework for Defining Project Success to contest the absence of practical processes concerning the management of project success. Inspired by the prestigious model developed by W. H. DeLone and McLean (2003), this framework intends to offer a holistic concept of project success, as seen in Figure 11. Focusing on two major concepts, the project management success and project outcome success, it provides the support needed for "re-focusing" project management forces on specific activities to guarantee project success. In the project management concept, Hoang *et al.* (2013) acknowledge the long-established triple constraint, time, scope, and budget. Situated in the center of the constraint triangle, "project stakeholder satisfaction" and "project leadership" are placed within to certify that they are not neglected by project managers. Dimensions like system, information, and service quality were concentred into "product quality" in order to provide a more simplistic view to the user. Regarding the project outcome success, the authors included "user adoption", "user satisfaction" and "net benefits" as success dimensions. This model identifies success criteria and factors, that can be easily mapped into the Success Canvas® (Varajão, 2016-2020).

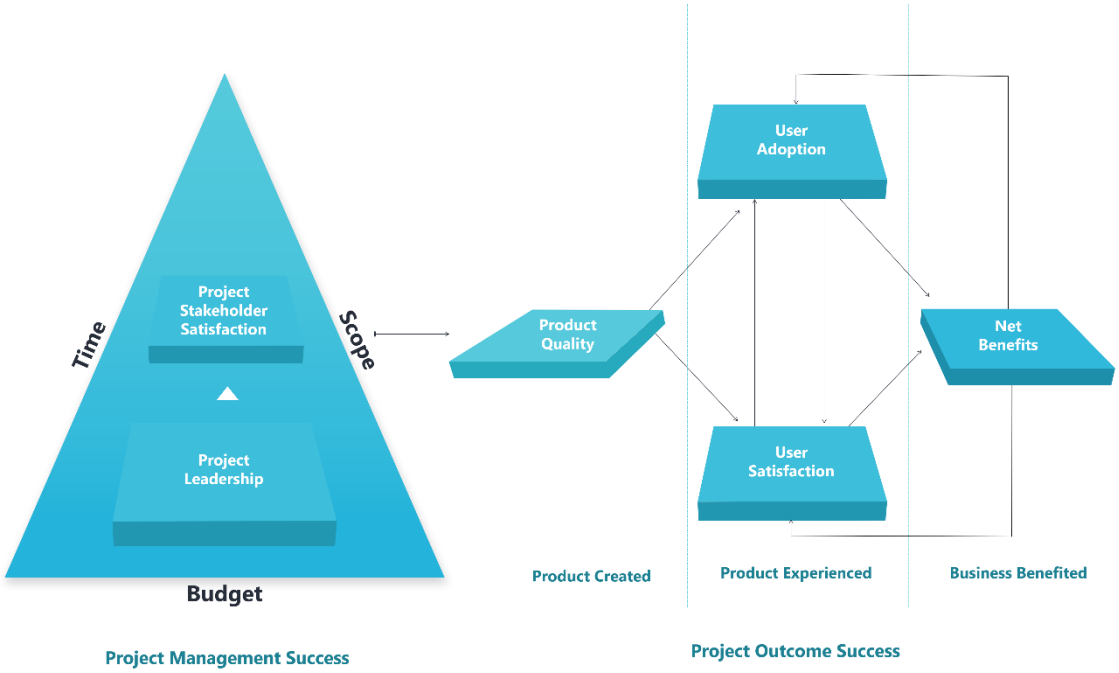

Figure 11- Defining Project Success Framework

Source: Adapted from Hoang (2013)

From this analysis, it is evident the concern for the clarification of the perception of project success and what influences it. The dearth of practical canvas and frameworks respecting the management project's success is additionally a considerable concern in this field. The scrutinized success frameworks, besides having the common purpose of determining project success, assesses the criteria for evaluating success and success factors (Guo (2019), Quelopana (2018), Hoang (2013)), the deliverables of the project (Guo, 2019), and the awareness for each project's time frame (Hoang, 2013). Figure 12 reflects a view of the success frameworks wrapped in the Success Canvas® (Varajão, 2016-2020), as well as the crucial aspects that are left behind in the current state of art.

The Success Canvas® (Varajão, 2016-2020) distinguishes itself by providing a more exhaustive overview of all the elements, perspectives and ideas to achieve success, including factors absent in other success management frameworks. Studying this unique canvas will provide a coherent foundation for future implementations of the canvas adding value to the success management culture. Furthermore, contributes to fill the gap from the lack of practical canvas and frameworks regarding this topic.

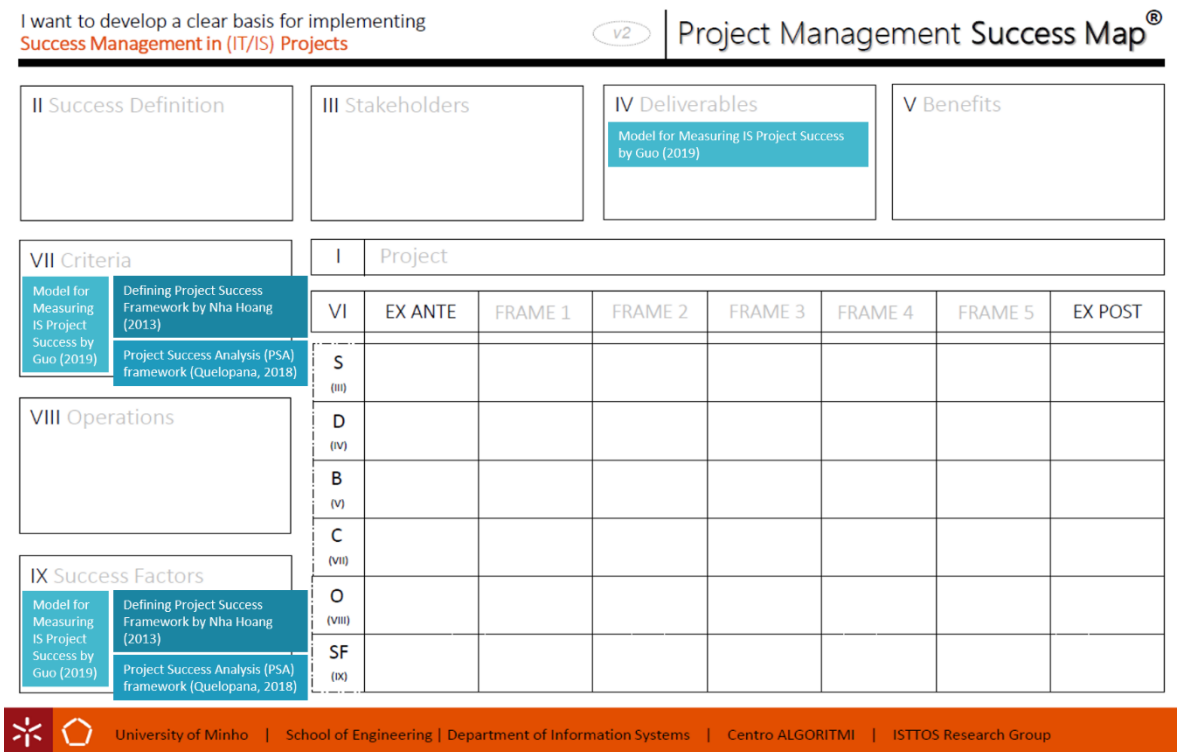

Figure 12- Success frameworks supported by the Success Canvas®

3. METHODOLOGY

This chapter describes the research methodology used in this dissertation, particularly the way how the investigation was carried out.

3.1. Data Sources and Research Strategy

As a starting point and from a primary investigation, it was found that there is a gap explaining and analyzing project management success, particularly when using canvas and frameworks as management tools to outline success, since this topic and encircled concepts are complex and inaccurate. Therefore, these concepts had to be reviewed from the existing literature to provide a better understanding of the relevance and context of the study.

Ahead of the actual search for the articles, it was made an analysis of what were the most trustworthy databases and search engines, to avoid unreliable sources. It was decided to concentrate the search on the following databases: Association for Information Systems Electronic Library (AISeL), Web of Science (WoS) and Scopus. Other databases not included in this selection might also contain relevant articles. However, the selected scientific databases were confirmed reliable and highly regarded, as aggregating multiple data sources into one database. Alongside, and to cover a wider spectrum, a Google search with the words “Canvas visual template” was also performed, having revealed itself crucial to complete the section regarding the state of art of canvas.

Afterward, handwritten database-specific queries were performed in the selected databases, adopting logical expressions from the terms within the context of the current study, to avoid open searches with large amounts of hits. It was also made a restriction in these searches to limit the results to the fields relevant to this literature review, such as project management, business, and management, computer science, information systems, and computer science theory methods. The performed queries can be found in Table 2, as well as the number of results from which one and the respective date of search. As expected, some searches display no results since there is a lack of literature related to the use of canvas/frameworks in the context of defining project management success, therefore supporting the relevance of this dissertation.

It is also important to mention that some references were found within the references of the identified articles, that were in the searches presented in Table 2.

Table 2- Performed search queries

Database	Query	Results	Date
Web of Science	"**success canvas**"	**0**	November 9th 2019
	(**canvas**) AND ("**project management**") AND ("**information systems**") AND (**success**) OR ("**project management success**") AND ("**project success**") Refined by WEB OF SCIENCE Disciplines: (MANAGEMENT OR BUSINESS OR COMPUTER SCIENCE INFORMATION SYSTEMS OR INFORMATION SCIENCE LIBRARY SCIENCE OR COMPUTER SCIENCE THEORY METHODS)	**36**	November 9th 2019
	("**information system**") AND ("**business model canvas**")	**3**	November 23rd 2019
	"**canvas**" [**EXCLUDED**] by WEB OF SCIENCE Disciplines: (ART OR CHEMISTRY PHYSICAL OR MICROBIOLOGY OR CLINICAL NEUROLOGY OR THEATER OR DERMATOLOGY OR CHEMISTRY ANALYTICALOR GENETICS HEREDITY OR OTORHINOLARYNGOLOGY OR ARCHITECTURE OR ENDOCRINOLOGY METABOLISM OR SPECTROSCOPY OR NURSING OR ARCHAEOLOGY OR PSYCHIATRY OR PHARMACOLOGY PHARMACY OR INFECTIOUS DISEASES OR NEUROSCIENCES OR CHEMISTRY APPLIED OR CHEMISTRY MULTIDISCIPLINARY OR MEDICINE GENERAL INTERNAL OR SURGERY OR OPTICS OR PHYSICS APPLIED OR FISHERIES OR CARDIAC CARDIOVASCULAR SYSTEMS)	**707**	February 11th 2020
Scopus	ALL ("**success canvas**")	**0**	November 9th 2019

Table 2- Performed search queries

Database	Query	Results	Date
	(TITLE-ABS-KEY ("i**nformation systems**") AND TITLE-ABS-KEY (**canvas**) AND TITLE-ABS-KEY ("**project management success**") OR TITLE-ABS-KEY ("**project success**")) AND (LIMIT-TO (SUBJAREA , "**COMP**") OR LIMIT-TO (SUBJAREA , "**BUSI**"))	**0**	November 9th 2019
	(TITLE-ABS-KEY ("i**nformation systems**") AND TITLE-ABS-KEY (**canvas**) OR TITLE-ABS-KEY (**framework**) AND TITLE-ABS-KEY ("**project management success**") OR TITLE-ABS-KEY ("**project success**")) AND (LIMIT-TO (SUBJAREA , "**COMP**") OR LIMIT-TO (SUBJAREA , "**BUSI**"))	**66**	November 9th 2019
	TITLE-ABS-KEY (canvas**)** AND (LIMIT-TO (DOCTYPE , "ar") OR LIMIT-TO (DOCTYPE , "cp")) AND (EXCLUDE (SUBJAREA , "ARTS")) AND (EXCLUDE (SUBJAREA, "MEDI")) AND (LIMIT TO (SUBJAREA, "COMP") OR LIMIT TO (SUBJAREA, "ENGI") OR LIMIT-TO (SUBJAREA, "MATE") OR LIMIT TO (SUBJAREA, "BUSI") OR LIMIT-TO (SUBJAREA, "SOCI") OR LIMIT-TO (SUBJAREA, "MATH") OR LIMIT-TO (SUBJAREA, "DECI") OR LIMIT-TO (SUBJAREA , "ECON") OR LIMIT-TO (SUBJAREA , "MULT") OR LIMIT-TO (SUBJAREA , "Undefined"))	**2710**	January 8th 2020
Association for Information Systems Electronic Library (AISeL)	"**success canvas**"	**0**	November 9th 2019
	"**project management success**" OR "**project success**" OR "**project management**" AND **canvas** AND "**information systems**" AND **success**	**54**	November 9th 2019

3.2. Article Selection

From the searches, the articles found were selected for analysis based mainly on their titles and abstracts. Since in some cases, the abstract did not make evident if the article was relevant to this study, it was necessary to examine it to make an informed decision if it was a valid reference or not. Even if a title or abstract were valid, this did not imply that the article would not be discarded later in the selection process. The articles were selected if they reviewed:

1. IS or IT project/project management;
2. Project/project management success;
3. Project/project management canvas/frameworks;
4. Project management tools and techniques;
5. Canvas (for the context of the section “state of the art regarding canvas”).

