

A Direct Research, presented as part of the requirements for the Award of a Master's degree in Management, Area of Expertise in Sustainability from the Nova School of Business and Economics.

REDEFINING THE SUCCESS CRITERIA OF PROJECTS TO ENCOMPASS
THEIR ENVIRONMENTAL IMPACT

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20-12-2023

Abstract

Projects are a vital element of our current economic development. Nevertheless, climate change is an increasingly present issue. Engagements for both countries and companies have been mandated to limit the impact of the current climate crisis. As projects are the main activities for companies, they are suitable candidates for the integration of sustainability concerns. Hence, this paper argues for integrating a project's environmental impact into its success criteria. Three approaches are proposed: imposing environmental reporting requirements, incorporating sustainability into the current quality and scope success criteria, and tailoring project financing towards sustainability.

Keywords: Project management, Project success, Sustainability, Sustainable project success

This work used infrastructure and resources funded by Fundação para a Ciência e a Tecnologia (UID/ECO/00124/2013, UID/ECO/00124/2019 and Social Sciences DataLab, Project 22209), POR Lisboa (LISBOA-01-0145-FEDER-007722 and Social Sciences DataLab, Project 22209) and POR Norte (Social Sciences DataLab, Project 22209).

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1. Introduction

Projects are a crucial element of our current economic development (Shirazi 2017, 395) and account for “up to 1/3 of global GDP is realised through projects” (Silvius & Schipper 2014a, 32). Nevertheless, climate change is an increasingly present issue as engagement for both countries and companies has been mandated during the COP21, which resulted in the Paris Agreement. As projects are the main activities for companies, generating general economic activity, they are suitable candidates for integrating sustainability concerns. However, traditional project management does not consider sustainability as a critical factor. Hence, this paper argues for integrating a project’s environmental impact into its success criteria. In doing so, an in-depth literature review was conducted, which is presented in **Section 2**, developing the concepts of project management success before analysing what is understood under sustainability and combining it all to look at sustainable project success. Then, **Section 3** develops the methodology used to elaborate this paper, explaining the dual approach of combining a literature review and an empirical survey which was adopted. Furthermore, it goes in-depth into how the literature review was conducted, how the survey was crafted, and the answers collected. **Section 4** provides an analysis of the data gathered from the study, firstly question by question and later by combining relevant results to extract further conclusions. A proposed answer to each research question (RQ) is developed based on the empirical results. **Section 5** expands these solutions to the research questions. In doing so, subsection **5.1** answers RQ1 by analysing how imposing sustainability reporting standards to projects will help their success criteria encompass their environmental impact, providing a review of the ISO14000 standards, and deepening the concepts of Environmental Impact Assessment and Life Cycle Assessment. Then, RQ2 is answered by subsection **5.2**, arguing for incorporating sustainability into the two most important success criteria: quality and scope. Finally, **Section 6** provides

concluding remarks, including a general conclusion, the limitation of this paper, as well as recommendations for future research.

2. Literature Review

Looking at the available publications, it is essential to note that it is a young field of research, as it only emerged in 2016 (Khalifeh, Farell, & Al-edenat 2020, 464). Nevertheless, despite this, “the relationship between project management and sustainability is rapidly gaining interest from professionals and academics” (Martens & Carvalho 2017, 1098) as project managers “are concerned about topics related to environmental sustainability” (Martens & Carvalho 2017, 1098). From the academic perspective, one can see a dominance of one author on the subject of sustainable project management success as “most of the identified contributions were (co)authored by Gilbert Silvius” (Friedrich 2023, 40), as most papers being published in the “Journal of Cleaner Production” (Friedrich 2023, 41).

2.1 Defining a project’s success: the literature’s view and frameworks

Firstly, it is essential to note that projects have been estimated over the last ten years to contribute to “about a third of the world gross product (the total global GDP)” (Økland 2015, 103), (Friedrich 2023, 32), which underlines the importance of studying and improving them. Furthermore, projects themselves have been looked upon as companies. Indeed, empirical research has found that projects are “temporary, task-oriented organizations” (Silvius & Schipper, 2014b, 41), which allows for the application of the exact expectations, standards, and theories on both companies and projects. This concept will be further developed later in **Section 7**. Hence, as it is the case for companies, a variety of standards, frameworks, as well as empirical studies are available to discuss, define, and assess their success. The academic literature, on the one hand, has found the “current standards for project management [to] reflect a narrower perception of project success” (Silvius & Schipper, 2014a, 75). This narrow view is “still largely dominated by the ‘iron triangle’ considerations of time, cost and quality” (Silvius & al.,

2017, 1134). This traditional view of success, however, has not been deemed satisfactory as the conventional project management view of controlling time, budget and quality is based on predictability that is not feasible (Silvius & Schipper 2014a, 79).

On the other hand, various standards offer their definition of a project's success. The PMBOK, which is published by the Project Management Institute (PMI), is the most widely used in the industry as well as the most commonly cited in the literature. A project's success is defined as fulfilling "six project performance variables" (Silvius & Schipper 2014a, 75), being scope, costs, time, risk, quality, and resources (PMBOK, 2021) will be used as reference for this paper. The ISO standards, more specifically the ISO 21500:2012 "Guidance of Project Management", define a project's success using only three criteria, being cost, scope and time (ISO 21500 2023.). Empirical research advocates for "a more holistic and less mechanical approach" (Silvius & Schipper 2014a, 78-79) to project management's success, excluding the ISO's definition for this paper.

Nevertheless, it is critical to note that none of the aforementioned definitions include sustainability concerns, which have been reported and criticised in the academic literature. Indeed, empirical studies "observe a discrepancy between the standards for project management competencies and the competencies that are required for considering sustainability" (Silvius & Schipper 2014b, 41) as decisions in project management are dominated by the 'iron triangle' considerations of time, cost and quality" (Silvius, & al. 2017, 1134). More generally, "sustainability considerations are regarded as external to the basic project" (Økland 2015, 103).

2.2 Defining sustainability

To begin with, it is essential to note that the notion of sustainability seems to have replaced corporate social responsibility (Økland 2015, 104). Nevertheless, "Sustainable development has been on the UN agenda for over forty years since the first Conference on the Human Environment in Stockholm, 1972" (Økland 2015, 104), and especially since the

Brundtland Commission in 1987. This commission offered the most widely used definition of sustainability, which is the “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (Brundtland 1987). Nowadays, it has been rephrased as “sustainability is about consuming income, not capital” (Silvius & Schipper 2014a, 70). In absolute, sustainability can be thought of as trade-offs (Økland 2015, 104).

These considerations and the view of sustainability as trade-offs between social, ecological, and economic concerns have led to the development of the “Triple Bottom Line” framework, which is, to date, the most common way of approaching sustainability (Silvius & Schipper 2014a, 67). Indeed, ten years ago, academic literature stated that “the triple bottom line concept captures the essence of sustainability” (Gareis & al. 2013, 2), which is composed of “environmental factor, financial factor and social factor” (Chawlaa & al. 2017, 162). In essence, the TBL is the mitigation of negative impacts on the environmental, social, and economic aspects of any activity, including projects. Nevertheless, this definition of sustainability is not unanimously accepted throughout the academic literature. Indeed, authors such as Braungart and McDonough have voiced critics of this definition. Indeed, in their book, the authors advocate to not simply do “less bad” (Braungart & McDonough 2002), referring to the TBL, but to do “more good” (Braungart & McDonough 2002). To achieve this, the authors refer to “principles [such as] ‘waste equals food’, suggesting continuous cycles of production and consumption, without waste” (Silvius & al. 2017a, 1135).

2.3 Defining sustainable project success

To begin with, it is essential to note that the only sustainability concern in project management frameworks is stakeholders’ engagement (Silvius & al. 2017, 1134), which falls outside the scope of this paper’s definition of sustainability. Thus, the link between sustainability and project management is interesting to explore, as “the intersection between

these two fields is still rarefied with just a few studies that have focused on both topics” (Martens & Carvalho 2017, 1084). One may argue that both fields of studies are inherently intertwined as “integrating sustainability in project management will influence the specifications and requirements of the project's deliverable or output, and the criteria for project success” (Silvius, 2017 1485). This can be seen throughout the literature as research concludes that the relationship between sustainability and project management is not addressed enough in the literature (Khalifeh & al. 2020, 464). Furthermore, authors argue that “the bridge between project management and sustainability is still being built” (Carvalho & Rabechini 2017, 1120), which requires “to go beyond an axiological mindset on sustainability”, which also requires “processes, tools and techniques related to the TBL in a project perspective that can be applied and, positively impact project success” (Carvalho & Rabechini 2017, 1121). Continuous research efforts are necessary as the lack of research reflects the absence of its integration in practice (Carvalho & Rabechini 2017, 1129).

