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Consideration of Sustainability in Projects: A Cross-Sectional Quantitative Analysis

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Abstract: The consideration of sustainability in projects is one of the most critical global trends in project management today, as projects are instrumental in the sustainable development of organisations and society. In the growing literature on this topic, most studies take a qualitative approach, often based on single case studies, and quantitative studies are underrepresented. To address these limitations, this study aims to examine the extent to which different aspects and perspectives of sustainability are integrated into projects by reporting a quantitative analysis of the consideration of sustainability in 134 projects. The analysis used the Sustainable Project Management Maturity Model SPM3 to analyse the level at which sustainability was considered in the projects. The results show that, on average, sustainability is considered at a reactive level, with the desired levels of consideration on average one level higher (proactive). When considering the different triple bottom line perspectives, the economic perspective scores highest, followed by the social and environmental perspectives. The study also shows that building-related projects score higher on sustainability considerations than other project types, as do larger projects. Limitations of the study include its European focus, the relatively small sample size, and the fact that the data was collected in different locations over a four-year period, which raises the possibility of subjective differences in the evaluation of individual projects. Nevertheless, the study can be seen as a 'wake-up call' for project practitioners, who need to be more proactive in this regard if projects are to be the route to sustainability.

Keywords: sustainable project management; project management maturity; triple bottom line

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1. Introduction

The instrumental role of projects in the transition of organisations, and thus society, towards sustainability affects how projects are planned, organised, executed, and managed [1]. As a result, 'green' or 'sustainable' project management is now considered one of the most critical global project management trends [2,3]. In the last decade, the integration of sustainability concepts has been addressed in many publications [4–6]. In their analysis of this growing literature base, Sabini et al. [6] found that most of these studies were qualitative, most often based on single case studies. Quantitative studies were underrepresented, and quantitative empirical analyses were rare. Moreover, while qualitative research may lend itself to a relatively young research stream, Silvius et al. [7] highlighted the need for more quantitative empirical studies.

This gap in the literature is addressed by the study reported in this paper. It adopts the concept of sustainable project management (SPM) maturity [8] to assess how sustainability is addressed in projects. SPM maturity refers to the extent to which a project embodies sustainable practices and principles at different stages of its life cycle. It also assesses how well a project team has integrated sustainability into its project management processes, strategies and decisions. Achieving a higher sustainability maturity level requires a sustained effort and commitment to integrate sustainability into project management processes and practices. The benefits of achieving higher levels of sustainability maturity can include improved project outcomes, reduced environmental impact, increased stakeholder engagement and an improved reputation [9].

SPM maturity can be assessed by expressing the degree to which a project team integrates the consideration of sustainability across different dimensions, such as governance, stakeholder engagement, environmental impact, social impact, and economic impact, at different levels. Such a model is described by [8] as the Sustainable Project Management Maturity Model (SPM3). Based on a questionnaire, this model allows us to assess to which level (Compliant-Reactive-Proactive-Purposeful) sustainability is considered in a project.

By applying SPM3 to a sample of projects, a quantitative analysis can be made of the extent to which different aspects and perspectives of sustainability are considered in projects, where the greatest opportunities for improvement lie, and whether these findings differ for different project types. It is these questions that the present study focuses on, with the central research question being "At what level are the different aspects and perspectives of sustainability considered in projects?". As the different aspects of and perspectives on sustainability do not have equal relevance to all industries, organisations and project types, the quantitative analysis that this study presents aims to contribute to an improved understanding of the differences in consideration of the different perspectives of sustainability in different industries and types of projects. An additional research question is therefore, "How do project characteristics such as project type, industry, size, and number of partners, influence the level of consideration of sustainability in projects?". As quantitative empirical studies on the integration of sustainability in project management are rare [6], this study addresses this gap in the literature.

The rest of the paper is structured as follows. The next section discusses the literature on SPM and SPM maturity. Section 3 will present the research methodology and design, after which Section 4 will present the findings before putting forward conclusions and recommendations in the final paragraph.

2. Theoretical Background and Hypotheses Development

2.1. Sustainable Project Management

SPM is defined 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." [4]. This definition highlights that SPM is about the integration of sustainability into the processes and practices of project management. Several studies identified the 'impact areas' where an integration of sustainability would impact the processes or practices of project management. Table 1 summarises these impact areas, as found in the literature on SPM, organised by phase of a project life cycle.

Table 1. Overview of impact areas of sustainability on project management.

Phase	Impact Area	Source
Project initiation	Setting of project objectives	Aarseth, Ahola, Aaltonen, Økland and Andersen [5]; Silvius and Schipper [4]
	Extending the scope of consideration in the project	Labuschagne and Brent [10]; Silvius and Schipper [4]
	Identification of benefits in the business case	Weninger and Huemann [11]; Silvius [12]
	Cost/benefits analysis in the business case	Silvius [12]
Project planning	Methods used in project planning	Carboni et al. [13]
	Identification and assessment of stakeholders	Eskerod and Huemann [14]; Sánchez [15]; Silvius and Schipper [16]
	Selection of contractors and suppliers	Molenaar et al. [17]; Aarseth, Ahola, Aaltonen, Økland and Andersen [5]
	Scheduling of the project	Taylor [18]
	Selection and organisation of the project team	Silvius and Schipper [4]
	Development of sustainability competencies	Aarseth, Ahola, Aaltonen, Økland and Andersen [5]
	Identification and management of project risks	Silvius [19]
Project execution	Monitoring of the project	Sánchez [15]
	Communication in and by the project	Pade et al. [20]; Barendsen et al. [21]
	Engagement with stakeholders	Eskerod and Huemann [14]; Sánchez [15]; Silvius and Schipper [16]
	Assessment and management of quality in the project	Silvius and Schipper [4]
Project closing	Evaluation and identification of lessons learned	Carboni, Duncan, Gonzalez, Milsom and Young [13]; Silvius and Schipper [4]

2.2. Factors Influencing the Consideration of Sustainability in Projects

The maturity of integrating sustainability considerations in project management can vary by project type or industry due to specific sustainability challenges, regulatory requirements, available resources, and stakeholder expectations.