Deriving from the 2869 articles found in the queries performed earlier, the selection process resulted in 159 articles, 11 from Web of Science, 147 from Scopus and 1 from AISeL. Alongside, and as stated earlier, Google searches and other sources also resulted in articles.

4. THE SUCCESS CANVAS®

Considering the purpose of this dissertation, an exploratory multi-case study was performed. Following Yin (2009) and taking into account the relevance of analyzing multiple cases, preferentially originating from multiple investigators and sources, this study involved eight cases from two different organizations. This interpretative multiple case study approach enabled a cross-case analysis contrasting perspectives about the utility of the Success Canvas® (Varajão, 2016-2020).

According to the Multiple Case Study approach by Yin (2009), subsequently to the understanding of the theoretical concepts, it is necessary to select the cases for the study. The case selection and data collection were carried out by the author of the Success Canvas® (Varajão, 2016-2020), throughout the developing and refining period of the canvas.

After the selection of the cases, was performed the examination of the data of each case providing an acknowledgment of the. Since all the original data was in paper support, it was necessary to transcribe and organize the information into a more manageable digital format. The result of this process can be observed in Appendix 1. In total, from the eight case studies were collected and analyzed forty-eight filled canvas, corresponding to one hundred and fifty-seven individuals involved in this study. Each case study included, having as reference the correspondent project, the fulfillment of the Success Canvas® (Varajão, 2016-2020). Additionally, it was requested to the participants to share their opinion about the relevance and importance of the use of the canvas.

Following the multiple-case study process logic, by the last phase, Analyze & Conclude, it is expected the empirical and comprehensive confirmation of the advantages of the utilization of the canvas. This occurred through systematical comparison between the eight cases studied and examining with the current literature, so that accumulating evidence from diverse sources converges.

4.1. Introducing the Case Studies

The case studies include the multiple experiences of the usage of the Success Canvas® (Varajão, 2016-2020), in distinct contexts, by several IS teams from different IS backgrounds. As addressed earlier, the cases were performed amid the developing and refining period of

this management tool, from the year 2015 to 2020, allowing the author to improve some aspects of the canvas during this process. Eight case studies were conducted within two large and very distinct organizations, so that the sample can provide more representative results. The data collection took place at the University of Minho, regarding academic projects, and company InfSysMakers (fictional name to keep the real name of the corporation anonymous), a multinational engineering and electronics corporation. In total, they consist of fifty inquires, corresponding to one hundred and fifty-seven individuals involved in the total of the case studies. Even though these two organizations have different purposes and operate in distinct industries, they both conduct settled and reputable Information Systems projects and departments. Currently, these institutions have a total of two thousand and thirty-eight (including professors, technical, administrative and management personal, and researchers) and three thousand and five hundred employees (regarding the company InfSysMakers, this number refers only to the subsidiary in Portugal), respectively.

Starting with the University of Minho's study cases, case **A** was carried out in 2017/2018, in the context of a doctoral program on Information Systems and Technology (PDTSI) at the University of Minho. This four-year doctoral program purpose is to educate researchers in the scientific area related to information systems and technologies (TSI). Students graduated by PDTSI should have a broad culture about the TSI area and skills to conduct and execute autonomously (individually or integrated in a team) research and development (R&D) activities that cover all phases of the research process (University of Minho, 2020a). Based on a small sample of individuals (four Ph.D. students), this case study was performed in the first year of the doctoral program, which is aimed to allow students to be aware of the relevant literature in their specific field of research, and also develop the dissertation proposal (University of Minho, 2020a). Each student filled the canvas individually based on her/his doctoral thesis, analyzing, and identifying the most relevant aspects to achieve success during the four years of the doctoral project.

Case study **B**, performed in late March 2018, corresponds to a course of the fourth year of the Integrated Master of Engineering and Management of Information Systems at the University of Minho - Information Systems Management (ISM). This course aims at providing a complete vision on Management of Information Systems, consistently centralized in the basic rationality "thinking before doing". The canvas was used by one hundred and twelve

students, divided into twenty-two groups. The objective was the characterization of success of the projects assigned to each group. Besides the filling of the Success Canvas® (Varajão, 2016-2020), to the participants was also asked to answer the following questions: 1. "How the Criteria can be measured?"; 2. "The Benefits/Criteria are the same for all stakeholders?"; 3. "The (first) definition of success should be updated after filling the canvas?". These questions aim at providing additional insights on how the students perceive core definitions and elements of the canvas.

Case **C** had the participation of students of the Master's in Information Systems (MSI) at the University of Minho, in the first year of their master's. This master course intends in training qualified professionals to understand the role of information technologies and information systems within organizations and in the current society, perceive and explain the technological, organizational, political, social, and cultural arguments for the successful adoption and management of IS, and identify possible problems associated with that same adoption (University of Minho, 2020c). Carried out in 2015 and 2016, this study was performed in groups of four elements, resulting in a total of sixteen students involved in this process, aiming to characterize the success in their master's dissertation.

Cases A, B, and C utilized version 0.6 of the Success Map® (Varajão, 2016-2020).

Case **D** was carried out in the course Information Systems and Technologies Projects (ISTP) in 2019, of the Integrated Master of Engineering and Management of Information Systems at the University of Minho. This course is project-based, and the students are organized in teams to engage and execute a project. Each project must be developed in a context as real as possible, allowing the application and the development of crucial professional engineering and management competencies of Information Systems (University of Minho, 2020b). For this case, it was carried out an in-depth study, focused on a single team. The project focus was the improvement of the workflow of the International Journal of Information Systems and Project Management (*ijispm.sciencesphere.org*). This case has an interesting insight on the use of the Success Canvas® (Varajão, 2016-2020), not only from the team members perspective, but also from the client itself.

Case **E** is similar to case A, since they both concern the success in the doctoral program on Information Systems and Technology (PDTSI). Carried out in the scholar year of 2019/2020, this case study was performed by three inquired students based on their perspectives and ambitions for their individual doctoral program.

Case **F** was completed in late 2018, and like cases A, and E, regards the success of the doctoral program on Information Systems and Technology. Involving nine doctoral students, this case study corresponds to the final case executed at the University of Minho.

Case study **G** regards to a software development project, which is part of a large IT development program. This case study has a particularity the involvement of a multidisciplinary team, incorporating two engineers from InfSysMakers (Sub team A - STA), and seven researchers from the University of Minho (Sub team B - STB).

Cases D, E, F, and G were performed using the current version of the Success Canvas® (Varajão, 2016-2020).

4.2. Multiple Case Study Findings

The current section presents the results of the case studies. First, the results are presented and described by case, centralizing in the focal points that emerged in each case. Secondly, the opinions of the participants are analyzed, to allow a better understanding of their experience and perspective on the use of the canvas.

4.2.1. Case A

Case A regards a Ph.D. in Information Systems Technology project at the University of Minho with a population of four Ph.D. students. All participants filled individually the canvas based on their doctoral thesis, describing the relevant elements to attain success during the doctoral program. All the elements of the canvas under study were identified correctly by each student. Results show that this population conferred a significant relevance to the study not only by providing unanimous positive feedback to the question “is the Success Canvas® a useful tool to influence and assist project managers in the Information Systems field?”, but also by identifying key features of the canvas. Additionally, it is important to highlight that success was defined differently by the participants, even though they all had the same type of project in hands, a doctoral thesis. To fifty percent of the students, success in their project is defined by “finishing the program on time”, and by the other half of the population, success means “contributing with knowledge to the scientific community”. Besides that, additional responses were recorded, such as “achieving the objectives defined in the study results”,

"being top of the class", or "apply the discovered knowledge in future endeavors". From these responses, even from a small population, and throughout all the study, it was observed that different individuals perceive success differently according to their expectations and goals regarding a specific project.

4.2.2. Case B

Being the largest case regarding the sample in this study, case study B concerns an academic course of Information Systems Management. The responses were recorded by twenty-two groups of students, where project was assigned per group. It is important to note that some groups had more than one response recorded. This fact became crucial corroborating the point identified previously in case study A, that despite the fact that a group of individuals shares the same project, the definition of success can vary, and every individual has his view of success and what it implies. Six out of the sixteen groups (37.5%), in the cases that recorded more than one response of the Success Canvas® per group, differed their visions about the definition of success for their project. For eighty-one percent of the participants, success in their project consists of "obtaining an in-depth understanding of the functions of an information system manager and the role that these systems have within an organization". The considerable remaining participants demonstrated that success for them embodies the "ability to identify and combat information systems failures and therefore, analyzing and improving the conditions of a company's future". Remarkably, especially due to the large sample of people taking part in this activity, nearly all participants identified and filled correctly all the elements of the canvas. Taking that into consideration, and to identify possible vulnerabilities of the Success Canvas®, one group inaccurately confused the expected benefits of the project with key performance indicators. As addressed by the Oxford Online Dictionary (2020), a key performance indicator is a quantifiable measure used to evaluate the success of an organization, employee, etc. in meeting objectives for performance. A benefit (Oxford Online Dictionary, 2020) corresponds to an advantage or profit gained from something. Even supposing that their confusion is not entirely preposterous, a benefit does not have the distinguishing quantifiable nature of a key performance indicator, therefore this misinterpretation does not suggest a misconception of the canvas under evaluation. Pertaining to the nature of the projects

within this case, some students felt the need to divide the fourth section of the Success Canvas® regarding the expected benefits, into three perspectives. These trilateral outlooks correspond to the work team, the company understudy for each project, and the professor of the course. Eighteen percent of the groups performed this separation, as they perceived that each one of these stakeholders will perceive different benefits, and therefore, they needed to be organized by stakeholder. This viewpoint and the need for this supplemental organization might be considered latterly as a future improvement of the Success Canvas®, not only due to the noticeable number of students that considered its importance, but also considering that the difficulty in reconciling the views of different natures of stakeholders was presented as a disadvantage of this framework by some students. As previously addressed, in this study was asked to the participants to answer additional questions besides the filling of the Success Map®. The relevant conclusions from the answers collected were that fifteen percent (15%) of the students believe that the benefits/criteria are equal to all the stakeholders. On the other hand, thirty-two and a half percent (32.5%) state that each stakeholder has a different set of benefits and criteria, and different weights for each benefit/criteria. To the question, "should the (first) definition of success be updated?", twenty-seven and a half percent (27.5%) of the students consider that it should be updated, since different criteria can be perceived throughout the project. Contrarily, forty-five percent (45%) believe that the definition of success should not be updated. Overall, taking that into account the advantages and disadvantages pointed out by the participants about the canvas, thirty-seven percent (37%) of the students evaluated the Success Canvas® as neutral, and sixty-three percent (63%) had a positive opinion. A neutral opinion is considered in the case of a participant stating an equal number of advantages and disadvantages.

