

Investigating the Relationship of Sustainability Factors with Project Management Success

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(Received: November 28, 2016 / Revised: December 6, 2016 / Accepted: December 12, 2016)

ABSTRACT

One of the main concerns of the present age, is attending to the issue of sustainability that in recent decades, the concept of it has grown in terms of recognition and importance. Sustainability have defined further the development of the welfare and living standards of the present generation, without the lives of future generations is at stake. One of these tasks of the business is project management and today, “green or sustainable project management” as one of the most important global trends of project management have been identified. The issue of present study was to investigate the relationship of sustainability factors with success of a project. The population of the research consists of directors of oil and gas in the South Pars region including 150 people that according to Cochran formula, the number of samples were obtained 108 people. In this study, data collection was conducted based on a structured questionnaire that from a sample set of questions was used for sustainability impact on 6 scale of project management success. For this purpose, the whole five-item Likert has been used. Also for statistical analysis, PLS software was used. The results of path analysis at confidence level of 95%, showed a significant relationship exists between “sustainability factor” and “project success criteria.” Since the correlation coefficient is positive, so this type of relationship is positive. Thus all the hypotheses at confidence level of 95 percent was confirmed and it became clear that there is a significant positive relationship between “sustainability factors” and “project success criteria.”

Keywords: Sustainability Factors, Project Management, Project Success

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1. INTRODUCTION

One of the main concerns of the present age, is attending to the issue of sustainability that in recent decades, the concept of it has grown in terms of recognition and importance. Sustainability have defined further the development of the welfare and living standards of the present generation, without the lives of future generations is at stake. The desirable and acceptable future can depend on the comprehensive sustainable development. Increasing human living standards directly related to improving access to natural resources for future generations. Kumaraguru *et al.* (2014) suggest that all de-

finitions are taken from the concept of sustainability, this concept is still vague in many cases. Especially in business concepts, that it used to explain everything (Veleva *et al.*, 2001). Regardless of the concept of sustainability, market leaders, rightly, the strategic benefits of the concept of sustainability have been recognized in the program and production (Farrow *et al.*, 1999). Also many companies and organizations seeking to understand the importance of sustainable development, although they do not understand the concept of sustainability used to be where their business (Veleva *et al.*, 2001). Reports show companies that operate in accordance with sustainability concepts, have a significant increase in

quality, market share and profits (Nambiar, 2010). By definition, sustainability must be guided by three indicators of environmental, social and economic seamlessly, and be evaluated according to three indicators (Amrina *et al.*, 2015). Accordingly, it is not possible to use only one criterion, suffice it to assess the sustainability of a system. An evaluation system have the ability to pay attention to three sustainability limitations (environmental, social and economic) is closer to comprehensive sustainability assessment (Doualle *et al.*, 2015). Sustainability has been recently associated with project management. The logic of the relationship between changes in emotional sustainability, and the projects that can achieve the necessary changes. BSR/Globe (2012) concludes that “the most important leadership challenge of today’s business, is the integration of sustainability with core business functions.” One of these business tasks, project management and today “green or sustainable project management” as one of the most important global trends of project management have been identified (Gilbert Silvius *et al.*, 2015). From another view, it seems that there is communication between the public administration and sustainable development. At least in two ways, this communication can be created. This ring link called sustainable development management. In the first meaning, sustainable development management can mean managing sustainable development or find strategies that based on the ideal of sustainable development, can take practical aspect. This interpretation implies the need for different types of research at all levels of government and in all aspects of life. If an idea, behavior and priorities change, need to be programs that can be effective in transforming ideas into reality. In the second meaning, management sustainable development can imagine as a sub-domain that focuses on sustainability management development. In this context, it is need for research on the changing environment of public management and strategy needed for implementation of governmental managers and experts with these changes (Redelift *et al.*, 2002). The importance of government’s role in the discussion of sustainability is on the rise increasingly and also the annual global sustainability reports are accelerated in the process. Governments have recognized the broad ways to make sustainability reports which can more effectively provide practical help with important non-financial information to markets, and also help organizations progress in line with the objectives agreed by the government in sustainable development (<https://www.globalreporting.org/>). However, in academic research, the relationship between project management and sustainability as one of the future developments in project management has been studied. Silvius *et al.* (2015) know one of the areas of influence sustainability on the project as project success that might be expected from sustainable integration in the project, for example, it cited an

