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TACKLING PROJECTS ON SUSTAINABILITY: A LITHUANIAN CASE STUDY*

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Abstract. Companies are increasingly coming under strong global pressure to incorporate sustainability considerations into their project decision-making process. This is where project managers play a vital role. However, how project managers approach sustainability in their daily work still has to be explored. Therefore, this article seeks to determine whether and to what extent project managers take into account sustainability in project management decision making. Research was carried out in Lithuania, selecting two industries: construction and automotive. The case study revealed that project managers in Lithuania still do not give much regard to sustainability when making their decisions. Only a limited number of sustainability criteria are taken into account by project managers in their decisions. Research also showed that a project manager gives more consideration to sustainability in project management decision making than a project team member.

Keywords: sustainability, project, project management, project manager, decision making.

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1. Introduction

At present, both sustainability and project management are important and expected to grow in importance even more in the future. The relationship between project management and sustainability is rapidly gaining interest from both practitioners and scholars (Silvius 2014; Dobrovolskienė and Tamošiūnienė 2015; Økland 2015; Marcelino-Sádaba et al 2015; Dobrovolskienė and Tamošiūnienė 2015a; Silvius 2016; Dobrovolskienė and Tamošiūnienė 2016; Carvalho and Rabechini 2017; Silvius et al 2017). Sustainability is one of the most important

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issues that need to be taken into account in decision-making process at different levels of project-oriented organization (Daneshpour 2015). It has to be incorporated within a project and project portfolio to support and achieve the objectives of organization (Tufino et al 2013; Hope and Moehler 2014; Sanchez 2015; Priess et al. 2017; Sulphey, Alkahtani 2017; Čirjevskis 2016; Strielkowsk et al. 2016; Jurigová et al. 2016; Doubravský et al. 2016; Traversari et al. 2017; Barberis et al. 2017).

With a relationship between projects and sustainability being established, it is recognized that project managers are in the best position to contribute to sustainable management practices (Silvius et al 2017). By virtue of their central position in the project, project managers are able to influence many aspects of the project (Silvius 2016). At the 22nd World Congress of the International Project Management Association (IPMA) in 2008, IPMA President Mary McKinlay stated that “the further development of the project management profession requires project managers to take responsibility for sustainability”. Today’s project manager not only performs traditional project management roles but also has to manage the project as efficiently and effectively as possible taking account of sustainability (Hwang and Ng 2013; Goedknecht 2013; Silvius et al 2017). However, project managers are still lagging behind when it comes to incorporating the concept of sustainability into core practices of project management (Banihashemi et al 2017). Silvius and Schipper (2014) stated that it has to be looked into how project managers approach sustainability in their operational daily work. Therefore, this study aims at clarifying whether project managers take into account sustainability in project management decision making.

In this research, two industries were selected, namely construction and automotive. The construction sector was chosen for three reasons. First, projects in the construction industry are among the most important, as this sector is one of the largest sectors and of major importance for the national economy (Dobrovolskienė and Tamošiūnienė 2015). Second, construction projects have a huge impact on the environment and society (Yao et al 2011). Third, within project management, sustainability, and more specifically the environmental dimension, is widely applied in construction projects (Marcelino-Sádaba et al 2015). The second sector, that is, automotive, was chosen to ascertain whether project managers working in companies in different industries have differing views on sustainability in project management decision making.

This article is structured into sections. Section 2 presents a review of the literature on sustainability in project management. Section 3 describes decision making in project management. The results of a case study are provided in Section 4. The paper is finished with some conclusions and suggestions for further research.

The research methods are: analysis of scientific literature and other information sources, survey and statistical analysis. Statistical analysis was performed by using SPSS24 software.