For example, as the construction industry dramatically contributes to environmental impacts such as carbon emissions, waste generation, and resource depletion [22–24], several industry standards and regulations have been developed aimed at reducing these negative impacts through sustainable design, choice of material, construction techniques and methods, and complying with regulatory requirements. Standards such as BREEAM (Building Research Establishment Environmental Assessment Method) and LEED (Leadership in Energy and Environmental Design) are well established and are driving the integration of sustainability in construction. Although these standards were originally mainly focused on the sustainability quality of new buildings, they have expanded their focus and today encompass the whole life cycle of buildings, from planning to in-use and refurbishment. Therefore, the maturity of sustainability considerations in building projects is expected to be quite high.

Sustainability standards can also be found for event projects. The ISO 20121 standard [25] describes a management system that has been designed to help organisations in the events industry improve the sustainability of their event-related activities, products, and services. The standard aims to describe the building blocks of a management system that will help any event-related organisation reduce its environmental footprint and become more socially responsible while remaining financially successful. ISO 20121 applies to all types and sizes of organisations involved in the events industry, from caterers, lighting and sound engineers, security companies, stage builders and venues to independent event organisers and corporate and public sector event teams. The maturity of sustainability considerations in event projects is, therefore, also expected to be high.

Another industry at the forefront of sustainable development is the energy industry. As this industry is critical to transitioning to renewable energy sources and reducing carbon emissions, organisations are experiencing a lot of societal and regulatory pressure to develop and implement renewable energy projects. This pressure and competitive market forces around renewable energy can also drive the maturity of project sustainability considerations.

The manufacturing industry is a significant consumer of natural resources and can generate large amounts of waste and pollution; therefore, sustainable project management must focus on reducing the environmental impact of manufacturing processes through waste reduction, energy efficiency, and sustainable material sourcing.

Given the functional ability of information technology (IT) and information systems (IS) to improve, change and reinvent business processes, IT/IS is considered to be an important contributor to more sustainable business practices [26]. However, IT/IS is also recognised as having a significant negative impact on the environment, as the IT industry is responsible for 2% of global CO_2 emissions, which is equivalent to the amount generated by the aviation industry [27]. It is for this reason that sustainability should be an important consideration in IT/IS projects. For this reason, sustainability should be an important consideration in IT/IS projects. Despite the environmental impacts of IT/IS, both positive and negative, Watson et al. [28] conclude that the IS community is largely unaware of these impacts. More recently, Asadi et al. [29] concluded that current knowledge about the sustainability impacts of IT/IS is still limited and that there is a need for a "better understanding of the multifaceted nature of green IT and the strategies and approaches that organisations can follow to green their IT" [29]. These indications suggest that the maturity of sustainability considerations in IT/IS projects may not be that high.

The evidence discussed above suggests that the consideration of sustainability may be more prominent in certain types of projects, most likely construction, energy, and events projects, than in other types, such as IT/IS projects. In addition to expectations about the extent to which sustainability is taken into account, it can also be expected that the diversity of projects will influence the materiality of different sustainability aspects. Moreover, particular industries and project types will, therefore, consider certain sustainability aspects more prominently than other industries or projects.

In addition to the type of project or industry, other situational variables may also influence the consideration of project sustainability. For example, the size of the project or the number of organisations or stakeholders involved. Small projects tend to be less complex than larger projects and may have fewer stakeholders. Sustainable project management for small projects may focus on identifying and mitigating potential negative environmental, social, and economic impacts of the project. It may depend highly on the resources available for sustainability initiatives, such as financial, human, and technological resources. Average-sized projects may have a moderate level of complexity; sustainable project management may focus on developing and implementing stakeholder engagement plans, sustainability goals, and sustainability reporting frameworks influenced by project team support. Large projects can typically be highly complex, with multiple stakeholders and sustainability challenges. These include integrating sustainability into project management processes and practices, such as risk and impact assessment and monitoring, while ensuring adequate levels of leadership commitment, stakeholder engagement and resource availability for sustainability initiatives. Therefore, it is expected that the size and number of partners involved in the project will influence the maturity of sustainable project management.

2.3. Assessing Sustainability in Project Management

The "maturity" of sustainability considerations in a project can be assessed using the Sustainable Project Management Maturity Model (SPM3) developed by Silvius and Schipper [8]. SPM3 is one of the few sustainability assessment tools developed specifically for projects [30], and its application has been reported in several studies—for example, Esezobor [31], Simionescu and Silvius [32], Clinning and Marnewick [33], and Marnewick [34]. SPM3 provides a descriptive maturity model with which organisations can assess their level of sustainability integration in a given project and develop insights on how to improve this consideration of sustainability in projects.

SPM3 structures the assessment of various sustainability impacts into 22 indicators of different aspects of sustainability, as shown in Table 2. The indicators are organised from the triple bottom-line perspective of economic, social, and environmental indicators.

Table 2. SPM3 indicators of sustainability based on Silvius and Schipper [8].

Indicator	Description
Indicators of economic sustainability	
Return on Investment	The creation and distribution of economic value as a basic indication of how the project creates wealth for all stakeholders.
Business Agility	The ability to be flexible or agile in strategies, objectives, requirements, decision making, processes, projects, and resources.
Competitive potential	Acquisition or development (through projects) of attribute or combination of attributes that allows the organisation to outperform its competitors.
(Business) Continuity	Ensuring that an organisation's critical business functions will continue to operate despite incidents or developments. Business continuity includes the ability to change or adapt business functions and the business model.
Motivation and incentives	Motivations and incentives that influence behaviour of individuals in the organisation. Personal incentives should be motivational but responsible with respect to stakeholder's interests and the society in general.
Risk reduction	The potential of losing something of (potential) value. Risk assessment should include also long term, social and environmental effects. Risk acceptance strategies should take a prudent approach.
Indicators of environmental sustainability	
Transport	The movement of physical objects from one place to another.
Energy	Use of energy for business resources and processes. Energy use is related to greenhouse gas (GHG) emissions and to scarcity of their origins (e.g., oil). The environmental footprint of a project (organisation) is shaped in part by its choice of energy sources.
Water	Use of clean water for business resources and processes. Withdrawals from a water system can affect the environment by lowering the water table, reducing the volume of water available for use, or otherwise altering the ability of an ecosystem to perform its functions.
Eco system	The community of living organisms (plants, animals, and microbes) in conjunction with the non-living components of their environment (things like air, water, and mineral soil), interacting as a system.
Waste and Packaging	Wastes are substances or objects, which are disposed of or are intended/required to be disposed of. Packaging is the enclosing or protecting objects (products) for distribution, storage, sale, and use.
Materials and resources	From an environmental perspective some attributes of materials and resources are important: for example, the extent to which materials used for the project are or become toxic during the project, the scarcity of the material, the extent to which fossil (or non-replaceable) materials are used by the project, the reusability of the material after their use, the origin of the material and the incorporated energy of the materials during sourcing or production or use by the project.
Emissions	Emissions of fluids or gasses resulting from an organisation's processes or resources on land, on water or in the air.

