

**DETERMINANTS AFFECTING THE SUCCESS OF DISTRIBUTION GRID PROJECTS IN BINH THUAN POWER COMPANY, VIETNAM****Pham Van Tai* & Le Duc Thu**

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DOI: 10.5281/zenodo.569373**Keywords:** Distribution grid success Project, set of factors, critical success factor**Abstract**

The research identified the critical factors affecting the success of the distribution grid project in Binh Thuan Power Company, clarify the mutual relationship between the critical factors affecting the success of the distribution grid project in Binh Thuan Power Company and recommended and rated the solution to enhance the success of the distribution grid project in Binh Thuan Power Company. The research had found four critical factors: External factors of project, Controlling and coordination factors, Characteristics of project, Competences of participants involved in the project. The regression results show that four groups of factors that are positively related to the success of the project and there is a statistically significant. Including theory and practice, the group highlights the impact factor is External factor of project and Controlling and coordination factors. The study results contribute theoretically about project management in Binh Thuan Power Company. The project manager at Binh Thuan Power Company manage effectively to enhance the likelihood of success of the project.

Introduction

In conditions more difficult of country, although the Electricity industry efforts to investment power and electricity grid to ensure electricity supply for production and people's life. However, with limited resources compared to the economic development demand in production and living, the investment in the power grid is still not enough to meet 100% of demand for Power Company is provided capital by Southern Power Corporation to construct distribution electricity in the province.

Every year, Binh Thuan grids supplying electricity to customers, due to limited funds, so the use of funds is efficient essential. Determinants affecting the success of distribution grid projects in Binh Thuan Power Company is required to provide solutions to contribute to the success of the distribution grid project, enhance the prestige of the power industry, efficient use of capital, contributing to the socio-economic development of the province.

Therefore, in order to find solutions to improve the success of the distribution grid is a strategic direction for the development of the electricity industry in general and the Binh Thuan Power Company in particular.

Theoretical bases and previous researches**Definition of the project**

In recent book written by Harold Kerzner (2003, page 2), a project can be regarded as any sequences of activities and tasks:

- Have a specific objective to be completed within certain specifications
- Have define start and end dates
- Have funding limits (if applicable)
- Consume human and nonhuman resources (ie., money, people, equipment)
- Are multifunctional (i.e., cut across several functional lines)

Defined by the Construction Law No. 50/2014/QH 13 at item 15, article 3, "Construction investment project means a collection of proposals concerning use of funds for construction, repair or renovation of a construction work with a view to developing, maintaining and raising the quality of the work or product or service within a given duration at specified costs".



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PMBOK Guide defined, “the project is a temporary endeavor undertaken to create a unique product, service or result. The temporary nature of projects indicates a definite beginning and end” (2008, page 5). This means that the nature of the project it will determine the start and end with the attainment of a unique product, service, or result. A distribution grid project also similar definition, but particularly the electricity sector products.

Definition of the factors affecting the success of project

According to Harold Kerzner (2003, page 6) successful projects can be defined as the achievement of the project objectives:

- Within the limited time period
- Within the budgeted costs
- At the proper performance or specification level
- With acceptance by the customer/ user
- With minimum or mutually agreed upon scope changes
- Without disturbing the main work flow of the organization
- Without changing the corporate culture

Viewpoint of successful project for distribution grid projects in Binh Thuan Power Company

The main task of Binh Thuan Power Company is the distribution and sale power to customers, the distribution grid investment is one of the other tasks in the operation of the Company, is assigned to some departments implementing, so a successful project can be defined as the achievement of the objectives

- Within the limited time period
- Within the limited budgeted
- Reach the proper performance or specification level
- With acceptance by the customer/ user

Research methodology

Research theoretical basis, offering theoretical model of the factors affecting the success of the project:

On the basis of the previous studies have identified factors affecting the success of the project is shown as follows:

The previous studies in the world

Anton de Wit (1988), “Measurement of project success”. Butterworth & Co (Publishers) Ltd Project Management Vol 6 No 3 August 1988, pp. 164-170. The research launched factors of project management including: cost, time and quality/performance; factors measure success of the project is objectives.

