Compare the success of Building and Installing Eleven Electrical Substation Project (transfer electrical high voltage 33KVA to 11KVA) to the failure of Construction of the Big Dam for Water Storage – Degalla Dam Project

Implemented by

Plan Company for Construction

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Introduction

The search around the factors that led to a success or failure of any project still continues. Research studies examine the rationale why projects fail, for example Morris Hough and Morris and Gallagher, give lists of reasons believed to contribute to the project management success or failure in any projects. Meanwhile the criteria that can be depended on for measuring the success or failure are available such as time, cost and quality which are also known as The Iron Triangle. In order to fulfill its goals, governments try to award projects to private sector as a way of providing services to public; it is an important mean for development. In investigating the reasons behind failure of a project, external and internal factors shall be taken into consideration; external factors such as weak government infrastructures, shortage of funds, an absent of accountability and skilled manpower and political instability, internal powers such as poor project design and planning, overoptimistic time schedules and high staff turnover.¹ There are many points that indicate the success in any project;

- Effective management can be a key factor in any project to make it successful.
- The balance between time, cost and scope are essential for any project.
- The project staff shall be well aware of the financial gain and loss throughout the project in order not to make lots of losses. For example, financial ratios are vital in assessing the financial position of any company.
- The success will be achieved if we can find the new field of the work and the field that has minimum competitors in the market because if we have scarcity in the market we can obtain high profit in the market.
- Culture is another aspect that needs to be taken account in implementing a project.

- Risk management is another sensitive key factor when it comes to the implementation of any project.

Projects, however, continue to be failed in many areas despite having all criteria for success and adopting them by the companies. The reason why the project fail despite knowing both the factors and the criteria for success is because project management seems very keen to have new factors to achieve success, such as tools, methodologies, knowledge and skills, but continues to measure or judge project management using tried and failed criteria. If these criteria are the main reasons behind failure, continuing applying same criteria will repeat the failure in the future.²

**Plan Company**

Plan Company implemented many strategic projects in Iraq, mostly in Kurdistan Regional such as (construction, electrical, irrigation, water dam construction, telecommunication sector, traffic signs, roads and investment in factory, etc...). One of the project that has been conducted by Plan Company was (Construction of the big dam for Water Storage – Degalla Dam Project). This project is considered to be one of the most complicated projects and the company was not successful in finishing it.

The company has implemented two projects, the successful one was “Building and installing Eleven Electrical Substation Project (transfer electrical high voltage 33KVA to 11KVA)” and the filed one was Construction of the Big Dam for Water Storage – Degalla Dam Project.

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The project of Building and installing Eleven Electrical Substation Project (transfer electrical high voltage 33KVA to 11KVA) is implemented by Plan Company of the budget of 74 million dollars. The location of the project is inside Sulaimani city and its outskirts. The project contain constructing a building for about one thousand meters, three floors and access road for the project exterior and interior and also the place for the huge transformer with many accessories inside the project such as trench, yard, place for guards and place for pool, …etc. Most importantly, the Plan Company alongside substation construction, it also provides and installs all electrical works that needed for completing substation. The failed project was “Construction of the big dam for Water Storage”. The project includes establishing and constructing of the dam for a budget about 8 million USD.

Outline of the paper

This paper identifies the key factors behind the success and failure of two different projects implemented by Plan Company. The key success factors of one project will be compared to the failure of the other project. The paper has adopted the opinions of key personnel involved in the implementation of these two projects alongside academic opinions to support the points throughout the paper. In the first part, the internal success factors will be compared between the two projects and in the second part the external factors.
Part one

Compare internal factors between the two projects

The internal factors are the major reason inside a business that are directly linked to the internal affairs of the project. Therefore, it is very important to compare these reasons in order to suggest proper solution inside the company to deal with the situation. Here, reasons related to budget, organizational chart, corruption, scope, risk and work break down structure will be evaluated.