2. Sustainability in project management

The link between sustainability and project management is increasingly being addressed in numerous publications (Silvius and Schipper 2014; Økland 2015; Marcelino-Sádaba et al 2015, Dobrovolskienė and Tamošiūnienė 2015a; Silvius 2016; Dobrovolskienė and Tamošiūnienė 2016; Silvius and Schipper 2016; Carvalho and Rabechini 2017; Silvius et al 2017). Sustainability in project management is primarily focused on the preservation of natural resources, positive impacts on the society and the strengthening of the global economy. The Project Management Institute states that sustainability in project management is a new global model of doing business and managing a project to incorporate sustainability in every phase (Gutierrez 2014; Dobrovolskienė and Tamošiūnienė 2015a).

The review of the academic literature indicates that some researchers have particularly focused on the link between project management and ecodesign, that is, the environmental dimension of sustainability (Knight and

Jenkins 2009; Brones et al 2014; Brones et al 2017; Oates et al. 2017; García-Fuentes, de Torre 2017; Gandini et al. 2017).

For example, Bovea and Pérez-Belis (2012) referred to three parameters in order to optimize a product's ecodesign process: (a) introducing environmental aspects into product design and the development process at an early stage; (b) life cycle focus; and (c) multi-criteria focus, given that environmental and traditional criteria have to be regarded concurrently. Pigosso et al (2013) proposed an ecodesign maturity model for manufacturing organizations that serves as a framework for its progressive implementation.

Quite a few authors have addressed sustainability in project management in the context of Triple Bottom Line, that is, considering all three aspects of sustainability (environmental, social and economic) (Fernández-Sánchez and Rodríguez-López 2010; Dobrovolskienė and Tamošiūnienė 2015a; Marcelino-Sádaba et al 2015; Sánchez 2015; Martens and Carvalho 2016; Siew et al 2016; Pimentel et al 2016; Dobrovolskienė and Tamošiūnienė 2016; Banihashemi et al 2017; Kivilä et al 2017). For instance, Marcelino-Sádaba et al (2015) showed the interrelations between sustainability and project management as well as outlined a new conceptual framework to manage sustainable projects. Their work is based on the assumption that project products developed in accordance with sustainability criteria, sustainable project processes, sustainability-oriented organizations, and project managers trained in sustainability are the key elements underlying sustainable projects.

Within project management, sustainability is widely applied in construction projects. Sustainability in construction covers not only environmental issues, technical efficiency and functional requirements, but also urban renewal and social aspects. Sustainable construction aims to design buildings that would allow saving energy and resources, protecting the health of residents and ensuring their well-being (Dobrovolskienė and Tamošiūnienė 2015). Construction projects have been explored in more depth because of their significant impact on the environment, society and economy (Yao et al 2011).

The review of the academic literature also shows that some authors considered the problem of building the best portfolio in terms of the organizational strategy incorporating sustainable goals. Vandaele and Decouttere (2013) developed a data envelopment analysis (DEA) model designed to support strategic research and development portfolio management. Khalili-Damghani and Tavana (2014) proposed a comprehensive framework for sustainable strategic project selection problem. Siew (2016) proposed methods whereby sustainability is taken into consideration during two crucial stages: screening and optimal portfolio selection. The screening stage involves proposing sustainability criteria and measuring the sustainability of projects. The means and variances derived from the screening stage are then used to find the efficient portfolio frontier (the expected return being substituted by the expected sustainability score of projects, and the variance of return being substituted by dispersion of the sustainability score). Dobrovolskienė and Tamošiūnienė (2016) developed a sustainability-oriented model of financial resource allocation in a project portfolio. The use of the model would allow decision-makers to decide on their optimal portfolio taking into account their respective preference with regard to return, risk and sustainability, i.e. they should decide what projects to finance and execute (e.g. those providing the greatest business value with the acceptable level of sustainability, or those providing the greatest value of sustainability with acceptable level of return). The model is therefore a suitable tool for most decision-makers to express their individual preference.