Secondly, the overwhelming majority of published research argues in favour of the integration of sustainability in project management by underlying its benefits and contribution to the overall success (He & al. 2019, 8). Nevertheless, the authors nuance this statement as “consensus on how to measure and assess sustainability in project has not emerged yet” (Silvius 2017, 1486) as “introducing the triple bottom line perspectives into the requirements and success definition of projects creates the challenge of definition and measurability” (Silvius 2017, 1485). Furthermore, it can be noted that a scission with the literature occurred, with papers discussing “the combination of the economic and the environmental dimensions” (Silvius & Schipper 2014a, 67), on the one hand, and the papers focusing “mainly the social dimensions” (Silvius & Schipper 2014a, 67), on the other.

Friedrich (2023) identified three definitions in the academic literature with “‘Sustainability as a constraint’ as a first interpretation of the role of sustainability in project

management [where is] seen as something that hinders the actual project goal or as a potential risk” (Friedrich 2023, 45). Then, he “identified ‘Sustainability as instrumental value’”, where “sustainability contributes to the project success” (Friedrich 2023, 45), and found the last “interpretation [to be] ‘Sustainability as intrinsic value’ in the current state of research” (Friedrich 2023, 45). Furthermore, two definitions have been proposed in the current literature, with the first dating from 2014 and defining “Sustainable Project Management [as] the planning, monitoring and controlling of project delivery and support processes, with consideration of the environmental, economic and social aspects of the life-cycle of the project’s resources, processes, deliverables and effects, aimed at realising benefits for stakeholders, and performed in a transparent, fair and ethical way that includes proactive stakeholder participation” (Silvius & al. 2014a, 79). The second one has been drafted by Friedrich and defines “Sustainable project management [as] a project management approach of ascribing intrinsic value to sustainability aspects by including all sustainability dimensions as equal parts of the project’s success and therefore creating a business case for sustainability” (Friedrich 2023, 45). The latter will serve as the base of this paper’s definition of sustainable project’s success to draw the limit of its scope.

3. Methodology

For this paper, a dual approach has been chosen, combining a literature review and an empirical survey to gather data. The literature review was centred around the search for articles concerning the following topics: project success, sustainability and sustainability project management. Furthermore, it was conducted following advice from the academic literature, thus using Google Scholar as the primary search engine (Bauer & Bakkelbasi 2005), as it allows for a simplified search for relevant articles (Falagas & al. 2008). In doing so, the search string which was used was composed of the terms “Success project management”, “project success”, “sustainability”, “sustainable project management”, and “sustainable project success”.

Nevertheless, other databases have been considered and explored to ensure ampleness. Such databases include JSTOR, ScienceDirect, Scopus, as well as SSRN. The literature review was then conducted, as presented in **Section 2**.

The second approach chosen to gather data comes in the form of an anonymous survey. This survey is the direct result of the aforementioned literature review, as the questionnaire is derived from the findings, understanding, and gaps identified in the current empirical research. The survey included 12 questions, which can be viewed as four separate sets of questions, preceded by a demographic assessment of the respondent.

The rest of the questions were divided into four sets. Each set is made up of 3 questions. The first set, including questions 1 to 3, was focused on whether frameworks and certifications were already used as guidelines for their company as well as the vital factor of a project's success. The second set, regarding questions 4 to 6, was focused on the definition of sustainability and how it is perceived by the respondents. The third set, covering questions 7 to 9, focuses on the personal and organisational conviction of what factor matters most when assessing the success of a project. Finally, the last set of questions, including questions 10 to 12, asks about the measurement and awareness of the respondent's project's sustainability performance and environmental impact.

The respondent was chosen based on their experience in project management and have been contacted directly and asked to complete the survey. The majority of respondents were found through LinkedIn, which clearly presented their level of experience.

3.1 Research questions:

Following the literature review and the drafting of the survey, two possible answers to the main research question have been developed. Indeed, the main research question (MRQ) is an open question, allowing for several approaches to answer it, as it reads:

How can the success of a project be redefined to encompass its environmental impact?

Thus, based on the research for the literature review, two possible answers to the MRQ have been developed, which then became the sub-research question. The first possible answer arose from the analysis of the current definition of sustainability and focused on sustainable reporting standards. Hence, it suggests that enforcing reporting standards found in other industries, such as the Environmental Impact Assessment and the Life Cycle Assessment of a project will help bring awareness to its environmental impact. Thus, the first sub-research question (RQ1) reads:

How can enforcing sustainable reporting standards to each project help shed light on its environmental impact?

The second sub-research question (RQ2) stems from the approach of aligning the environmental impact of a project to some of the most common success criteria. In doing so, it advocates for the integration of sustainability within the following success criteria: risk, cost, and use of resources. Thus, RQ2 reads:

How can the environmental impact of a project be included in its quality and scope?

4. Data Analysis

The survey received 76 answers, with only one incomplete response where a single question was not answered. Hence, counting over 30 answers, this survey is considered statistically relevant to draw conclusions beyond the observed sample, as the central limit theorem may be applied. The respondents have been chosen on the basis that they are either working in project management or have worked in this field, with a minimum of two years of experience in both cases. The sample did not include environmentalists, nor project managers with a specific background in sustainability. The age group include spanned from 28 to 62 years. Respondents provided having concluding at least a bachelor during their studies. Aspects that were ranked as “Given priority over most aspects” or “Top priority” are considered as vital. All questions and answer tables can be found in the Appendix, under *7.2 Questions*. The results are detailed and illustrated under *7.3 Results*.

Q1 is purely demographic so as to determine whether there might be any bias linked to a particular industry. Indeed, all projects differ. Nevertheless, this is especially true between industries, as each has its own challenges and stakes for its project. Hence, it is critical to gather a sample covering a variety of industries, ideally with the answers distributed evenly. To this end, the survey encompasses a total of 19 industries. The three most represented industries comprise 27.63% of the total answers, indicating a small concentration of answers originating from the IT sector (10.53%), the Tech industry (9.21%), and the Banking/Finance Industry (7.89%). However, the rest of the answers do not present any significant concentrations; thus, the survey cannot be seen as biased.

Q2 simply aims to determine whether developing a new framework would be beneficial in practice as if a majority of professionals do not follow already established frameworks or certifications, the incremental benefits of creating a new one may not be relevant. The vast majority of the respondents (64.47%) submitted that they do not follow any framework or certifications. Thus, developing a new framework falls outside the scope of this paper, as results indicate that it would likely not be relevant for professionals.

Due to the unanticipated majority of negative answers from the previous question, **Q3** cannot be considered statistically relevant as it only accounts for 27 answers. Nevertheless, it can be seen that the respondents who answered positively to Q2 follow a framework developed by the PMI, such as PMBOK, thus tallying with the findings of the literature review developed earlier.

Q4 asked the respondents to complete a matrix, ranking each success criterion defined by PMBOK (PMBOK 2021) from “not considered” to “Top priority”. Two groups of criteria are distinguishable when summing up the answers, ranking the criteria as key. On the one hand, the three highest-ranking criteria are Quality (71.05%), Scope (63.16%), and Time (61.84%). On the other hand, resources and risks have not received such high rankings, being ranked as

essential 36.84% and 30.26% of the time, respectively. It is important to note that, on average, all aspects of the PMBOK's definition have been ranked as crucial for the majority of answers (52.85%).

Following the success criteria, **Q4b** asked to define how respondents perceive sustainability, being given the choice of “cost”, “risk”, “opportunity”, “requirements”, or “other”. Results indicate that sustainability is overwhelmingly considered an opportunity (37.50%) or a requirement (44.23%).

