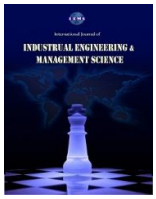
University of Hormozgan

International Journal of Industrial Engineering & Management Science

journal homepage: www.ijiems.com



A Structural Equation Model for Success Measurement of Regional Development Projects

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ARTICLE INFO

Article history:
Received: 2021-09-06
Received in revised form: 2021-12-10
Accepted:
2021-12-28

Keywords:
Project Management
Success Criteria
Critical Success Factors
Regional Development Projects
PLS-SEM

ABSTRACT

Recent studies on determination of success criteria and critical success factors have gained a large share in project management research. However, there exist no "one-way" to define the project success. Meanwhile, it is also difficult to determine the success criteria and critical success factors to cover each type of project. This paper describes the development and investigation of the attributes of the success criteria and critical success factors and an analysis of the relationship between the success criteria and the success factors for regional development projects. A partial least square structural equation model (PLS-SEM) has been developed that includes variables of training, project team, project design, risk, sponsor, monitoring and project success. The model is validated using the data collected by a survey conducted for the past projects financially supported by Istanbul Development Agency. The overall results emphasize project design as the key success factor for the success of the project. Three success factors- project team, risk and monitoring- also matter as much if not more than the project design. We propose that the effect of sponsor can be displayed with an improved database due to its wide-ranging contribution to regional outcomes, the breadth of their partnership working and the long-term nature of their actions. This study has contributed to the growing literature related to success criteria and critical success factors for regional development projects.

1. Introduction

Development projects are globally used as managerial tools to achieve poverty reduction, to improve health, education, agriculture, food security, to enhance trade, to develop private sector and to build capacity in developing countries/regions. In the development process, however, it has been recognized that regional development which enables local governance and local institutions as key factors promotes sustainable development more than ever. Meanwhile, the context for local and regional development has become significantly more challenging due to the complexity, uncertainty, risk and rapidity of economic, social, political and cultural changes. Regional development agencies (RDAs) and their execution strategy of management by projects are considered as a way to cope with the high uncertainty in multiple dimensions. Posterior to the regional policy making, RDAs introduce development projects as a subset of a program or part of a long-term development plan (five to ten years). Regional development projects are complex and bureaucratic so handled differently depending on the different managerial, economic and political conditions of the region targeted to be developed.

Despite similarities such as uniqueness, temporality and multidisciplinary nature, regional development projects are largely different from regular industrial projects. Moreover, development projects can also demonstrate some diverse characteristics based on being managed on a local scale or on national or international scale. Below we list the characteristics of development projects. The first four of these are common to all development projects and the latter three can be considered as the unique characteristics of regional development projects:

- Almost all development projects are non-profit projects but technical, social and political initiatives.
- They have multiple stakeholders compared to regular projects particularly industrial projects which have commonly two categories of stakeholders: (i) customers who funded the project and benefit from the project results, (ii) contractors who are responsible for

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implementing the client-funded project and presenting the expected results. Development projects have at least three key stakeholders: (i) finance providers that do not receive project outputs, (ii) implementers that participate in project execution, and (iii) beneficiaries who hope to benefit from the outputs [1].

- The development projects focus on achieving stakeholder satisfaction and minimizing costs whereas, regular industrial projects focus on customer satisfaction and maximizing profit.
- They are financed by credits or direct incentives. Thus, these projects are required to comply with general framework of the agency that provides funds [2].
- They use the potential of local governance and reduce transaction costs because the funder and the implementer, as well as the beneficiaries are both at the same local region.
- They are geographic-specific, customized for regional needs and identity and they provide collective good. They mobilize regional assets and create synergies.
- Due to locality, they generate place-specific forms of trust among actors, and adapt in the face of shocks in order to provide problem-solving arrangements. They reduce the risk of social and political instability and conflict.

Due to these political, cultural and economic differences and heterogeneous stakeholders, management of development projects is commonly specified with less tangible goals. Besides the results are quite different from conventional industrial or commercial project types which have more concrete targets and results [3]. Another concern is that the success rate of development projects is quite low. According to a recent World Bank performance review conducted by the Independent Evaluation Group, about one quarter of the World Bank financed projects and programs have failed [4]. So, studies in this domain focus on determining the factors that affect project success or failure. Thus, a framework for development projects to meet critical factors for project success is important for both granting institutions and beneficiary institutions.

Today, in addition to a result-oriented approach which emphasizes target dates and budget, the perception of different groups (e.g., stakeholders, managers, customers and project team members) about the project is also seen as an important success assessment factor [5]. Especially, taking the behavioral aspect into account is important for development projects due to its multidimensional nature. In the literature, there exist many studies examining the relationship between success criteria and critical success factors of regular industrial projects and international development projects. Nevertheless, to the best of our knowledge, there exists no work investigating to what extent regional development projects are similar yet different from international development projects or from regular industrial projects in terms of the relationship between the success criteria and critical success factors.

In this paper, we address the relationship between the success criteria and critical success factors for regional development projects. Our goal is to propose a model to assess the effectiveness of project management by RDAs. We first identify project success criteria and critical success factors for regional development projects. Then a partial least squares structural equation model (PLS-SEM) has been developed with the variables of training, project team, project design, risk, sponsor, monitoring and project success. Finally, a case study is presented to validate the model using a survey conducted for the past projects of a RDA, namely Istanbul Development Agency.

This paper identifies success criteria and critical success factors for effective project management at the regional level. The studies on determining key project success criteria and critical success factors have mostly focused on private sector projects, international development projects or public projects. This research deals with regional development projects, a project type that has not received much attention in the literature. Identifying the success criteria of regional development projects in Turkey, will enable project stakeholders, including sponsors, project team, project managers to identify what they should focus on to achieve successful projects.

The study is organized as follows: In the next section, we provide a review of the literature on project management and project success and conceptual model of the research. The methodological approach of the research is detailed in Section 3, followed by the results given in Section 4 and discussions presented in Section 5. Finally, concluding remarks are provided in Section 6.

1.1. The Role of Regional Development Agencies

Local and regional development has become an increasingly global issue in two perspectives: First, the challenge of enhancing prosperity, improving well-being and increasing living standards has become an ongoing issue for regions considered discrete parts of the ‘developed’ and ‘developing’ worlds [6]. Second, building and sustaining the identity and specifics of the regional and local context have been a concern for nations across the world due to the enormous impacts that modern globalization trends are playing in shaping the economic geography of places, irrespective of whether we define places in terms of countries, regions, or cities [7]. The cases of the developing world and the European Union are used as examples of how in this context, development intervention should increasingly focus on efficiency and social inclusion at the expense of an emphasis on territorial convergence and how strategies should consider economic, social, political, and institutional diversity in order to maximize both the local and the aggregate potential for economic development [7]. It is considered that the unique aspects of locality and the ability to create and strengthen a comparative advantage are at the heart of regional development and success.

Questions such as “Why are recent regional development policies not universally successful? Why, despite development intervention in many parts of the world, do regional disparities continue to grow?” lead researchers to investigate the important factors of the success of regional development. A consensus in the literature is that regional development requires departing from implementing “similar, if not identical, development strategies” [7]. Under a neoclassical growth framework, achieving economic development is mainly a matter of investing in physical capital, regardless of the local institutional contexts [8]. However, when too much emphasis on top-down, supply-side, “one-size-fits-all” approaches is given, it eventually results in unbalanced policies and ultimately incapable of delivering sustainable development [6].

Opportunities for growth exist in every region and the role of development intervention is to mobilize regional assets and exploit [9]. The role of local and regional governments and institutions in the development process is emphasized and the

potential of local governance and institutions as key factors in promoting sustainable development is stressed [10]. Thus, the place-based approach assumes that the interactions between institutions and geography are critical for development [11]. Thus, in the last few years, researchers have increasingly come round to the conclusion that institutions, matters as much, if not more, for economic development than long-established traditional factor-endowments, such as physical and human resource endowments, trade or technology transfers [12; 13; 14; 15]. In many studies, the link between place-specific institutional structures and economic performance has been investigated. The effectiveness of social institutions to improve the provision of collective or public goods and the market failures are addressed [16]. Local and regional institutions are considered to be not only simple regulators of economic activity but they have the ability to promote development and growth through creating the necessary 'orgware' [17] that is, the adequate conditions for investment, economic interaction and trade, that, at the same time, reduce the risk of social and political instability and conflict [18]. In related disciplines, it is believed that institutions not only shape, but also are shaped by the environment. Institutions thus become place specific, sharing common features across territories, but also adopting a place distinctiveness which, in turn, is fed by the very institutional environment of every territory [19]. They generate place-specific forms of trust among economic actors and reduce transaction costs [20; 21], provide collective goods [16], foster transparency [22], promote entrepreneurship, grease the functioning of labor markets [23], adapt in the face of shocks in order to provide problem-solving arrangements [24] and ultimately lead to greater economic efficiency [21]. It is thus believed that specific local institutional arrangements enable localities and regions to achieve a sustainable and high-end road to economic development [16]. And it is often thought that these institutional arrangements work better at both the local and the regional scales, as the national scale can be too distant, remote and detached in order to be effective in mobilizing organizations [12].

The main role of formal development institutions is measuring. Apparently identical formal institutional structures yield differences in social capital. They concluded that further research is necessary in order to assess how and to what extent apparently similar institutional arrangements affect regional and local economic performance. Thus, formal institutions need to be arranged context and geography specific. Geography exerts a significant effect on the type and quality of institutions [25]. Together with geography, time also affects the influence of institutions on economic development [22].