Walid Belassi, Oya Icmeli Tukul (1996), “A new framework for determining critical success/failure factors in projects”. International Journal of Project Management Vol. 14, No. 3, pp. 141-151, 1996. Rankings success factors by industry, for the construction industry, including: Environment, Project Management, team members, characteristics of project.

C S Lim and Zain Mohamed (1999), “Criteria of project success: an exploratory re-examination”, International Journal of Project Management Vol.17, No. 4, pp. 243-248, 1999, classify project success into two categories: the macro and micro viewpoints. Macro groups including completion factors (economy, management, supervision, weather) and satisfaction factors (convenience, location, prestige, parking, cost). Micro groups including: Technical, commercial, finance, risk, environmental, human.

Terry Cooke-Dvies (2002), “The “real” success factors on projects”, International Journal of Project Management, 2002, pp. 185-190, identified 12 critical factors that are: Risk management, assigning ownership of risks, visible risk register is maintained, risk management plan, organizational responsibilities on the project, project stage duration, control process, measurement baseline, co-operation of project management and line management functions, Portfolio- and programme management practices, feedback on current project performance, learning from experience.



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Cao Hao Thi and Fredric William Swierczek (2010), "Critical success factors in project management: implication from Vietnam", findings factors affecting the success of the project, including the external environment, project managers, members of project management, organization and characteristics of the project. These results also confirm that success is defined one way, including cost, time, technical features and customer satisfaction.

Amaka Ogwueleka (2011), "The critical success factors influencing project performance in Nigeria", International Journal of Management Science and Engineering Management, 6(5): 343-349, 2011. Results showed sixteen success factors for the real satisfaction of the successful implementation of the project, from the results, taking out the critical success factors are: objective management, management of design, technical factors, top management support and risk management.

Lavagnon A. Ika, Amadou Diallo, Denis Thuilier (2012), "Critical success factors for World Bank projects: An empirical investigation", International Journal of project Management 30 (2012) 105-116. As a result, highlights a specific set of five critical success factors: supervision, coordination, design, training, and organizational environment.

Afshin Pakseresht, Dr. Gholamreza Asgari (2012), "Determining the critical success factors in construction projects", Interdisciplinary Journal of contemporary research in business, December 2012, Vol 4, No 8, 383-393. As a result, the group of seven critical success factors including: project management, logistics, employer, design team, contractor, project manager, environment and business environment.

Zhen-Yu Zhao, Jian Zou, George Zillante (2013), "Factors influencing the success of BOT power plant projects in China: A review", research has shown 14 factors affecting the success of the project include: Macro: Local economy development, public acceptance, environmental regulations, political stability, legal landscape, economy policy, credit regulations. Micro include: Project profitability, technology complexity, project developer's business, project developer's management capacity, project contractor's capacity, project supplier's capacity, previous success.

S. H. Wai, Aminah Md Yusof, Syuhaida Ismail and C.A. Ng (2013), "Exploring Success Factors of Social Infrastructure Projects in Malaysia", International Journal of Engineering Business Management, 2013, Vol. 5, 2:2013. Research launched six elements: Preconstruction, construction, post-construction, internal: organizational, information management, change management.

Bassam A. Hussein (2013), "Factors influencing project success criteria", The IEEE International conference on Intelligent Data Acquisition and Advanced computing systems: Technology and Applications 12-14 September 2013, Berlin, Germany. On the basis of the statistical correlation we may conclude that there are four factors in the initiation phase that, if occurring, will lead to the occurrence of risk factors in the implementation and evaluation phase. These are: having an incomplete set of criteria, diversity, basing a project on unrealistic targets, and using ambiguous/no measurable criteria. These factors affect all aspects of management and evaluation

The previous studies in Vietnam

Vu Anh Tuan, Cao Hao Thi (2009), "Critical factors impact on electrical projects performance in Viet Nam", research has confirmed that there are six critical factors that impact on the success projects in the electrical project in Vietnam, include: External environment stability, project manager competencies, team member competencies, organizational support and project characteristics.