Q5 aims to assess whether sustainability is already part of the success criteria of a project by choosing anywhere between “Not at all” and “Completely”. The survey demonstrates that an overwhelming majority of respondents do not consider sustainability as a success criterion, with 72.37% not ranking sustainability high enough to be considered a success criterion, thus portraying a lack of interest in practice for this subject.

Q6 can be used to determine which aspect of sustainability, following the aforementioned Triple-Bottom-Line approach, is prioritised. Respondents completed a matrix akin to the one presented in Q4. Taking into consideration the number of responses ranking each aspect as key, one can identify that Economic Viability is the most essential aspect of the TBL approach, as it ranked high at 64.47%, followed by Social Responsibility (40.79%), and finally, Environmental Impact (32.89%). Such results indicate an apparent lack of interest by their project managers in any environmental impact of the projects.

Q7 serves a double purpose by analysing both the relevance of developing a new framework, hence confirming the findings of Q2, and identifying where change will have the most significant impact. Results suggest that the development of a new framework will not have a relevant effect, as only 11.25% of respondents would change their vision of a project's success, whereas targeting the companies will have an impact on 48.13% of respondents, as it encompasses both a new company vision (23.75%) and new directives or orders (24.38%).

Q8, similar to Q4, seeks to determine the key stakeholders in a project for its project manager. Using the same analysis, one can see that customers are the most important stakeholders (86.84%), followed by employees (65.79%), and investors (48.68%). Thus, a change in these stakeholders' expectations of the environmental impact of a project will have a direct effect on its definition of success by the project manager.

Contrary to the previous question, **Q9** moves away from the personal convictions of the project managers to a more objective assessment of these professionals of the importance of each stakeholder in the construction and later success of each project. Comparing the results with the previous questions, one can see that all three key stakeholders were not ranked as high, ranking, on average, lower by 8.33 percentage points. Thus, project managers tend to personally consider the stakeholders to be more critical than they objectively assess them.

Q10 is split into five sub-questions looking at environmental impact indicators, social impact indicators, Economic indicators, Stakeholder engagement, and Sustainability certifications or standards compliance. The results suggest a bipolarity of the environmental impact assessment of projects as a majority of respondents indicated looking for the carbon footprint (33.59%) and energy consumption (30.47%) of their projects; however, they do not follow any sustainability certification or comply by any sustainability standards (62.96%). Incidentally, the economic indicators were concentrated between the profitability of the project (36.20%) and its return on investment (34.97%), once again cementing the importance of investors in the success of the project.

Following the previous question, the dichotomy of the answers may suggest a lack of awareness of the environmental impact of projects. **Q11** solidifies this finding as 80% of respondents are not aware of their project's sustainability performance or ecological impact after its completion.

Finally, **Q12** builds upon Q11 by offering a variety of key performance indicators (KPIs) to measure the environmental impact of a project and presenting the respondents to choose up to three KPIs, with the option of selecting “none” if it is simply not measured. The results demonstrate why project managers are not aware of any environmental impact, as 48.08% answered that no KPIs are used for this. Only considering SDGs (13.46%) and measuring the carbon footprint (10.58%), they have been selected more than 10% of the time but cannot be seen as crucial KPIs due to their low selection.

In-depth analysis

First, it is essential to state that developing a new framework is excluded from the scope of this paper. Indeed, Q2 and Q7 clearly demonstrate the professionals' lack of interest in any academic material. Furthermore, Q12 emphasises this position as not following any certification seems to be a norm; hence, it is doubtful that frameworks will be considered, as accreditation may result in a competitive edge and, thus, provide an incentive to be pursued.

Section 2 exposed the current state of the literature, which is portrayed in the results. Indeed, the PMI frameworks seem to be the most used (Q3), which is demonstrated by the respondent considering, on average, all success criteria of the PMBOK's definition of project success as crucial elements (Q4). Nevertheless, as identified in the literature, there is a lack of environmental awareness by the project manager about their projects. Indeed, the economic pillar of the TBL is overwhelmingly considered the most essential aspect of sustainability, where the environmental impact is considered last (Q6). Furthermore, project managers do not consider sustainability and environmental impact as success factors (Q5). In addition, the majority are not even aware of their project's environmental impact (Q11) and are not using any KPIs to keep track of the project's sustainability performance.

Furthermore, the literature has considered the project to be time-limited and task-oriented companies (Silvius & Schipper 2014b, 41), and the results suggest focusing on

companies. Indeed, project managers personally overestimate the importance of various stakeholders compared to when asked for an objective assessment (Q8 & Q9). This can be seen in the increase of 8.33 percentage points on average when asked their subjective opinion. Hence, one may argue that changing the view of the project managers is vital, as they are critical players in the development of projects and their success, and their personal convictions outweigh objective assessment. Changes in project managers' views on project success are inherently linked to the company they are working for (Q7). Hence, the difference must be focused on the company rather than on customers or employees themselves.

Answering the research question

The survey offers critical insights which will orientate the answer to each sub-research question, which will be discussed in turns. The research question asks, "How can the success of a project be redefined to encompass its environmental impact?" and can be answered in three separate manners.

Firstly, 44.23% of project managers already view sustainability as a requirement (Q4b). Furthermore, although not the highest priority, the government has consistently ranked high (Q8 & Q9). Finally, the aforementioned lack of environmental awareness is further emphasised by only 5.77% of the respondents knowing about any sustainable reporting linked to their projects (Q11). Hence, one answer to the research question is encompassing the environmental impact of a project by enforcing sustainable reporting standards to the project, leading to the RQ1 "How can enforcing sustainable reporting standards to each project help assess and shed light on its environmental impact?", which will be the core focus of **subsection 5**.

Then, one may determine that quality, scope, and time are considered the most critical success criteria for any project, closely followed by cost, whereas sustainability is not considered as such (Q4). Thus, another approach to encompassing the environmental impact of a project in its success definition is to insert sustainability concerns in some of the most critical success

criteria. In doing so, quality and scope seem ideal choices due to their importance, as well as the use of resources, due to its ease of implementation, resulting in RQ2: “How can the environmental impact of a project be included in its quality, scope, and use of resources?”, which will be explored in **subsection 5.2**.

5. Discussion

Section 5 aims to combine the findings of the survey with existing literature to develop two separate answers to the research questions generated through the literature review.

5.1 Imposing sustainable reporting standards

This part will develop the first approach to answering the research question: enforcing sustainable reporting standards for projects.

Current reporting standards

Firstly, it is important to note that sustainability reporting is not a common practice in project management. Indeed, research suggests that “project organizations are unaware of how their PM practices compare with best practices” (Sanjuan & Froese 2012, 92), which is in accordance with the findings of the survey, as 64.47% of respondents do not follow any sort of guidance. Furthermore, both in the study and the literature, the leading standard has been found to be PMBOK (Ahlemann & al. 2009, 298), which **Section 2** has found to be lacking sustainability concerns. Hence, the practitioners have submitted in various studies, as well as in the present survey, to rarely follow any standards that do not include sustainability concerns.

These findings have led to the current project managers not being aware of the environment of their projects, hence not being able to include it in their success criteria. Indeed, 72.32% of respondent do not view sustainability as a success criterion, and 80% have submitted not being aware of their project’s environmental impact. Such findings discredit previous research on “corporations are shifting away from environmental compliance toward environmental management that continuously improves their environmental advances” (Rezaee

& Elam 2000, 60), as the last two decades did not portray a more significant commitment to environmental disclosure. Hence, such reporting must become a legal obligation for companies, allowing for the identification and elimination of unsustainable practices (Elefsiniotis & Wareham 2005, 211).

Finally, the ISO 14000 standards can serve as a groundwork for such legislation as it is already widely accepted and adopted, whilst imposing it on a majority of companies, as, for example, all listed enterprises, will lead to a snowball effect and compliance by the rest of the industry (Castkaa & Balzarovab 2008, 76). Nevertheless, such standards are not unanimously accepted and are the target of critics (Elefsiniotis & Wareham 2005, 212). Furthermore, this offers companies an excuse to avoid environmental disclosure, hence slowing the desired snowball effect on the entire industry, which advocates for the need for “coherent and integrated efforts to achieve a generally accepted framework of environmental reports by cooperation between accountancy bodies, academics and practitioners” (Dixon & Woodhead 2005, 714).