Table 2. *Cont.*

Indicator	Description
Spatial planning	Regional/spatial planning gives geographical expression to the economic, social, cultural, and ecological policies of society. Several aspects influence this: the use and quality of space, the social relevance and welfare related to the space, reachability, and investment climate to business and inhabitants.
Nuisance	Nuisance describes an activity or condition that is harmful or annoying to others (e.g., loud noises, vibrations, dust, dirt). Nuisance is relevant to project, while during execution nuisance levels of noise, vibrations, dust, or dirt) commonly rise above aesthetic levels and can be annoying to the community.
(Business) Continuity	Ensuring that an organisation's critical business functions will continue to operate despite incidents or developments. Business continuity includes the ability to change or adapt business functions and the business model.
Indicators of social sustainability	
Labour practices and decent work	Fair labour practices and decent work are the availability of employment in conditions of freedom, equity, human security, and dignity.
Human rights	The extent to which processes have been implemented to safeguard stakeholders' ability to enjoy and exercise their human rights. Among the human rights issues included are non-discrimination, gender equality, freedom of association, collective bargaining, child labour, forced or compulsory labour, and Indigenous rights.
Ethical behaviour	Ethical behaviour, consisting of anti-competitive behaviour, anti-trust, and monopoly practices must ensure a level playing field for customers (and supplier) regarding consumer choice, pricing, and other factors that are essential to efficient markets.
Society, customer, and product responsibility	Society, customer, and product responsibility concerns with impacts caused by project activities, project results and their effects on customers, society, local communities, and other stakeholders.
Participation	Participation is about the proactive involvement of stakeholders, suppliers, and customers with respect to the project's development, design, processes, deliverables, and effects.
Human capital development	The development of the organisations or individual's intellectual capital (competencies, knowledge, and skills).
Corporate governance	Governance broadly refers to the mechanisms, processes, and relations by which corporations and projects are monitored, evaluated, and directed. Sustainability aspects should be covered and integrated in the areas of documentation, reporting and decision making and strategy formulation.

The SPM3 assessment assesses the consideration of the various aspects of sustainability on a four-level maturity scale: (1) compliant—projects at this stage have little consideration of sustainability and are focused only on meeting requirements; (2) Reactive—projects' sustainability practices are ad hoc; at this stage, projects are beginning to consider sustainability but have yet to integrate it thoroughly and consistently into project management; (3) Proactive—projects have established sustainability objectives, policies, and procedures and are integrating them into project management; and (4) Purposeful—projects have embedded sustainability into project management practices and are monitoring sustainability performance; sustainability practices are consistent and well documented, and projects are striving to measure and optimise sustainability impacts.

SPM3 covers both the sustainability *by* the project and the sustainability *of* the project, as identified by Huemann and Silvius [1] and Sabini et al. [6]. Sustainability *by* the project refers to the sustainability of the project's outputs or outcomes. In contrast, the sustainability *of* the project refers to the sustainability of the project's planning, management, and implementation processes, as shown in Table 1. The reporting format of SPM3 (Figure 1) shows the assessment of the consideration of the 22 different aspects of sustainability separately for the project process, expressing the sustainability *of* the project perspective, and for the project product, expressing the sustainability *by* the project perspective. Both assessments are expressed in the four maturity levels mentioned earlier.