As formal regional institutions, RDAs implement and prepare economic and social development strategies by demonstrating the added value of a regional perspective. In general, RDAs are charged with six statutory purposes [26],

- to further economic development and regeneration;
- to promote business efficiency, investment and competitiveness;
- to promote employment;
- to enhance the development and application of skills relevant to employment;
- to contribute to sustainable development; and
- to contribute social development.

In order to achieve development while sustaining the identity and specifics of the regional and local context in an effective way, RDAs should identify how they intend addressing their regional priorities and contribute to the delivery of national targets on regional economic performance, sustainable development, national productivity and reducing productivity disparities in rural areas. Regional development agencies execute key processes of mobilization, awareness-raising, framing, coordination and visioning between visions for gaining influence. Because success in regional development depends partly on existing resources, but equally on the abilities of regions (or on those of their key players) to create and attract new resources, to mobilize collective action and to pool existing resources [27].

As a result, regional development agencies are considered as more acknowledged about the localities and the region, moreover they are at the same time more agile to mobilize resources and to interact with the parties related to development compared to national or international institutions. Due to these advantages, we hypothesize that differences in success assessment framework may emerge for the development projects of regional agencies. Owing to the models investigated in the project success literature, we examine the relationship of the success criteria and critical success factors of development projects of regional agencies. We investigate to what extent the relationship of the success criteria and success factors are similar and different than the regular corporate projects or development projects executed by international agencies.

2. Literature Review

Although there is no consensus on project success definition, authors agree on the presence and importance of project success criteria and critical success factors.

2.1. Project Success Criteria

Project success criteria are used to determine project success or to make a judgment about project performance.

In the 80's, scientists or researchers used the time, budget, quality and scope criteria, which are generally referred to as traditional criteria, to evaluate projects. After 90s, researchers agree that project success must be considered multidimensional [28; 29; 30] and as the perceptions of various stakeholders. Pinto and Slevin [29] divided project success into two main components as project-related and client-related. Time, cost, performance, usage, satisfaction and effectiveness are the criteria to measure these two components. Pinto and Pinto [31] made another division as task-related consisting of time, cost and quality and psychological consisting of customer satisfaction, project team satisfaction and the other stakeholders' ideas. Chan and Chan [32] gathered different success criteria which were offered until then as budget, cost, quality, commercial value, environmental performance, user expectation/satisfaction, stakeholder satisfaction, and health/security. Cserháti and Szabó [33] reported that success criteria used in recent years include criteria such as benefit to organization, innovation and capability development. Bayiley and Teklu [34] on the other hand, listed success criteria as relevance, effectiveness, efficiency, sustainability and impact. In the literature, there exists no criteria that fits to all project types. Moreover,

project success perception may differ depending on the expectations of the stakeholders. Thus, appropriate project success criteria change for different project types.

2.2. Critical Success Factors

Project critical success factors can be defined as factors, circumstances or items that affect project performance or outcomes. There also exists vast research to identify critical success factors. Rockart [35] first identified critical success factors of projects and defined as factors, circumstances or items that affect project performance or outcomes. In Table 1, the critical success factors used in different studies are summarized.

Table 1. Summary of literature review about critical success factors

Critical Success Factors	Pinto-Slevin [29], [36]	Kerzner [37]	Belassi-Tukel, [38]	Baccarini [39]	Cooke-Davis [40]	Westerveld [41]	Belout-Gauvreau [5]	Müller-Turner [42]	Kloppenborg et al [43]	Constantino et al [44]	Todorovic et al. [45]	Bayiley&Teklu[34]
Project Understanding		+	+	+								
Top Management Support	+		+				+	+		+		
Project Mission	+		+	+	+	+	+		+	+		
Communication/Knowledge	+		+			+	+		+	+	+	
Client Consultation	+		+				+			+		
Project Team Competence	+		+	+	+	+	+	+		+		
Project Manager/Leader	+	+	+	+		+		+				
Efficient Time and Budget Planning	+			+	+						+	
Project Control	+	+									+	
High Motivation and Interest												+
Troubleshooting	+						+			+	+	
Project Risk Management	+			+		+						
Project Resource Management			+	+	+	+		+			+	
Project Plan	+	+				+	+		+	+	+	+
Monitoring and Feedback	+				+		+	+		+		
Project Ownership					+			+				+
Project Manager Selection		+							+			
Organizational Adaptation		+					+					
Client Acceptance	+					+						
Stakeholder Management									+			
Compatible Rules and Procedures												+

2.3. Relationship between Success Criteria and Critical Success Factors

The critical success factors can be thought as the input factors that help to predict the success of the project, whereas project success criteria are the multiple dimensions of success which would be the output variables of a model. Developing a model of the relationship between the success criteria and critical success factors is one of the effective ways of project management [45,46] proposed a regression model for analyzing the relationship between success criteria and critical success factors of World Bank projects. Critical success factors are monitoring, coordination, design; training and institutional environment and all are found to be significant for the success criteria. Among them, most effective factors are design and monitoring. Cserháti and Szabó [33] divided

success factors as work-related and relationship-related for organizational activity projects. They used correlation analysis and found that most important factors are relationship-related factors such as communication, corporation and project leadership. Kloppenborg et al. [43] evaluated how sponsor affects the project success at various project phases by specifying different success factors for each phase. Using correlation analysis, they concluded that sponsors should work on communication during the execution phase to increase the customer satisfaction. Marzagão and Carvalho [47] used least square structural equation models to investigate the success factors' effects on the performance of six-sigma projects. It is found that capability of the project manager not only strongly affects project performance but also empowers the six-sigma management and project management. As summarized, research studies on determination of success criteria and critical success factors have gained a large share in project management research because it is not possible to define project success in just "one-way". It is also difficult to determine the success criteria and critical success factors to cover each project type. For this reason, many studies have been carried out to determine critical success factors that affect project success and success criteria that are used to measure project success. Throughout the literature, studies on different project types in different sectors related to this topic have been found. The majority of these studies constitute research that addresses projects related to private sector projects. Despite similarities such as uniqueness, temporality and multidisciplinary nature, RDPs projects are largely different from regular industrial projects. They have multiple stakeholders compared to regular projects particularly industrial projects. The RDPs focus on achieving stakeholder satisfaction and minimizing costs whereas, regular industrial projects focus on customer satisfaction and maximizing profit. Also, RDPs are financed by credits or direct incentives. These properties are similar with international development projects. But regional development projects differ from international projects by some aspects. RDPs use the potential of local governance and reduce transaction costs because the funder and the implementer, as well as the beneficiaries are both at the same local region. They are geographic-specific, customized for regional needs and identity and they provide collective good. They mobilize regional assets and create synergies. Due to locality, they generate place-specific forms of trust among actors, and adapt in the face of shocks in order to provide problem-solving arrangements. They reduce the risk of social and political instability and conflict. Related to the development projects, there exist some studies on determining success criteria and critical success factors of international development projects. However, there exists no study on project success of regional development organizations.

As a result, regional development agencies are considered as more acknowledged about the localities and the region, moreover they are at the same time more agile to mobilize resources and to interact with the parties related to development compared to national or international institutions. Due to these advantages, we hypothesize that differences in success assessment framework may emerge for the development projects of regional agencies.

Hence, this study aims to provide a comprehensive and generalizable success evaluation framework for regional development projects. We believe this study will provide important contributions to fill this gap in the literature. Moreover, we will present a case study of the proposed framework for the projects financed by Istanbul Development Agency, one of 26 development agencies in Turkey.

2.4. Conceptual Model for Regional Development Project Success

In this section, we first describe the case of IDA, Istanbul Development Agency which is a national scale institution for developing and managing development projects for the city of Istanbul, Turkey. Then, we propose our research questions related to regional development project success and finally present the conceptual model for regional development project success.

2.4.1. The Case of Istanbul Development Agency

Regional development agencies (RDA) are important institutions used in the implementation of regional policies. The main role of an RDA is to guide regional development and revitalize the regional economy. There are more than ten thousand RDAs in the world. Established to encourage local development and growth, RDAs have different features in many aspects such as institutional structures, organizational structures, activities and founders.

In Turkey, central development planning approach has shifted to local development approach by the effect of the European Union membership processes. Development Agencies were established in 26 regions in 2006 in order to prepare and implement development plans for regions. The main purposes of development agencies are the reduction of interregional and intra-regional development disparities and accelerating regional development. To this end, the main task of development agencies is to increase cooperation between private sector, public and non-governmental organizations, to ensure efficient use of resources and to mobilize the potential of the region. Istanbul Development Agency (IDA) which is one of those development agencies established in 2006 focuses on development programs for Istanbul which is the largest city of Turkey with 17 million populations.

IDA and similar development agencies aim to ensure regional development and provide financial support for projects and activities in the areas covered by both national development plans and programs together with regional plans and programs. Various support mechanisms such as direct activity support, call for proposals, guided project support and technical support are widely used financial support methods of agencies.

IDA uses call for proposals method as a support mechanism which is also preferred by international organizations such as European Union. The call for proposals is for prospective applicants whose qualifications are clearly identified by the agency to submit project proposals in accordance with pre-determined terms and conditions under a specific support program conducted by the agency. Support programs that can be diversified in line with the basic needs of region, are planned to serve social and economic development and are mainly concerned with topics such as innovation, R&D, entrepreneurship, urban infrastructure, environment, energy, tourism, disadvantaged children and youths, elders and women.