Hence, it can be seen that the current landscape includes a lack of framework and voluntary disclosure. Therefore, project managers cannot act to have environmental impact in their success criteria. This is the base for a legal obligation for sustainability reporting.

Environmental Impact Assessment as early sustainability reporting

Firstly, it is important to note that Environmental Impact Assessment (EIA) differ from strategic impact assessment as the latter is a legal requirement for plans and policies. EIA apply to projects and can be viewed as a form of sustainability reporting. It has been defined as “the evaluation of the effects likely to arise from a major project (or other action) significantly affecting the environment” and requires “the publication of an EIA report describing the likely significant impacts in detail” (Jay & al. 2007, 287), thus, serving as sustainability reporting document. The purpose of an EIA is to identify the critical impacts of any project, allowing for a variety of mitigation opportunities (Wang & al. 2012). Nevertheless, “the existence of a

culture of resistance and disownment among some of those charged with its implementation” (Weston 2011, 97) is the principal reason for its lack of implementation. This can be viewed through the survey, as only 5.77% of respondents submitted to disclosing any form of sustainability reporting.

Despite its lack of popularity amongst practitioners, EIA helps with decision-making in the infancy of projects, allowing for the mitigation of adverse environmental impacts, as well as providing an apparent oversight on the final sustainability performance of any given project, which is crucial in determining the sustainable objectives and success criteria. Indeed, empirical studies reported that “respondents indicated that they are always or most times consulted in consideration of alternatives at the early stages of a project’s life-cycle” (Brent & Werner 2007, 117), indicating that EIA allows for better decision-making, exploring alternatives that will mitigate the environmental impact of a project, which they would not have been made aware if such reporting was not pursued. Furthermore, EIA has also been attributed to “various purposes orientation [which] are very helpful for [...] decision-making, stakeholders and the practitioner” (Chang & al. 2018, 18). Indeed, EIA is viewed as a tool to “empower stakeholders” (Cashmore 2004, 413), which has been explained in **Section 4** to be of great importance to project managers. Finally, the legal enforcement of EIA on a small number of influential corporations can, as for the ISO14000, lead to a snowball effect and a broader integration and application by the majority. Indeed, as for the aforementioned standards, EIA has been described “as a key component of environmental management” (Morgan 2012, 5) by practitioners. Lastly, it is essential to note that the subjectivity of the decision-making throughout the EIA process has been found to be a drawback to its more comprehensive application; however, this can be counterbalanced by the integration of the public in the process (Wilkins 2003, 413), leading to greater transparency. Hence, EIA will provide project managers with the insights to develop the sustainability success criteria, as well as any possible mitigation,

whilst being pressured by the general public to truly pursue them, thus integrating the environmental impact of a project in its definition of success.

Life Cycle Assessment to ensure the completion of sustainability objectives

Firstly, it is important to note that Life Cycle Assessment (LCA) is generally applied to products, sometimes to services, but rarely to projects. Nevertheless, research has shown that “its application on the organizational level is getting more and more relevant” (Finkbeiner 2013, 3), and projects have been found to be time-limited, task-oriented organisations, as developed in **Section 2**. Hence, it is relevant to discuss the implementation of LCA in project management. Research has developed that “LCA is a tool for comparing goods and services (products) and for identifying opportunities for reducing the impacts attributable to associated wastes, emissions and resource consumption” (Pennington & al. 2004, 735), and defined it as the “compilation and evaluation of the inputs and outputs and the potential environmental impacts of a product system throughout its life cycle” (Guinée & al. 2011, 90). This notion is concerned with three phases of any project: the “pre-use life cycle phase”, “operational phase”, and the “end-of-life phase” (Sharma & al. 2011, 874). Thus, it can be seen that it is concerned with all aspects of a project. Nevertheless, the infancy of the project has been argued to be covered by the EIA, whilst the operational phase is the focal point of the ISO14000 standards. Incidentally, LCA has been integrated and “standardized in the ISO 14040 series” (Rigamonti & Mancini 2021, 1938), being introduced in 2013 under the ISO/TR 14047 (Finkbeiner 2013, 2). Hence, for the purpose of this part, the end-of-life part will be the core interest as it covers the only phase being excluded from the aforementioned reporting standards.

The end-of-life of a project is not commonly the focal point of planning. Indeed, a compelling example of this is the research done in the construction industry, where a LCA was conducted and shed light on the fact that “demolition is more impactful than deconstruction for twelve environmental impacts, with an increase mean of 35% and an increase maximum of

112% for freshwater eutrophication” (Quéheille & al. 2022, 6), which would not have been discovered otherwise and led to an opportunity to mitigate its environmental impact, allowing for better compliance with any sustainability goals set out in the EIA. Furthermore, this example illustrates the variety of ecological impacts explored, which then builds upon the previously conducted EIA, thus allowing for greater ease of implementation. Moreover, the standardisation of LCA through the ISO14000 standards contributes to its ease of application as the incremental commitment required from the organisation is reduced. Furthermore, LCA has been attributed to helping with decision-making (Finnveden & al. 2009, 3), as “LCA can provide a holistic perspective into decision making” (Rigamonti & Mancini 2021, 1938). Indeed, the project manager's decisions are focused “not only on the production of upstream products. It also includes, for example, the use of the upstream processes in other life cycles, the waste management of other products, and the level of economic activity in the society” (Finnveden & al. 2009, 3). Finally, “governments all over the world encourage the use of LCA” (Guinée & al. 2011, 90) and this part argues in favour on imposing it rather than simply encouraging it, for the same reasons as stated for both the ISO14000 standards and the EIA.

5.2 Developing sustainability as a success criterion

This section will explore the most important success criteria and develop how sustainability can be introduced to them, focusing on Quality was ranked highest, 71.05% as key, followed by Scope (63.16%). Hence, this part will discuss the incorporation of sustainability in the success criteria of Quality and Scope, analysing how they are pursued before arguing how they can be coupled with sustainability.

Quality

Quality has been found to be at the root of two main benefits. On the one hand, “researchers reported that [quality management] programmes have led to improvements in productivity” (Mosadeghrad 2012, 90) and, more generally, the reduction of costs linked to any

given project. Indeed, empirical studies found that quality management, when supported by an information system, can help reduce time as “Non-productive time is waste” as well as costs by avoiding “the direct cost of rework” (Love & Irani 2003, 655). On the other hand, quality management has been linked to the facilitation of project success through “clarity of project mission and goals” (Ofori 2013, 28), which are key missions for project managers (Mosadeghrad 2012, 104). Hence, quality in itself is a crucial component to project success as it helps in both the reduction of costs as well as with the enhancement of clarity.

As the vital role of quality has been established, it is essential to review the factors that lead to compelling integration. Successful implementation of quality management is dependent on the integration of two stakeholder groups. As previously developed, stakeholders are of particular importance to project managers, hence leading to more outstanding care for quality management. These stakeholder groups are the two most essential both when objectively ranked by project managers, as well as in their personal opinion, being the customers (86.84%) and the employees (65.79%). The former will be the purpose of the following part, whereas the latter will be analysed here. Employee management can be viewed as part of the clarity of vision offered by quality management; nevertheless, it must be considered on a broader spectrum. Furthermore, project management standards such as ISO9000 can help in achieving quality (Bryde & Robinson 2007, 58), which can be submitted to the analysis proposed for ISO14000 in subsection 5.1. Finally, sustainability considerations can be directly incorporated into quality management when considering how it can support it as projects are considered complete upon their delivery (Atkinson 1999, 339); however, 5.1 argued for the importance of end-of-life reporting, forcing the assessment of success to also consider post-implementation phases, which in turn paves the way for quality to be valued as a critical success factor. In doing so, it contributes to “the level of quality associated with the completed project”, which is how it is valued by the client (Liberatore & Pollack-Johnson 2013).