First: Budgetary factors

Control and Planning and related resources with their costs are the keys to good management in every projects. The procedures of improving plans for a company’s expected actions and controlling operations helps to carry out those plans is known as budgetary control. The main Objectives of budgetary control are: To provide support in creating processes for preparing a company’s planned Costs and revenues. Budgets also help in coordinating and communicating these plans to various levels of management. Moreover, in order to take benefit from budgetary control, companies should set quantitative objectives and define individuals’ roles and responsibilities.³ These could not be seen in Construction of the Big Dam for Water Storage – Degalla Dam Project which led to the major flaw in the project. In this project, incremental budgeting was used when the numbers are based on the real expenditure of previous year. The figures were brought from similar project by Plan Company and utilized in implementing Degalla project compare to the project of Building and installing Eleven Electrical Substation Project (transfer electrical high voltage 33KVA to 11KVA when zero based budgeting was adopted by the senior managers of the project. This type is more detailed and

takes longer time to be prepared.\textsuperscript{4} Thus it can be said that the company was not aware of the details of the budget of Degalla Dam project and they depended on some data from previous similar projects.

Furthermore, one other reason behind the failure of the project of Construction of the big dam for water storage was the miscalculation in budget as the estimated budget was not matched the actual budget; during the tendering process, the staffs who was involved in preparing the budget was unsuccessful in expecting all the costs of the project. For instance, from the beginning of the project the budget was estimated at 7600000USD but during the implementation the project was actually cost 8100000USD which put a heavy financial extra cost to the company. Thus, the company has to spend an extra amount 500000 USD to fill the gap between estimated and actual. It is generally agreed that the first step before awarding the tender is filling the tender. This process includes analyzing every item in the bill and finding their price and resources for implementation. Thus, during analyzing these tender there were no actual assumption for each price and resources which led to big problem after the implementation. For example, the course aggregate material which is the biggest item in the project calculated as 2 USD for each cubic meter but in actual, the cost was about 3 USD without administration cost. As the result, many other items in the bill were not analyzed well which make the total loss in the project after the implementation. The time period for the implementation of the project was also not analyzed well which forced the company to pay a delay fine and the company bears the huge administration cost because of not having a proper analysis of time period of the project.

On the other hand, the side of the project is too far from Sulaimani and the cost of the materials and machine are more expensive than if it located inside Sulaimani. For instance, one ton of steel

\textsuperscript{4} These data has been received from the Financial Department of Plan Company.
bar is about 500 USD inside Sulaimani while in Degala Location (the location of constructing the dam) become 600 USD because of transportation. The items of transportation in filling the bill were not calculated well; there was not a field visit to the side of the project before filling the bill this has led to unrealistic assumption for all the prices.

In Building and installing Eleven Electrical Substation Project (transfer electrical high voltage 33KVA to 11KVA, however, for the sake of having a successful project, the company dedicated a huge budget for this project with the needed cash flow of 3000000 USD that make the project difficult for other companies who does not possess this ability. Thus, Plan Company had comparative advantage in implementing this project. The project continued without temporary stop despite the general financial crisis in Kurdistan. The company has been praised for this continuation.

**Second: Organizational Chart factors**

In order to avoid or reduce the number of potential conflicts, organizations and firms have adopted different types of organizational structure. In both projects, Plan Company has utilized project-based structure where project is given to a group of specialized employees who are organized within a new field. Despite the fact that in both project the projectized type has been adopted, there were differences in application of such system. The differences will be explained below:

Some standards indicate the success of Building and installing Eleven Electrical Substation Project (transfer electrical high voltage 33KVA to 11KVA project. One of them is organizational chart

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Organizational chart of Building and installing Eleven Electrical Substation Project

In this chart, all the parts that included in the project are well separated and well defined in their location and all parts are well communicated with other part that make the project successful. In other words, reporting system was well organized throughout the whole project. Moreover, regarding to management, the project is very well organized and the tree of the organization was projectized style that give the project manager a huge authority during implementation which is very important to the success of any project.

However, the project of Construction of the big dam for Water Storage did not have an effective organizational cart. As it has been discussed before, the dam is far from Sulaimani for about three hours and the company has a gap in the organizational chart which cannot indicate the roles and responsibilities of each person inside the field during the implementation of the project and the company has also not own a clear vision of prioritizing the items in the project that make rebuilding most of the items of the project after the completion. Another important point is that the company has not proper reporting mechanism. For example, the company adopted functional
projectized style that each person below the project manager shall report to the project manager.