increase in satisfaction with project stakeholders. Although attending to the aspect of sustainability in projects linked mainly to the cost in time and money, but simply are not as supportive measures the success of a project, however, in academic research, the relationship between project management and sustainability as one of the future developments in project management has been studied. Gilbert Silvius *et al.* (2015) know one of the areas of influence sustainability on the project, project success that one might expect the integration of sustainability in projects, for example, can be cited to satisfy stakeholders. However, according to aspects of sustainability in projects linked mainly to the cost in time and money, but just are not as supportive measures the success of a project has been studied. Gilbert Silvius *et al.* (2015) know one of the spheres of influence sustainability on the project as project success that one might expect that the integration of sustainability in projects, for example, it can be noted with satisfaction the project stakeholders. However, according to aspects of sustainability in projects linked mainly to the cost in time and money, but not merely as supporter of success criteria of a project, thus, according to research topics presented may question how the concept of sustainability in a project, with regard to government agents on the success of the project expressed that this paper aims to address the review of these factors and their impact on the success of a project based on sustainability criteria.

2. LITERATURE REVIEW

Given that the main variables of the study include: project success, sustainability and government agents, is intended to examine each of these concepts can be effective in identifying the conceptual model.

2.1 Project Success

Several studies have been done on how the concept of adverse effect on project management, concept or project success criteria in most studies as a variable has been discussed. The few people who are many ways to interpret the meaning ascribed the success of the project. In simple terms, it seems that the majority of primary research, instead of an “elusive concept” of the success of the project on the traditional three dimensions include: relied on time, budget and specification, from which the iron triangle to the success of this project is therefore now this method has been the subject of criticism. However, in the early 1980s, several other factors emerged in the literature that the success of the project, including the “measure of success after delivery” that “is required to review the benefits and effectiveness of a project from the perspective of stakeholders” noted that one of the issues cited in the decade, the attitude developed on

the success of the project. Pinto *et al.* (1988) emphasized the importance of “over time” in the success of the project. The perceived success of the project development over time is again considered by Shenhar and colleagues. Thomas *et al.* (2008) distributed 155 questionnaires and the problem of defining success criteria studied in Norway industry. The study showed that these problems are mainly due to weak or insufficient stakeholder involvement during the start phase, imbalances for organizations for project success and lack of support of senior managers. Wateridge *et al.* (1998) paid to a limited review to develop a set of appropriate criteria for IT projects and suggest that all criteria are not appropriate for all projects and project managers must consider the standards project stakeholders, provide appropriate factors. Müller *et al.* (2007) using an online survey on 959 respondents showed that the criteria of success and the success of the project according to the type of industry, complexity of the project and the project manager is different age and nationality. Nelson *et al.* (2005) in a review article in IT projects, discussed the importance of assessing project success rates from multiple dimensions and perspectives of different stakeholders. Success criteria that were considered in this paper include: completion of the project according to the schedule, completion of the project according to the budget, project delivery and technical specifications, project delivery with the performance, client project in use after delivery, to meet the organization’s business goals and projects for the future, expressed.