The importance of the client's valuation of the project is a crucial indicator of the necessity to consider customer satisfaction when determining the success of the project. However, customers have been found to have changed their habits over two decades ago towards "sustainable consumption alternatives" (Mont 2004, 151), voluntarily supporting products and projects that benefit the environment (Wang & al. 2019, 869). Researchers described sustainable consumption as gaining momentum (Tseng & al. 2013, 5) a decade after its introduction by Mont and has recently been identified as continuously accelerating through social media (Radziszewska 2021). This matters for project managers as "marketers have not succeeded in selling green products at pace with consumer growth rate" (Ali & al. 2019, 1), creating an unexploited market to capture. Finally, the recent definition of quality by Rose should be adopted as it sets out quality to be "features of products which meet customer needs and thereby provide customer satisfaction", as well as "freedom from deficiencies", where deficiencies are errors that lead to customers' reclamations and discontent (Rose 2022, 5), hence having to comply with the sustainable consumption that is becoming the norm.

Scope

Although being one of the more intangible success criteria, scope has received a great deal of attention from both the respondents as well as from the academic community. Indeed, scope has been associated with the objective of controlling the product and project boundaries (Lampa & al. 2017, 370), as well as serving to "identify and control what should be and what should not be in a project" (Shirazi 2017, 397). Scope management can be divided into two distinct areas. On the one hand, "the product scope is related to everything that is within the boundaries of the product" (Lampa & al. 2017, 371). Naturally, product scope management may not be applied if the aim of the project is not to develop a product, as it becomes irrelevant. On the other hand, "the project scope is related to the description of all necessary work to achieve what was defined on the product scope" (Lampa & al. 2017, 371), which may be

applied regardless of the nature of the project. Scope management has been identified as a critical factor in project management by the respondents, which also has been the case in the empirical literature. Indeed, poor scope management in itself has been found to “lead to expensive changes, delays, rework, cost overruns, schedule overruns, and project failure” (Fageha & Aibinu, 2013, 155), whilst mismanagement of the uncertainty surrounding projects may lead to scope creep and ultimately to the failure of the project (Shirazi 2017, 396). Three elements are key to achieving effective scope management. Firstly, a clear vision for the project must be established (Dekkers & Forselius 2007, 7), which has been developed in the previous part. Secondly, stakeholder management is a critical element (Fageha & Aibinu 2013, 162). Thirdly, the management of uncertainty is vital, as mentioned above, it may lead to scope creep, which has been defined as “the uncontrolled changes in a project” (Shirazi & al. 2017, 396) and has been found to be the principal cause of cost increases (Lampa & al. 2017, 370). Finally, scope management can be enhanced by following the P.O.W.E.R. acronym, focusing on Predisposition, Wherewithal, Evaluation, and Resources (Dekkers & Forselius 2007, 7).

Sustainability can be integrated into scope management through scope’s consideration of risk management, the stakeholder and the use of resources. The most tangible aspect of these is the use of resources, as the first definition of sustainability points towards the use of our resources without compromising those of future generations (Bruntland 1987). To this extent, the Resources aspect of the POWER framework is a great anchor for sustainability concerns as it resources may consider all natural resources and the environmental impact. Secondly, risk management is a consideration of scope management, as the latter has been found to be of great help in managing uncertainty and risks (Atkinson & al. 2006). One may argue that most of the risks faced by projects in the long term are due to climate and, thus, incorporating sustainability measures is a form of risk mitigation. Thirdly, stakeholders can be the gateway for sustainability concerns, as the second most important stakeholders are the customers. To this end, research

has demonstrated that defining scope requires input from all stakeholders at an early stage (Fageha & Aibinu 2013, 155), which is an excellent opportunity to emphasise both the value of customers and their increasing sustainable consumption as well as underlining the usefulness of EIA which would perfectly accomplish this task.

Hence, sustainability may be incorporated into the already most used success criteria through the modification of the definition of quality, shifting its focus to be centred around the customer and, thus, allowing for a more significant impact of their sustainable consumption. Furthermore, scope management can be a fertile ground for sustainability concerns as its close links with risk management, stakeholders' satisfaction and use of resources can all be harvested to create an ideal gateway for sustainability as a success criterion.

6. Concluding remarks

6.1 General conclusion

After developing an extensive literature review, this paper argues that the best definition of sustainable project success is “a project management approach of ascribing intrinsic value to sustainability aspects by including environmental dimensions as equal parts of the project's success as the financial considerations, resulting in a business case for sustainability”. To achieve the acceptance of such a definition, the environmental impact of projects must be encompassed by its definition of success. To this extent, the empirical evidence collected, as well as the academic literature, points towards three compatible possible approaches. Firstly, imposing sustainability reporting standards, such as the ISO14000 standards, the Environmental Impact Assessment, or the Life Cycle Assessment, will help develop the environmental awareness that is lacking in project managers. Secondly, sustainability concerns can be incorporated into the definition of quality and scope management, which are two predominant success criteria for projects. In doing so, project managers would incorporate the environmental impact to satisfy various groups of stakeholders, which they highly value.

Hence, applying some or all of these approaches together will result in project managers redefining the success criteria of their project to encompass its environmental impact.

6.2 Limitations

This paper admits some limitations. The survey limited its scope to only include the environmental aspects of sustainability, disregarding its considerations of social and economic concerns. Furthermore, it did not expand on the subject of greenwashing, which is a very present issue when discussing environmental sustainability. Hence, the risk of greenwashing must be addressed, especially if environmental sustainability is imposed rather than incentivised, as companies and projects will look for an easy way to comply with new regulations. Finally, this paper is centred around a European view of sustainability and project management, only looking at post-industrialised economies and not taking into account the impact which different legal and economic landscapes would have. Another limitation stems from the sample as it only focuses on traditional project managers. Indeed, no respondent is working in an environmental-focused company, nor is an environmentalist. Hence, critical input from respondents that are at the forefront of implementing sustainability in project management is lacking.

6.3 Further Research

As stated in the previous part, this paper does not cover the entire width of the subject. Hence, further research is needed. The cultural, economic, and legal differences must be analysed so as to determine how to apply these findings effectively in other continents. Indeed, for example, the American continent, although culturally and economically resemblant, provides a very different landscape. Furthermore, how to integrate social considerations into project success must be addressed, as this third pillar of sustainability has received little attention in this context. Finally, an analysis of how current frameworks can be adapted to integrate sustainability concerns may be relevant.

7. Appendix

7.1 Bibliography:

Ahlemann, Frederik, Teuteberg, Frank, Vogelsang, Kristin. (2009). „Project management standards – Diffusion and application in Germany and Switzerland.” *International Journal of Project Management*, 27: 292-303.

Ajmal, Mian, Khan, Mehmood, Al-Yafei, Hanan. (2019). “Exploring factors behind project scope creep – stakeholders’ perspective.” *International Journal of Managing Projects in Business*, 13(3): 483-504.

Ali, Afzaal, Xiaoling, Guo, Ali, Adnan, Sherwani, Mehkar, Muneeb, Farhan. (2019). “Customer motivations for sustainable consumption: Investigating the drivers of purchase behavior for a green-luxury car.” *Business Strategy and the Environment*: 1-14.

Alotaibi, Abdulrahman, & Mafimisebi, Oluwasoye. (2016). “Project Management Practice: Redefining Theoretical Challenges in the 21st Century.” *Journal of Economics and Sustainable Development*, 7(1): 93-99.

Amiri, Omid, Ayazi, Amir, Rahimi, Mahmoud, Khazaeni, Garshasb. (2021). “Risks of water and wastewater PPP projects: an investors’ perspective.” *Construction Innovation*: 1471-1488.

Atkinson, Roger. (1999). “Project management: cost, time and quality, two best guesses and a phenomenon, it’s time to accept other success criteria.” *International Journal of Project Management*, 17(6): 337-342.

Atkinson, Roger, Crawford, Lynn, Ward, Stephen. (2006). “Fundamental uncertainties in projects and the scope of project management. *International Journal of Project Management*.”, 24: 687-698.

Bartelmus, Peter. (2009). “The cost of natural capital consumption: Accounting for a sustainable world economy. *Ecological Economics*.”, 68: 1850-1857.

Bauer, Kathleen, & Bakkalbasi, Nisa. (2005). "An examination of citation counts in a new scholarly communication environment." *D-Lib Magazine*, 11(9): 24-58.

Bhargav, David (2006). Project management quality and the value of flexible strategies. *Engineering, Construction and Architectural Management*, 13(3), 275-299.

Brent, Alan, Petrick, Werner. (2007). "Environmental impact assessment during project execution phases: towards a stage-gate project management model for the raw materials processing industry of the energy sector." *Impact Assessment Project Appraisal*, 25(2): 111–122.