No negative opinions were registered.

4.2.3. Case C

Case C was performed by first year students of a master's in Information Systems. Alike the previous case study, the filling of the Success Canvas® (Varajão, 2016-2020) was performed by groups of students (in this circumstance by fours groups of four individuals each). One of the most meaningful aspects of this analysis is to determine if all the

elements of the canvas were identified correctly by the students. In this case, one of the groups mistaken the concept of deliverables in the fourth phase of the canvas (concerning the identification of the deliverables of the project). This specific group identified "finishing the master's" as a deliverable, which is incorrect since the final document is indeed one example of a deliverable and not making the dissertation itself. Due to this confusion, became clear that the understanding of key concepts is crucial for the use of the Success Canvas®. As seen in the previous case studies, despite the same nature of the project, different individuals have different perspectives of what success means for their project. Fifty percent (50%) defined success as "finishing the master's dissertation" and "produce artifacts relating to their theme of the dissertation". For twenty-five percent (25%) of the population, success is "obtaining a grade higher or equal to sixteen values (from a scale from zero to twenty)" and "finding constructive conclusions that can allow future investigation". When asked about their opinion of the canvas, a unanimous positive feedback was provided by these master students.

4.2.4. Case D

Case D distinguish itself from the others by having the Success Canvas® (Varajão, 2016-2020) filled not only individually by the project team but also by the client of the project. This case involves a work team of the academic course Information Systems and Technologies Projects (ISTP) that carried out a project that had as a main purpose the enhancement of the workflow of a scientific journal. Due to its particularity, this case provided many valuable insights to the evaluation of the canvas. Starting with the definition of success, three out of the four (75%) team members divided the success definition into client and project team. Regarding the definition of success for the team, there was a consensual agreement from all the team members by describing success for their project as "compliance with project deadlines and budget, customer satisfaction, customer usability, and as the satisfaction of the team with the work accomplished". The team defined success in the perspective of the client, as the "achievement of the project objectives", "ensure that the results are used/implemented in the context of improving the organization" and "guarantee the efficiency in the resources". Coinciding with the team's perspective, the client itself defined success with the same three descriptions. The division that most of the team members did regarding the definition

of success between the client and the team's perspective, can be questioned since almost all of them coincide although the phrasing may differ. Regardless, it is not the first time that users of the Success Canvas® felt the need to do some type of division within a specific phase to include different perspectives (as seen in case B). All the other remaining elements of the canvas under study were identified correctly by each individual. Concerning the opinion of the inquired, it was mainly positive, with all the participants identified advantages and some disadvantages about the use of the Success Canvas®.

4.2.5. Case E

Case E was carried out by three doctoral students in the Information Systems Technology program. When asked how they define success, these three PhD students presented different perspectives, such as "finishing their thesis in the expected time", "provide a significant contribute for the research community", "compliance with the research plan and goals", and "acquire research skills". Analyzing the phase VI of the framework, "identify the main time frames of the project", they were identified correctly but not applied to the intended matrix by all the individuals in this case study, which may be an indicator that the canvas might not be clear or was not properly explained. In phase IX, "identify the success factors of the project", one of the students incorrectly identified the PhD output as a success factor, which can be concluded as a misunderstanding of the concept, and not as a vulnerability of the Success Canvas®. All the other remaining elements of the canvas were identified correctly. The entire population under study had a positive opinion about the Success Canvas®.

4.2.6. Case F

Case F was carried out by nine Ph.D. students in Information Systems Technology at the University of Minho. Fifty five percent (55.5%) of the doctoral students defined success in their project as "making a practical contribution impacting the research community and the society in general with new knowledge and insights". Other percentage of students defined success as "obtaining a Ph.D. diploma from the IST department" (33.3%), and as "accomplish all the defined goals within the expected time, and resources" (22.2%). As seen in previous case studies, some participants exhibit a

misunderstanding of the key concepts of the Success Canvas®. In this case, one of the students identified "contribution for body of knowledge" as a deliverable. Similar to case E, the entire population (100%) identified correctly the main time frames of the project, in phase VI, but they did not apply those same time frames to the matrix. As explained previously, this may indicate that the canvas might not be as clear as expected, or that it was not properly explained. In this case study, there was a unanimous positive opinion of the use of the Success Canvas®.

4.2.7. Case G

Case G, a partnership project between company InfSysMakers and the University of Minho, consisted in the development of a software tool to automate the verification of layout guidelines (design and process rules) of Printed Circuit Boards (PCBs). This case study completed by nine individuals divided into two sub teams, two engineers from InfSysMakers (STA), and seven researchers from the University of Minho (STB). This case started by identifying the main reasons that justify the need for implementing a success management process, since it was concluded that each sub-team could not fully understand what was being valued by the other sub-team, namely in the establishment of the priorities and in the identification of the objectives that were more valuable to the Top Management Team as described by Varajão *et al.* (2018). The filling of the Success Canvas® was performed by both sub-teams in two different moments, in order to avoid one sub-team from inducing or influencing the visions and ideas of the other. In this process there was an overall difficulty of both teams understanding the main concepts involved in the framework under study. Starting with the difficulty to define success criteria besides the evident Iron Triangle, the sub-teams also encounter difficulties differentiating the concepts of result indicators and success criteria. Regarding the phase IX of the framework, identify the success factors of the project, it was noticeable an agreement in one of them the "commitment of all team elements in the development of the work", even though sub team A identified four success factors while sub team B identified thirteen. A second meeting was performed with both sub-teams attending simultaneously, and the main goal was to show and comment on the previously collected ideas of each sub-team. In this meeting, were also planned the success management activities. Varajão *et al.* (2018) concluded that the entire process

promotes a precise definition of success, a better understanding of the different perspectives of the participating stakeholders, a greater focus in what is most important for achieving the project success, the identification and definition of criteria for evaluating success, and definition of milestones. Additionally, all stakeholders agreed that a systematic process, promoting a continuous evaluation and accommodating the perspectives of the involved participants, may contribute to better monitoring and performance of the project.

4.3. Discussion

Compiling all the observations made across the studied cases, Figure 13 shows the ranking of the most mentioned advantages and disadvantages of the Success Canvas® (Varajão, 2016-2020). The ranked catalog of these considerations, in order of their occurrence, is beneficial to the examination of the usability and perception of the Success Canvas®. All the advantages/disadvantages have a percentage based on their occurrence across the study cases, by the total number of participants. The top seven most significant advantages for the Success Canvas® (Varajão, 2016-2020) are the capability of defining the critical/main success related aspects of a project, brainstorm/clarify and unify ideas, track success, provide a success-based project overview, enhance and promote project organization, allow an advanced perception of the project success, and improve and promote project planning. The number of observations in the previous described advantages varies between nineteen and fourteen, in opposition the number of observations for each disadvantage is considerably lower, varying between three and five.

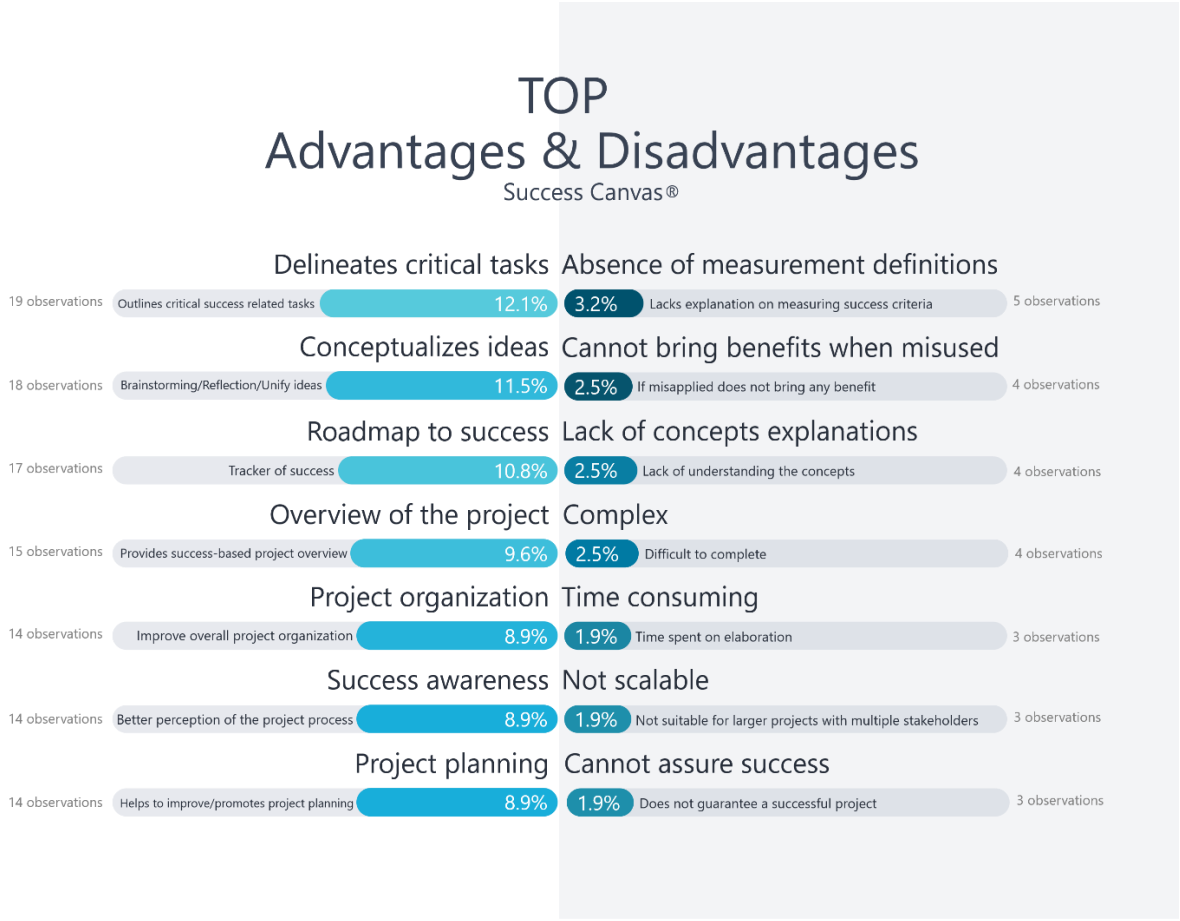

Figure 13- Top advantages and disadvantages of the Success Canvas®

The most noted disadvantages for the Success Canvas® are the absence of explanation on measuring success criteria, the possible misuse of the canvas, lack of understanding the concepts, difficulty to complete, time spent on the elaboration, not being suitable for larger projects with multiple elements and the fact that cannot assure success. For better analysis, Table 3 and Table 4 show the total of the advantages and disadvantages of the participants of this multiple case study, including the original expressions.