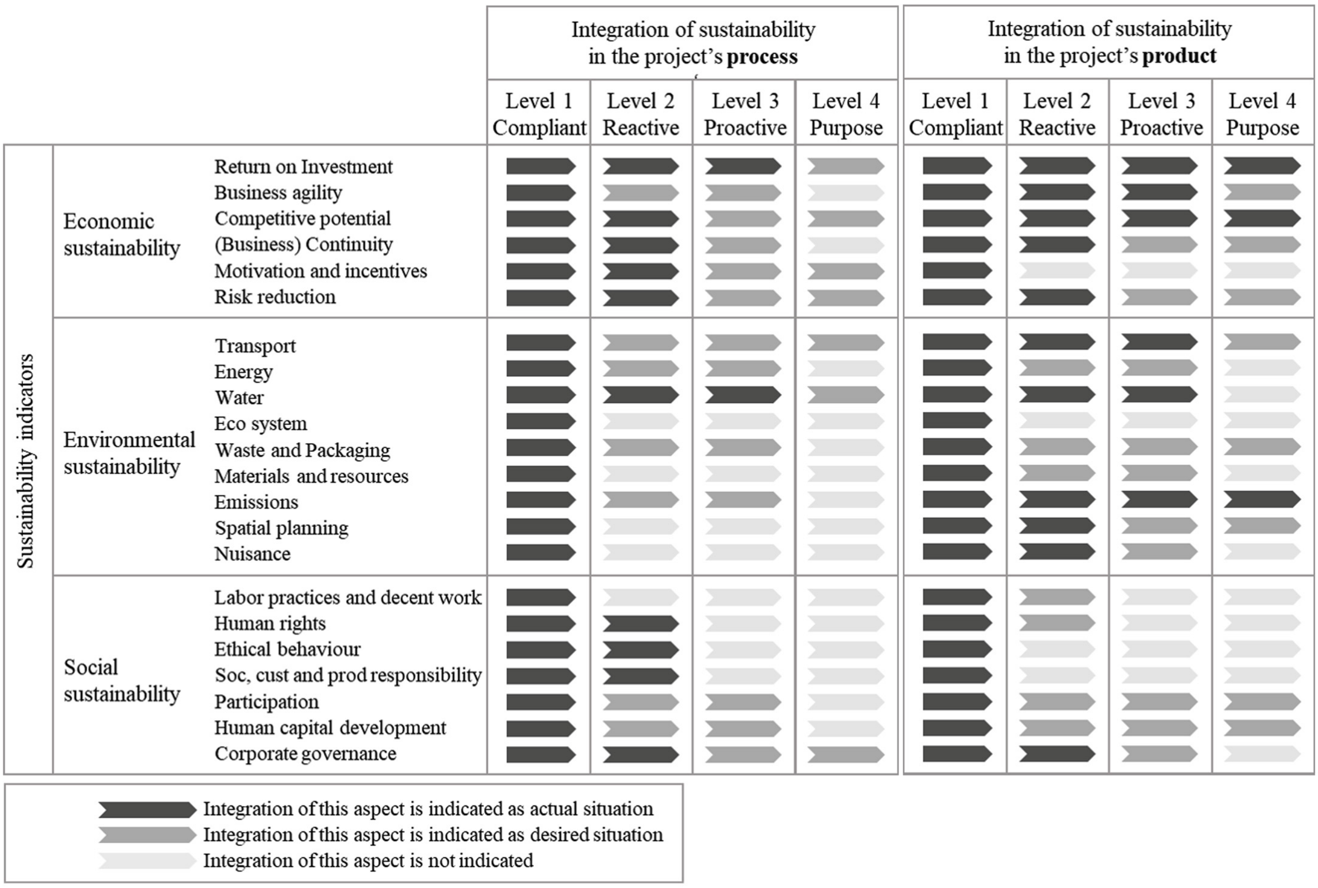

Figure 1. SPM3 reporting format—example [32].

Since SPM3, like most maturity models, is designed as a tool to support the development of the consideration of sustainability, it is suggested that each individual aspect of sustainability be assessed twice: once as an assessment of the "actual" situation in the project (indicated in black in Figure 1) and the second time as an assessment of the "desired" situation in the project (indicated in middle grey in Figure 1).

2.4. Earlier Studies

SPM3 provides an assessment model for holistically measuring and reporting sustainability performance, considering the interdependence of social, environmental, and economic factors, thereby enabling organisations to identify areas where they can improve sustainability performance and track progress over time. This research will use SPM3 to assess how sustainability is addressed in projects. In addition to the individual indicators for different aspects of sustainability, we will also develop aggregated indicators to consider the different triple bottom line (TBL) perspectives for the current and desired situation of the projects, both from the perspective of sustainability *of* and *by* the project.

Empirical studies on the integration of sustainability into project management are often qualitative in nature and based on a limited set of case studies [6]. The scarce quantitative studies that were published (e.g., [33–35]) concluded that "sustainability is not something that project managers think of by default or as part of their planning" [34] and that "the project management sustainability capability levels of (IS) projects are extremely low". In response to the need for more quantitative empirical studies on the integration of sustainability [7], the study reported in this paper used the SPM3 maturity model to investigate the levels at which different aspects and perspectives of sustainability are considered in projects. In addition to developing a quantitative insight into the consideration of sustainability in projects, the study also analysed the correlations of this consideration with project characteristics such as project type, industry, size, and number of partners, which have been suggested in prior studies [36,37]. The following hypotheses were developed for these correlations:

Hypothesis H1. *The level of consideration of sustainability in projects differs by project type*.

Hypothesis H2. *The level of consideration of sustainability in projects differs by industry group*.

Hypothesis H3. *The level of consideration of sustainability in projects differs by project size*.

Hypothesis H4. *The level of consideration of sustainability in projects differs by the number of partners involved in the project*.

3. Materials and Methods

3.1. Procedures

To assess the level of sustainability consideration in projects, the study used the SPM3 questionnaire developed by Silvius and Schipper) [8] and applied it to a sample of projects. The data sources used to assess these projects included the project documentation (project tasks and project plans) and interviews with the project managers. The data collection was carried out by a research team from HU University of Applied Sciences Utrecht (Netherlands), Turku University of Applied Sciences (Finland), the University of Aveiro (Portugal) and the University of Porto (Portugal) in several periods during the years 2018–2022. The SPM3 questionnaire was translated into Portuguese for part of the sample. The research protocol included informed consent, which included the study's objectives and guaranteed the participants' confidentiality and anonymity.

According to the SPM3 framework (Figure 1), the questionnaire consists of 22 items related to different aspects of sustainability (six items representing economic aspects, nine items representing environmental aspects, and seven items representing social aspects). For each item, the consideration of the item in managing and executing the project was assessed separately from the consideration of the item in the deliverable (product) of the project and the benefits that this deliverable is expected to generate. For these two assessment areas, process and product, the consideration of each item was also assessed for the actual situation in the project and the desired situation, resulting in a total of 88 scores per item (22 items $\times$ 2 assessment areas $\times$ 2 actual/desired). The scale of each score was based on the four maturity levels recognised by SPM3: 1—compliant; 2—reactive; 3—proactive; 4—purposeful.

To capture the characteristics of the projects assessed, an additional questionnaire was developed with questions about the type of project (1—Construction—Public Infrastructure, 2—Construction—Real Estate, 3—Construction—Development, 4—Organisational Change, 5—Information Technology, 6—Research and Development, and 7—Other types); the primary sector in which the projects took place (1—Agriculture, 2—Industry, 3—Energy, 4—Construction, 5—Healthcare, 6—Wholesale & Retail, 7—Logistics, 8—Financial Services, 9—Facility & Real Estate Services, 10—Legal Services, 11—Human Resources, 12—ICT & Communication Services, 13—Consulting, 14—Public Administration, 15—Education

& Training, and 16—Other sectors); the financial size of the project (1—less than EUR 1 million, 2—between EUR 1 million and EUR 10 million, 3—between EUR 10 million and EUR 100 million, and 4—more than EUR 100 million) and the number of partners involved in the project (1—0, 2—1 to 5, 3—6 to 15, 4—16 to 50, and 5—more than 50). A pilot study was conducted to test the consistency of the data collection tool.