Bryde, David, Robinson, Lynne. (2007). "The relationship between total quality management and the focus of project management practices." *The TQM Magazine*, 19(1): 50-61.

Carvalho, Marly, Rabechini, Roque. (2017). "Can project sustainability management impact project success? An empirical study applying a contingent approach." *International Journal of Project Management*, 35(6): 1120–1132.

Cashmore, Matthew. (2004). "The role of science in environmental impact assessment: process and procedure versus purpose in the development of theory." *Environmental Impact Assessment Review*, 24: 403-426.

Castka, Pavel, & Balzarova, Michaela. (2008). "The impact of ISO 9000 and ISO 14000 on standardisation of social responsibility—an inside perspective." *International Journal of Production Economics*, 113: 74–87.

Castka, Pavel, & Corbett, Charles. (2013). "Management Systems Standards: Diffusion, Impact and Governance of ISO 9000, ISO 14000, and Other Management Standards." *Foundations and Trends in Technology, Information and Operations Management*, 7(3): 1-48.

Chang, I-Shin, Wang, Wengi, Wu, Jing, Sun, Yuhong, Hu, Rong. (2018). "Environmental impact assessment follow-up for projects in China: Institution and practice." *Environmental Impact Assessment Review*, 73: 7-19.

Chawla, V.K., Chanda, Arindam, Angra, Surjit. (2018). “The sustainable project management: a review and future possibilities.” *Journal Project Management*, 3(3): 157–170.

Dekkers, Carol, Forselius, Pekka. (2007). “Increase ICT Project Success with Concrete Scope Management.” *Conference on Software Engineering and Advanced Applications*: 1-8.

Dixon, Robert, Mousa, Gehan, Whoodhead, Anne. (2005). “The Role of Environmental Initiatives in Encouraging Companies to Engage in Environmental Reporting.” *European Management Journal*, 23(6): 702–716.

Egginton, Bill. (2012). “Realising the benefits of investment in project management training: Evidence supporting the need for a more strategic approach.” *International Journal of Managing Projects in Business*, 5(3): 508-527.

Elefsiniotis, Panagiotis, & Wareham, David. (2005). “ISO 14000 Environmental Management Standards: Their Relation to Sustainability.” *Journal of Professional Issues in Engineering Education and Practice*: 208-212.

Fageha, Mohammed, Aibinu, Ajibade. (2013). “Managing Project Scope Definition to Improve Stakeholders’ Participation and Enhance Project Outcome.” *Social and Behavioral Sciences*, 74: 154-164.

Falagas, Matthew, Pitsouni, Eleni, Malietzis, George, & Pappas, Georgios. (2008). “Comparison of PubMed, Scopus, web of science, and Google scholar: strengths and weaknesses.” *The FASEB Journal*, 22(2): 338-342.

Finkbeiner, Matthias. (2013). “From the 40s to the 70s—the future of LCA in the ISO 14000 family.” *The International Journal of Life Cycle Assessment*, 18: 1-4.

Finnveden, Goran, Hauschild, Michael, Ekvall, Tomas, Guinée, Jereon, Heijungs, Reinout, Hellweg, Stefanie, Koehler, Annette, Pennington, David, Suh, Sangwon. (2009). “Recent developments in Life Cycle Assessment.” *Journal of Environmental Management*, 91: 1-21.

Friedrich, Kevin (2023). "A systematic literature review concerning the different interpretations of the role of sustainability in project management." *Management Review Quarterly*, 71: 31-60.

Frösch, Georg. (2015). "Sustainability issues in the valuation process of project developments." *Energy and Buildings*, 100: 2-9.

Gareis, Roland, Huemann, Martina, Martinuzzi, Andre. (2013). "Project Management & Sustainable Development Principles." Project Management Institute: 1-4.

Ghosh, Saumyendu, Buckler, Lauren, Skibniewski, Mirosław, Negahban S., Kwak, Y. (2014). "Organizational governance to integrate sustainability projects: a case study." *Technological and Economical Development of Economy*, 20(1): 1–24.

Ghosh, Sam, Forrest, Danny, DiNetta, Thomas, Wolfe, Brian, & Lambert, Danielle. (2015) "Enhance PMBOK® by Comparing it with P2M, ICB, PRINCE2, APM and Scrum Project Management Standards." *PM World Journal*, 4(9): 1-75.

Grzeszczyk, Tadeusz, Waszkiewicz, Malgorzata. (2020). "Sustainable Investment Project Evaluation." *Entrepreneurship and Sustainability Issues*, 7(3): 2363-2382.

Guinée, Jeroen, Heijungs, Reinout, Huppes, Gjalt, Zamagni, Alessandra, Masoni, Paolo, Buonamici, Roberto, Ekvall, Tomas, Rydberg, Tomas. (2011). "Life Cycle Assessment: Past, Present, and Future." *Environmental Science & Technology*, 46(1): 90-96.

He, Qinghua, Chen, Xiaoyan, Wang, Ge, Zhu, Jun, Yang, Delei, Liu, Xiaoxue, Li, Yang. (2019). "Managing social responsibility for sustainability in megaprojects: an innovation transitions perspective on success." *Journal of Cleaner Production*, 241: 1-11.

Jay, Stephen, Jones, Carys, Slinn, Paul, Wood, Christopher. (2007). "Environmental impact assessment: Retrospect and prospect." *Environmental Impact Assessment Review*, 27: 287-300.

João, Elsa. (2002). "How scale affects environmental impact assessment." *Environmental Impact Assessment Review*, 22, 289-310.

Joslin, Robert, & Müller, Ralf. (2015). The impact of project methodologies on project success in different project environments. *International Journal of Managing Projects in Business*, 9(2): 364-388.

Khalifeh, Amin, Farrell , Peter, Al-edenat, Malek. (2019). "The impact of project sustainability management (PSM) on project success." *Journal of Management Development*, 39(4): 453-474.

Khang, Do, Myint, Yin. (1999). "Time, cost and quality trade-off in project management: a case study." *International Journal of Project Management*, 17(4): 249-256.

Kuhn, Berthold. (2022). "Sustainable finance in Germany: mapping discourses, stakeholders, and policy initiatives." *Journal of Sustainable Finance & Investment*, 12(2): 497-524.

Kudratova, Shamsiya, Huang, Xiaoxia, Zhou, Xiaoguang. (2018). "Sustainable project selection: Optimal project selection considering sustainability under reinvestment strategy." *Journal of Cleaner Production*, 203: 469-481.

Lampa, Igor, Contessoto, Allan, Amorim, Anderson, Zafalon, Geraldo, Valêncio, Carlos, Souza, Rogeria. (2017). "Project Scope Management: A Strategy Oriented to the Requirements Engineering." *Proceedings of the 19th International Conference on Enterprise Information Systems*, 2: 370-378.

Lappe, Marc, Spang, Konrad. (2014). "Investments in project management are profitable: A case study-based analysis of the relationship between the costs and benefits of project management." *International Journal of Project Management*, 32, 603-612.

Liberatore, Matthew, Pollack-Johnson, Bruce. (2013). "Improving Project Management Decision Making by Modeling Quality, Time, and Cost Continuously." *IEEE Transactions on Engineering Management*, 60(3): 518-528.

Lipovetsky, Stan, Tishler, Asher, Dvir, Dov, & Shenhar, Aaron. (1997). "The relative importance of project success dimensions." *R&D Management*, 27(2): 97-106.

Love, Peter, Irani, Zahir. (2003). A project management quality cost information system for the construction industry. *Information & Management*, 40, 649-661.

Marcelino-Sadaba, Sara, Gonzalez-Jaen, Luis, & Perez-Ezcurdia, Aamaya. (2015). "Using project management as a way to sustainability. From a comprehensive review to a framework definition." *Journal of Cleaner Production*, 99: 1-16.

Martens, Mauro, & Carvalho, Marly. (2016). "The challenge of introducing sustainability into project management function: multiple-case studies." *Journal of Cleaner Production*, 117: 29-40.

Martens, Mauro, & Carvalho, Marly. (2017). "Key factors of sustainability in project management context: A survey exploring the project managers' perspective." *International Journal of Project Management*, 35: 1084-1102.