Table 3- Advantages Output Data

EXPRESSION	FREQUENCY	%	CASES
Define critical/main success related aspects	19	12.1%	A, B, C, D, E, F, G
Brainstorming/ Clarify/ Reflection/Unify ideas of the project's purpose	18	11.5%	A, B, D, E, F
Roadmap/Tracker of success	17	10.8%	A, B, E
Provides success-based project overview	15	9.6%	B, D, F

Table 3- Advantages Output Data

EXPRESSION	FREQUENCY	%	CASES
Improve overall project organization	14	8.9%	B, E, F
Better project planning	14	8.9%	A, B, F, G
Reflection on the meaning of success	14	8.9%	B, D, E, F
Better perception of the project process	13	8.3%	B, C, F
Understand aspects that might affect/impact/influence the project	13	8.3%	A, B, D, E
Takes into account the project timeframes / Time mapping	11	7.0%	A, B, D, E, F
Contributes to a structured/systematic project	9	5.7%	A, B, C, F, G
Useful to address all components of success	9	5.7%	A, B, D, E
Addresses the stakeholders and their expectations	9	5.7%	B, C, D
Focus resources	9	5.7%	A, B, F
Align the tasks alongside with stakeholders/client's goals	8	5.1%	B, C, F
Allows different perception in different phases of the project	8	5.1%	C, D
Get clarity about risks and how to mitigate them (Risk Management)	8	5.1%	A, B, D, F
Better perception of Project Management	7	4.5%	A, B, E, F
Allows constant update of success aspects	6	3.8%	A, B, F
Delineates objectives and deadlines	4	2.5%	A, B, E
Easy to use/understand	4	2.5%	D, E, F
Guide the plan of activities	4	2.5%	A, B, F
Provides clarity of the challenge size	4	2.5%	D, F
Compare different perspectives on the success of the project	3	1.9%	B, C
Considers the restrictions of the project	3	1.9%	B, F
Decrease risk of failure	3	1.9%	B, F
Detail the steps/elements of the project	3	1.9%	D, F
Plan before and after the project	3	1.9%	E, F
Prioritize time according to tasks	3	1.9%	A, F
Enables the validations of the elements (criteria, deliverables, …)	3	1.9%	C, E, F

Table 3- Advantages Output Data

EXPRESSION	FREQUENCY	%	CASES
"Guarantees" that the final result will be in agreement with all parts involved expectations (Management of expectations)	3	1.9%	D, F
Detailed analysis of the project	2	1.3%	C, F
Identify weakness	2	1.3%	F
Manage complexity associated with projects	2	1.3%	B, F
Mapping and crossing information	2	1.3%	B
Robust one-page visual chart	2	1.3%	A, F
Acquire knowledge on success-related concepts	1	0.6%	B
Easy comparison/discussion of the project requirements	1	0.6%	D
Establish relationships on stakeholder's needs	1	0.6%	F
Succinct	1	0.6%	D
Total implementation costs are low	1	0.6%	G

Table 4- Disadvantages Output Data

EXPRESSION	FREQUENCY	%	CASES
Does not define how to measure success criteria	5	3.2%	B, D, G
When misapplied does not bring any benefit	4	2.5%	B
Lack of understanding of the concepts	4	2.5%	B, G
Difficult to complete	4	2.5%	B
Cannot be applied to larger projects with multiple stakeholders	3	1.9%	B
Time spent on elaboration	3	1.9%	B
Does not guarantee a successful project	3	1.9%	B
Difficulty in reconciling the views of different stakeholders	2	1.3%	B
Excessive focus on the project's result rather than its development	2	1.3%	B
In complex or extensive projects, complicated to analyze	2	1.3%	B
Limitation of space to define ideas	2	1.3%	B
Limited timeframes (does not consider large projects)	2	1.3%	B, D
Little detail regarding each topic	2	1.3%	B

Table 1- Disadvantages Output Canvas

EXPRESSION	FREQUENCY	%	CASES
Must be a periodic exercise, as the projects are constantly changing	1	0.6%	B
Non-intuitive map	1	0.6%	B
Poor understanding of the project leads to a poor success map	1	0.6%	B
Redoubled effort to cross elements (codes) in various moments	1	0.6%	D
Time frame not well explained	1	0.6%	D
The framework might be a way of controlling team's actions	1	0.6%	G

Taking into consideration the filling of the Success Canvas® (Varajão, 2016-2020), four distinct observations were common and evident across all the case studies. First, the concept of success is perceived differently by the individuals for their specific project. This conclusion was noticed even when the nature of the project was the same, or in some cases the same project and/or team. Concluding that distinct individuals perceive success differently according to their expectations and goals regarding a specific project. As established by Fraser (2002), success is a complex phenomenon that may fluctuate depending on the context and type of measurement. Secondly, and one of the most important aspect of this study is to determine if the Success Canvas® is correctly perceived by the users. In most case studies, the participants correctly filled the canvas, with only a few exceptions. In the total of the fifty inquires, corresponding to one hundred and fifty-seven individuals involved in the total of the case studies, only six of them identified incorrectly a specific element of the canvas. Identifying incorrectly an element was observed in most of those cases, as a misunderstanding or as a lack of knowledge of the concepts in the Success Canvas®. This erroneous identification of an element was observed in the elements IV, V, VI, VIII and IX of the canvas, as observed in Figure 14. It was also observed that five out of the total of the participants did not identified some elements of the canvas. These blank answers were detected in the section I and VIII. Fifteen partially correct fillings of an element of the Success Canvas® were detected, being this determined if an answer was correct but with minor confusions or misinterpretations. A practical example of this, and the most noticeable throughout the analyzed case studies, was regarding the element

VI - “Identify the time frames of the project”, where the time frames were identified correctly but not applied to the correspondent matrix.

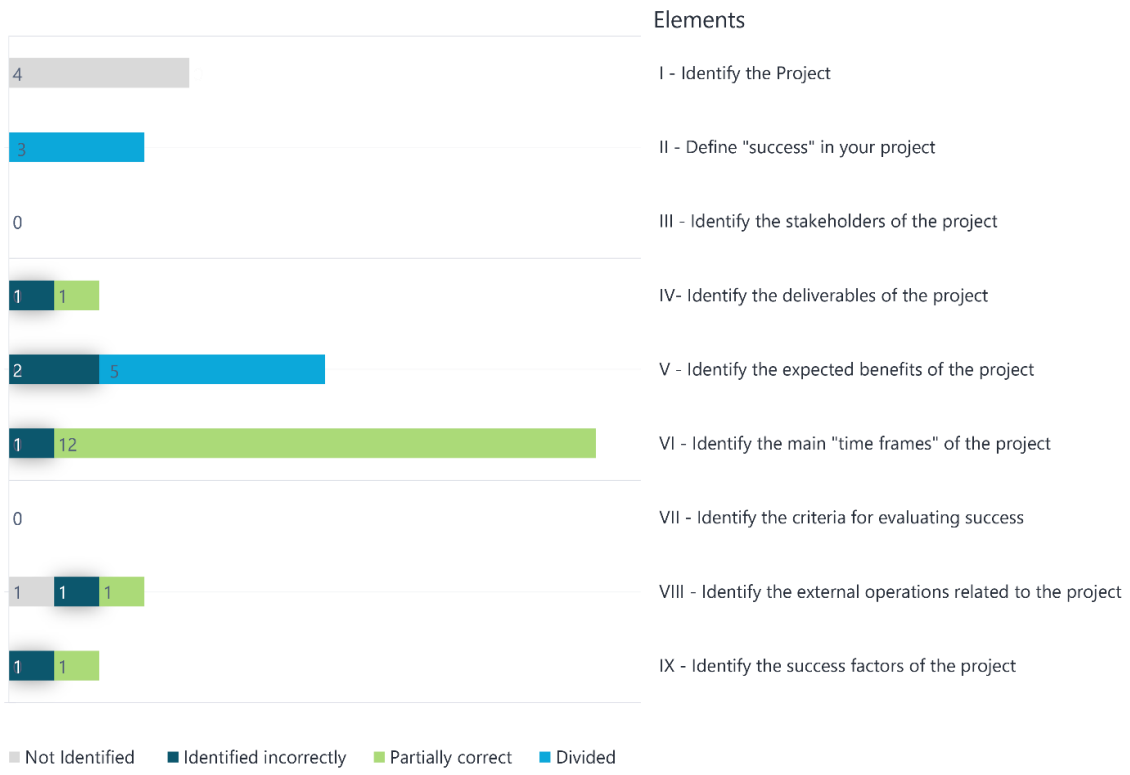

Figure 14- Analysis of the erroneous fillings of the Success Canvas®

Thirdly, and going back to the common observations across the case studies, it is also important to note the need that some participants felt to divide some elements of the Success Canvas® into sections. Commonly, these divisions were seen when the nature of the projects surrounded different perspectives (e.g., work team, company/client, professor of the course, etc.). Eight participants performed divisions in the element II, regarding the definition of success and/or element V, that corresponds to the expected benefits of the project. The participants, as previously noted, perceived that each perspective will understand different success definitions/benefits and therefore, they needed to be categorized by stakeholder. Concluding with the fourth of the most relevant aspects of this study, it was noticeable an overall difficulty of understanding the main concepts involved in the framework under study by the participants. Starting with the difficulty to define success criteria besides the evident Iron Triangle. Some individuals struggled with the difference of the concept of key performance indicators, success criteria and the expected benefits, between other aspects.

5. CONCLUSIONS

This chapter provides the review of the conclusions of this study regarding the application of the Success Canvas® (Varajão, 2016-2020). Starting with an overview of the final remarks, followed by the theoretical and practical limitations, and finalizing with the limitations and future work.

5.1. Final Remarks

This dissertation is the first study that analyses and discusses the practical benefits of the Success Canvas® (Varajão, 2016-2020). Based on an exploratory multiple case analysis, the case studies had as a common ground the filling of the canvas, followed by the opinion of each participant, aimed at contributing to a better understanding of the acceptance of the Success Canvas®. The results obtained in this study provided a positive answer to the question "Is the Success Canvas® a useful tool to assist project managers in the Information Systems field?", confirming the initial assumption of the need of a project management success-orientated canvas. The major contribution of this study was the clarification and answering of the research question "What are the main benefits of using Success Canvas® in Information Systems Project Management?". The results obtained in this study provided an answer to the research question, both confirming and extending the results from a prior study performed by Varajão *et al.* (2018). Some of these findings were able to be compared alongside with Varajão *et al.* (2018) study, were it was identified that the canvas helps at promoting a specific definition of success, a better comprehension of the different perspectives of the involved stakeholders, an improved focus of the crucial steps for achieving project success, the identification of criteria for evaluating success, and definition of milestones. Besides the consolidation of the benefits previously identified, it was showed that not only the Success Canvas® does in fact promotes a clear perception of success, it also helps the clarification, reflection and unifying of the different ideas that different participants and stakeholders of the project might have regarding the project's purpose and therefore, their perception of the meaning of success. Related with this, it was solidified the idea that every individual has a different perspective of success, even when the circumstances of the project are equal. As noted previously by multiple authors in the review of the existing literature, project success can be perceived differently according to

the project stakeholders (Varajão *et al.* (2018), Anantatmula *et al.* (2018), Foote and Halawi (2016), Barclay (2008)), and for this study it was confirmed this affirmation to be true. Providing a better project planning and improving overall project organization, were also crucial findings of this study regarding the usefulness of the Success Canvas®, and consequently the value that this canvas can provide when assisting project managers in the Information Systems field.

The results obtained, presenting, and organizing the findings across the multiple case studies, can be easily interpreted and encourage users to apply the Success Canvas® when managing their projects. Concluding, it was observed that managing the success of a project is not simple nor trivial. As addressed by Varajão *et al.* (2019), project management entails the need of several and complementary competences and it is a permanent challenge for project managers. As important as the intrinsically competences are for a project manager, the performance and outcome of a project will not depend entirely on them. The Success Canvas® aims at being a useful tool to help project managers implement success management practices effectively and efficiently.