3.2. Data Analysis

For analysis, the study followed an "intervalist" approach in which data collected using the SPM3 ordinal maturity scale (1—compliant, 2—reactive, 3—proactive, 4—purposeful) were processed as interval data [38]. Statistical analyses were performed using SPSS (version 28.0).

The sample was characterised by descriptive analysis (means, standard deviations, percentages, and cumulative percentages). The normality of the item distributions was assessed by determining skewness and kurtosis indicators: skewness values below three and kurtosis values below 10 indicate normality [39]. Sixteen aggregate variables were constructed from the items to convey aggregate sustainability maturity for each TBL dimension, the current and desired situation, and processes and products (Table 3). To assess the reliability of the variables, Cronbach's alpha coefficients were determined ($\alpha > 0.7$) [40].

Table 3. Aggregate variables.

Variables	Consideration of Sustainability in the Process of Managing and Performing the Project		Consideration of Sustainability in the Project's Product and Benefits	
	Actual Situation	**Desired Situation**	**Actual Situation**	**Desired Situation**
Economic	proc_cur_eco	proc_des_eco	prod_cur_eco	prod_des_eco
Environmental	proc_cur_env	proc_des_env	prod_cur_env	prod_des_env
Social	proc_cur_soc	proc_des_soc	prod_cur_soc	prod_des_soc
Total TBL—indicators	proc_cur_total	proc_des_total	prod_cur_total	prod_des_total

Finally, to analyse whether the items correlated with the characteristics of the projects in the sample, the independent t-test, Kruskal–Wallis H and Mann–Whitney tests were performed, whose interpretation followed Cohen's guidelines (Cohen, 1988); the Shapiro–Wilk test was used to analyse the normality of the distributions of the variables. The statistical significance level was set at 0.05.

3.3. Sample

The study assessed a total of 134 projects from Finland (*n* = 24), The Netherlands (*n* = 36) and Portugal (*n* = 74). The projects in the sample were characterised in terms of project type, industry, size, and the number of partners, as shown in Table 4.

Almost half of the sample consisted of (different types of) building and construction projects, while the other half consisted of more diverse types. The industries in which these projects were carried out were quite diverse, with manufacturing (13.4%) and public administration (14.2%) standing out. The projects in the sample varied in financial size, with the largest segment being between 1 and 10 MEUR (41%). The projects also varied in the number of partners involved, with most projects having less than 15 partners (69%).

Table 4. Sample characteristics.

Project Type		***N***	**Percent**
Building-related projects		65	48.5
	Building and Construction public infrastructure	17	12.7
	Building and Construction real estate	17	12.7
	Building and Construction development	31	23.1
Other project types		69	51.5
	Organisational change	13	9.7
	Information technology	14	10.4
	Research and development	18	13.4
	Other	24	17.9
Total		134	100.0
Dominant industry in which the project takes place		***N***	**Percent**
Manufacturing industry		18	13.4
Energy		11	8.2
Building & Construction		13	9.7
Healthcare		8	6.0
ICT/Communication services		10	7.5
Public Administration		19	14.2
Logistics		19	14.2
Other industries		36	26.9
Total		134	100.0
Project size			
<1 million EUR		29	21.6
Between 1 and 10 million EUR		55	41.0
Between 10 and 100 million EUR		29	21.6
>100 million EUR		21	15.7
Total		134	100.0
Number of partners involved			
5 or less		59	44.0
6–15		34	25.4
16–50		25	18.7
>50		16	11.9
Total		134	100.0

4. Results

4.1. Descriptive Statistics

Economic, environmental, and social indicators for the current and desired situation and both project processes (sustainability of projects) and project products (sustainability of projects) were determined, as the scale consistency of the variables was verified by Cronbach's ($\alpha > 0.7$; Table 5). Figure 2 visualises these results.

A visual inspection of the results shows that the consideration of sustainability in projects in the actual situation is still on an average reactive level. Of the eight aggregated variables of the actual situation, only the consideration of the economic and social dimensions in the project process scores on the proactive side of the scale. This situation is not considered adequate, as the desired situation is consistently rated about half a level higher.

The level of consideration for sustainability in the project process consistently scores slightly (0.07 to 0.26) higher than the level of consideration for the product and benefits of the project. This is in line with the findings of [35], who found that the consideration of sustainability in projects "corresponds to a traditional 'less bad' approach to sustainability".

Table 5. Variables descriptives and Cronbach's α.

Variables	**Consideration of Sustainability in the Process of Managing and Performing the Project**						**Consideration of Sustainability in the Project's Product and Benefits**					
	Actual Situation			**Desired Situation**			**Actual Situation**			**Desired Situation**		
	M	***SD***	**α**	***M***	***SD***	**α**	***M***	***SD***	**α**	***M***	***SD***	**α**
Economic	2.60	1.12	0.70	3.14	0.98	0.81	2.46	1.14	0.77	2.98	1.03	0.85
Environmental	2.11	1.18	0.85	2.71	1.16	0.92	2.04	1.17	0.87	2.59	1.23	0.93
Social	2.51	1.15	0.82	2.92	1.07	0.88	2.25	1.10	0.87	2.76	1.13	0.93
Total	2.37	1.15	0.91	2.89	1.08	0.94	2.22	1.14	0.93	2.75	1.15	0.96

Note: *M* = mean; *SD* = standard deviation; α—Cronbach's alpha.

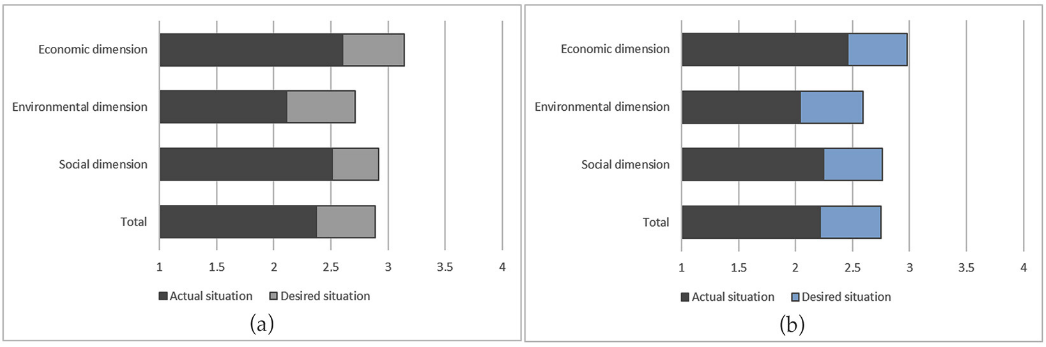

Figure 2. Levels of consideration of sustainability in (**a**) the process of managing and performing the project (left side figure) and (**b**) the project's product and benefits (right side figure).