The majority of recognized project management standards, such as PMBOK of PMI (Project Management Institute 2012) or ISO 21500, are based on processes. Many authors (Marcelino-Sádaba et al 2015) applied the process approach for the purpose of introducing sustainability in project management. The following are among the most frequently mentioned processes: stakeholder management, life cycle management, assessment and decision making (Marcelino-Sádaba et al 2015). From the sustainability point of view, stakeholder management is

focused on balancing their interests, and in particular the pursuit of personal economic benefit against social and environmental goals (De Brucker et al 2013). Some authors (Pade et al 2008; Gareis et al 2009; Eskerod and Huemann 2013) stress the importance of stakeholder participation in projects. The life cycle is the focus paradigm for business and projects based on sustainability criteria. Nearly all sustainability elements identified across the projects, take the life cycle focus (Marcelino-Sádaba et al 2015). According to Labuschagne and Brent (2005), as a starting point for aligning project management standards against sustainable development principles, one needs to understand that several life cycles are involved in a project interacting with each other. The sustainability assessment can be applied in implementing projects and in making strategic decisions (Marcelino-Sádaba et al 2015). Assessment tools are techniques used to facilitate the comparison of different project alternatives (Gasparatos and Scolobig 2012) and decision making (Bond et al 2012). The sustainability assessment process must be designed explicitly to deliver sustainable results. Ness et al (2007) developed a holistic framework for sustainability assessment tools, which includes three categories: (a) indicators and indices; (b) product-related tools; and (c) integrated assessment. Sustainability assessment is linked to decision making. Sustainability assessment is increasingly introduced as a key decision making tool (Bond et al 2012). The most frequent decision making support systems related to sustainability are based on indicators or indices (Marcelino-Sádaba et al 2015).

Although there are over 200 publications dealing with sustainability and project management (Økland 2015), many questions still need to be answered (Marcelino-Sádaba et al 2015). This means that sustainability in project management still represents a vast untapped research area (Singh et al 2012, Martens and Carvalho 2016). Furthermore, more empirical, not conceptual, studies need to be carried out look into how sustainability could be practically implemented in the field of project management.

3. Decision making in project management

In the complex global business environment, decision makers find themselves faced with increasing challenges and exposed to unforeseen circumstances. On the other hand, decision making is crucial to every aspect of business, and in particular project management, which involves making a multitude of decisions on a daily basis about priorities, approaches, resources, and timelines (PMI 2015). Within project management, decision making has a primary role in determining success or failure of a project. There is no question that poor decisions lead to negative consequences for project outcomes. The most effective decision making – the kind that contributes to achieving better project outcomes – results from a formal, methodical approach, such as the five-step process described in *A Guide to the Project Management Body of Knowledge*: (1) problem definition; (2) problem solution generation; (3) ideas to action; (4) solutions evaluating planning; and (5) evaluation of the outcomes and process. So, decision making does not merely mean making a specific choice at a particular point in time. Decision making is a process (Kock and Georg Gemünden 2016), which can be influenced by many factors (Behrens et al 2014; Kester et al 2014; Marcelino-Sádaba et al 2015). The stage-gate process facilitates the decision-making process in projects. The purpose of the gates is not only to decide on the continuation of the process, but also to identify failure at an early stage so that resources would not be wasted but would be allocated to activities with better prospects (Silvius et al 2017). Decision making in project management is traditionally based on the three constraints or “iron triangle”, i.e. cost, time and quality (Papke-Shields et al 2010; Silvius et al 2017). The factor “risk” is also among the control variables in project management (Silvius et al 2017). Decisions in projects are made under risk and uncertainty, which means that decision makers do not fully know what the states of nature will occur and what payoffs will be achieved for each state of nature.

Thus, decision making in project management is traditionally dominated by considerations relating to cost, time, quality and risk. However, some authors (Hwang and Ng 2013; Silvius et al 2017) argue that sustainability aspect should be also considered in decision making and that decision making is a critical skill for sustainable projects.

4. Case study: sustainability in project management decision making

In order to ascertain whether project managers and project team members consider sustainability in project management decision making, reference was made to the study carried out by Silvius et al (2017). A two-part questionnaire was prepared. Two questions were defined in the first part, namely: (1) How well is sustainability incorporated in the strategy of your company? and (2) How well is sustainability incorporated in your daily work? The second part included a list of 14 statements. Each statement was related to aspect of sustainability (Table 1).