Projects submitted to an agency within the Financial Support Programs are designed in accordance with the aims and priorities of financial support program. In this context, the supported projects are similar to the international development projects. International development projects are generally not profit-oriented projects. These projects consist of a large number of stakeholders with different characteristics. They have to comply with the general outline that the funding institution has drawn for the project, mostly because they are financed by loans or grants. The goals and results are less intrusive than the other product types. But for international development projects like other projects, there are time, budget and quality constraints. There are also project design, implementation and monitoring processes in development projects similar to other projects. Development projects do not have standardized project management and project success definitions just like other projects. Likewise, success criteria and critical success factors for these types of projects differ from project to project.

Because projects financed by Development Agencies are carried out within a specific program like international development projects, they must be in accordance with general framework of program. Despite, each project is unique, consisting of different activities with the participation of different stakeholders and different target groups. As a result of this uniqueness, it is difficult to define and evaluate the success of agency that supported the project.

2.4.2. Research Questions

This study briefly focuses on the following research questions:

- Is there a meaningful relationship between success performance and critical success factors for RDPs? What is the most important critical success factors influencing the success of RDPs?
- Does the relationship between the success criteria and critical success factors differ based on other variables such as institution type, project type, budget of the project or project implementation year?
- Is there a significant moderator effect of project team-project coordinator relationship, project team-monitoring specialist relationship and project team-target group relationship variables on the relationship between success performance and critical success factors of RDPs?

2.4.3. Conceptual Model

In the context of this study, a simplified version of the developed model is presented in Figure 1. In the model project team, training, sponsor, project design and monitoring factors are proposed to be related to perceived project success. Additional to that, relationships of the project team, training and sponsor factors to the project design and monitoring factors are investigated in the model. The project team-project coordinator, project team-monitoring specialist and project team-target group relationship variables are used as moderators in analyses. For this reason, it is not shown in the simplified model.

Figure 1. A conceptual model for regional development project success.

3. Research Methodology

In this study, we propose a model to identify the critical success factors which affect the success of the regional development projects. To test the hypotheses of the model, first we collect data via a survey and then we use partial least square (PLS) SEM methodology. In Figure 2, we illustrate the overall methodology of this study.

3.1. Data Collection

The data used within the scope of the research consists of 270 completed projects. These projects were financed under the 15 Financial Support Programs announced by IDA in 2014 and 2015 using the call for proposal method. In this study, the success criteria and critical success factors of the projects are specified through a literature review, then we propose a model and to validate the model we collect data via a survey. The respondents of survey consist of project coordinators, coordinator assistants and project team members.

In the questionnaire preparation process, the conformity of the statements in the survey which are obtained by the literature review is controlled and approved by the project monitoring specialists of IDA and the project coordinators. Then, we conduct a pilot survey in order to test whether the expressions used in the questionnaire are clear for the respondents. The final version of the questionnaire is developed after the pilot study.

The questionnaire consists of three main parts. The first part contains basic questions such as the demographic characteristics of the respondent, project code, and project team size. The second part consists of the questions about project success criteria and the third part consists of the questions about determining the success factors. We use a 7-point Likert scale and ask the respondents to affirm the level of their agreement with the given statements from “Very strongly disagree” to “Very strongly agree”.

The questionnaire is prepared electronically using the Survey Monkey application and sent via e-mail to the participants. The e-mails are successfully delivered to 460 people who were involved in 270 projects and 156 responses are received. After examining these responses, 148 valid responses are used to estimate the model parameters.

3.2. Definition of Variables

We derive the independent variables of our model, named as critical success factors by a thorough literature review. The critical success factors are obtained as latent variables or constructs which are defined by a number of indicators in the model. Some of the indicators of the related critical success factors and sample of the questionnaire can be found in Appendix A.

Project Design: Project design factor is related to activities such as designating the stakeholders' roles in the project, identifying the target group that will benefit from the outputs of the project, planning the time and resources required for the implementation of the project, budget and workforce and assessing the risks. Project design has been identified as one of the most important factors affecting success in many studies conducted on different project types (5; 48; 46; 29; 49; 43; 50; 51; 45; 41]. In the questionnaire of our study, the contribution of project design factor is measured by 8 questions and we propose the following hypothesis:

H1: A detailed project design has a positive influence on project success.

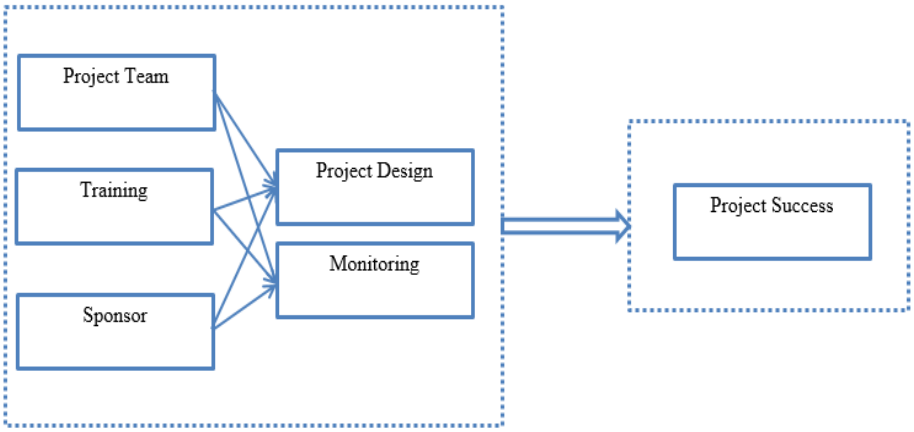

Fig. 1. A conceptual model for regional development project success

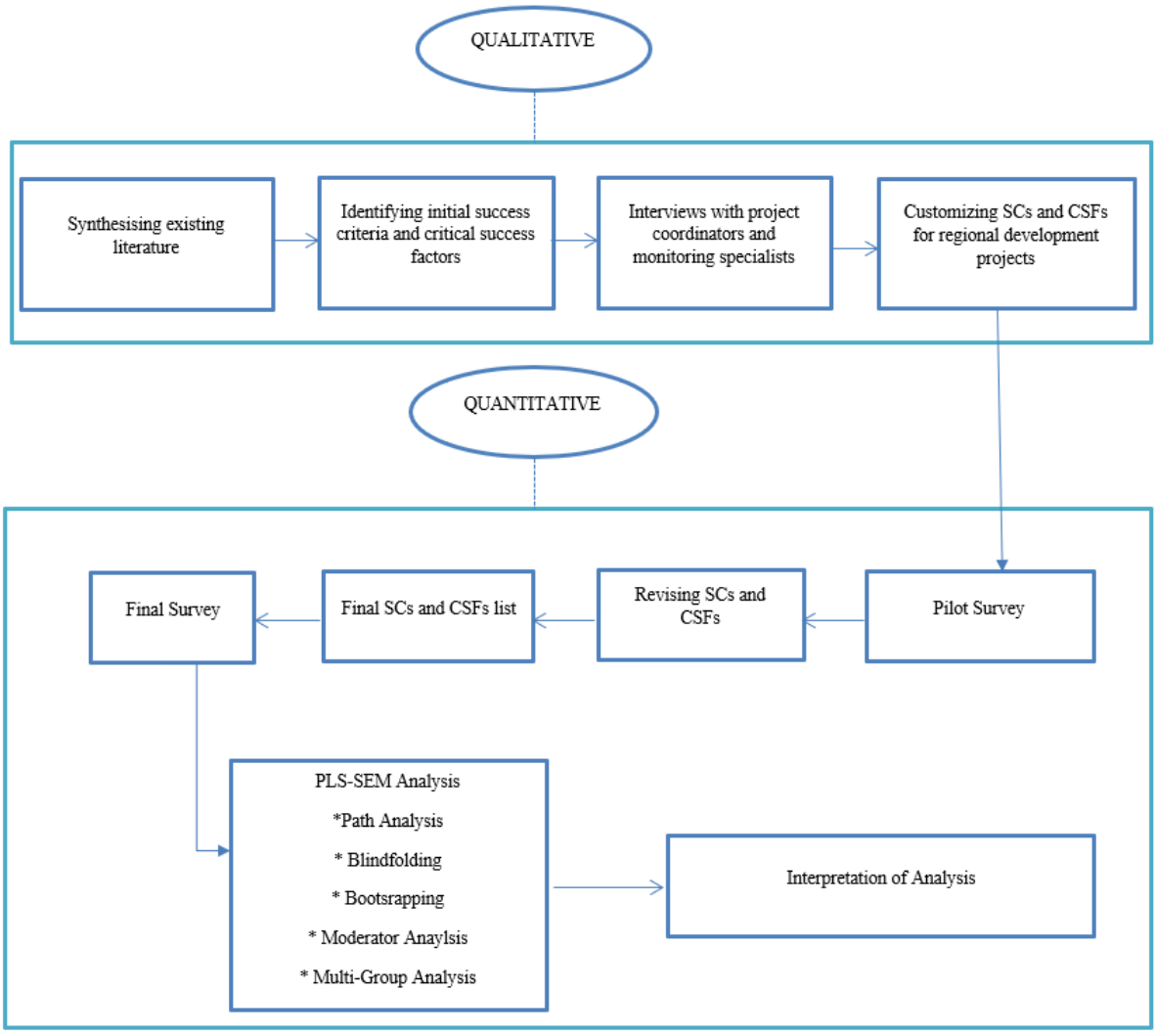

Fig. 2. The overall methodology of the study (SC: Success Criteria; CSF: Critical Success Factor)

Monitoring: The monitoring factor covers the controlling of the issues affecting project outputs, process assessments and project status reports. The monitoring factor has been identified as a significant success factor in many studies in the literature [5; 40; 44; 46; 29; 42; 51]. In the questionnaire, the contribution of monitoring factor is measured by 7 questions and we propose the following hypothesis:

H2: Frequent monitoring and feedback has a positive influence on project success.