5.2. Contributions

Being the first study related to the practical benefits of the Success Canvas® (Varajão, 2016-2020), this study contributes to the management of Information Systems projects in various aspects. From a theoretical perspective, demonstrates the importance of the adoption of a project management tool, embracing a better perception and understanding of the project's aspects for achieving a successful outcome. From a management perspective, both practitioners and researchers can use this multiple case study as a foundation to perceive core elements of a success-based project management canvas. For practitioners, this study provides an in-depth overview of the Success Canvas® in practice. With categorized advantages and disadvantages observed by other users, a project manager searching for a success-oriented management tool can easily decide if the canvas will provide a beneficial help to their project, based on this analysis. The Success Canvas®, focusing all the important aspects to identify when accessing a project's success, may help mitigate the risk of failure in Information Systems projects. The canvas also helps analyzing elements and areas where project managers may overlook when delineating their project and its crucial aspects. For researchers, this multiple case study provides empirical insights on the most important

assets required and appreciated on a success-oriented project management tool. Due to the scarce studies in the Information Systems area that focus on practical cases using canvas as management instruments, specifically examining project success, this study represents a significant opening for future applications of the Success Canvas®. As a complementary result of this study, two papers originated, with the collaboration of Margarida Sequeira, "Canvas for IT/IS - a literature review and a framework of canvas" and "Canvas as Management Tools – a Review and Framework", and another one is in progress.

5.3. Limitations and Future Work

The results of this study should be viewed considering two main limitations. First, this dissertation employs a multiple case study approach on two organizations of reputable Information Systems departments in Portugal. As noted by Benbasat *et al.* (1987), a multiple case study, allows for a cross-case analysis producing more general research results, helping validating and applying the theory generated in the present study. With that perspective in mind, generalizing the findings of this research and applying it to other industries and cultural backgrounds should be done with caution. Further empirical studies should be done applying the Success Canvas®, exploring other projects of areas besides Information Systems, and outside organizations with a well-established knowledge of IS project management concepts and practices. Upcoming case-based research could possibly replicate this study in other geographical contexts, industries and with different organization sizes. A research outside IS projects will allow the validation that the Success Canvas® can be applied to different types of projects, and a broader collection of industries should be considered to consolidate this viewpoint. As discussed earlier, this study provides empirical insights on the most important aspects required and appreciated in the canvas. Another additional avenue for future research would be to examine if the ranking of advantages and disadvantages, differs according to the different types of projects and industries. The second major limitation concerns that most of the cases under study were analyzed in a specific period, at the beginning of the projects. The limited time analysis of the case studies prevented the analysis from observing the full values, advantages, and benefits of the application of the Success Canvas®. A follow-up study would be interesting to be conducted, to examine the difference in terms of the user's perspectives about the long-term usage of the canvas. Further improvements should also be applied to the Success

Canvas® as pointed out throughout this dissertation, such as the addition of further explanations and practical examples of the concepts involved, and the supplemental organization when dealing with multiple answers and stakeholders' viewpoints for each element present in the canvas.

REFERENCES

Alario-Hoyos, C., Perez-Sanagustin, M., Cormier, D., & Delgado-Kloos, C. (2014). Proposal for a Conceptual Framework for Educators to Describe and Design MOOCs. *J.UCS Journal of Universal Computer Science, 20*(1), 6-23.

Albers, A., Bernijazov, R., Kaiser, L., Dumitrescu, R. . (2018). *Internet of Things Canvas for Ideation in Model-Based Product Generation Planning*. Paper presented at the 13th Annual Conference on System of Systems Engineering (SoSE).

Anantatmula, V. S., & Rad, P. F. (2018). Role of Organizational Project Management Maturity Factors on Project Success. *Engineering Management Journal, 30*(3), 165-178.

Azevedo, P., Filho, P., Freitas, F., Silva, S. (2019). Strategic Model Canvas: a tool proposition to optimize strategic planning. *Revista de Gestão e Projetos, 9*(3).

Baccarini, D. (1999). The Logical Framework Method for Defining Project Success. *PMI, Project Management Journal, 30*, 25-32.

Barclay, C. (2008). Towards an integrated measurement of IS project performance: The project performance scorecard. *Information Systems Frontiers, 10*, 331-345.

Benbasat, Goldstein, D. K., & Mead, M. (1987). The Case Research Strategy in Studies of Information Systems. *Mis Quarterly, 11*(3), 369-386.

Benbasat, I. (1984). *An Analysis of Research Methodologies, in The Information Systems Research Challenge*. Harvard Business School Press, Boston, Massachusetts: F. Warren McFarlan (ed.).

Benta, C., Wilberg, J., Hollauer, C., Omer, M. (2017). *Process model for data-driven business model generation*. Paper presented at the Proceedings of the International Conference on Engineering Design.

Bezerra, J., Hirata, C., Randall, D. (2015). A Conceptual Framework to Define Incentive Mechanisms for Virtual Communities. *J.UCS Journal of Universal Computer Science, 21*(9), 1107-1135.

Bjil, M., Delvin, J., Ruting, D. (2019). Process Model Canvas. Retrieved from http://www.processmodelcanvas.com/

Bonoma, T. V. (1985). Case Research in Marketing: Opportunities, Problems, and a Process. *Journal of Marketing Research, 22*(2), 199-208.

Campbell, A., Gutierrez, M., & Lancelott, M. (2017). *Operating Model Canvas*: Van Haren Publishing.

Carvalho, J. A., & Varajão, J. (2020). Digital Transformation Canvas. *ITx Canvas/Digital Transformation Canvas.* Retrieved from http://www.sciencesphere.org/ispmsig/dtc

Ciaglia, M. (2016). The Startup Canvas. Retrieved from https://thestartupcanvas.com/en/

Cicchetti, A., Sentilles, S., Ciccozzi, F., Carlson, J., Wohlin, C., Axelsson, J., Petersen, K., Papatheocharous, E. (2017). *The GRADE Decision Canvas for Classification and Reflection on Architecture Decisions*. Paper presented at the Proceedings of the 12th International Conference on Evaluation of Novel Approaches to Software Engineering.

CognitiveApplications. (2017). The Digital Strategy Canvas. Retrieved from https://www.cogapp.com/digital-strategy-canvas

DeLine, R., Rowan, K. (2010). Code Canvas: Zooming towards Better Development Environments *CM/IEEE 32nd International Conference on Software Engineering, 10*, 207-210.

DeLone, W., McLean, E. (2016). *Information Systems Success Measurement, Foundations and Trends in Information Systems*. Published by Now Publishers Inc.

DeLone, W. H., & McLean, E. R. (2003). The DeLone and McLean model of information systems success: a ten-year update. *Journal of Management Information Systems, 19*(4), 9-30.

DeLone, W. H., McLean, E. R. (1992). Information Systems Success: The Quest for the Dependent Variable. *Information Systems Research, 3*(1), 60-95.

Espinosa, A., Delone, W., Lee, G. (2006). Global Boundaries, Task Processes and IS Project Success: A Field Study. *Information Technology & People, 19*(4), 345-370.

Ferreira, R. (2019). *Project Management Change Canvas, University of Minho.*

Foote, A., & Halawi, L. A. (2016). Knowledge Management Models within Information Technology Projects. *Journal of Computer Information Systems, 58*(1), 89-97.

Forrester. (2018). Business Innovation Canvas. Retrieved from https://go.forrester.com/blogs/business-innovation-canvas/

Fraser, M. (2002). *Project Management: a conceptual framework for identifying components of reported project success - insights for Information Systems (IS) researchers*. Paper presented at the ACIS 2002 Proceedings.

Funck, B. (2018). The Personal Canvas. Retrieved from https://www.thepersonalcanvas.com/

Gray, K., & Ulbrich, F. (2017). Ambiguity acceptance and translation skills in the project management literature. *International Journal of Managing Projects in Business, 10*(2), 423-450.

Guo, J. X. (2019). Measuring Information System Project Success through a Software-Assisted Qualitative Content Analysis. *Information Technology and Libraries, 38*(1), 53-70. doi:10.6017/ital.v38i1.10603

Gustavo, H., Alexandre, S., Santos, S. (2018). *PBL Planner Toolkit, A Canvas-Based Tool for Planning PBL in Software Engineering Education*. Paper presented at the 2018 ACM/IEEE 40th International Conference on Software Engineering: Companion Proceedings.

Heberle, A., Löwe, W., Gustafsson, A., Vorrei, O. (2017). Digitalization Canvas – Towards identifying digitalization use cases and projects. *J.UCS Journal of Universal Computer Science, 23*(11), 1070-1097.

Hemmje, M., Bornschlegl, M., Berwind, K., Nawroth, C., Eljasik-Swoboda, T., Kaufmann, M. (2017). *Modeling and Qualitative Evaluation of a Management Canvas for Big Data Applications*. Paper presented at the Proceedings of the 6th International Conference on Data Science, Technology and Applications.

Hoang, N., Deegan, G., Rochford, M. (2013). *Managing IT Project Success: A Case Study in the Public Sector*. Paper presented at the Proceedings of the Nineteenth Americas Conference on Information Systems.

Ika, L. A. (2009). Project Success as a Topic in Project Management Journals. *PMI, Project Management Journal, 40*(4), 6-19.

Institute, P. M. (2000). *A Guide to the Project Management Body of Knowledge (PMBOK Guide)*.

Ivison, R. (2019). The Digital Transformation Canvas. Retrieved from https://medium.com/@ricardoivison/the-digital-transformation-canvas-a56b29ed219d

Joyce, A., & Paquin, R. L. (2016). The triple layered business model canvas: A tool to design more sustainable business models. *Journal of Cleaner Production, 135*, 1474-1486.

Jurina, K., Vrečko, I., Barilović, Z. (2013). Web 2.0 Technologies Supporting Project Management Needs. In (Vol. 9, pp. 219-226). Josip Juraj Strossmayer University of Osijek, Faculty of Economics, Croatia.

Kaplan, R. S. (1985). The Role of Empirical Research in Management Accounting. *Accounting, Organizations and Society, 11*(4-5), 429-452.

Klapperich, H., Laschke, M., & Hassenzahl, M. (2018). *The positive practice canvas*. Paper presented at the Proceedings of the 10th Nordic Conference on Human-Computer Interaction - NordiCHI '18.

Kline, W., Hixson, C., Mason, T. (2013). *The innovation canvas - A tool to develop integrated product designs and business models*. Paper presented at the 120th ASEE Annual Conference and Exposition.

Kozlowski, A., Searcy, C., & Bardecki, M. (2018). The reDesign canvas: Fashion design as a tool for sustainability. *Journal of Cleaner Production, 183*, 194-207.

Kuhn, A., Joppen, R., Reinhart, F., Roltgen, D. (2018). *A new methodology to analyze the functional and physical architecture of Data Analytics Projects*. Paper presented at the 28th CIRP Design Conference.

Lehmann, V. (2010). Connecting changes to projects using a historical perspective: Towards some new canvases for researchers. *International Journal of Project Management, 28*(4), 328-338.

Lüftenegger, E., Grefen, P., Weisleder, C. (2012). *The Service Dominant Strategy Canvas: Towards Networked Business Models*. Paper presented at the IFIP International Federation for Information Processing 2012

Marin, I. (2019). *Data Science and development team remote communication: the use of the Machine Learning Canvas*. Paper presented at the 14th International Conference on Global Software Engineering.

Maurya, A. (2010). The Lean Canvas. Retrieved from https://leanstack.com/leancanvas

McQuater, R. E., Scurr, C. H., Dale, B. G., & Hillman, P. G. (1995). Using quality tools and techniques successfully. *The TQM Magazine, 7*(6), 37-42.