Nguyen Thi Minh Tam, Cao Hao Thi (2009), "Critical factors varying construction cost", research has indicated 6 main factors varying construction cost: Project planners, project executives, economics, political, natural environment, fraudulent and lost.

Chau Ngo Anh Nhan (2011), "Improve the progress of construction projects completed under budget Khanh Hoa Province", based on the theory of the role of the successful progress of the project and the factors affecting the progress of completing the project, researchers has confirmed seven groups of factors that affect the project



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completion schedule includes: external environmental factors, policy, information systems management, capacity main contractor, investor capacities, decentralize authority to the investor, consultant capacity.

Nguyen Chanh Tai, Luu Truong Van (2012), research results showed 10 leading success construction projects financed by state capital, include: favorable ground, the schedule of the ground is on time; Profile project fully implemented, clear technical drawings, no mistakes, no contradiction between the design phase, between design and construction; Human capacity, machinery and equipment of the Contractor; Capacity, experience design consultancy contractors; Experience, capacity of project management consultancy; Financial capacity of the construction contractor; Financial ability to meet the investor's planned; Market fluctuations, prices of construction materials; Capacity, experience works commander; No bureaucracy, corruption in the implementation of the project (as in the selection of contractors, construction, acceptance, ...).

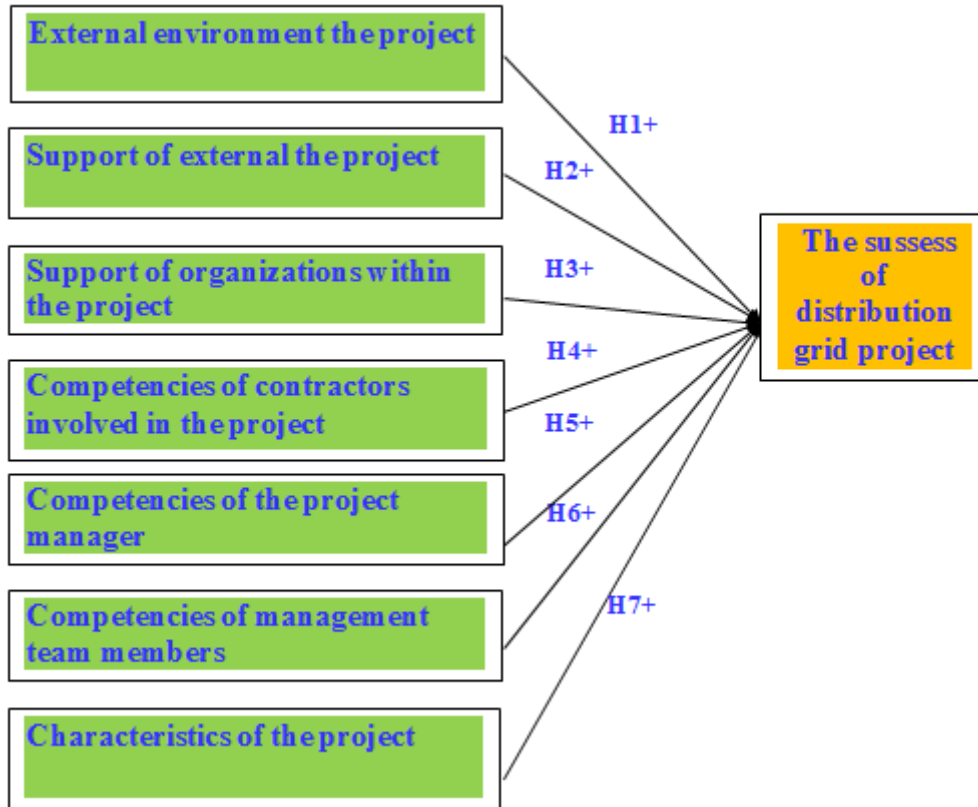
Trinh Thuy Anh (2014), "Factors causing delay in transportation projects using state budget in the southern province". The result of the study shows six factors that affect to time delay in transport projects are: Limited capability of the owner, constructor, designer, consultant, supervisor, mechanism and external factor, financial and material.