Project Team: Project team factor is associated with selecting and recruiting project team members in order those to participate in the best way in specified project tasks [51]. The competence of the human resources managing every stage of the project is dealt with in the studies of Baccarini [39], Belassi and Tukel [38], Belout and Gauvreau [5], Cooke-Davies [40], Constantino et al. [44], J. K. Pinto and Slevin [29], Khan et al. [49], Müller and Turner [42] and Slevin and Pinto [51]. Project performance increases if project team is selected in accordance with the project, team members understand the role in the project and adopt. Also, the correct selection of the project team and their understanding of the roles and their adoption affect the correct design of the project and the correct identification of the risks. At the same time, the project team contributes to the strong monitoring and feedback mechanism of the project. In the questionnaire, the contribution of project team factor is measured by 7 questions and we propose the following hypotheses:

H3a: Competent project team selection has a positive influence on project success.

H3b: Competent project team selection has a positive influence on project design.

H3c: Competent project team selection has a positive influence on successful implementation of monitoring.

H3d: Competent project team selection has a positive influence on risk determination.

Training: The training factor is related to the training received by project team members in terms of technical issues and project management. It is investigated that training of the project team affects the project success, project design, risks of the project and monitoring. In the questionnaire, the training factor is measured by 5 questions and we propose the following hypotheses:

H4a: Training received by project team about technical issues and project management has a positive impact on the project success.

H4b: Training received by project team about technical issues and project management has a positive influence on project design.

H4c: Training received by the project team about technical issues and project management has a positive influence on monitoring.

H4d: Training received by project team about technical issues and project management has a positive influence on risk determination.

Sponsor: The sponsor factor is related to the supporting institution that provides the resources and authority/power necessary for the success of the project. According to Belassi and Tukel [38], Constantino et al., [44], Hermano et al. [52], J. Pinto and Slevin [36], [53] and Müller and Turner [42]; sponsor (i.e., Top management support) is found to be a critical success factor affecting the project success. It is proposed that the sponsor support is affecting the monitoring and feedback phase and project design. In the questionnaire, the sponsor factor is measured by 8 questions and we propose the following hypotheses:

H5a: High sponsor support has a positive influence on project success.

H5b: High sponsor support has a positive influence on project design.

H5c: High sponsor support has a positive influence on successful implementation of monitoring.

Relationship: Relationship factor refers to the establishment of the necessary communication channels and the flow of information between the project coordinator, project team, project monitoring specialist and the target group. Relationship/Coordination need is high in regional development project because several stakeholders are involved in either granting approvals or carrying out the work. In the questionnaire, the relationship factor is measured by 24 questions. Three different moderator effects have been examined in our model as follows;

- There exists a moderator effect of project team-project coordinator relation variable on the project design and project success connection,
- There exists a moderator effect of project team-target group relation variable on project design and risk connection,
- There exists a moderator effect of project team- monitoring specialist relation on relationship between monitoring and training connection.

Additionally, we identify the "project success" as the dependent variable in our model. The project success dependent variable is defined by 11 success criteria. These success criteria are also derived from a comprehensive literature review. In the scope of this study, the success criteria of are adapted to suit the projects supported by IDA. While 10 of these questions are related to project success criteria, the last question is to learn the subjective thinking of the participant about the overall success. The success criteria are listed together with their definitions as follows:

Time: The project is completed within planned schedule.
Cost: The project is completed within planned budget.
Project Output Works: The output of the project is used by the target group.
Target Group's Satisfaction: Target group is satisfied from output of the project.
Benefits to Project Team: Project team is pleased to take part in the project.
Benefits to Target Group: The output of the project benefits to target group with respect to efficiency and effectiveness.
Best Solution: The output of the project is the best solution for the target group's problem and requests.
Minimum Problem: The output of the project is acknowledged by the target group and initial non-technical problems are insignificant.
Multiplier Effect: Project output affects replicates and spreads broader areas.
Positive Effect: The output of the project has a positive impact on target group.
Overall Success Perception: Regardless of ten performance statements, what the project team personnel thinks about the project success.

3.3. PLS-SEM Model Specification

In the literature, various data analysis techniques have been used to determine the success criteria and critical success factors. Since project success is multidimensional, multivariate statistical techniques like factor analysis, regression analysis, correlation analysis and variance analysis have been widely used. Structural Equation Modeling (SEM); is a second-generation multivariate statistical method which is widely used in project success studies [4; 47; 55; 56; 57] in recent years.

Structural Equation Modeling (SEM) is a second-generation multivariate statistical method based on the identification of variables that can and cannot be observed based on a particular theory in a relational and causal model. In fact, SEM is a combination of regression and factor analysis. SEM consists of two sub-models: 1. Measurement or exogenous model that focuses on the relationship between measurement variables (also known as unobserved variables indicators or items) and latent variables (also known as unobserved variables or constructs). 2. Structural or endogenous model that focuses on the relationship between latent variables.

Two of the most preferred methods of SEM are used as the dominant analytic tool in the analysis of cause-effect relationship models generated by latent variables. These are Covariance-based Structural Equation Modeling (CB-SEM) and Partial Least Squares Structural Equation Modeling (PLS-SEM). These two methods differ in terms of the goal of analysis, statistical assumptions and the suitability criteria.

Two of the most preferred methods of SEM are used as the dominant analytic tool in the analysis of cause-effect relationship models generated by latent variables. These are Covariance-based Structural Equation Modeling (CB-SEM) and Partial Least Squares Structural Equation Modeling (PLS-SEM). CB-SEM and PLS-SEM produce different parameter estimates because CB-SEM is based on common variance whereas PLS-SEM is based on total variance. These two methods differ in terms of the goal of analysis, statistical assumptions and the suitability criteria. When choosing appropriate SEM, there are numerous subjects to be considered. The rules of thumb for selecting each SEM method are listed by Hair et al. [58] and shown in Table 2. With the improvements and updates made in the PLS-SEM method in recent years, the analysis capabilities of the PLS-SEM have gone beyond CB-SEM. As can be seen from Table I, there are quite a few cases where PLS-SEM is the preferred method instead of CB-SEM. Model complexity, formative construct, small sample size and non-normal data are the most common reason for preferring PLS-SEM over CB-SEM. Another important reason is that PLS-SEM can be used for both exploratory and confirmatory research. In contrast, CB-SEM is based on covariance and it is only suitable for confirmatory research. Besides PLS-SEM requires reliability and validity metrics for confirmation while CB-SEM is confirmed with goodness-of-fit, reliability and validity metrics. Also, in PLS-SEM constructs can be measured reflectively or formatively that makes the method attractive for researches.

Table 2. Rules for choosing SEM method [58]

PLS-SEM	CB-SEM
1. The aim of the research is to explore or confirm the theory based on total variance.	**1.** The aim of the research is to test, compare and confirm well developed measurement and structural theory based on common variance.
2. The philosophy of measurement is estimation with the composite factor model using the total variance.	**2.** The philosophy of measurement is estimation with the common factor model using only common variance (covariance).
3. The aim of the research is to explain the relationships between exogenous and endogenous variables.	**3.** Research requires a global goodness-of-fit criterion.
4. Structural or measurement models are complex (more than 6 variables and more than 50 indicators).	**4.** Structural or measurement models are simple (5 or less variables and 50 or less indicators).
5. Formative or reflective indicators can be used in the model.	**5.** Reflective indicators can be used in the model.
6. This is the preferred method when the sample size is small (n <100). However, PLS is also an excellent method for a larger data set.	**6.** Error terms require additional features such as covariation.
7. The data does not have to be normally distributed.	**7.** The structural model includes non-recursive relationships.
8. Scaling of responses can be either ordinal or nominal.	
9. Indicators measured with single item or secondary data can be used in the model.	
10. The analysis involves a continuous moderator	
11. The investigation examines the model for unobserved heterogeneity.	

In the analysis made within the scope of this study, PLS-SEM method is preferred considering the size of the data set and the complexity of the model.

The PLS-SEM method consists of two steps. In the first stage (i.e., measurement model), the model loads are predicted using the relations of the indicators with the latent variables. In the second phase, the structural model, the relations between latent variables are estimated [59]. The interested reader can refer to Hair et al. [60] for a detailed explanation of PLS-SEM methodology.

4. Analysis and Results

The data obtained via questionnaire is analyzed in four steps. Firstly, the demographic data of respondents is examined. After that, all data is analyzed in terms of outliers, missing data, normality and reliability by using various tests on SPSS 20.0 (Statistical Package for the Social Science). Thirdly, the reliability and validity of the expressions used

for each variable in the measurement model are tested. For this purpose; composite reliability, indicator/expression reliability, average variance extracted and discriminant validity are tested. Finally, to investigate statistical significance and degree of the relationship between variables in the structural model, the model is estimated on SmartPLS 3.2.6.

4.1. Demographic Findings

The questionnaire includes a number of questions related to the characteristics of the project team members (gender, age, level of education, work experience, project management experience and training) and the characteristics of the projects (project code and project team size). Table 3 reveals the summary of the demographic data of respondents.