Regarding the consideration of the different TBL perspectives, the consideration of the economic perspective scores highest, followed by the social perspective, and the environmental perspective scores lowest. This pattern is consistent for both process and product and for both actual and desired situations. This result might be considered somewhat unexpected since, in previous studies, the environmental perspective scored higher than the social perspective [7], and the environmental perspective is also emphasised by the previously discussed sustainability standards for construction and event projects.

Table 6 reports the results in more detail and provides the descriptive statistics obtained for each item—mean (*M*), standard deviation (*SD*), skewness, and kurtosis—confirming the item distributions' normality.

A first observation is that the individual items all score quite close to the aggregate scores of the TBL perspective to which they belong. To illustrate, only a handful of items score more than 0.2 level points from the mean of the aggregate variable. For the actual situation, these are: Return on Investment, Business Continuity, Motivation and incentives, Ethical behaviour, Human capital development, and Corporate governance. For the desired situation, Nuisance and Participation of stakeholders can be added to this list. The item Motivation and incentives consistently scores a lower level of consideration, a pattern that can also be found in Corporate governance in the actual situation. The item Human capital development scores higher than the mean of the social perspective when considering sustainability in the process but lower when considering it in the product of the project.

The authors of the SPM3 model suggest that the consideration of different aspects of sustainability in a project should be aligned with the organisation's material impacts, strategy and ambitions. The results do not really show this alignment, as the relatively related scores of the items with the aggregate variable of the applicable TBL perspective suggest that the consideration of sustainability in projects is not really specified at the item level.

Table 6. Item descriptives.

Items	Project Process Sustainability								Project Product Sustainability							
	Actual				Desired				Actual				Desired			
	M	*SD*	*Sk*	*Kr*	*M*	*SD*	*Sk*	*Kr*	*M*	*SD*	*Sk*	*Kr*	*M*	*SD*	*Sk*	*Kr*
Economic dimension	**2.60**	**1.12**			**3.14**	**0.98**			**2.46**	**1.14**			**2.98**	**1.03**		
Return on Investment	2.83	1.13	−0.454	−1.197	3.34	0.90	−1.174	0.313	2.65	1.15	−0.207	−1.397	3.09	0.98	−0.722	−0.603
Business agility	2.74	1.06	−0.225	−1.209	3.20	0.90	−0.725	−0.636	2.49	1.10	−0.068	−1.302	3.01	1.04	−0.659	−0.819
Competitive potential	2.60	1.12	−0.165	−1.328	3.16	0.97	−0.819	−0.496	2.45	1.17	0.000	−1.491	3.08	1.01	−0.786	−0.556
(Business) Continuity	2.81	1.08	−0.426	−1.091	3.28	0.89	−1.047	0.172	2.72	1.09	−0.358	−1.167	3.19	0.89	−0.890	−0.031
Motivation and incentives	2.16	1.18	0.452	−1.323	2.93	1.11	−0.558	−1.081	2.17	1.13	0.358	−1.312	2.71	1.14	−0.280	−1.330
Risk reduction	2.49	1.15	0.034	−1.427	2.95	1.11	−0.539	−1.131	2.31	1.18	0.196	−1.478	2.79	1.14	−0.419	−1.242
Environmental dimension	**2.11**	**1.18**			**2.71**	**1.16**			**2.04**	**1.17**			**2.59**	**1.23**		
Transport	2.03	1.17	0.657	−1.115	2.69	1.20	−0.257	−1.491	1.84	1.13	0.949	−0.652	2.42	1.27	0.109	−1.666
Energy	2.05	1.21	0.597	−1.281	2.72	1.19	−0.288	−1.455	1.93	1.15	0.802	−0.924	2.65	1.26	−0.206	−1.618
Water	2.17	1.26	0.472	−1.467	2.71	1.20	−0.240	−1.503	2.13	1.21	0.483	−1.381	2.69	1.21	−0.278	−1.490
Eco system	2.08	1.16	0.477	−1.330	2.69	1.18	−0.289	−1.416	2.04	1.17	0.552	−1.287	2.62	1.23	−0.219	−1.557
Waste and Packaging	2.29	1.19	0.252	−1.482	2.81	1.12	−0.390	−1.240	2.19	1.19	0.420	−1.373	2.63	1.22	−0.204	−1.536
Materials and resources	2.05	1.12	0.582	−1.095	2.72	1.10	−0.258	−1.266	2.09	1.14	0.533	−1.186	2.66	1.20	−0.249	−1.484
Emissions	2.01	1.17	0.666	−1.130	2.80	1.12	−0.384	−1.230	2.03	1.20	0.603	−1.275	2.66	1.22	−0.213	−1.543
Spatial planning	2.29	1.19	0.236	−1.479	2.78	1.12	−0.410	−1.204	2.15	1.13	0.393	−1.307	2.58	1.20	−0.157	−1.509
Nuisance	2.04	1.17	0.591	−1.208	2.49	1.20	−0.031	−1.540	1.96	1.16	0.770	−0.956	2.42	1.25	0.107	−1.622
Social dimension	**2.51**	**1.15**			**2.92**	**1.07**			**2.25**	**1.10**			**2.76**	**1.13**		
Labour practices and decent work	2.43	1.13	0.010	−1.390	2.83	1.08	−0.415	−1.122	2.30	1.14	0.199	−1.390	2.76	1.09	−0.357	−1.175
Human rights	2.43	1.18	0.023	−1.503	2.81	1.15	−0.418	−1.289	2.43	1.17	0.068	−1.465	2.81	1.16	−0.441	−1.293
Ethical behaviour	2.66	1.17	−0.185	−1.452	2.90	1.12	−0.497	−1.172	2.48	1.19	0.027	−1.524	2.81	1.18	−0.416	−1.349
Social cost and prod. responsibility	2.49	1.19	0.050	−1.510	2.83	1.11	−0.350	−1.290	2.30	1.10	0.214	−1.282	2.66	1.11	−0.253	−1.275
Participation of stakeholders	2.56	1.12	−0.135	−1.344	3.07	1.01	−0.767	−0.551	2.41	1.05	0.023	−1.203	2.99	1.08	−0.655	−0.911
Human capital development	2.74	1.12	−0.307	−1.291	3.19	0.96	−0.903	−0.288	2.03	1.06	0.629	−0.880	2.72	1.13	−0.268	−1.340
Corporate governance	2.24	1.12	0.333	−1.267	2.80	1.10	−0.392	−1.170	1.83	1.00	0.947	−0.282	2.57	1.18	−0.125	−1.478
Total TBL-indicators	**2.37**	**1.15**			**2.89**	**1.08**			**2.22**	**1.14**			**2.75**	**1.15**		