Table 1. Statements

No	Statements	Sustainability dimensions
S1	Within decision making in projects the ecological footprint should be taken into account	Sustainability is about balancing or harmonizing social, environmental and economic interests
S2	Within decision making in projects a percentage of project time and budget should be spent on health and safety practices	Sustainability is about values and ethics
S3	Within decision making in projects sustainable resources should be used	Sustainability is about consuming income, not capital
S4	Within decision making in projects we listen to other people's point of view, seeking to understand them	Sustainability is about stakeholder orientation
S5	Within decision making in projects the economic, social and environmental consequences are crucial	Sustainability is about balancing or harmonizing social, environmental and economic interests
S6	Within decision making in projects the amount of energy used in the project is essential to take into consideration	Sustainability is about balancing or harmonizing social, environmental and economic interests
S7	Within decision making in projects stakeholder engagement is vital	Sustainability is about stakeholder orientation
S8	Within decision making in projects we need to be aware of the community's opinion	Sustainability is about transparency and accountability
S9	Within decision making in projects health and safety issues are checked	Sustainability is about values and ethics
S10	Within decision making in projects the amount of waste produced in the project is key	Sustainability is about eliminating waste
S11	Within decision making in projects the carbon footprint is crucial to take into account	Sustainability is about balancing or harmonizing social, environmental and economic interests
S12	Within decision making in projects the sustainability of the project life cycle is important	Sustainability is about both short-term and long-term orientation
S13	Within decision making in projects sustainable procurement is a must	Sustainability is about both local and global orientation
S14	Within decision making in projects renewable resources are vital	Sustainability is about consuming income, not capital

Source: Silvius et al 2017

Our study was carried out in Lithuania. It involved companies operating in two industries (construction and automotive). Questionnaires were sent out to 185 companies. Respondents were selected on the basis of the following criteria: their position, work experience. After questionnaires were sent out, including follow-up reminders, a total of 28 responses were received (a response rate of around 15%). Our response rate is consistent with other studies, e.g. Martens and Carvalho (2016) had a 13.6% response rate, Pagell et al (2015) had a 12.1% response rate in their study.

Thus, 28 respondents took part in research: 71% from the construction industry and 29% from the automotive industry. The respondents were project managers (43.75%) and project team members (56.25%). The respondents were 33 years old (on average), with seven years of experience in project management (range 5...22). 17.86 % of the group had a Bachelor's or Master's degree in the field of project management.

As already mentioned above, the respondents were first asked two questions about (1) the incorporation of sustainability in the strategy of the company and (2) the incorporation of sustainability in their daily work. The respondents rated these questions on a scale from one to ten. Table 2 shows the results on two initial questions.

Table 2. Incorporation of sustainability

Questions	Minimum	Maximum	Mean	Std. Deviation
Construcion industry				
How well is sustainability incorporated in the strategy of your company?	1	9	5.88	2.53
How well is sustainability incorporated in your daily work?	1	8	5.50	2.33
Automotive industry				
How well is sustainability incorporated in the strategy of your company?	1	8	5.38	2.20
How well is sustainability incorporated in your daily work?	1	8	5.13	2.30

Source: authors

The average value of the incorporation of sustainability in the strategy of a company is a little bit higher than the incorporation of sustainability in the daily work. This trend is characteristic of both industries. These findings are not contrary to the results obtained by Silvius et al (2017). Moreover, these findings seem to support the statement of Briassoulis (2001) that it remains difficult to express sustainability in concrete, operational terms. When the two industries are analyzed separately, it is clear that the average values of both questions are slightly higher in the construction industry. This could be due to the fact that sustainability is widely used in construction projects (Yao et al 2011; Bal et al 2013; Marcelino-Sádaba et al 2015). The respondents were then asked to rate each statement on a 5-point Likert scale, where 1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree. The results are presented in Table 3.