Table 3. Summary of the demographic data of respondents

	Frequenc (n)	Percent (%)		Frequency (n)	Percent (%)
Project Team Size (N:148)			**Project Year (N:148)**		
1-3	33	22,3	2014	74	50
4-6	53	35,8	2015	74	50
7-10	38	25,7			
11-15	13	8,8			
16 and above	11	7,4			
Institution Type (N:148)			**Project Fields (N:148)**		
Municipalities	20	13,5	Human Capital	17	11,5
Associations	4	2,7	Environmental Structure	22	14,9
Societies	10	6,8	Entrepreneurship	14	9,5
Private Sector Entities	16	10,8	Development of Institutional Capacity	19	12,8
Governorships	20	13,5	Social Development	39	26,4
Public Offices	8	5,4	Innovation and R&D	37	25
Chambers	4	2,7			
Universities	40	27			
Foundations	20	13,5			
Others	6	4,1			
Gender (N:148)			**Total work experience (N:148)**		
Female	77	48	0-1 year	3	2
Male	71	52	2-5 years	26	17,6
Age (N:148)					
25 and below	6	4,1			
26-35	74	50			
36-45	45	30,4			
46 and above	23	15,5			
Level of education (N:148)			**Total work experience on project (N:148)**		
High school/College	6	4,1	0-1 year	33	22,3
Bachelor Degree	69	46,6	2-5 years	61	41,2
Master Degree	52	35,1	6-10 years	34	23
PhD	21	14,2	11-15 years	6	4,1
			Above 15 years	14	9,5
Participation in project management training (N:148)			**Participation in project cycle management training (N:148)**		
Yes	82	55,4	Yes	92	62,2
No	66	44,6	No	56	37,8

4.2. Reliability Analysis

Before the PLS-SEM analysis, all variables are carefully examined according to the precision of data entry, dataset size, the distributional characteristics of the data, missing value and outliers. Generally, PLS-SEM provides strong statistical results even with small datasets [61; 62]. However, some researchers still argue that the minimum dataset size for PLS-SEM analysis should be carefully considered [63]. Barclay and Smith [11] developed "10-time rule" which indicates the sample size should be greater than 10 times the largest number of structural paths directed at a particular construct in the structural model. According to this rule, the maximum number of arrows to a construct in the model prepared in this study is 11. Therefore, the minimum dataset size should be 110. Also Bullet et al. [64] suggested a guideline table to determine minimum sample size required. This table depends similarly on the maximum number of arrows pointing at a latent variable as specified in the structural equation model. According to that, the minimum dataset size for 11 arrows should range from 95 to 98. In both cases, the size of the dataset of this study which is 148 is greater than the minimum dataset size required.

In this study, only 8 observations are removed from the dataset considering the rule "overall missing data on the questionnaire exceed 15% should be removed [60]". In order to determine the outliers, box plot and stem-leaf plot techniques in SPSS program are used. No outliers have been found that need to be removed from the dataset.

Lack of normality in variable distributions can distort the results of multivariate analysis. But there is no precondition for data distribution for PLS-SEM analysis. Nevertheless, the data should not go too far from normality [60]. In this study, skewness and kurtosis of data is examined. According to George and Mallery [65], the values of skewness and kurtosis are between -2 and +2, indicating that the variable is normally distributed. Each of the latent variables is examined sequentially whether data is normally distributed or not. Results of the analysis show that the data is not far from normal distribution.

Generally, Cronbach's alpha is not used to measure the internal consistency in PLS-SEM nevertheless in this study we examine Cronbach's alpha coefficients for each latent variable in order to measure the reliability of the questions. Cronbach's alpha value is between 0 and 1 and considered to be sufficient for reliability when its value is 0.70 or more [66]. Our results show that Cronbach's alpha coefficients for each latent variable are greater than 0.70 and range from 0.751 to 0.915. This approves the reliability of the relationship among the constructs and the measurement variables.

4.3. PLS-SEM Measurement Model Analysis

In evaluating the PLS-SEM results, a two-step approach (measurement model and structural model) must be performed, starting with the assessment of the quality of the measurement models. The measurement model shows the relation between the latent variables and indicators. Each type of measurement model (i.e., reflective or formative) has specific evaluation criteria. As shown the initial measurement model established in this study in Figure 3, the connection between the indicators and the variables is reflective.

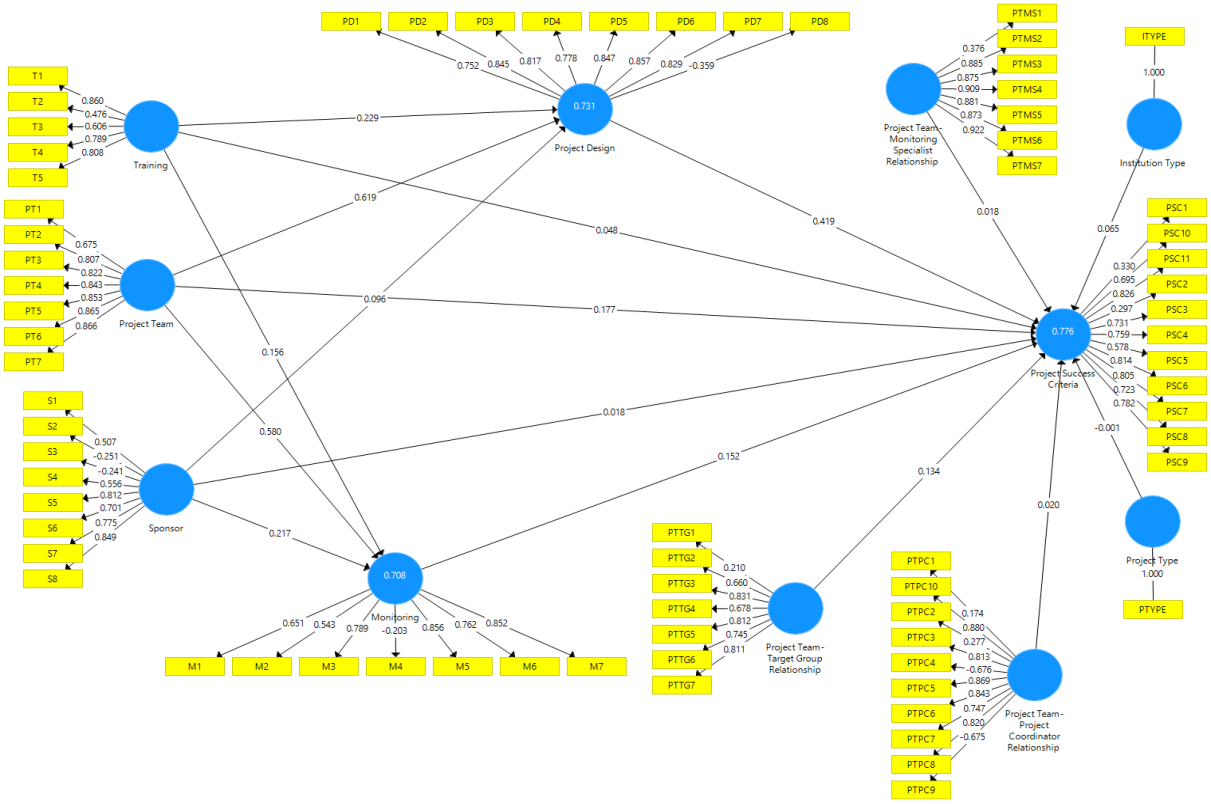

Fig. 3. Measurement model

The following reliability and validity requirements must be met for the adoption of a regulatory measurement model:

- To ensure internal consistency reliability, compound reliability must be greater than 0.70 [60; 67].
- Indicator reliability equals the square root of the outer loadings of each indicator. According to Wong [67], the value obtained should be greater than 0.40 in order to ensure indicator reliability. Hair Jr et al. [60] stated that outer loadings of indicator should be examined under three different conditions in order to ensure indicator reliability. Indicator's outer loadings should be higher than 0.70. Indicators with outer loadings 0.40 should be removed from the model. Indicators with outer loadings between 0.40 and 0.70 should be considered for removal if the deletion leads to an increase in composite reliability

and AVE (Average variance extracted) above the suggested threshold value.

- For convergent validity, AVE value should be greater than 0.50 [60; 67].
- To evaluate discriminant validity HTMT (Heterotrait-Monotrait) ratio, also recommended by the SmartPLS program developers, is used. HTMT ratio should be lower than 0.90 for discriminant validity between two reflective variables [62].

The measurement model established on the basis of the literature study is analyzed using the SmartPLS program. After inserting the answers of the survey on the measurement model originally proposed, we run PLS algorithm. The initial model and factor load obtained as a result of PLS algorithm are shown in Figure 3. This model does not provide the reliability and validity requirements for some latent variables. For ensuring reliability and validity of each latent variable, we remove some indicators from the model according to internal consistency, indicator reliability, convergent validity and discriminant validity rules as mentioned above. By removing some indicators in every iteration, the desired results achieved for each latent variable except Project Design. For this reason, the expressions of Project Design construct are examined and similar expressions are collected in two groups. Four expressions related to project design are collected under Project Design construct and three expressions related to risk are collected under Risk construct.

Risk factor is related to the planning of any deficiencies in the project. Predicting the risks of the project and making the right plans to eliminate these risks increases project performance.

The risk factor has been identified as a significant success factor in many studies in the literature [39; 36; 41]. In the questionnaire, the contribution of risk factor is measured by 3 questions and we propose the following hypothesis:

H6a: Determination of risk has a positive relationship with project success and explains the variance in it.

H6b: Determination of risk has a positive relationship with project design and explains the variance in it.

After the necessary adjustments to the model, measurement model provides internal consistency reliability, indicator reliability, convergent validity and discriminant validity.