The research hypothesis and hypothetical models

Based on the theoretical concepts, the previous studies mentioned above, along with the actual construction of the project in Vietnam and the actual investment distribution grid projects in Binh Thuan Power Company, after conducting interviews with experts on distribution grid projects in Binh Thuan Power Company and the contractors concerned, this study modeling formal study of seven factors including: External environment the project, support of external the project, support of organizations within the project, competencies of contractors involved in the project, competencies of the project manager, competencies of management team members, characteristics of the project.

Dependent variable: The success of distribution grid project

The independent variables: External environment the project, support of external the project, support of organizations within the project, competencies of contractors involved in the project, competencies of the project manager, competencies of team members, characteristics of the project.



Model of formal study of factors affecting the success of the project

Research methodology

From the previous studies relating to the factors affecting the success of the project, this study includes the following procedural steps:

- Research on the theoretical basis, offering theoretical model of the factors affecting the success of the project.
- Preliminary studies: use of qualitative research methods; expert interviews, adjust and supplement the theoretical models.
- Research official: using quantitative research methods, polled by questionnaire four related groups of projects and assessment scales. After completing the official survey questionnaire, 150 survey questionnaires were sent to those who have experience (working in the field of investment, project management in Binh Thuan Power Company, the District Power Units, the Engineering consulting company, the Construction company consisting of commanders, civil engineers, electrical engineers, design engineers, accountants ...) in the electrical construction industry has ever done in Binh Thuan province via e-mail (70 sheets) and directly send the questionnaire survey (80 sheets). As a result, there were 61 sheets with e-mail responses out of 70 sheets sent by e-mail (87.14%) and received 67 sheets out of 80 sheets sent directly (83.75%), no questionnaire is not valid, the number of questionnaires collected about 128 sheets (85.33%).