2.2 Sustainability

There is a wide attitudes to the concept of sustainability and its activities. So in terms of sustainability, broad and fragmented as: ethics, decision-making, assessment, rules, and has been mentioned, but usually at the global level to analyze, in a dimension attended to it (Lozano *et al.*, 2014; Baghchesaraei *et al.*, 2015). Marcelino *et al.* (2015) studied the hypothesis about the lack of sustainable integration and project management. Marcelino *et al.* (2015) studied the hypothesis about the lack of sustainable integration and project management and a comprehensive literature review of more than 100 reference analyzed, and came to the conclusion that especially in aspects of environmental sustainability has become a very important step. However, progress has been less in social areas. Martens *et al.* (2016) began to investigate how the concept of sustainability to project managers, and adverse effect on project success. This research was conducted in four Brazilian and American companies that the results showed that the companies are interested in creating sustainability in project management. But there is a gap between perceived importance and actual use in practice. Finally, public sector companies show more interest from other companies in the social dimension. Silvius *et al.* (2013) in a book titled sustainable integration for effective project management, pointed out on a

comprehensive understanding of the issues, concepts, procedures, methods and good practices in sustainability for project management. Research and concepts discussed in this book by experts and academics, aims to provide the latest knowledge about the principles of sustainability to prospective professionals, were developed. Silvius *et al.* (2014) in an article focused on the structure 164 articles and books, in the period 1993, 2013, which were related to sustainability in project management. Researchers have identified areas of influence sustainability in project management, and realized that sustainability in project management is effective on different levels. According to the sustainability refers to 1. Change the scope of project management, including: time management, budget and quality, to effectively manage social, environmental and economic. 2. Change the paradigm of project management including forecasting and control approach that is determined, to approach with flexibility, complexity and opportunity is determined and 3. Changing mind of project manager which may include: providing results of demands, is the result of responsibility for sustainable development and community organization. Goedknecht *et al.* (2012) in an article, 9 enduring principle applied in a case study for project managers to review how project managers can implement to fulfill it. Silvius *et al.* (2015) pays to understand how to evaluate adverse effect on project success. The researcher suggests that project managers, logically trying to project success and sustainability may be affected due to the perceived success of the project. The conceptual model provided by the researcher, pointed out that a more thorough understanding of how different aspects of sustainability according to individual criteria that may affect the success of the project. In this article, 27 different scale is concluded the success of the project and therefore of the view that the project is a multi-dimensional concept.

3. HYPOTHESIS

Given the articles mentioned, hypotheses have been developed as follows (Baghchesaraei *et al.*, 2014; Silvius *et al.*, 2015; Baghchesaraei *et al.*, 2016):

Assumptions:

- 1) Sustainability factors are associated with the implementation of project by controlled method.
- 2) Sustainability factors are associated with the completion and delivery of the agreed projects according to schedule and budget.
- 3) Sustainability factors are associated with the delivery of project fits with the target.
- 4) Sustainability factors are associated with achievement of business objectives or goals of the project.
- 5) Sustainability factors are associated with project stakeholders’ satisfaction.
- 6) Sustainability factors are associated with preparing the organization for the future by the project.

4. METHODOLOGY

4.1 Model Design

Table 1 provides measures that Silvius *et al.* (2015) examined and also shows that there is no general con-

sensus about the scale (a set of scales) for project success.

Silvius *et al.* (2015) to develop a more comprehensive set of criteria for project success, it is considered relevant measures have been grouped and have concluded six criteria massive success of the project. Table 2 provides a comprehensive set of standards.

Table 1. Scales of project success in literature

Scales of Project Success			
1	Project is completed according to the program	15	Project team is satisfied with the project.
2	Project is completed according to the budget	16	Project stakeholders (other) are satisfied with the project.
3	Delivery with technical specifications	17	Business objectives have been achieved
4	Delivery with functional performance requirements	18	Business objectives of suppliers and contractors have been achieved
5	Project management process is worthy	19	Delivery has created a larger market share of the customer
6	Project risks are adequately managed	20	Project, has prepared the organization for its future
7	Working parties and individuals in the project is good.	21	Project helps in the growth of participating organizations
8	Project was carried out with a high standard of quality of work.	22	Project helps in the progress of participants
9	Customer of project is using delivery (after completion)	23	Project has gained public recognition
10	Delivery is to satisfy customer needs.	24	Project reduced wastes
11	Delivery is solve customer problems.	25	Project has created a positive economic impact in the community
12	Project sponsor is satisfied with the project.	26	Project has created a positive social impact in the community
13	End-user project is satisfied with the project.	27	Project has created a positive environmental impact in the community
14	Project supplier is satisfied with the project.		