4.4. PLS-SEM Structural Model Analysis

After verifying the model is reliable and valid, the prediction ability of the variables and the relationships between constructs in the model are examined. The main purpose here is to test how well the proposed model predicts endogenous variables or dependent variables. In order to analyze the magnitude and significance of the predicted causality relationships between variables in the proposed structural model, Partial Least Square (PLS) algorithm in SmartPLS software is run. The final structural model is obtained as shown in Figure 4.

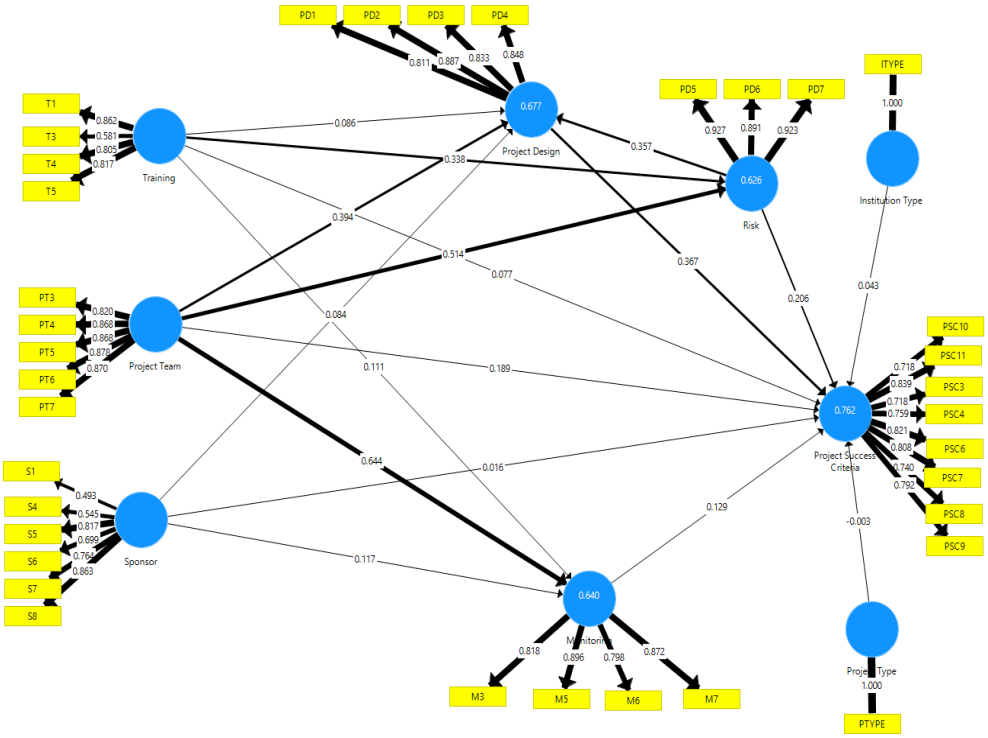

Fig. 4. Structural model

The evaluation of the statistical significance of each path (that shows the effect of variables on each other) in the proposed model is analyzed using the t and p values. SmartPLS software can provide t values for both measurement model and structural model using a method called bootstrapping. With bootstrapping method, many sub-samples (e.g., 5000) are taken from the dataset and resampling is done. By this method, statistical results can be obtained for small data sets.

Table 4 presents t values and p values for evaluating the statistical significance of each path of the proposed model. A statistically significant and positive relationship (with t=4.481, p=0.000) is found between project design and project success which support H1. The relationship between monitoring and project success (with t=1.67, p=0.108), project team and project success (with t=1.920, p=0.055) and risk and project success (with t= 2.131, p=0.033) are also positive and statistically

significant. These findings clearly validate hypotheses H2, H3a and H6a respectively. However, there is no relationship between the sponsor and project success (with t=0.270, p=0.787); training and project success (with t=1.148, p=0.251) that do not support hypotheses H4a and H5a.

Table 4. Structural model analysis results

	Original Sample (*O*)	Sample Mean (*M*)	Standard Deviation (*STDEV*)	*t* Statistics (|*O/STDEV*|)	*P* Values	Significant Level	f^2 Values	f^2 Effect Size
Project Design -> Project Success	0.367	0.370	0.082	4.481	0.000	***	0.170	MEDIUM
Monitoring -> Project Success	0.129	0.133	0.080	1.67	0.108	*	0.023	SMALL
Sponsor -> Project Success	0.016	0.021	0.060	0.270	0.787	N.S.	0.001	NO
Training -> Project Success	0.077	0.082	0.067	1.148	0.251	N.S.	0.010	NO
Project Team -> Project Success	0.189	0.185	0.099	1.920	0.055	*	0.036	SMALL
Risk -> Project Success	0.206	0.194	0.097	2.131	0.033	**	0.055	SMALL
Training -> Project Design	0.086	0.088	0.078	1.092	0.275	N.S.	0.010	NO
Training -> Monitoring	0.111	0.112	0.078	1.420	0.156	N.S.	0.016	NO
Training -> Risk	0.338	0.340	0.093	3.637	0.000	***	0.151	MEDIUM
Project Team ->Monitoring	0.644	0.641	0.075	8.540	0.000	***	0.497	LARGE
Project Team -> Project Design	0.394	0.396	0.108	3.641	0.000	***	0.165	MEDIUM
Project Team -> Risk	0.514	0.513	0.095	5.430	0.000	***	0.350	LARGE
Sponsor -> Project Design	0.084	0.086	0.075	1.116	0.264	N.S.	0.014	NO
Sponsor -> Monitoring	0.117	0.122	0.058	2.012	0.044	**	0.025	SMALL
Risk -> Project Design	0.357	0.353	0.097	3.664	0.000	***	0.144	SMALL
Project Type -> Project Success	-0.003	-0.004	0.042	0.083	0.934	N.S.	0.000	NO
Institution type -> Project Success	0.043	0.045	0.040	1.081	0.280	N.S.	0.007	NO

After examining which critical success factor has a significant relationship with project success, the results of the other hypotheses in the model are examined. A significant and positive relationship is found between project team and project design (with t=3.641, p=0.000), project team and monitoring (with t=8.540, p=0.000), project team and risk (with t=5.430, p=0.000). Thus, H3b, H3c and H3d hypotheses are also supported. There is positive and statistically significant relationship between training and risk whereas no relationship between training and project design, training and monitoring respectively that validates H4d but not H4b and H4c. The relationship between sponsor and monitoring variable is significant at 0.05 level (with t=2.012, p=0.044). But the sponsor variable has no influence on project design (with t=1.116, p=0.264). As a result, the H5c hypothesis is supported, but the H5b hypothesis is not supported. Risk factor and project design has a positive and significant relationship (with t=3.664, p=0.000) confirming H6b hypothesis. Finally, the effect of differentiation of project type and institution type on project success is not statistically significant.

Another measure to be considered when analyzing the structural model is the coefficient of determination (R2 coefficient). The coefficient of determination represents the combined effects of exogenous latent variables on the endogenous latent variables. The PLS-SEM aims to maximize the R2 values of the inner latent variable(s) in the path model. In general, R2 values of 0.25, 0.50 and 0.75 for the targets construct are considered as weak, moderate and significant respectively. We also examine the f2 effect size, which indicates the contribution of an external variable to the explanation power of the internal variable. If the value of f2 is greater than or equal to 0.02, it can be said that the effect of the exogenous variable on the endogenous variable is small, if the

effect is above 0.15 then the effect is medium and if it is above 0.35, the effect is large [68; 69].

Table 5 shows the combined effects of exogenous latent variables on the endogenous latent variables R2 values of the structural model. According to this; the R2 value for project success endogenous variable is 0.762. This means that six latent variables (training, monitoring, project team, project design, risk and sponsor) account for a significant (76.2%) variance in project success. According to the path coefficient in the structural model; Project Design (0.367) has the greatest influence on Project Success. It is followed by risk (0.206), project team (0.189), monitoring (0.129), training (0.077) and sponsor (0.016). The value of f2 effect size indicates the contribution of an external variable to the explanation power of the internal variable. According to the f2 effect size, the effect of project design on the project success is found to be medium. Risk, project team and monitoring have small effect on project success. Whereas training and sponsor have no effect on project success. These results are parallel to R2 values.

Table 5. R2 and Q2 values for structural model

Endogenous Latent Variable	R^2 Value	Q^2 Value
Project Success	0.762	0.420
Monitoring	0.641	0.428
Project Design	0.677	0.449
Risk	0.626	0.484

Another measure that needs to be considered in the structural model is the Q2 value, which is called the predictive relevance. The blindfolding procedure in the SmartPLS program is applied to calculate Q2 value of the path model. If the Q2 value of the reflective endogenous variable is greater than 0, it is said that the load model has predictive relevance [60; 67]. In Table 5, all Q2 values are much larger than zero. Hence, the model's predictive relevance in endogenous latent variables is supported.

According to the results, the moderator effect of the project team-project coordinator relation variable in relation to project design and project success is significant at the level of 0.05. Also, the moderator influence of the project team- monitoring specialist variable in relation to training and monitoring is significant at the level of 0.1. The results show that the project team-target group variable is not active as a moderator.

4.5. Multi-group Analysis

Multi-group analysis also referred to as PLS-MGA (Partial Least Square-Multigroup Analysis), is also conducted to analyze the differences of the model relationships with respect to some variables. In PLS-MGA, it is assumed that the moderator variable is categorical (usually with two categories) and potentially affects all relationships in the structural model (Hair et al., 2014).