Munns, A. K., & Bjeirmi, B. F. (1996). The role of project management in achieving project success. *International Journal of Project Management, 14*(2), 81-87.

Nagle, T., Sammon, D. (2016). The development of a Design Research Canvas for data practitioners. *Journal of Decision Systems, 25*(1), 369-380.

Ojasalo, J., & Ojasalo, K. (2018). Service Logic Business Model Canvas. *Journal of Research in Marketing and Entrepreneurship, 20*(1), 70-98.

Orellano, M., Neubert, G., Gzara, L., Le Dain, M. (2017). *Business Model Configuration for PSS: An Explorative Study*. Paper presented at the Procedia CIRP.

Osterwalder, & Pigneur. (2010). *Business Model Generation. A Handbook for visionaries, game changers and challengers*. Published by John Wiley & Sons Inc.

Osterwalder, A. (2016). The Mission Model Canvas: An Adapted Business Model Canvas For Mission-Driven Organizations. Retrieved from https://www.strategyzer.com/

Osterwalder, A., Pigneur, Y., Bernarda, G., & Smith, A. (2014). *Value proposition design: How to create products and services customers want*. Published by John Wiley & Sons, Inc.

Osterwalder, A., Pigneur, Y., Clark, T. (2010). *Business model generation : a handbook for visionaries, game changers, and challengers*. Published by John Wiley & Sons, Inc.

Oxford Online Dictionary. (2020). Retrived from https://en.oxforddictionaries.com.

Pan, G., Hackney, R., & Pan, S. L. (2008). Information Systems implementation failure: Insights from prism. *International Journal of Information Management, 28*(4), 259-269.

Papke-Shields, K. E., & Boyer-Wright, K. M. (2017). Strategic planning characteristics applied to project management. *International Journal of Project Management, 35*(2), 169-179.

Patanakul, P., Iewwongcharoen, B., & Milosevic, D. (2010). An empirical study on the use of project management tools and techniques across project life-cycle and their impact on project success. *Journal of General Management, 35*(3), 41-65.

Peter, M. (2018). Digital Transformation Canvas. The seven Action Fields of Transformation. Retrieved from https://www.marcpeter.com/s/Digital-Transformation-Canvas-Marc-Peter-English.pdf

Pize, A. (2015). PSA Canvas Model. Retrieved from https://www.canvasworld.com.br/psacanvasen

Plenter, F., Fielt, E., Hoffen, M., Chasin, F., Rosemann, M. (2017). *Repainting the Business Model Canvas for Peer-to-Peer Sharing and Collaborative Consumption*. Paper presented at the Proceedings of the 25th European Conference on Information Systems

Quelopana, A., Flores, V. (2018). *A framework for IS Project Success Analysis: a proposal*. Paper presented at the 13th Iberian Conference on Information Systems and Technologies (CISTI).

Reijers, W., Koidl, K., Lewis, D., Pandit, H.J., Gordijn, B. (2018). *Discussing ethical impacts in research and innovation: The ethics canvas*. Paper presented at the IFIP International Conference on Human Choice and Computers.

Ross, J. (2003). *The Importance of Political Influence in Enplaning Project Management Success Factors*. Paper presented at the 14th Australasian Conference on Information Systems.

Sankey, S. (2010). *Project Management in Information Systems - Art, Science, or Magic: Defining criteria for testing IS Project Ideas*. Paper presented at the UK Academy for Information Systems Conference.

Savolainen, P., Ahonen, J. J., & Richardson, I. (2012). Software development project success and failure from the supplier's perspective: A systematic literature review. *International Journal of Project Management, 30*(4), 458-469.

Schoormann, T., Behrens, D., Kolek, E., Knackstedt, R. (2016). *Sustainability In Business Models – A Literature-Review-Based Design-Science-Oriented Research Agenda*. Paper presented at the 24th European Conference on Information Systems (ECIS).

Shahin, A., Arabzad, M., Mazaher, G. (2010). Proposing an Integrated Framework of Seven Basic and New Quality Management Tools and Techniques: A Roadmap. *Research Journal of International Studies, 17*, 183-195.

Shenhar, A. (2001). One Size Does Not Fit All Projects: Exploring Classical Contingency Domains. *Management Science, 47*(3), 394-414.

Shenhar, A. J., Tishler, A., Dvir, D., Lipovetsky, S. and Lechler, T. (2002). Refining the search for project success factors: a multivariate, typological approach. *R&D Management, 32 (2), 111-126*.

Smirnova, I., Munch, J., Stupperich, M. (2014). *A Canvas for Establishing Global Software Development Collaborations*. Paper presented at the Communications in Computer and Information Science.

Spil, T., Effing, R., Both, M. (2016). *Enable, Engage and Evaluate: Introducing the 3E Social Media Strategy Canvas Based on the European Airline Industry*. Paper presented at the 15th Conference on e-Business, e-Services and e-Society (I3E).

Tandemic. (2019). The Social Business Model Canvas. Retrieved from http://www.socialbusinessmodelcanvas.com/

Tha, K. K. O. (2019). *Developing a Framework for User Participation in Information System Development Projects*. Paper presented at the 25th Americas Conference on Information Systems.

Thijs, V., Thomas, S., Stubben, S., Liengård, S., Vyrostko, M., Bonne Breum, N. (2016). Project Canvas. Retrieved from http://www.projectcanvas.dk/

Tranquillo, J., Kline, W., Hixson, C. (2016). *Making Sense of Canvas Tools: Analysis and Comparison of Popular Canvases*. Paper presented at the American Society for Engineering Education.

University of Minho, D. o. I. S. (2020a). Doctoral Program on Information Systems and Technology Retrieved from https://www.uminho.pt/PT/ensino/oferta-educativa/_layouts/15/UMinho.PortalUM.UI/Pages/CatalogoCursoDetail.aspx?itemId=3452&catId=10

University of Minho, D. o. I. S. (2020b). Integrated Masters of Engineering and Management of Information Systems Retrieved from https://www.uminho.pt/PT/ensino/oferta-educativa/_layouts/15/UMinho.PortalUM.UI/Pages/CatalogoCursoDetail.aspx?itemId=3680&catId=11

University of Minho, D. o. I. S. (2020c). Master in Information Systems. Retrieved from https://www.uminho.pt/PT/ensino/oferta-educativa/_layouts/15/UMinho.PortalUM.UI/Pages/CatalogoCursoDetail.aspx?itemId=3699&catId=11

Van Capelleveen, G., Amrit, C., Yazan, D. M., & Zijm, H. (2019). The recommender canvas: A model for developing and documenting recommender system design. *Expert Systems with Applications, 129*, 97-117.

Varajão. (2016). *Success Management as a PM knowledge area – work-in-progress*. Paper presented at the Conference on ENTERprise Information Systems / International Conference on Project MANagement / Conference on Health and Social Care Information Systems and Technologies / ProjMAN / HCist 2016.

Varajão. (2016-2020). Project Management Success Map® or Success Canvas®. Retrieved from http://www.sciencesphere.org/ispmsig/successcanvas/

Varajão. (2018). The many facets of information systems (+projects) success. *International Journal of Information Systems and Project Management, 6*(4), 5-13.

Varajão, J. (2018). Project Management Success Map ®. *Universidade do Minho*.

Varajão, J., Dominguez, C. , Ribeiro, P. , Paiva, A. (2014). Critical success aspects in project management: Similarities and differences between the construction and the software industry. *Tehnički vjesnik/Technical Gazette, 21*, 583-590.

Varajão, J., Magalhães, L., Freitas, L., Ribeiro, P., Ramos, J. (2018). *Implementing Success Management in an IT project*. Paper presented at the Procedia Computer Science.

Varajão, J., Silva, H., Pejic Bach, M. (2019). Key Competences of Information Systems Project Managers. *International Journal of Information Technology Project Management, 10*(3), 73-90.

Varajão, J., Trigo, A. (2016). Evaluation of IS project success in InfSysMakers: an exploratory case study. *ICIS*.

Willness, C., Bruni-Bossio, V. (2017). The Curriculum Innovation Canvas: A Design Thinking Framework for the Engaged Educational Entrepreneur. *Journal of Higher Education Outreach and Engagement, 21*(1), 134-164.

Yin, R. K. (1984). *Case Study Research, Design and Methods*. Published by SAGE Publications.

Yin, R. K. (2009). Case Study Research: Design and Method (4th ed.). *Canadian Journal of Action Research, 14*(1), 69-71.

Zavcer, G., Mayr, S., Petta, P. (2014). *Design Pattern Canvas: Towards Co-Creation of Unified Serious Game Design Patterns*. Paper presented at the 2014 6th International Conference on Games and Virtual Worlds for Serious Applications (VS-GAMES).

Zolnowski, A., Weiß, C., Böhmann, T. (2014). *Representing service business models with the service business model canvas - The case of a mobile payment service in the retail industry*. Paper presented at the 47th Hawaii International Conference on System Sciences.

APPENDIX 1

Processing of the responses by case

The present section serves as a demonstration of the transcription, sorting and organization of the information by case. It is important to refer that Case G represents the only case not present in this section, since all the information had been previously analyzed and organized by the author of the Success Canvas® (Varajão, 2016-2020).

Case A

SUCCESS CANVAS
MULTIPLE CASE STUDY

A. PHD in Information Systems Technology (PDTSI) 2017-2018 (V0.6 - success map)

1. Identify the relevant aspects to achieve success in the four years of this doctoral program;
2. Performed in the first year of the PHD, each student filled the canvas based on their doctoral thesis, analyzing the most relevant aspects.

	I - Identify the project	II - Define "success" in your project	III - Identify the stakeholders of the project	IV- Identify the deliverables of the project	V - Identify the expected benefits of the project	VI - Identify the main "time frames" of the project	VII - Identify the criteria for evaluating success	VIII - Identify the external operations related to the project	IX - Identify the success factors of the project	OPINION OF THE INQUIRED	COMMENTS
Inquired 1	PHD in Process Engineering	Improve knowlegment in the area of study; achieve the objectives defined in the study results	Identified correctly ✓	Identified correctly ✓	-	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Positive	Defining critical and main tasks during the projects; prioritize time according to tasks; organize ideas/time/deliverables/papers; design a risk plan to support and antecipate some problemas during the 4 years; define factos and direct behaviours to achive those factors
Inquired 2	PHD in Data Mining Artificial Intelligence	Contributing with knowledge to the scientific community	Identified correctly ✓	Identified correctly ✓	-	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Positive	Helps organize critical and main tasks of the project
Inquired 3	PHD	Finish in 4 years, top of the class	Identified correctly ✓	Identified correctly ✓	-	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Positive	Serves as a roadmap to achieve the success established in the beggining of the PHD, working as a robust and visual way to respond to changes during the PHD. Keep track of what have been achieve, focus resources.
Inquired 4	PHD	Finish on time; adding value to the organizations; feel confortable applying the discovered knowledge	Identified correctly ✓	Identified correctly ✓	-	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Positive	Helps ensure project success; Identify weaknesses in plan; Get clarity about the riskes and how to mitigate them; To establish relationships between stakeholders, success criteria and plan execution; Focus on planning the deliverables and understading the success factors and external operations might be affecting the plan.
COMMON ANSWERS & CONCLUSIONS			Student; Supervisor; IS Department; University; Organization involved in the project	Thesis; Papers; Artifacts; Literature Review	-	Thesis; Papers; Artifacts; Presentation	Publish in journals and conferences ; alignment with the superisor metrics/ requirements/ expectations; Acceptance of the papers in recognized journals	Administrative services; E-learning platforms (access); Access to data resources	Complete within Timeline; Effective Communication; Keep funding; Self enthusiasm; Good mitigation; Priotization of the key subjects	-	-