Table 2. Comprehensive criteria

Row	Criterion	Available scales in criteria
1	Project is implemented in a controlled method.	Project management process is worthy Project risks are adequately managed Project was carried out with a high standard of quality of work
2	Agreed project delivery be completed according to schedule and budget.	Project is completed according to the program Project is completed according to the budget Delivery with technical specifications
3	Delivery of the project is appropriate for the purpose	Delivery with functional performance requirements Customer of project is using delivery (after completion) Delivery is to satisfy customer needs Delivery is solve customer problems
4	Business purposes or objectives of the project are achieved	Business objectives have been achieved Business objectives of suppliers and contractors have been achieved Delivery has created a larger market share of the customer
5	Project stakeholders are satisfied.	Project sponsor is satisfied with the project End-user project is satisfied with the project Project supplier is satisfied with the project Project team is satisfied with the project Project stakeholders (other) are satisfied with the project Working parties and individuals in the project is good
6	Project preparing the organization for the future.	Project, has prepared the organization for its future Project helps in the growth of participating organizations Project helps in the progress of participants Project has gained public recognition Project has created a positive economic impact in the community Project has created a positive social impact in the community Project has created a positive environmental impact in the community

Table 3. Concepts of sustainability

Sustainability is about balance or coordination of the interests of social, environmental and economic.
Sustainability is both for short-term and long-term orientation.
Sustainability is both the local and global trends.
Sustainability is about values and ethics.
Sustainability is about transparency and accountability.
Sustainability is about stakeholder participation.
Sustainability is about risk reduction.
Sustainability is about eliminating wastes.
Sustainability is about income consumption, not capital.

Silvius *et al.* (2015) have also investigated nine dimensions of the concept of sustainability that Table 3 shows them.

Thus, according to Table 1, Table 2, Table 3 Silvius *et al.* (2015) have provided the following conceptual model.

The population of the research consists of directors of oil and gas in the South Pars region including 150 people that according to Cochran formula, the number of samples were obtained 108 people. In this study, data collection was conducted based on a structured questionnaire that from a sample set of questions was used for sustainability impact on 6 scale of project management success. For this purpose, the whole five-item Likert has been used. To asses validity of structure from factor analysis test and SPSS statistical software was used. For Kaiser-Meyer-Olkin (KMO) measure also usually values of more than 50% is acceptable. This is a statistic that indicates the amount 0.869 is the ideal situation. Also quantitative methods such as correlation in analyzing the data, and for statistical analysis, PLS software was used.

4.2 The Results of Data Inferential Analysis

In order to analyze the data, first it has been paid to review variables status by T-test.