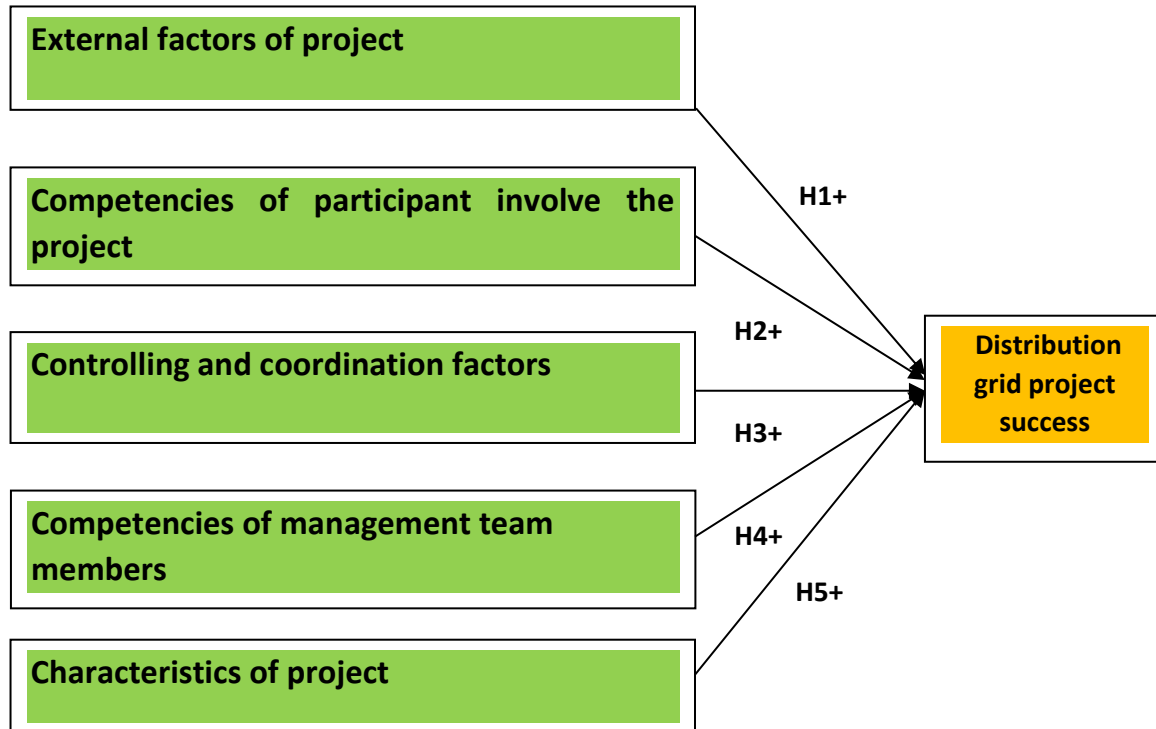
Data analysis and findings

Analysis content includes: Firstly is characterized sample, the second is testing the scales through coefficient method reliability Cronbach's Alpha and exploratory factor analysis (EFA), the third test and give results accreditation of research models and hypotheses using regression analysis methods. Methods of testing were conducted through SPSS 20 software (Statistical Package for the Social Sciences).

The theoretical model of EFA analysis results

Based on the results of EFA analysis, there were 5 hypotheses in the model affect the success of the project: External factors of project (EFAC), Competencies of participant involve the project (CPAR), Controlling and coordination factors (CFAC), Competencies of management team members (TEAM), Characteristics of project (CHAR).

Therefore, the proposed model includes 5 hypotheses as follows:



Regression procedures are not standardized representation of the model are as follows:

$$Y = 1.071 + 0.258X1 + 0.141X2 + 0.280X3 + 0.195X5$$

Or $DGPS = 1.071 + 0.258(EFAC) + 0.141(CPAR) + 0.280(CFAC) + 0.195(CHAR)$

In four factors, factor “Controlling and coordination factors (CFAC)” affect the success of the project is the most powerful with Beta = 0.280, the second factor “External factors of project (EFAC)” with Beta = 0.258, the third factor is the “Characteristics of the project (CHAR)” with Beta = 0.195, finally “Competencies of participant involve the project (CPAR)” with Beta = 0.141.

Standardized regression equation:

$$Y = 0.343X1 + 0.176X2 + 0.334X3 + 0.206X5$$

Or $DGPS = 0.343(EFAC) + 0.176(CPAR) + 0.334(CFAC) + 0.206(CHAR)$

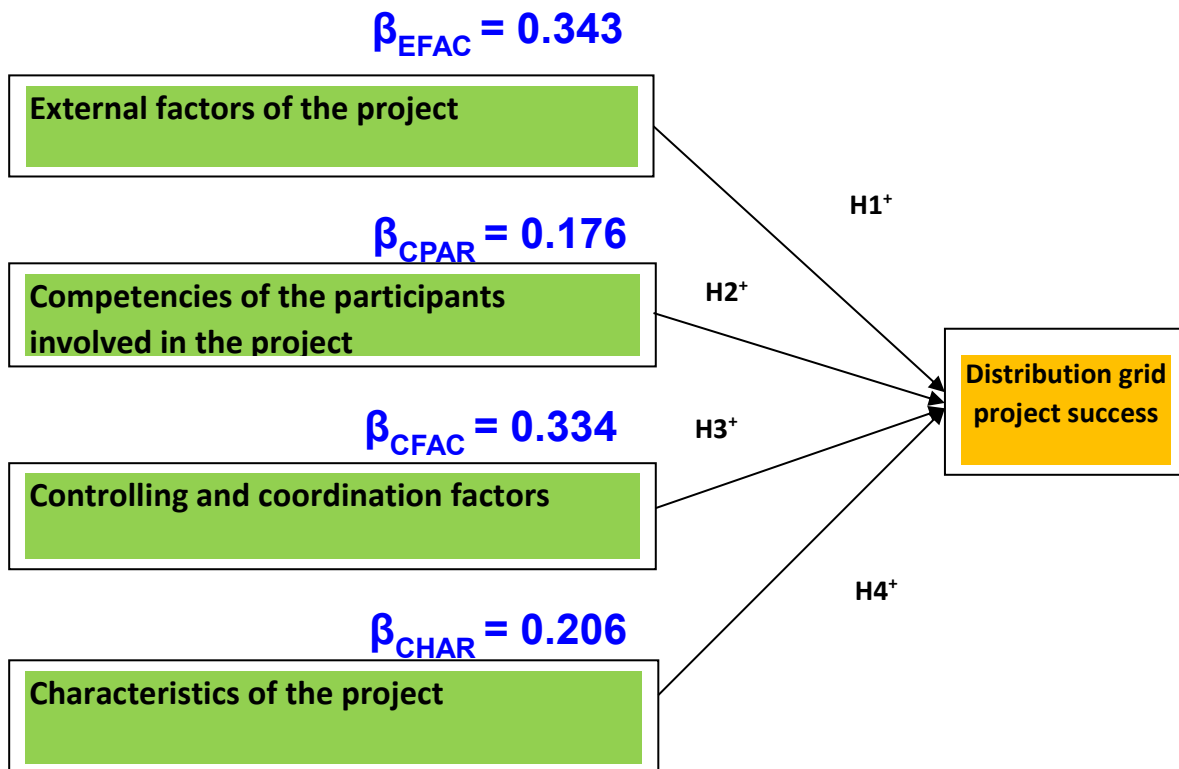


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When put on the Standardized regression, factor “External factors of project (EFAC)” with Standardized Beta = 0.343 is the impact on the success of the project is the most powerful, the second was “Controlling and coordination factors (CFAC)” with Standardized Beta = 0.334.

The results of the research hypothesis in the model

Finally, after checking the model assumptions are as follows:



Conclusion and recommendations

Conclusions

Based on observations of 25 factors that affect the success of the distribution grid projects invested by Binh Thuan Power Company in the locality in the province has been compiled from the relevant research, research “Determinants affecting the success of distribution grid projects in Binh Thuan Power Company” is performed with the goal of identifying, defining the relationship between these factors and propose solutions legal, ranking solutions to increase the likelihood of success of the project's distribution grids Binh Thuan Power company investment in the future. This is a research project in the field of construction project distribution grid.

- Results of inspection scales through accreditation Cronbach's alpha indicates the observed variables are consistent with the model study.
- Results of EFA Analysis, formed model consists of 5 groups of factors. The support of the administrative functions in the settlement of the related procedures (ESUP2) was eliminated, this due to the current state authorities has made an administrative one door, so turn this observation is suitable with the reality
- Results hypothesis testing and regression analysis, the factors “Competencies group of management team members (TEAM)” was removed from the model. This factor is not affect to the success of the distribution grid projects in Binh Thuan Power Company



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- The results of research finding four groups factors that affect the success of the distribution grid project in Binh Thuan Power Company (External factors of project, Controlling and coordination factor, Characteristic of project, Competences of participants involved in the project). This result is consistent with results of previous studies and hypotheses of the study model.

Recommendation

Based on the degree of 4 factors that affect on the success of the distribution grid project in Binh Thuan Power Company, the study recommended 11 solutions for Binh Thuan Power Company to strengthen the factors promoting successful projects. The solution that was proposed study as following:

1. Publicize information about the projects.
2. Develop processes to coordinate with local authorities at all levels where the construction project.
3. Set up Scheduling construction time in line with the conditions of the local weather.
4. Make good survey supervision to avoid design document missing.
5. Signing contracts with the terms of the contract strictly, the responsibility of the contractor, the applicable conditions of the contract penalties for delays if the fault of the contractor. Close supervision of contractors.
6. The owner setting up management system independent of project management to control, appraise performance.
7. Set up the process of selecting suppliers of materials and equipment specifically suitable for a tender package property, project schedule and rules of law.
8. Develop a plan for the overall progress of the project. Build relationships and coordinate inside and outside the project, providing the regime reported.
9. Setting up contractor selection criteria for consulting, construction, provision of supplies and equipment appropriate to the nature of the project.
10. Project manager implements information through the reporting system, check the parties involved in the project. Capture and synthesize information related to the project, performing the function of management and administration.

Training, annual testing for supervisor members of District Power units, paying allowances more suitable for supervisor members.

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