In this study, it is examined whether the relations in the structural model differ for two categories. These are the project implementation year (2014 and 2015) and the total budget of the project in Turkish lira (small budget <500.000 TL and large budget >500.000 TL).

Group comparison results with respect to project implementation year show statistical significance only in one relationship (path coefficient). That is, the impact of project design on project success is higher for the year 2015 compared to 2014 ($p<0.05$).

The second group comparison analysis is based on the total budgets of the projects. The effect of training on monitoring, project success and project design variables are higher for small budget projects ($p<0.05$). The effect of institution type on project success is found higher for small budget projects ($p<0.1$). The impact of the project team on project design is higher for large budget projects ($p<0.05$). Finally, the sponsor's impact on monitoring is higher for large budget projects ($p<0.01$).

5. Discussion

The overall results emphasize project design as the key success factor for the success of the regional development projects which is a conclusion in line with the existing literature on success of regular industrial and development projects [36, 29; 37; 5; 41; 44; 45; 43; 46]. Thus, we can point out that whether a project is industrial or development project which is mostly a non-profit project, project design is critical for the end success. The role of project design extends further specifically for development projects which have multiple stakeholders compared to regular industrial projects. Particularly for regional development projects, the effect of project design may flourish by the enhanced recognition of geographic-specific needs and regional assets to create synergies.

Our results show that, for project success, three success factors- project team, risk and monitoring- also matter as much if not more than the project design. These factors are also shown to be significant by researchers for industrial and development projects [36; 41; 5; 42; 46; 44]. Dedicated to the locality of regional development projects, management of risks becomes easier and problem-solving arrangements are quicker, which in return reduce the negative effects on success. Training success factor which is an activity of the regional development on-hands education program given to the project team by the regional development agency is shown to be significantly in relation to the risk success factor. For regional development projects, project team and monitoring become even more important factors with the potential of local governance, reduced transaction costs and the advantage of all parties (sponsor, implementer and beneficiaries) being at the same local region.

Sponsor, solely, is not found to be a significant factor for project success. The literature on regional development reports that the main mission of the sponsor (i.e., regional development agency) is to achieve mobilization, framing and measuring [26; 27; 7]. Mobilization is the activation of actors with important resources, competences and knowledge project programs and measurement (i.e., monitoring). Framing is making progress in collective action and strategic awareness through policy-making, project programs and proposal calls. These two missions of the sponsor are assumed to be encompassed by other success factors in our model such as the project team and the project design. The measuring mission of the sponsor is also represented by another success factor- namely, monitoring

factor- of the model. Thus, sponsor variable has been found to be in relation to the monitoring success factor. Moreover, the project team and monitoring specialist relationship also plays a role in project success via monitoring variable. We believe the effect of sponsor can be displayed using a richer information infrastructure since RDAs impact is complex to assess given their wide-ranging contribution to regional outcomes, the breadth of their partnership working and the long-term nature of their actions (Pearce and Ayres, 2009). This concern should lead to more effort to improve the regional database for the sake of measuring the RDAs' impacts. Specific to our case study, the current database used "Management Information System of Development Agencies" is observed to have deficiencies for satisfying the needs of operational and monitoring data collection of RDAs.

6. Conclusion

This study aims to identify the most effective success factors of regional development projects. So that, project coordinators should focus on these factors in order to obtain project outputs which will satisfy the target groups and project team while satisfying the time-budget-quality constraints. In the limited literature on the management of development projects, previous studies emphasize that the project design and the monitoring are the most effective success factors. Parallel to the literature, project design is found to be one of the most important factors for the success of regional development projects in this study. However, other effective success factors are found to be the risk, the project team and monitoring for regional development projects in this study.

Clear project description in recognition of geographic-specific needs and regional assets and accurate project design is one of the most important factors of the project success for regional development projects. Together with the correct time-labor-budget planning which affects all of the project processes and achievement of the project goals and targets, identification of the target group problems clearly, consideration of the target group's opinion and project team's knowledge about the target group will allow a more accurate project design. Project risk management is also an effective factor of success. In regional development projects potential risks can be time-budget excesses, setbacks in the activities, project being not adopted by the target group, economic problems in the country, etc. Dedicated to the locality of regional development projects, management of risks becomes easier and problem-solving arrangements are quicker. Thus, the capability to manage risk as a part of the daily activities would decrease the costs and increase the satisfaction of the stakeholders, hence support the success of the project. Project team, third most effective success factor, is required to be technically trained for the specialized and highly adopted to the project as well as well-informed about the procedural works. With the potential of local governance, reduced transaction costs and the advantage of all parties (sponsor, implementer and beneficiaries) being at the same local region of regional development projects, feedback, high communication skills, close relationship with the project manager and the monitoring specialist are enhancing the success of the project within the project team construct.

In contrast, the monitoring factor in this study is not as effective as in previous studies. In international development projects there exist two monitoring processes: internal and external. Internal monitoring is executed by the local project team and government whereas external is made by the funding institute (i.e., sponsor). These procedures are highly data-driven and analytical, and their results are used in decision-making processes. The case of IDA examined in this study does not include such a data-driven, analytic monitoring process rather; a control-based monitoring is made. Thus, the model does not exhibit high effect of the monitoring. This may be concluded as a gap for the regional development agency to improve. Tools such as monitoring information systems within the agency can be used for real-time monitoring, document and information sharing, coordination and communication purposes. During the monitoring process, the main purpose should be transformed from controlling to improving the project outputs and enhancing the project success. Thus, monitoring should begin at the early stages and for each stage specific indicators should be specified.

In this study, we use data from one regional development agency, in future studies the dataset can be enlarged to several regional agencies. So that, the more generalized results can be obtained. Moreover, in this study, survey only encompasses the project leaders and project members. However, in regional development projects there are various stakeholders such as sponsor, target group, etc. Collecting opinions of various stakeholders can also yield more generalization of the results.

References

[1] Khang, D.B., Moe, T.L. (2008). Success Criteria and Factors for International Development Projects: A Life-Cycle-Based Framework. Project Management Journal, 39(1), 72-84.

[2] Youker, R. (1999). Managing International Projects - Lessons Learned. Project Management Journal, 30(2), 6-7.

[3] Ika, L.A., Diallo, A., Thuillier, D. (2010). Project management in the international development industry. International Journal of Managing Projects in Business, 3(1), 61–93.

[4] Yamin, M., & Sim, A. K. S. (2016). Critical success factors for international development projects in Maldives: Project teams' perspective. International Journal of Managing Projects in Business, 9(3), 481-504.

[5] Belout, A., Gauvreau, C. (2004). Factors influencing project success: The impact of human resource management. International Journal of Project Management, 22(1), 1–11.

[6] Pike, A., Rodriguez-Pose, A, & Tomaney, J. (2006). Local and Regional Development, Taylor Francis, London.

[7] Barca, F., McCann, P., & Rodríguez-Pose, A. (2012). The Case for Regional Development Intervention: Place-Based Versus Place-Neutral Approaches. Journal of Regional Science, 52 (1), 134–152.

[8] Solow R. M. (1956). A contribution to the theory of economic growth. Quarterly Journal of Economics,70, 65 – 94.

[9] OECD (2009). Regions Matter: Economic Recovery, Innovation and Sustainable Growth. Paris: Organization for Economic Growth and Development.

[10] CAF. (2010). Desarrollo Local: Hacia un Nuevo Protagonismo de las Ciudades y Regiones. Caracas: Corporaci´on Andina de Fomento.

[11] Barclay, M. J., & Smith, C. W. (1995). The Maturity Structure of Corporate Debt. The Journal of Finance.

[12] Rodríguez-Pose A. (1999) Instituciones y desarrollo económico, Ciudad y territorio: Estudios territoriales 122, 775–784.

[13] Hall, R. E.& Jones C.I. (1999). Why do some countries produce so much more output per worker than others? Quarterly Journal of Economics 114, 83 –116.

[14] Rodrik D. (2004). Getting Institutions Right. CESifoDICE Report Number 2/2004. Ifo Institute for Economic Research, Munich.

[15] Acemoglu, D., & Johnson, S. H. (2006). De facto political power and institutional persistence. American Economic Review 96, 325–330.

[16] Streeck W. (1991). On the institutional conditions of diversified quality production in METZNER E.andSTREECK W.(Eds) Beyond Keynesianism: Socio-Economics of Production and Full Employment, pp. 21–61. Edward Elgar, Aldershot.

[17] Vázquez-Barquero A. (1999). Desarrollo, redes e innovación: lecciones sobre desarrollo endógeno. Pirámide, Madrid.

[18] Jütting J. (2003). Institutions and Development: A Critical Review. OECD Development Centre, DEV/DOC (2003): 08. Working Paper Number 210. organization for Economic Co-operation and Development (OECD), Paris.

[19] Gertler M.S. (1997). The invention of regional culture, in LEE R. and WILLIS J. (Eds) Geographies of Economies, pp.47–58. Arnold, London.

[20] Fukuyama F. (2000). Social Capital and the Civil Society. IMF Working Paper Number 74. International Monetary Fund (IMF), Washington, DC.

[21] North, D. C. (2005). Understanding the Process of Economic Change. Princeton University Press, Princeton, NJ.

[22] Storper, M. (2005). Society, community and economic development, Studies in Comparative International Development 39, 30 –57.

[23] Giddens, A. (1990). The Consequence of Modernity. Polity, Oxford.

[24] North D. C. (1990). Institutions, Institutional Change and Economic Performance. Cambridge University Press, New York, NY.

[25] Easterly W. & Levine (2003). Tropics, germs, and crops: how endowments influence economic development, Journal of Monetary Economics 50, 3 –39.