It is very essential to determine the line management process to avoid duplicated reporting.

Generally, organizational chart will help in facilitating the implementation of the chain of command by which contradiction will not take place between the supervisors and subordinates.

The following diagram is the organizational chart of the Degalla Dam Project:
Third: Corruption factor

There is plenty of evidence that prove that corruption has a strong negative impact on businesses. It has been argued that “the strong negative correlation between perceived corruption and the level of output provides prima facie evidence of the negative impact corruption has on value creation”. Moreover, Giorgio Locatelli and others in their emphasis on the importance of battling corruption during project implementation, they said

“In project management, corruption is the “elephant in the room” that needs to be acknowledged and discussed. This paper summarizes the key aspects known from the wide literature concerning such “elephant”, shows the relevance of this topic in project management and suggests a research agenda.”

The project of Construction of the big dam for Water Storage had suffered from a high scale of corruption. As long as the staff was not fully aware of the core of the project, there was a great opportunity for manipulating some terms of the project. Financial department has accused of stealing some amount particularly in purchasing committee when they were asked to buy administration needs and buying items with higher price while the real price were cheaper. Thus, the project did not gain enough profit as planned. The senior management team could have prevented corruption by having an effective management and many committees, particularly in financing for purchasing and procurement departments with minimum routine during implementation.

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How the corruption will happen?

There are two types of corruption in the financial department, the first one in the entire project particularly in the purchasing department. For example, there was some corruption as there was ignorance by the project manager. Money was stolen and the project manager was unaware of the stealing. The second type is corruption in the budget of the whole company. Some of the financial personnel tried to manipulate in money transfer and the exchange rate and the process of payment. The second point has a great effect on the financial situation of the company.

**Fourth: Financial ratios factor**

There was a big difference in the financial ratios of the company under the two projects. The ratios of the company were below the standards when they implement the Degalla Dam project and the details are explained below:

According to the financial ratios, particularly the company has a below liquidity ratio comparing to the average as current assets dividing by current liability is below industry liquidity ratio average. For example, the current ratio of Plan Company is 3.2 while the industry average is 4.2.

Quick or asset test ratio also below the average because current asset minus inventory divided by current liability is less than industry average ratio. For instance, the quick or asset ratio of Plan Company is 1.2 and the industry average is 2.2.

The profit margin ratio which is net income divided by sale of Plan Company is 4 while the industry average is 5 this indicates that the company not operating a good income regarding to the sale.
Finally, the most important ratio which is DUpot equation is also below the industry standard. This ratio stating that the rate of return on equity can be found as the product of profit margin which is very essential to know the profitability ratio, asset management and debt management. 

On the other hand, the ratios of the company when they implement Building and installing Eleven Electrical Substation Project (transfer electrical high voltage 33KVA to 11KVA project) were above the standard level. Thus, all the ratios of the company were positively shown during the project. For example, according to the financial ratios, the company has above liquidity ratio comparing to the average as current assets dividing by current liability is above industry liquidity ratio average. For example the current ratio of Plan Company is 5.2 while the industry average is 4.2. Quick or asset test ratio also above the average because current asset minus inventory divided by current liability is more than industry average ratio. For instance, the quick or asset ratio of Plan Company is 2.5 and the industry average is 2.2. The profit margin ratio which is net income divided by sale of Plan Company is 6 while the industry average is 5 this indicates that the company were not operating a good income in relation to sale. Finally, the most important ratio which is DUpot equation is also above the industry standard. This ratio stating that the rate of return on equity can be found as the product of profit margin which is very essential to know the profitability ratio, asset management and debt management.