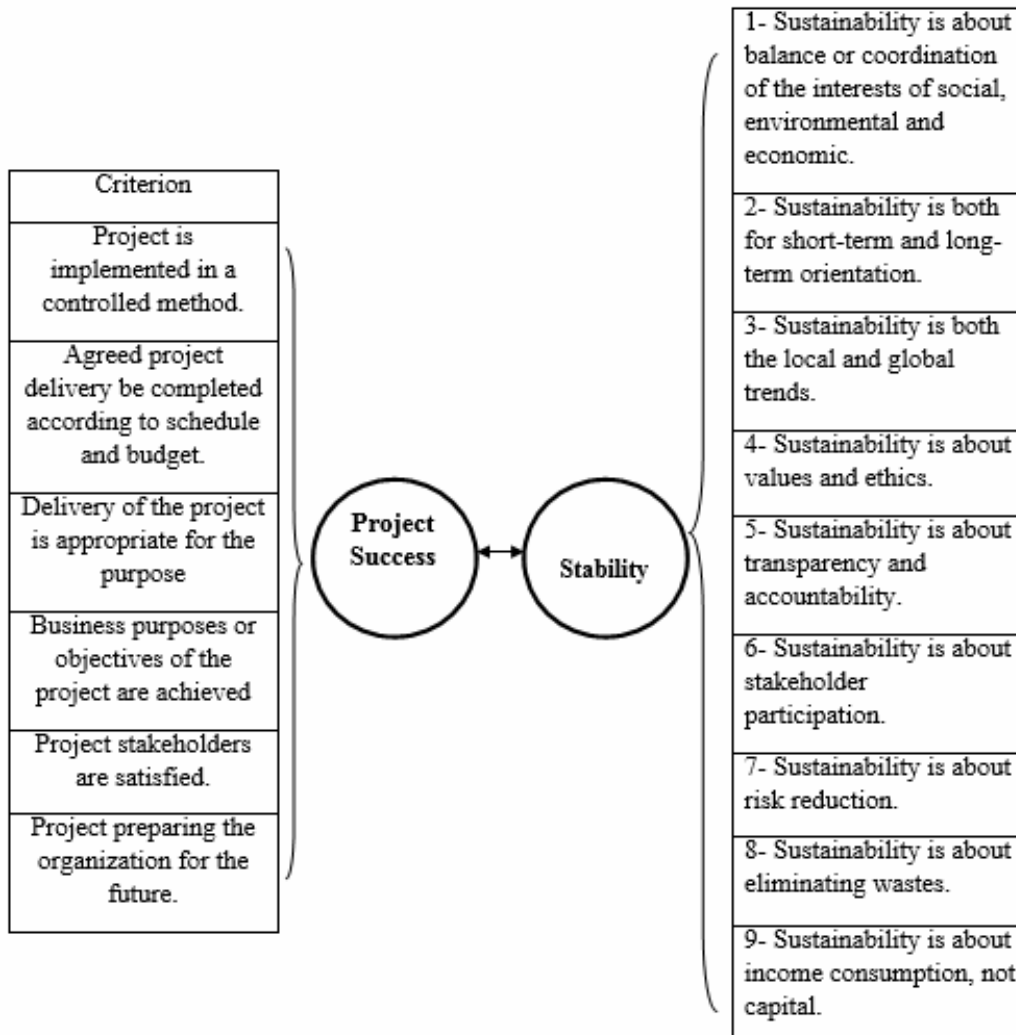


Figure 1. Conceptual model research.

According to t-test results characterized by the lowest level of significance of the 0.05 and positivity of the average difference between the two variables appropriate project delivery with the aim of implementation of project control procedures are in above average condition. The rest of the variables are in average condition.

Given that the right amount for two Cronbach's alpha and composite reliability index is the amount of 0.7 is determined that the hidden variables (structures) are examined in good condition. For reviewing convergent validity of AVE index was used. Given that the right amount is determined for the index value is 0.5 the hidden variables (structures) are examined in good condition. Also, all amounts are reported in reliability more combinations of values convergent validity (AVE) and CR > AVE condition is established. R Square criterion showed the impact of an exogenous variable (independent variable) on an endogenous variable (dependent variable). According to the standard this indicator which is higher than 0.33 as the criterion for average and 0.67 is as strong criteria, project delivery variables fit for purpose and satisfaction of stakeholders and prepare the organization for future projects by the project are in average condition and the rest of the variables are in

poor condition. To check the quality or validity of the model check the validity of which contains indices sharing credit check and check the validity of redundancy index or redundancy is used. Share index, quality of Stone-Geyser model also say, each block measuring quality measures. With regard to the size of redundancy index, measuring the quality of endogenous structural model for each block. Positive values of the parameters of acceptable quality indicator measurement model and structure. In Table 5, the values of each of the indicators related to the dependent and independent variables. As can be seen, the indicators are positive and greater than zero. So approved model based on these indicators. According to Table 5, characterized 0.664 is the average amount of shares. The mean of R Square is reported in Table 5 at a rate of 0.307. According to the aforementioned values GOF index is equal to 0.451 according to the standard level indicator (0.36) is determined appropriate models and in good condition. Model designed in software according to the conceptual model for Figure 2. In this diagram, the arrows indicate the numbers are variable loads. Also in Figure 3, significant levels of each factor loadings have been reported. Arrows drawn of latent variables observed variables are routes that each of these variables was observed that demonstrate how to define