Monfreda, Chad, Wackernagel, Mathis, Deumling, Diana. (2004). "Establishing national natural capital accounts based on detailed Ecological Footprint and biological capacity assessments." *Land Use Policy*, 21: 231-246.

Mont, Oksana. (2004). "Institutionalisation of sustainable consumption patterns based on shared use." *Ecological Economics*, 54: 135-153.

Morgan, Richard. (2012). "Environmental impact assessment: the state of the art." *Impact Assessment and Project Appraisal*, 30(1): 5-14.

Mosadeghrad, Mohammad. (2012). "Towards a theory of quality management: an integration of strategic management, quality management and project management." *International Journal of Modelling in Operations Management*, 2(1): 89-118.

- Ofori, Daniel. (2013). "Project Management Practices and Critical Success Factors—A Developing Country Perspective." *International Journal of Business and Management*, 8(21): 14-31.
- Økland, Andreas. (2015). "Gap analysis for incorporating sustainability in project management." *Procedia Computer Science*, 64: 103-109.
- Olsson, Nils, Frydenberg, Stein, Jakobsen, Erik, Jessen, Svein. (2010). "In search of project substance: how do private investors evaluate projects?." *International Journal of Managing Projects in Business*, 3(2): 257-274.
- Orwig, Robert, Brennan, Linda. (2000). "An integrated view of project and quality management for project-based organizations." *International Journal of Quality & Reliability Management*: 351-363.
- Papke-Shields, Karen, Beise, Catherine, & Quan, Jing. (2010). „Do project managers practice what they preach, and does it matter to project success?." *International Journal of Project Management*, 28(7): 650-662.
- Pennington, D.W., Potting, J., Finnveden, G., Lindeijer, E., Jolliet, O., Rydberg, T., Rebitzer, G. (2004). "Life cycle assessment Part 2: Current impact assessment practice." *Environmental International*, 30: 721-739.
- Project Management Institute. (2021). *Project Management Body of Knowledge (PMBOK) (7th ed.)*. Project Management Institute.
- Quéheille, Eva, Ventura, Anne, Saiyouri, Nadia, Taillandier, Franck. (2022). "A Life Cycle Assessment model of End-of-life scenarios for building deconstruction and waste management." *Journal of Cleaner Production*, 339: 1-16.
- Radziszewska, Aleksandra. (2021). "Managing Customer Knowledge of Sustainable Consumption using Social Media." *European Conference on Knowledge Management*: 623-634.

Rezaee, Zabihollah, & Elam, Rick. (2000). "Emerging ISO 14000 environmental standards: a step-by-step implementation guide." *Managerial Auditing Journal*, 15(1): 60-67.

Rigamonti, Lucia, Mancini, Elianna. (2021). "Life cycle assessment and circularity indicators." *The International Journal of Life Cycle Assessment*, 2:, 1937-1942.

Sanjuan, Antonio., & Froese, Thomas. (2012). "The Application of Project Management Standards and Success Factors to the Development of a Project Management Assessment Tool." *Social and Behavioral Sciences*, 74: 91-100.

Sebestyen, Zoltan. (2017) "Further Considerations in Project Success." *Procedia Engineering*, 196: 571-577.

Silvius, Gilbert., (2017). "Sustainability as a new school of thought in project management." *Journal of Cleaner Production*, 166: 1479-1493.

Silvius, Gilbert, De Graaf, Marc. (2019). "Exploring the project manager's intention to address sustainability in the project board." *Journal of Cleaner Production*, 208: 1226–1240.

Silvius, Gilbert, Kampinga, Martin, Paniagua, Silvana, Mooi, Herman. (2017). "Considering sustainability in project management decision making; An investigation using Q-methodology." *International Journal of Project Management*, 35: 1133-1150.

Silvius, Gilbert, & Schipper, Ron (2014a). "Sustainability in project management: A literature review and impact analysis." *Social Business*, 4(1): 63-96.

Silvius, Gilbert, & Schipper, Ron (2014). "Sustainability in Project Management Competencies: Analyzing the Competence Gap of Project Managers." *Journal of Human Resource and Sustainability Studies*, 2: 40-58.

Sharma, Aashish, Saxena, Abhishek, Sethi, Muneesh, Shree, Venu, Varun, Venu. (2011). "Life cycle assessment of buildings: A review." *Renewable and Sustainable Energy Reviews*, 15: 871-875.

- Shirazi, Farshad, Kazemipoor, Hamed, Tavakkoli-Moghaddam, Reza. (2017). "Fuzzy decision analysis for project scope change management." *Decision Science Letters*, 6: 395-406.
- Smyth, Hedley, Lecoivre, Laurence. (2015). "Differences in decision-making criteria towards the return on marketing investment: A project business perspective." *International Journal of Project Management*, 33(1): 29-40.
- Spalek Seweryn. (2014). "Does Investment in Project Management Pay Off?." *Industrial Management & Data Systems*, 114(5): 832-856.
- Sumiani, Y., Haslinda, Y., Lehman, G. (2007). Environmental reporting in a developing country: a case study on status and implementation in Malaysia. *Journal of Cleaner Production*, 15, 895-901.
- Tseng, Ming-Lang, Tan, Raymond, Siriban-Manalang, Anna. (2013). „Sustainable consumption and production for Asia: sustainability through green design and practice." *Journal of Cleaner Production*, 40: 1-5.
- Wang, Q., Du, Y., Chen, K. (2012). "Environmental Impact Post-Assessment of Dam and Reservoir Projects: A Review." *Procedia Environmental Sciences*, 13: 1439 -1443.
- Wang, Y., Xiang, D., Yang, Z., Ma, S. (2019). "Unraveling customer sustainable consumption behaviors in sharing economy: A socio-economic approach based on social exchange theory." *Journal of Cleaner Production*, 208: 869-879.
- Wang, Juying, Xiaoqing, Yu. (2021). "The Driving Path of Customer Sustainable Consumption Behaviors in the Context of the Sharing Economy-Based on the Interaction Effect of Customer Signal, Service Provider Signal, and Platform Signal." *Sustainability*, 13: 1-16.
- Westhuizen, Danie, & Fitzgerald, Edmond. (2005). "Defining and measuring project success." *ECMLG*: 1-17.
- Weston, Joe. (2011). "Screening for environmental impact assessment projects in England: what screening?." *Impact Assessment and Project Appraisal*, 29(2): 90-98.

Wilkins, Hugh. (2003). "The need for subjectivity in EIA: discourse as a tool for sustainable development." *Environmental Impact Assessment Review*, 23: 401-414.

Wolniak, Rodaslaw. (2022). "Project Management Standards." *Organization and Management*, 160: 639-655.

Yu, Minna, Zhao, Ronald. (2015). "Sustainability and firm valuation: an international investigation." *International Journal of Accounting and Information Management*, 23(3): 289-307.

Zeng, Sai, Tam, Chun, Tam, Vivian. (2010). "Integrating Safety, Environmental and Quality Risks for Project Management Using a FMEA Method." *Economics of Engineering Decisions*, 21(1): 44-52.

Zerjav, Vedran. (2021). "Why Do Business Organizations Participate in Projects? Toward a Typology of Project Value Domains." *Project Management Journal*, 52(3), 287-297.

Websites:

European Commission (2020). EU taxonomy for sustainable activities. Retrieved December, 6th from https://finance.ec.europa.eu/sustainable-finance/tools-and-standards/eu-taxonomy-sustainable-activities_en

European Commission. (2021). Overview of sustainable finance. European Commission. Retrieved on December, 6th 2023 from https://ec.europa.eu/info/business-economy-euro/banking-and-finance/sustainable-finance/overviewsustainable-finance_en

European Commission. (2022). Supplementing Regulation (EU) 2019/2088 of the European Parliament and of the Council. Retrieved on December 7th, from https://ec.europa.eu/finance/docs/level-2-measures/C_2022_1931_1_EN_ACT_part1_v6%20%281%29.pdf

European Commission (2023) The European Green Deal: Striving to be the first climate-neutral continent. Retrieved December, 6th from https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_en

7.2 Survey Questionnaire:

Q1: What industry are you working in?

Open-ended question

Q2: Do you follow any framework/certification for projects?

Yes/No question

Q3: Which of the framework(s) or certification(s) you follow is the most important for you?