Figure 15 - Categorization of the responses - Case A

Case B

Group 12	Caso de Estudo Primavera BSS	Characterization and analysis of the organization, clarifying the role of information systems and IS management	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	All criteria can be evaluated using a scale from 0 to 100. - The setting must not be changed - The benefits are the same for the different stakeholders	Neutro	It provides a significant focus on the relevant aspects at each stage of the project. It allows organizing and structuring and evaluating the various aspects inherent to the management of the project leading to a successful final solution. Disadvantage: The poor elaboration of the map may result in decontextualized scenarios which will lead to an unsuccessful, poorly
	Caso de Estudo Primavera BSS	Characterization and analysis of the organization, clarifying the role of information systems and IS management	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	The definition should be updated. Different benefits for different stakeholders.	Neutro	Advantage in the perception of various topics and global vision about the company's success. Gain new perspectives on the success of a project. Difficulty in obtaining the various topics of the project and definition of the critical factors of success, more specifically in the definition of success
Group 11	Wintouch	Effective characterization of IS management and function	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	The definition should be updated. Different benefits for different stakeholders.	Positive	Better view of stakeholders, deliverables, benefits, criteria, external operations and factors. Better perception of what phases they are inserted in.
	Wintouch	Reliable and clear characterization of the company taking into account the company's IS function and IS management	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓ Divided into work team and company	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	The definition should be updated. Different benefits for different stakeholders.	Neutro	Advantages: In-depth knowledge about the project and its surroundings in order to direct it more accurately. Standardization of project ideas between the team and the teacher, namely criteria and benefits. Acquired knowledge. Disadvantage: Time spent
Group 21	Câmara Municipal de Guimarães	Understand and describe the role of a public organization's information system	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	UC Grade	Positive	Orientation and contextualization about the project and to be developed, as well as unify the ideas of the project. Identify the weaknesses of the project in order to be corrected.
Group 15	Exército Português	Effective characterization of IS management and function	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	The definition should be updated. Different benefits for different stakeholders.	Positive	Important in terms of cohesion of the project's success criteria, of the factors to better define our objectives and have a perception of what is expected at the end of the project
Group 16	Hospital de Braga	Clear and intuitive understanding of how the hospital organizes information technologies and systems	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Should no be updated.	Neutro	Transparency and clarity of the project. Structuring work. Disadvantage: Time spent on elaboration
	Hospital de Braga	Clear and intuitive understanding of how the hospital organizes information technologies and systems	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Should no be updated.	Neutro	Better understanding of the project, working as a reference, giving comprehensive notions of the project. Disadvantage: it must be a periodic exercise, as the projects are constantly changing.
Group 42	Multinacional do ramo automóvel	To be able to understand the IS function and the role of the manager	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Should no be updated.	Neutro	It allows us to understand how complex the definition of success is, which can vary according to the perspective of each stakeholder. It allows defining the criteria to be followed for the project to be successful. It allows you to define what you want to achieve for the project's success. Disadvantage: Difficulty in reconciling the views of different stakeholders
Group 31	---	Good characterization of the function of information systems and helping the company to implement new methodologies for system management.	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Should no be updated.	Neutro	Make a management of expectations. Control who the stakeholders are and their motivations. It collects constant structured feedback. Project roadmap control. Disadvantage: Time allocated for the realization. Inadequate identification of the elements of the success map
Group 43	---	The result of our work being easily understood by others	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Should no be updated. Should not have different criteria	Neutro	Understand the customers' perspectives. Better plan the project. Disadvantage: Non-intuitive map.
Group 45	SC Braga	To be able to understand the IS function and the role of the manager	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Should no be updated. Should not have different criteria	Positive	It allows to identify: compliance with deadlines; the fulfillment of the phases identified at the beginning of the project; organization of work to meet criteria and objectives; task management; the likelihood of success on the project.
Group 8	Ordem dos solicitados	To be able to understand the IS function and the role of the manager	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Should no be updated. Should not have different criteria	Neutro	Definition of stakeholders, deliverables (...) that influence the project; Global vision of the project; Identification of any problems or limitations that are not well defined in the development of the project. Disadvantage: Limitation of space to define ideas; Little detail regarding each topic
COMMON ANSWERS & CONCLUSIONS			Professor, Work Team, Organization in study and their representitive, University of Minho, FSI Company's responsible, Other teams of the UC	Organization Analysis Report; Presentation; (Relatório do Papel das Tecnologias e Sistemas de Informação nas organizaçõesII/Relatório da função de sistemas de informaçãoII/Relatório da gestão de sistemas de informaçãoII/Relatório da descrição da organizaçãoII/ Guião de recolha de dadosII/ Apresentação dos resultados)	Improve operations and organizational's processes; Understand the reality of na organization. Better understand the role of information systems and technologies in organizations; Understand the role of information systems and the management of information systems; Improve communication with the outside world; Improve the information system; Reduce IS failures; Improve customer service; To better understand the role of FSI and the company; Promote IS, their importance and respective managers; Understand the current state of the company regarding the adoption of IS; How some IS technologies can be integrated into the workplace; Knowledge gained about the company's information systems function, knowledge gained about the other companies presented, obtaining credits related to uc, Acquisition of new knowledge of information systems	Scrip construtor; Obtain data; ETL data; Presentation of results	client's receptivity to the work team's suggestions; data quality; customer satisfaction; quality of guidance; good analysis of the data collected; good interpretation of data provided by the company; good communication between the client and the work team; delivery on the stipulated dates; Work quality; Acquire knowledgment; Information quality and aplly; degree and quality of information acquired about the company's IS; Presentation of true and real results; Understand the information from the client; Script with well structured questions; Positive feedback from the professor in the course of the semester, Timely delivery of deliverables; Proper application of concepts, Feedback from stakeholders; Structure of the results presented, Sources used to collect information	Failure in google drive/google docs, scopus, wos; company willingness to answer questions; Failure in equipment; Availability and quality of information obtained in the company or scopus / wos services	communication between the team and the organization under study; compliance with deadlines; good project management; good interpretation of the requirements expected by customers; good communication within the team, stakeholders; Availability of the company representative; availability of the working group; Commitment and proactive attitude of all members of the group		

Figure 17- Categorization of the responses - Case B, Pt. II

Group 44	Estudo de Caso Natixis	Have a clear description of the role of information systems and the duties of the IS manager in a large company	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Relevance, consistency, framing within the UC context. ----- No, each stakeholder has a different set of benefits and criteria, in addition to different weights for each benefit or criterion. ---- Should be updated. Different criteria can be perceived throughout the project.	Positive	It is a tool that promotes reflection on fundamental factors about the success of the project.
	Estudo de Caso Natixis	Have a clear description of the role of information systems and the duties of the IS manager in a large company	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	No, each stakeholder has a different set of benefits and criteria, in addition to different weights for each benefit or criterion.	Positive	The use of the mapping of the success of a project brings advantages in the sense that it allows to have an overview of all the components developed and thus adjust the processes according to the evaluation carried out
Group 14	Estudo Aplicado à organização GidaCarnes	Monitoring the evolution of the sector's information systems	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓ Divided into work team and company	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Success criteria: 1. Number of questions asked in order to answer the following questions; 2. Greater detail in the information (0% to 100%); 3. Correct application of knowledge (0% to 100%); 4. Percentage obtained weekly (0% to 100%); 5. Coherent descriptions and applied to the area in question (0% to 100%). ----- Benefits: Differentiated in section V. --- Not updated	Neutral	Wide view of a project and ease of crossing between the various sections. Disadvantage: Difficulty in measuring the success criteria, if there was an auxiliary table with examples of success criteria and we are going to evaluate them, it would be easier in the execution.
	Estudo Aplicado à organização GidaCarnes	Reflection of the company in relation to its information systems and what it is willing to change / add for a better functioning of it.	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓ Divided into work team and company	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Should not be updated.	Neural	Perception of the steps to take into account in project management. In case the Success map is not well prepared, the team is not strictly followed, its creation becomes a disadvantage
Group 34	Gestão de SI da Câmara Municipal de Braga	Characterization of the information system of the city council of braga	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Criteria: 1. is or is not delivered on time. 2. Discount for each task not performed - No, each stakeholder has a different way of evaluating the project and each stakeholder has its own benefit. - They changed to perceive themselves in the municipal chamber of braga	Positive	Beneficial. Helps to plan better and find critical success factors, makes it easier to understand where we should focus more
	Gestão de SI da Câmara Municipal de Braga	Grade above 15	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Should not be updated.	Positive	It gives thought and will cause the redefinitions of the previous fields, with this leads in the end to the best and clearest definition of the objectives and perception about the work to be done and how to do it, as well as the organization of it
Group 17	Descrição do departamento de sistemas de informação da TUB	Get a detailed analysis of the IS department and its functions	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	The criteria can be measured: 1. Analysis of information sources, verification if the articles are scientifically proven; 2. Complexity / diversity of responses to the script; 3. Synthesize the data; 4. Consistency of the results with the supporting arguments. The benefits and criteria are different for each stakeholder.	Positive	Clarification of ideas, benefits, objectives, criteria involved in the project; Clarification of the stages of the project; Time mapping of all factors involved.
	Descrição do departamento de	Understand and describe the role of the information systems department and								Benefits are different for each		1. Organization of ideas; 2. Mapping and crossing information; 3. Definition of all stakeholders and their actions; 4. Approaching the achievement of the

Figure 16- Categorization of the responses - Case B, Pt. I

Case C

SUCCESS CANVAS
MULTIPLE CASE STUDY

C. Master's in Information Systems (MSI) 2015-2016 (V0.6 - success map)

1. Study performed in the first year of the Master's;
2. Performed in groups;

	I - Identify the project	II - Define "success" in your project	III - Identify the stakeholders of the project	IV- Identify the deliverables of the project	V - Identify the expected benefits of the project	VI - Identify the main "time frames" of the project	VII - Identify the criteria for evaluating success	VIII - Identify the external operations related to the project	IX - Identify the success factors of the project	OPINION OF THE INQUIRED	COMMENTS
Group 1	Master's dissertation	Finish the dissertation; Obtaining a grade higher or equal to 16; Produce artifacts relating to the theme of the dissertation.	Identified correctly ✓	Confusion between the document and thesis, the document is the deliverable and not making the thesis. Finishig the master's is not a deliverable	-	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Positive	-
Group 2	Master's dissertation	Finish the dissertation; Attain defined goals	Identified correctly ✓	Identified correctly ✓	-	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Positive	Better perception of the dissertation process regarding the difficulties that may arise, organizint ideas, trace and improve goals. Keepp track of all the phases with the advantage of being updated alongside of the time and project demands. Each user of this map can define its way to achieve the success.
Group 3	Master's dissertation	Find constructive conclusions that can allow a future investigation.	Identified correctly ✓	Identified correctly ✓	-	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Positive	Help guide and plan the plan of activities in project management. Gives a general view of the main topics to develop in the project. Allows a continuous update of the goals, stakeholders and identify new dificulties in the time course of the project.
Group 4	Master's dissertation	Produce artifacts relating to the theme of the dissertation.	Identified correctly ✓	Identified correctly ✓	-	Identified correctly ✓	Identified correctly ✓	Confused lack of financial resources as a external operation	Identified correctly ✓	Positive	Reflect on the most important focus to keep track of the process of development of IS Projects. Allows to define sistematic evaluation porcesses in the different phases of the project.
COMMON ANSWERS & CONCLUSIONS			Students; Advisors; Avaliation commite; Family; Company (when applied); University	Clentifical articles and publications; Presentation			Firme theories; clear writing; valuable academic contribuction	Enquirees answers; review of articles and publishing times; Obtain data	Correct time management; work ethics and method; Cost, risk and resources management; Cooperation with external entities; Regular mettings with the advisor	-	-