Table 4. Review variables status

Variables	Mean	Standard deviation	T-Statistics	Degrees of freedom	Significance level	Average difference
Implementation of project by controlled method	3.2222	0.78934	2.926	107	0.004	0.22222
Completion and delivery of the agreed projects according to schedule and budget	3.1481	0.85905	1.792	107	0.076	0.14815
Project delivery fit for purpose	3.3704	0.91488	4.207	107	0.000	0.37037
Realization of business objectives or goals of the project	3.0370	0.85905	0.448	107	0.655	0.03704
Project stakeholder satisfaction	3.1512	0.93021	1.690	107	0.094	0.15123
Preparing the organization for the future by project	3.0728	0.90213	0.838	107	0.404	0.07275
Sustainability factors	3.0628	0.96975	0.673	107	0.503	0.06276

Table 5. Fitting model indexes

Variable	Variable code in model	Average variance extracted	Composite reliability	R Square	Cronbach's alpha	Shared values	Redundancy	CV red	CV com
Implementation of project by controlled method	D1	0.63	0.84	0.23	0.71	0.63	0.14	0.144	0.629
Completion and delivery of the agreed projects according to schedule and budget	D2	0.65	0.85	0.20	0.76	0.65	0.10	0.100	0.650
Project Delivery fit for purpose	D3	0.62	0.86	0.37	0.80	0.62	0.20	0.198	0.615
Realization of business objectives or goals of the project	D4	0.66	0.85	0.29	0.75	0.66	0.19	0.191	0.660
Project stakeholder satisfaction	D5	0.64	0.91	0.34	0.89	0.64	0.20	0.190	0.637
Preparing the organization for the future by project	D6	0.61	0.92	0.40	0.90	0.61	0.21	0.202	0.609
Sustainability factors	I	0.85	0.98	-	0.98	0.85	0.00	0.850	0.850

and measure their hidden variables are involved. Load factor by calculating the correlation value index is calculated by a structure with structures that if this amount is equal to or greater than 4.0 suggests that the variance between the structure and its index is greater than the measurement error variance of structures and reliability of the measurement model is acceptable. Some authors have suggested the value of 0.5 as the criterion. Also flash connection between latent variables reports the impact of the main variables on each other. Positivity of values indicate that the impact is positive and shows that there is a direct relationship between variables. Also this model shows significant level of your routes is the most basic measure of the relationship between structures in the model that reported T significant number. If the value of this measure is more than 1.96 characterized the relationship between the structures is significant. It should be noted that this relationship does not measure

severity and only used to evaluate significance of the routes. The results of confirmatory factor analysis and the numbers reported in Figure 2 and Figure 3 determined the observed variables explain the significance of their hidden variables.

In Table 6, the results of the analysis have been provided to the main hypothesis.

At 95% confidence level, due to the larger significance level of T than 1.96 and positivity of path coefficient, characterized that all assumptions were approved. And the sustainability factor has positive and significant relationship with implementation of project by controlled method, completion and delivery of the agreed projects according to schedule and budget, project delivery fit for purpose, realization of business objectives or goals of the project, project stakeholder satisfaction and project preparing the organization for the future.