Note: *M* = mean; *SD* = standard deviation; *Sk*—Skewness; *Kr*—Kurtosis.

The items Emissions, Energy, Transportation, Motivation and Incentives, Materials, and Corporate Governance show the most prominent differences between actual and desired levels of consideration in the project process, suggesting that it is in these aspects of sustainability that the ambition to advance the consideration of sustainability is most present. This is consistent with the earlier observation that the level of consideration of sustainability in projects is likely to be driven by the ambition to make projects ‘less bad’. In terms of the consideration of sustainability in the project’s product and benefits, these were energy, emissions, human capital development, and corporate governance.

4.2. Differences Analysis

No statistically significant differences were found in aggregated indicators between groups of projects taking place in different industries or with different numbers of partners. As such, hypotheses 2 and 4 are not supported. However, significant differences have been found regarding project type and size, as follows.

4.2.1. By Project Type

All exploratory statistical tests for differences in aggregated indicators between groups of projects of different types did not yield any significant results. As such, we re-coded projects into two groups: 'building-related projects' (group 1; $n = 65$) and 'other project types' (group 2; $n = 69$). The normality of the variables distributions across groups was not ensured in all cases, as shown by a Shapiro–Wilk test; therefore, a Mann–Whitney U test was run to determine if there were differences in those variables between building-related projects (group 1) and other project types (group 2). Table 7 documents only the statistically significant differences that were found ($p < 0.05$).

Table 7. Differences in aggregated indicators by project type.

Variable	Group	*N*	*M*	*SD*	Mean Rank	*Md*	Mann–Whitney U	*z*	Asymp. Sig. (2-Tailed)	Effect Size *r*
proc_cur_env	1	65	2.1	0.76	75.51	2.11	1722.000	−2.321	0.020	−0.20
	2	69	1.9	0.73	59.96	1.78				
	Total	134	2.0	0.75		1.89				
proc_cur_total	1	65	2.4	0.66	74.42	2.27	1793.000	−2.002	0.045	−0.17
	2	69	2.2	0.64	60.99	2.00				
	Total	134	2.3	0.65		2.16				
prod_cur_env	1	65	2.0	0.81	74.99	1.78	1755.500	−2.175	0.030	−0.19
	2	69	1.7	0.76	60.44	1.44				
	Total	134	1.7	0.79		1.67				
prod_cur_total	1	65	2.2	0.72	74.40	1.95	1794.000	−1.999	0.046	−0.17
	2	69	2.0	0.66	61.00	1.82				
	Total	134	2.1	0.70		1.86				

Note—*N*—number of cases; *M* = mean; *SD* = standard deviation; *Md*—Median; *Z*—*z*-score; Asymp. Sig. (2-tailed) = *p*-value.

The median of the project process-related current environmental indicator was higher for building projects (Group 1; *Md* = 2.11) than for other project types (Group 2; *Md* = 1.78), while the median of the project process-related current total indicator was higher in Group 1 (*Md* = 2.27) than in Group 2 (*Md* = 2.00). In Group 1 projects, the medians of the project product-related current economic (*Md* = 1.78) and total (*Md* = 1.95) indicators were also higher in Group 1 than in Group 2 (*Md* = 1.67 and *Md* = 1.82, respectively). Having found these differences, Hypothesis 1 is supported.

4.2.2. By Project Size

A Kruskal–Wallis H-test was used to test for differences between projects of different sizes: less than 1 MEUR (group 1; $n = 29$), between 1 and 10 MEUR (group 2; $n = 55$), between 10 and 100 MEUR (group 3; $n = 29$), and over 100 MEUR (group 4; $n = 21$). The results are documented in Table 8, which shows only those indicators for which statistically significant differences between the groups were found ($p < 0.05$).

Pairwise comparisons performed for the indicators displayed in Table 6 revealed median scores statistically significant different for: 'prod_cur_env' between groups 2 (*Md* = 1.44) and 4 (*Md* = 2.56; $p = 0.004$), groups 3 (*Md* = 1.44) and 4 ($p = 0.019$), and groups 1 (*Md* = 1.78) and 4 ($p = 0.039$); 'prod_cur_total', only between groups 2 (*Md* = 1.73) and 4 (*Md* = 2.23) ($p = 0.028$). Therefore, hypothesis 3 is supported.

Table 8. Differences in aggregated indicators by project size.

Variable	Group	*N*	*M*	*SD*	Mean Rank	*Md*	Kruskal–Wallis H	*df*	Asymp. Sig.
prod_cur_env	1	29	1.8	0.65	64.93	1.78	12.903	3	0.005
	2	55	1.8	0.76	61.02	1.44			
	3	29	1.8	0.86	62.34	1.44			
	4	21	2.4	0.78	95.14	2.56			
	Total	134	1.9	0.79		1.67			
prod_cur_total	1	29	2.0	0.61	66.50	1.86			
	2	55	2.0	0.74	60.88	1.73	8.203	3	0.042
	3	29	2.0	0.70	65.43	1.82			
	4	21	2.4	0.65	89.07	2.23			
	Total	134	2.1	0.70		1.86			

Note—*N*—number of cases; *M* = mean; *SD* = standard deviation; *df* = degrees of freedom; Asymp. Sig. = Asymptotic significances (two-sided tests); *Md*—Median.