[26] Pearce, G. & Ayres, S. (2009). Governance in the English Regions: The Role of the Regional Development Agencies, Urban studies, 46(3) 537–557.

[27] Sotarauta, M., (2010). Regional development and regional networks: The role of regional development officers in Finland, European Urban and Regional Studies 17(4) 387–400.

[28] Atkinson, R. (1999). Project management: cost, time and quality, two best guesses and a phenomenon, its time to accept other success criteria. International Journal of Project Management, 17(6), 337–342.

[29] Pinto, J. K., & Slevin, D. P. (1988). Project Success: Definitions and Measurement Techniques. Project Management Journal, 19(1), 67-72.

[30] Wateridge, J. (1998). How can IS/IT projects be measured for success? International Journal of Project Management, 16(1), 59–63.

[31] Pinto, M. B., & Pinto, J. K. (1991). Determinants of Cross-Functional Cooperation in the Project Implementation Process. Project Management Journal, 20(4), 15-20.

[32] Chan, A. P. C., & Chan, A. P. L. (2004). Key performance indicators for measuring construction success. Benchmarking, 11(2), 203-221.

[33] Cserháti, G., & Szabó, L. (2014). The relationship between success criteria and success factors in organizational event projects. International Journal of Project Management, 32(4), 613–624.

[34] Bayiley, Y. T. & Teklu, G. K. (2016). Success factors and criteria in the management of international development projects: Evidence from projects funded by the european union in ethiopia. International Journal of Managing Projects in Business, 9(3), 562-582.

[35] Rockart, J. F. (1982). The Changing Role of The Information Systems Executive: A Critical Success Factors Perspective. Sloan Management Review, 24(1), 3-13.

[36] Pinto, J., & Slevin, D. (1987). Pinto, J.K. & Slevin, D.P. (1987). Critical Factors for Successful Project Implementation. IEEE Transactions on Engineering Management, 34(1), 22-27.

[37] Kerzner, H. (1995). Project Management: A System Approach to Planning, Scheduling, and Controlling. Van Nostrand Reinhold, New York.
[38] Belassi, W., & Tukel, O. I. (1996). A new framework for determining critical success/failure factors in projects. International Journal of Project Management, 14(3), 141–151.
[39] Baccarini, D. (2018). The Logical Framework Method for Defining Project Success. Project Management Journal, 30(4), 25-36.
[40] Cooke-Davies, T. (2002). The "real" success factors on projects. International Journal of Project Management, 20(3), 185–190.
[41] Westerveld, E. (2003). The Project Excellence Model®: Linking success criteria and critical success factors. International Journal of Project Management, 21(6), 411–418.
[42] Müller, R., & Turner, R. (2007). The Influence of Project Managers on Project Success Criteria and Project Success by Type of Project. European Management Journal, 25(4), 298–309.
[43] Kloppenborg, T. J., Tesch, D., & Manolis, C. (2014). Project success and executive sponsor behaviors: Empirical life cycle stage investigations. Project Management Journal, 45(1), 9-20.
[44] Costantino, F., Gravio, G. D., & Nonino, F. (2015). Project selection in project portfolio for Building and Testing Behavioral Causal Theory: When to Choose It and How to Use It. IEEE Transactions on Professional Communication, 57(2), 123–146.
[45] Todorović, M. L., Petrović, D. T., Mihić, M. M., Obradović, V. L., & Bushuyev, S. D. (2015). Project success analysis framework: A knowledge-based approach in project management. International Journal of Project Management, 33(4), 772-783
[46] Ika, L. A., Diallo, A., & Thuillier, D. (2012). Critical success factors for World Bank projects: An empirical investigation. International Journal of Project Management, 30(1), 105–116.
[47] Marzagão, D. S. L., & Carvalho, M. M. (2016). Critical success factors for Six Sigma projects. International Journal of Project Management, 34(8), 3-9.
[48] Dvir, D., Ben-David, A., Sadeh, A., & Shenhar, A. J. (2006). Critical managerial factors affecting defense projects success: A comparison between neural network and regression analysis. Engineering Applications of Artificial Intelligence, 19(5), 535–543.
[49] Khan, Z. A., Thornton, N., & Frazer, M. (2000). Experience of a financial reforms project in Bangladesh. Public Administration and Development, 20(1), 33–42.
[50] Kerzner, H. (2009). Project Management: A Systems Approach to Planning, Scheduling and Controlling. 10thEd.pdf. In New York: John Wiley.
[51] Slevin, D. P., & Pinto, J. K. (1986). The Project Implementation Profile: New Tool for Project Managers. Project Management Journal, 17(4), 57.
[52] Hermano, V., López-Paredes, A., Martín-Cruz, N., & Pajares, J. (2013). How to manage international development (ID) projects successfully. Is the PMD Pro1 Guide going to the right direction? International Journal of Project Management, 31(1), 22–30.
[53] Lee, J., & Jang, Y. (1998). Factors influencing the success of management consulting projects. International Journal of Project Management, 16(2), 67–72.
[54] Banihashemi, S., Hosseini, M. R., Golizadeh, H., & Sankaran, S. (2017). Critical success factors (CSFs) for integration of sustainability into construction project management practices in developing countries. International Journal of Project Management, 35(6), 1103–1119.
[55] Basu, R. (2014). Managing quality in projects: An empirical study. International Journal of Project Management, 32(1), 178–187.
[56] Chipulu Maxwell, Ojiako Udechukwu, Gardiner Paul, Williams Terry, Mota Caroline, Maguire Stuart, Marshall Alasdair. (2014). Exploring the impact of cultural values on project performance: The effects of cultural values, age and gender on the perceived importance of project success/failure factors. International Journal of Operations & Production Management, (3), 364.
[57] Doloi, H., Iyer, K. C., & Sawhney, A. (2011). Structural equation model for assessing impacts of contractor's performance on project success. International Journal of Project Management, 29(6), 687–695.
[58] Hair, J.F., Hollingsworth, C., Randolph, A. & Chong, A. (2017). An updated and expanded assessment of PLS-SEM in information systems research. Industrial Management & Data Systems, 117(3), 442-458.
[59] Chin, W. W. (1998). The partial least squares approach for structural equation modeling. In Modern methods for business research, 295-336.
[60] Hair Jr, J. F., Hult, G., Ringle, C. & Sarstedt, M. (2014). A primer on partial least squares structural equation modeling (PLS-SEM). (1st ed.). Los Angeles, London, New Delhi, Singapore and Washington DC: SAGE.
[61] Hair, J. F., Sarstedt, M., Ringle, C. M., & Mena, J. A. (2012). An assessment of the use of partial least squares structural equation modeling in marketing research. Journal of the Academy of Marketing Science, 40(3), 414–433.
[62] Henseler, J., Ringle, C. M., & Sarstedt, M. (2014). A new criterion for assessing discriminant validity in variance-based structural equation modeling. Journal of the Academy of Marketing Science, 43, 115-135.
[63] Reinartz, W., Haenlein, M., & Henseler, J. (2009). An empirical comparison of the efficacy of covariance-based and variance-based SEM. International Journal of Research in Marketing, (44), 1-49.
[64] Bullet, P. L. S. a S., Marcoulides, G. a, & Saunders, C. (2010). Editor's comments. MIS Quarterly, 30(2), 3-9.
[65] George, D., & Mallery, P. (2003). SPSS for Windows Step by Step: A Simple Guide and Reference 17.0 Update. In 2010.Boston: Pearson.
[66] Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2013). Multivariate data analysis. Harlow: Pearson.
[67] Wong, K. K. (2013). Partial least squares structural equation modelling (PLS-SEM) Techniques using SmartPLS. Technical note 1. Marketing Bulletin, 24, 1–32.
[68] F. Hair Jr, J., Sarstedt, M., Hopkins, L., & G. Kuppelwieser, V. (2014). Partial least squares structural equation modeling (PLS-SEM). European Business Review, 26(2), 106–121.
[69] Lowry P B, & J, G. (2014). Partial Least Squares (PLS) Structural Equation Modeling (SEM).

Appendix A. Sample questionnaires associated with the critical success factors.

Excerpt of the Sample Questionnaire	**1-Strongly Agree 2- Agree; 3-Somewhat Agree; 4-Neither Agree nor Disagree; 5-Somewhat Disagree; 6- Disagree; 7-Strongly Disagree** 1 2 3 4 5 6 7	**References**
Project Design (PD)		
PD1: The objectives of the project are clearly defined.		(Ashley et al., 1985; Slevin & Pinto, 1986; Francesco et al., 2015)
PD2: The necessary planning (schedule/manpower/budget) to complete the project has been done correctly.		(Slevin & Pinto, 1986; Todorović et al., 2015)
PD3: The target group of the project has been correctly identified and is described in detail.		(Slevin & Pinto, 1986)
PD4: Key personnel needs (who and when) are specified in the project plan.		(Slevin & Pinto, 1986; Cserháti & Szabó, 2014)
PD5: Emergency planning is done in case the risk of the project exceeding the time or budget occurs.		(Slevin & Pinto, 1986; Ika et al., 2012)
PD6: The project has a comprehensive management plan that includes information flow and decision-making processes.		(Might & Fischer, 1985; Slevin & Pinto, 1986)
PD7: Measures to manage the risk factors and possible disruptions in the project are planned.		(Slevin & Pinto, 1986; Ika et al., 2012)
PD8: In the implementation phase of the project, the work distribution and budget planning between the partners are insufficient.		(Slevin & Pinto, 1986)