Figure 18- Categorization of the responses - Case C

Case D

SUCCESS CANVAS
MULTIPLE CASE STUDY

D. UC PTSI (Project in Technologies in Information Systems) 2019 (current version)

1. For the magazine;
2. With the perspective of the client and the team;

	I - Identify the project	II - Define "success" in your project	III - Identify the stakeholders of the project	IV- Identify the deliverables of the project	V - Identify the expected benefits of the project	VI - Identify the main "time frames" of the project	VII - Identify the criteria for evaluating success	VIII - Identify the external operations related to the project	IX - Identify the success factors of the project	OPINION OF THE INQUIRED	COMMENTS
Team Member 1	PTSI-UISPM	Achievement of objectives ensuring resource efficiency. Results are used in the context of improving the organization. Ensure that the plan is adhered to the maximum trying to satisfy all the requirements of the client.	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Confusion	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Mainly Positive + Disadvantages	Advantages: succinct and easy to use; easy comparison / discussion; takes into account the project time; provides project overview Disadvantages: time frame is not well explained; success criteria are not measured.
Team Member 2	Improve workflow of the UISPM magazine	[Divided the success definition into client and project team]	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Positive + Disadvantages	Useful, allows to obtain an overview of measures and factors that can affect the success of the project. Advantages: early perspective of the elements that can affect success + easy understanding of the needs of the client and the team. Disadvantages: there is no way to measure the success criteria
Team Member 3	UISPM 2019	[Divided the success definition into client and project team]	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Positive + Disadvantages	Information organized by the appropriate areas; allows you to comfort different perspectives and more easily identify some conflicts Disadvantages: does not define how to measure the criteria described
Team Member 4	UISPM 2020	[Divided the success definition into client and project team]	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓ criteria only applied to the client	Identified correctly ✓	Identified correctly ✓	Positive + Disadvantages	It makes it possible to compare different perspectives on the success of the project (team, client, ceo, etc.) when carrying it out; assists in the development of the component related to the project's success; useful exercise that addresses all components of success Disadvantages: does not identify how to measure, only what to measure; may be limited by the number of stages / frames of the project (possibly unnecessary for large projects).
Client / Editor-in-chief / General manager	PTSI-UISPM	PTSI-Achievement of objectives, ensuring the efficiency of their achievement. Production of the results that will effectively be used to improve the magazine.	Provider, Cliente (me)	website, OJS (plataforma open source para gestão da revista - open journal system), BPMN as is, BPMN to be, Documentação suporte OJS, Documentação suporte ferramente edição; Documentação de suporte ferramenta de edição	Improved image of the magazine, Improved the process of submission and review of the magazine, Improved the editing process, Improved the indexing process	Identified correctly ✓	Time, Budget, Objectives, Level of fulfillment of requests for change of scope, Entry into production of solutions (website, OJS, editing tool), Quality of documentation, Quality of applications, Support requests, Increasing the quality of the magazine, Improvement of productivity in the management of the magazine	Identified correctly ✓	Frequent communication (eg regarding the progress of the project), frequent updating of the solution under development, supplier compliance, availability of everyone to meet, kindness in the deal, quality of work	Positive + Disadvantages	Advantage: it forced you to reflect on the meaning of success, particularly on its influencers and metrics Disadvantage: Once completed, as in the time frames only the codes (metrics, etc.) are placed, it can be difficult to identify what is important at each moment because it requires the redoubled effort of crossing between elements.
COMMON ANSWERS & CONCLUSIONS		Client: Compliance with the objectives, ensuring efficiency in the use of resources; Results actually used / implemented in the context of the organization. Team: Team satisfied with the work done; Compliance with project deadlines; Customer satisfaction; Budget compliance; Customer usability (if the customer's process has improved and if the customer uses it)	Sponsor; Client; Financial and Commercial Director; CEO; Project Team	Website; Support documentation	Improve magazine look; Improve process of submission and review; Aquire experience (for the team)		Increase in the number of quality submissions; compliance with deadlines, budgets and objectives; level of service to change the scope; entry into production of the 3 solutions (editing support tool, OJS, website, quality of the system; quality of documentation; number of support requests	api's used for the editing support tool; changing word templates (.docx); server's ability to support processing and storage; infrastructure	frequent communication; frequent presentation of solutions under development; discussion of important decisions with the client; supplier commitment; availability of everyone to gather; quality of work	-	-

Figure 19- Categorization of the responses - Case D

Case E

SUCCESS CANVAS
MULTIPLE CASE STUDY

E. PHD in Information Systems Technology
2019-2020 (current version)

	I - Identify the project	II - Define "success" in your project	III - Identify the stakeholders of the project	IV- Identify the deliverables of the project	V - Identify the expected benefits of the project	VI - Identify the main "time frames" of the project	VII - Identify the criteria for evaluating success	VIII - Identify the external operations related to the project	IX - Identify the success factors of the project	OPINION OF THE INQUIRED	COMMENTS
Inquired 1	Not identified	A significant contribute for the research community; compliament with the plan; setting skills	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓ but not applied to the matrix	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓ Is PHD output a success factor?	Positive	Usefull to improve the success of the organization (improve their results and outcomes); To organize and plan the project success and obtain the critic points where we need to be more careful to obtain success.
Inquired 2	Not identified	Reach the goal and finalize the research obtaining the expected results.	Identified correctly ✓	Identified correctly ✓	Not identified correctly	Identified correctly ✓ but not applied to the matrix	Identified correctly ✓	Not identified correctly	Not identified correctly	Positive	Time, scope and cost need to be considered for achiving project management success.
Inquired 3	PHD	Finishing in the expected time, well-graded.	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓ but not applied to the matrix	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Positive	Helps the organization to set the important variables of the project (benefits, stakeholders...) before it starts; Makes the evaluation of success easier because the goals where set beforehand; Helps the organization to plan projects in a more mature way.
COMMON ANSWERS & CONCLUSIONS			Student; University; Research groups & institutions; supervisors; Research community; Department	PHD thesis; publications; Final presentation; Reports;	Improve research skills; More knowledge area; Personal growth; Expertise in the area of research		Functional output (results applied and evaluated in real context); evaluation phd thesis; evaluation of supervisors; time; Grade; Hours of work/time to complete; Monetary cost	Feedback of supervisors; institution support; academic services and department support; Obtaining data; Software support;	Communication with supervisors; Follow the dissertation plan	-	There are benefits from creating a PM Success Map?

Figure 20- Categorization of the responses - Case E

Case F

SUCCESS CANVAS
MULTIPLE CASE STUDY

F. PHD in Information Systems Technology (PDTSI) 2018-2019 (current version)
11/14/2018

	I - Identify the project	II - Define "success" in your project	III - Identify the stakeholders of the project	IV- Identify the deliverables of the project	V - Identify the expected benefits of the project	VI - Identify the main "time frames" of the project	VII - Identify the criteria for evaluating success	VIII - Identify the external operations related to the project	IX - Identify the success factors of the project	OPINION OF THE INQUIRED	COMMENTS
Inquired 1	My PHD	Make a contribution with new knowledge and impact society with a practical contribution.	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓ but not applied to the matrix	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Positive	It is important to keep track of progress to know the relevancy of each phase and to be aware of deliverables and timeframes. It keeps a project stuctured in what concerns the factors for its success. Although it looks very much like the Business Model Canvas, it complements it, showing a different perspective.
Inquired 2	My PHD	Obtain a PHD diploma from IST department in Uminho	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓ but not applied to the matrix	Identified correctly ✓	Identified correctly ✓ Related to risk management commentary	Identified correctly ✓	Positive	What are the benefits to create a project management map? 1. have a plan; 2.manage risk; 3. prepare for what is comming; 4. know the challenge size; 5. know the stakeholders and their different perspectives
Inquired 3	My PHD	Finish on the expected time, within resources, (money, healthe, physical health)	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓ but not applied to the matrix	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Positive	The to plan gets you thinking about the process; Plan to succeed
Inquired 4	Blockchain in context of government	Discovering advantages & disavantages and applications about the technology that improve the governance and bring benefits for society.	Identified correctly ✓	(contribution for body of knowledge not a deliverable) Partially identified correctly ✓	Identified correctly ✓	Identified correctly ✓ but not applied to the matrix	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Positive	Usefull. Help for the think ahead in the ways for the thesis. This ways it is possible review the walks for a good elaboration of the thesis.
Inquired 5	My PHD	Acomplish all the objectives that are related to the project: Deliver the PHD thesis	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓ but not applied to the matrix	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Positive	It is a visual way to se success and measure it. It has the definition of our objectives. It provides a better understanding and wide view of the project in its all and we can go the smaller objectives and check indivally.
Inquired 6	My PHD	Find the gap in research; Build artifact that fixes the gat; Bring new knowledge for community	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓ but not applied to the matrix	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Positive	Simple way to organize/manage the work/project. Clarify the objectives and deadlines. If we have a way to measure success we can focus to get this success.
Inquired 7	Knowledge management impact sustainable development/ Complex concept / Multi dimension	Improve knowledge about my area; Discuss with some experts; Collect articles and books related to my area; to get information and data	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓ but not applied to the matrix	Identified correctly ✓	Not identified	Identified correctly ✓	Positive	Advantages: 1. Different perspective for the area; 2. Gant chart and schedule about your projects; 3. Can clear about objectives, keywords and goals; 4. Analyze the variables and understand the concept; 5. Find question between two variables and what is effect to other; 6. Make the plan to improve the area; 7. Finally, the project will success with the map or plan.
Inquired 8	My PHD	Present the thesis and with the result approved.	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓ but not applied to the matrix	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Positive	Didint concentrae just in scope, time and cost. As a Canvas, you have in one sheet what is the most important to succes for your project. You open your mind for the success, not about only deliverables and benfits. You can plan what you need to do in different aspects. (criteria, factors, benefits) and in different time. You can plan before and after your project, that is not common.
Inquired 9	My PHD	Have users that can use the solution presented regurarly (w/ some frequency)	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓ but not applied to the matrix	Identified correctly ✓	Identified correctly ✓	Identified correctly ✓	Positive	Help us to better understand and define the global scope of our phd project, to understand the main stakeholders that will interact with our project. Also, it provide a brief introduce about some aspects to be considerate in order to achieve the success of our project.
COMMON ANSWERS & CONCLUSIONS			Student; Supervisor; Academics (University/Department); Non profit organizations (society); Family; Goverment Research community; Company and clients (when applied); Employers in institution; Coleages from the institute; Cientific community	Thesis(report)+ Thesis Plan; Publications (journals/conferences); Presentations; Outputs (model/framework); it functional artifacts (code, etc);	Increase knowledge (expertise); Have a PHD degree; UM Reputation; Personal growth; Contribution to the research community/university; Help improve society contribution for body of knowledge; Contribution to government business (artifacts/processes); improve society; Improve english; Prestige in the family (first phd); Have good relationship between end user using the artifact; User satisfactions; Approved		Approved with distinction; Grade; Contribution to knowledge; Robusteness of the research; Argument defense; Articles pplished and accepted; Social impact; Thesis approved by the Juri; Guarantee of scientific rigour; Discussion performance; The acceptence of the project by the client; IT Artifact innovation; Discussion performance; Social impact and contribution	Juri contribution; Political situation; Publishers schedule/acceptance; Timetable/schedule of the Juri/supervisor; Acess to the informations in public agencies or others necessary information besides the literature; The client not delivering data, and answering questions and doubts in time; Critical data access	Time management (work the defined hours); Be aware of conferences call for papers; Regular meeting with supervisor in order to keep him informed; Satisfied supervisor; Get approval of the articles; Get a scholarship; Put pressure on myself	-	

Figure 21- Categorization of the responses - Case F