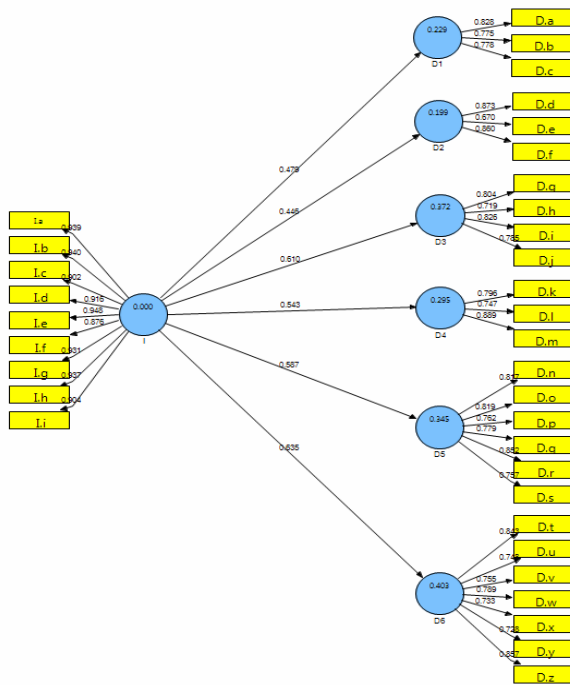


Figure 2. Coefficients review chart.

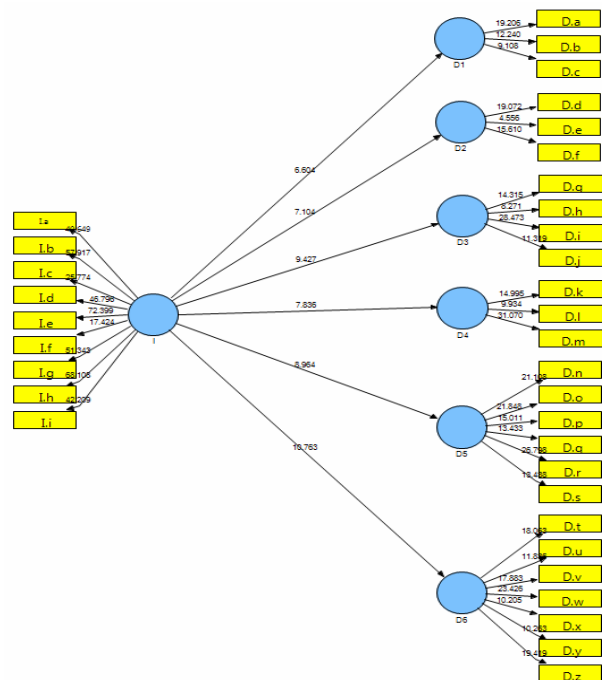


Figure 3. Significant level review chart.

Table 4. Path analysis for the main hypothesis review

Independent variable	Dependent variable	Path coefficient	Standard error	T Significance level	Result
Sustainability factors	Implementation of project by controlled method	0.4786	0.0725	6.6037	Confirmation
Sustainability factors	Completion and delivery of the agreed projects according to schedule and budget	0.4461	0.0628	7.1041	Confirmation
Sustainability factors	Project delivery fit for purpose	0.6101	0.0647	9.4273	Confirmation
Sustainability factors	Realization of business objectives or goals of the project	0.5428	0.0693	7.8358	Confirmation
Sustainability factors	Project stakeholder satisfaction	0.587	0.0655	8.9644	Confirmation
Sustainability factors	Project preparing the organization for the future	0.635	0.059	10.7631	Confirmation

5. CONCLUSION

The essential dynamics in today economy world, is existence of projects that can bring a major change in people's lives. According to the current crises and lack of resources in the future, project managers must act in such a way to develop new and innovative approaches in the field of sustainability to ensure that optimal sustainability have achieved. Strategies of most organizations focus only on the values of the expectations of the stakeholders that couldn't result in long-term survival for these organizations. But fortunately, in recent years there has been a change of mind and this awareness has led to the increased pressure on companies and organizations and instead of focusing on economic performance and accountability to shareholders, report stable performance for all stakeholders. In this paper was to investigate the relationship between sustainability factors with project management success and the relationship of 9 sustainability factors with 6 scales of project management success including completion and delivery of the agreed projects according to schedule and budget, project delivery fit for purpose, realization of business objectives or goals of the project, project stakeholder satisfaction and project preparing the organization for the future were investigated by the project. According to the correlation test results, it was found that sustainability factors have a positive and significant relationship with the 6 scale of project management success.

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