Table 3. Consideration of sustainability

Statement No	Construction industry				Automotive industry			
	Minimum	Maximum	Mean	Std. Deviation	Minimum	Maximum	Mean	Std. Deviation
S1	3	5	4.00	0.53	2	5	3.75	1.16
S2	3	5	4.12	0.64	2	5	3.62	1.18
S3	3	5	3.87	0.83	1	4	3.00	1.06
S4	2	4	2.87	0.64	1	4	2.75	1.16
S5	3	4	3.25	0.46	1	4	2.75	1.16
S6	3	5	4.12	0.83	3	4	3.50	0.53
S7	2	4	3.00	0.53	1	5	3.00	1.41
S8	1	4	2.25	0.88	1	3	1.87	0.99
S9	4	5	4.75	0.46	4	5	4.50	0.53
S10	3	4	3.62	0.51	1	4	3.25	1.03
S11	2	4	2.87	0.83	1	5	2.62	1.18
S12	1	4	2.75	1.03	1	5	2.62	1.18
S13	1	4	2.50	1.30	1	4	2.12	0.83
S14	1	4	2.25	1.16	1	2	1.87	0.35

Source: authors

The analysis of the findings shows that, when taking decisions, both construction sector project managers and automotive sector project managers take the utmost account of health and safety (statement No S9). This shows that the social dimension receives a lot of attention. It is an interesting insight, once some studies suggest that the social dimension represents a major gap (Singh et al 2012). There is also a difference between our findings and the results obtained by Silvius et al (2017). The study carried out by Silvius et al (2017) showed that the statement “Stakeholder engagement is vital” is most present in the project managers’ considerations. Moreover, the statement “We need to be aware of the community's opinion” was also among the top ranked statements in their research, whereas our research revealed that the community's opinion does not perform a significant role in the decision-making process of project managers.

When rating the statements, the respondents could have assigned a maximum of 70 points and a minimum of 14 points. The figures in Table 4 lead to the conclusion that project managers employed in construction companies put more emphasis on sustainability in their decisions than project managers employed in automotive companies (the average score in the construction industry is 12% higher than in the automotive industry). As already mentioned above, it could be due to industry-specific features.

Table 4. Consideration of sustainability by industry

	Construction industry	Automotive industry
Minimum	61	52
Maximum	34	22
Mean	46,25	41,25
Std. Deviation	8,68	11,66

Source: authors

Furthermore, the analysis of the survey data revealed that there is a moderate correlation (Pearson Correlation is 0.55, correlation is significant at the 0.05 level (2-tailed) between position (project manager or project team member) and sustainability considerations. Project managers’ considerations of sustainability are higher (the highest score was 61) than project team members’ considerations (the highest score was 52). This could be due to the fact that project managers are more aware of the benefits of sustainability. The analysis of the survey data by industry showed that this correlation is stronger in the construction industry (Pearson Correlation is 0.74) than in the automotive industry (Pearson Correlation is 0.53).

Conclusions

This paper contributes to discussions on sustainability in project management. The paper presents an empirical study on how sustainability considerations are integrated into the decision-making processes of project managers. We found that only a limited number of sustainability criteria are taken into account by project managers when making their decisions, health and safety being most present in project managers’ considerations. The priority for health and safety issues may be explained by industry-specific features.

Our research also revealed a moderate correlation between position and sustainability considerations (Pearson Correlation is 0.55). Overall, project managers give more consideration to sustainability in project management decision making than project team members. This could be due to the fact that project managers, being responsible for the success of a project, are more aware of the benefits which sustainability can bring. Moreover,

this correlation is stronger in the construction sector (Pearson Correlation is 0.74) than in the automotive sector (Pearson Correlation is 0.53)

The findings of the study should be interpreted with caution due to some limitations. The sample size was relatively small. Moreover, the respondents came only from two industries. These findings do not necessarily reflect the viewpoints of project managers working in other business sectors. These limitations give grounds for further investigation using larger samples across different industries. Furthermore, different phases of project management can be measured in the decision-making process. For instance, sustainability might be the most important issue when making decisions on project financing and play a less important role during project implementation.

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