5. Discussion

This paragraph reflects on the main findings from the study, as presented above.

5.1. Overall Levels of Consideration

The study shows that the current consideration of sustainability is still largely 'reactive'. Given the increased attention to sustainability in academic studies, as reported by Sabini et al. [6], and the integration of sustainability considerations in project management standards, such as the IPMA Competence Baseline 4 [41] and the Project Management Institute's 'A Guide to the Project Management Body of Knowledge' [42], this conclusion can be seen as disappointing or even concerning. The impact of standards and academic studies on project management practice seems to be limited. It should also be noted that the consideration of sustainability in the deliverables and benefits of the project (sustainability by the project) consistently scores lower than the consideration of sustainability in the project process (sustainability of the project).

The findings are certainly concerning from a strategy implementation perspective, where projects are instruments of organisational change [4] aimed at realising the strategies and ambitions of the organisation. The 2019 State of Sustainable Business report reported that "deeper integration is challenging" [43], indicating that organisations are struggling to implement their sustainability ambitions. The conclusion that the consideration of sustainability in projects is still largely reactive may provide some explanation. Clearly, organisations are failing to align their projects and their sustainability strategies in a more proactive way, but it is unclear whether this lack of alignment is due to a lack of awareness, lack of motivation, lack of transparency, or lack of tools. However, the finding that the desired level of consideration for sustainability is consistently on the "active" side of the scale suggests that the motivation to align more actively is present. Therefore, it should be recommended that organisations improve the transparency of the consideration of sustainability in projects, for example, by conducting a sustainability impact analysis of their projects, as reported in this study, and comparing it with the organisation's sustainability strategy. Incorporating such a sustainability impact analysis into an organisation's project management processes requires cooperation between sustainability experts, project managers and the project management office.

5.2. Levels of Consideration of the Different TBL Perspectives

When considering the different TBL perspectives, the study shows that the economic perspective scores highest, which is not surprising as this is traditionally the dominant perspective in business. However, it may be surprising that the social perspective ranks second and the environmental perspective ranks third. The environmental indicators of transportation, energy, emissions, and materials all score low, which is remarkable given the attention given to environmental challenges, especially in Europe. Again, this is a rather reactive consideration of sustainability in projects, which is remarkable given the sustainability ambitions that many large organisations publish on their websites. Sustainable business may indeed still be 'greenwish': the 'wishful thinking that undermines the ambition of sustainable business' [44].

5.3. Correlation with Type and Size of Project

The analysis showed that project type and size were significantly related to the level of sustainability consideration. Building-related projects scored a higher level of sustainability consideration than the other project types, just as larger projects scored a higher level. This conclusion is consistent with the construction industry's position as "one of the most critical sectors for adopting sustainable development principles because of its size, activities, number of people employed, services provided, waste generated, etc." [45]. Another possible explanation for the higher level of consideration of sustainability in building-related projects is provided by Silvius et al. [46], who found that sustainability is easier to evaluate when the outcome is tangible, such as a building or a piece of infrastructure. The construction industry has also developed several standards, such as BREEAM and LEED, which address sustainability. "Projects with less tangible deliverables, such as organisational changes, information systems, and marketing campaigns, are more difficult to evaluate" [44,46]. The IT/IS community, in particular, appears to be largely unaware of the challenge of sustainable development [28].

6. Conclusions

The study reported in this paper aimed to investigate "At what level are the different aspects and perspectives of sustainability considered in projects?". By conducting a quantitative study, the study contributed to the gap in the literature identified by Silvius et al. (2013). Based on an analysis of 134 projects, the findings show that, on average, sustainability is (still) considered on a reactive level. In view of the challenges that humankind is facing, it should be concluded that this result is concerning and perhaps even alarming. As projects are recognised as the "path to sustainability" [47], a more active approach is needed. If we, as a society, want to develop towards sustainability, projects, as change organisations, should consider sustainability more proactively. The findings may, therefore, be seen as confirmation of the need for a "mind shift", as Silvius and Schipper (2014) [4] concluded.

The fact that the desired consideration levels score, on average, one level higher is encouraging, as it shows that the intention to consider more proactively is there. However, the gap between the actual and desired levels also suggests that something is holding the good intentions back. This may be one of the conclusions that should be investigated further. What barriers are experienced concerning the consideration of sustainability in projects?

The implications of these main conclusions should be that organisations start supporting the consideration of their sustainability strategies and ambitions in projects more. For example, by integrating their sustainability ambitions into project assignments [12] and by stimulating project managers and project owners to explicitly consider sustainability in the management and governance of the project [30]. Requiring a project-specific sustainability impact analysis, as SPM3 provides, is instrumental in this integration of the consideration of sustainability and should therefore be integrated into the project management standard that the organisation applies. As the study showed that building-related projects scored a higher level of sustainability consideration than the other project types, this might be especially relevant in the case of non-building projects, such as information technology, organisational change, and/or product development projects.

The study inevitably has a number of limitations. A first limitation is presented by the geographical focus of the sample, which was Europe-based. As sustainability is a values-based concept, it should be expected that its consideration in projects in other geographical regions may show a different pattern. Nevertheless, as Europe is the front-running region on sustainability in project management, the results of the study are insightful and make a contribution. A second limitation may be provided by the fact that the quantitative research design does not allow for much information on the context of the projects. Our analysis of the type and size of the projects in the sample showed that building-related projects and large projects had a higher level of sustainability consideration than the other project types. However, the sample size of the study did not allow for a more detailed analysis of other project types and/or other contextual factors, such as the strategy of the organisation. A second suggestion for future research, therefore, may be to further investigate the influence of contextual factors on the consideration of sustainability. A final limitation is provided by the fact that the data collection was performed by a research team consisting of several individuals from several European countries over several periods during the years 2018–2022. Although the data collection followed a very structured process and every project's SPM3 assessment was checked by another member of the research team, subjective differences in the assessment of individual projects cannot be completely excluded.

The authors hope that the study may act as a 'wake-up call' for all project professionals. For projects to be the way to sustainability, this role needs to be considered more proactively. Project managers and owners will need to 'up their game', in order for projects to realise the change society needs.

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