Open-ended question

Q4: The success of a project has been defined by the PMBok as a project that is completed within time, scope, cost, quality, resources, and risks. In your opinion, how important is each aspect of this definition of a project's success?

6-points Likert scale (not considered to top priority)

Q4b: How do you perceive sustainability?

Choose between 5 options: Cost, Risk, Opportunity, Requirement, Other

Q5: To what extent do you currently consider sustainability aspects when defining success criteria in your projects?

5-points Likert scale (not at all to completely)

Q6: Sustainability is often defined by the triple bottom line approach, meaning it is comprised of economic, social, and ecological concerns. How do you consider sustainability dimensions when determining project success criteria?

6-points Likert scale (not considered to top priority) for each of the following aspects: Environmental Impact, Social responsibility, Economic viability, Stakeholder engagement, Risk management, Resilience

Q7: What would change your own vision of a project's success?

Choose between 6 options: New company vision, Personal conviction, New directives/orders, Public opinion, Academic publishing, Others

Q8: How much do you personally consider these stakeholders when developing a project?

6-points Likert Scale (not considered to top priority) for the following 6 stakeholders: Employees, Customers, Suppliers, Government, General public, Investors

Q9: What do you think would be the importance of each one of the previous stakeholder's opinions when constructing a project?

6-points Likert Scale (not considered to top priority) for the following 6 stakeholders: Employees, Customers, Suppliers, Government, General public, Investors

Q10: How do you measure and evaluate the sustainability performance of your projects?

Q10a. Asks about Environmental Impact Indicators: Choose between 5 options: Carbon Footprint, Energy consumption, Water pollution, None, Others

Q10b. Asks about Social Indicators: Choose between 5 options: Gender Equality, Social inclusivity, Employment opportunities, None, Others

Q10c. Asks about Economic Indicators: Choose between 5 options: Cost savings, Return on Investment, Profitability of the project, None, Others

Q10d. Asks about Social Indicators: Choose between 5 options: High level of communication with stakeholder, High level of stakeholder's involvement, Satisfaction survey, None, Others

Q10e. Asks about Sustainability certifications/standards compliance: Choose between 5 options: Cradle-to-Cradle, ISO14000, ISO21500, None, Others

Q11: Are you aware of your project's actual sustainability performance or environmental impact after completion?

Yes/no answers

Q12: How is this measured for your project?

Choose up to 3 answers among the following options: Carbon footprint, Water usage, Waste reduction, Use of renewable energy, Sustainability reporting, Supply chain transparency, Sustainability innovation, Sustainable Development Goals, None

7.2 Results:

Table 1: Mean and Standard Deviation of Q4 results.

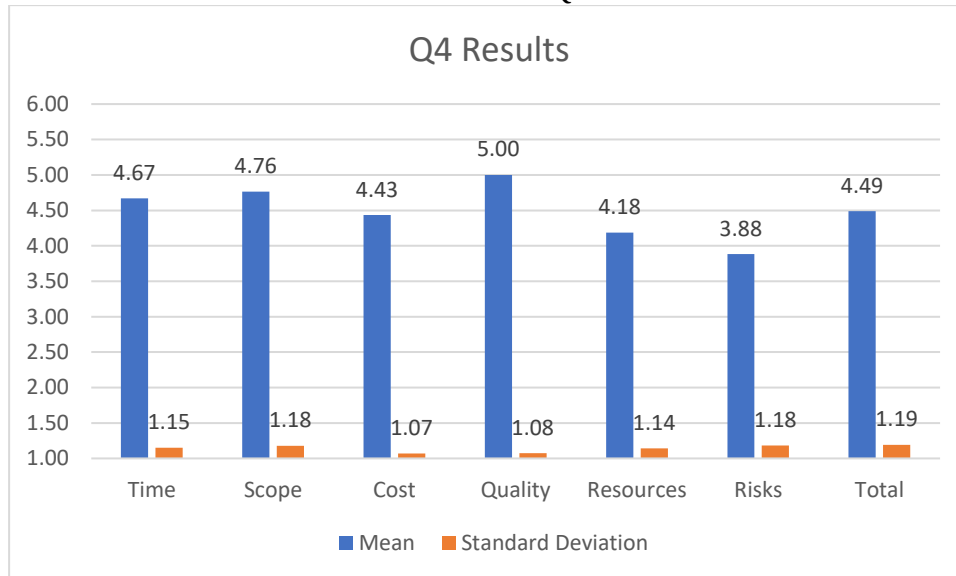


Table 2: Mean and Standard Deviation results of Q8 and Q9.

Q8 & Q9 Results		
	Mean	Standard Deviation
Employees (Q8)	4.79	1.20
Employees (Q9)	4.49	1.01
Customers (Q8)	5.34	1.03
Customers (Q9)	5.01	1.04
Suppliers (Q8)	3.91	1.28
Suppliers (Q9)	3.71	0.94
Government (Q8)	3.24	1.37
Government (Q9)	3.46	1.13
General public (Q8)	3.25	1.52
General public (Q9)	3.37	1.07
Investors (Q8)	4.08	1.57
Investors (Q9)	4.21	1.32
Total (Q8)	4.10	1.54
Total (Q9)	4.04	1.24

Table 3: Mean comparison between Q8 and Q9 results.

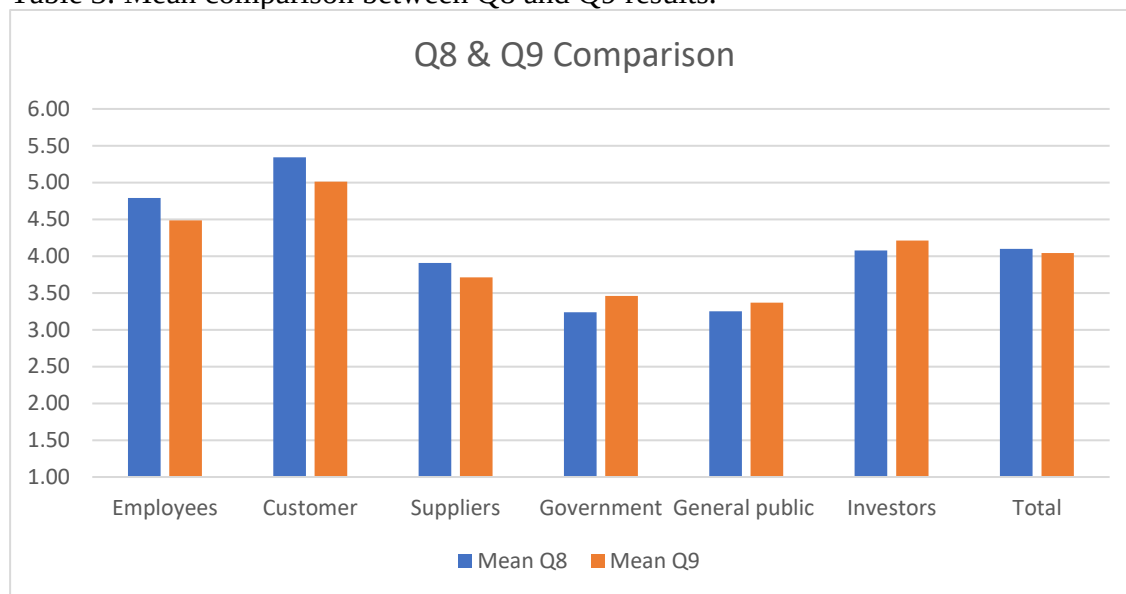


Table 4: Combined Sustainability results.

Sustainability results	
Q5 mean	2.87
Q5 standard deviation	1.02
Environmental Impact Awareness (Q11)	
Are aware	20%
Are not aware	0.8
Use of KPIs to measure sustainability performance (Q12)	
Carbon footprint	10.58%
Water usage	0.96%
Waste reduction	5.77%
Use of renewable energy	7.69%
Sustainability reporting	5.77%
Supply chain transparency	2.88%
Sustainability innovation	4.81%
SDGs	13.46%
None	48.08%

Table 5: Results on the perception of sustainability (Q4b).

Sustainability is viewed as a...	
Cost	14.42%
Risk	2.88%
Opportunity	37.50%
Requirement	44.23%
Other	0.96%