**Fifth: Scope of the project factor**

The scope of the project of Building and installing Eleven Electrical Substation Project (transfer electrical high voltage 33KVA to 11KVA is well detailed and the project is turnkey that makes the Plan Company calculate everything with details that led the project to be finished during the

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decided time and scope according to the scope management plan. More importantly, the duration of the project and the time schedule for completing the project is very well created and well implemented with all details that make the administration cost not exceed the devoted amount. Moreover, Due to having an efficient project management plans by the staff of the Building and installing Eleven Electrical Substation Project (transfer electrical high voltage 33KVA to 11KVA project, the administration cost has been decreased from 1400000 USD to 875000USD. This information has been obtained from the financial department. It is widely agreed that each project should have project management plan and the project manager of this project was successful in having such a good plan. The project has also successful in having a good scope management plan because scope management plan was prepared by ABB Company with efficiency and detail that help the project not having extra or elimination item during implementation of project and the fund is from government and in this time the government had enough cash which make the payment and deliverable easily transfer from government; this helped plan company to be continues till finishing the project. However, the specifications were not considered properly in Degalla Dam project. The gaps between the scope and implementation caused delay in the project. There are many criteria to be met in discussing the scope, without meeting these criteria; the deliverables of the project cannot be achieved. The followings are the criteria of the scope:

- Concrete work according to ACI Code and Iraqi specification for concrete
- Finishing work like dam finishing and road access for the project
- Mechanical work according to Iraqi specification
- Electrical work according to ABB standard specification
- Irrigation work and landscape according to Plan Company
Furthermore, the project failed in determining critical path of the project as it did not have a good critical path. This is very essential to know the period and time needed for completing the project. Thus, any delay in the critical path will delay the whole project and that was the case in Degalla Dam project.

**Sixth: Risk mitigation factor**

Generally, Construction projects consist of five main phases namely planning, design, procurement, construction and finally project closing. In each of these phases, typical risks shall be taken into consideration. For example, the risks of planning phase contain poor estimates of budget and poor scope definition based on inappropriate data. The design phase may have risks such as poor constructability, over-design, poor estimating. Moreover, the procurement phase is always under the risks of shortened documents, insufficient competition, poor contracting strategy and other kinds of fraud in the bidding process. In construction, there is often the risk of inconsistency with the specifications or government regulation for engineering standards.\(^\text{10}\) In addition, Mobey and Parker have emphasized on the role of risk management plan on the success of any project. They indicated that “to increase the chances of a proposed project succeeding, it is necessary for the organization to have an understanding of potential risks, to systematically and quantitatively assess these risks, anticipating possible causes and effects, and then choose appropriate methods of dealing with them”\(^\text{11}\) It has been agreed that applying the principles of risk management would improve the quality and cost estimation by mitigating potential risks.


even before the beginning of the project. The lack of having a proper risk management plan will increase the possibility of project failure. For example, in building Panama Canal by a French company, the company was plagued with landslides by the lack of a good risk management plan. Workers piled dirt on each side of the excavation site which caused the muddy landscape to fall back into the trench, much to the dismay of the workers.

All the future risks were well defined before the beginning of the project of Building and installing Eleven Electrical Substation Project (transfer electrical high voltage 33KVA to 11KVA project. Moreover, the mitigation elements were also took into account. The senior management team has anticipated all the risks that might face the implementation of the project.

While in Degalla Dam project, some risks were neglected such as

A. The safety of the staff who implemented the project especially in the dam location which caused some human resource injuries that took place which was not covered in the risk management plan.

B. The weather in winter forced the staff not to work on the dam location due to the raining and snowing which caused an increase in administration cost and delay in project implementation.

C. The risk of losing skilled worker by the company competitors.

These risks had a very negative impact on the overall performance of the project of Degalla Dam.

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Seventh: Similar works and previous experience factor

Recently, the Kurdistan government announced the establishment of many dams in Kurdistan in order to solve the problem of drought in the region. This is considered as a new field of construction. Finding a skilled workers and staff were quite challenging, as the company had to recourse to foreign labors and engineers which are too costly. After offering tender in this field by the clients in 2005, many companies going through filling the tender without having a clear vision of the difficulties and how they can implement dam construction. Thus, the Plan Company after awarding the tender for Degalla dam project exposed to many difficulties and losing money in all parts of the tender. The company signed a joint venture agreement with the Iranian Company that was expert in this field which makes the company to pay more than they earn to protect the reputation of the company. Each company shall have a clear strategy of what they are going to implement. It can be said that according to the instructions of implementing public contracts by the government, all the companies who will be awarded by the government shall have a joint venture agreement with a foreign company to bring expertise to the local workers.

On the other hand, in Building and installing Eleven Electrical Substation Project (transfer electrical high voltage 33KVA to 11KVA project, a special staff was assigned to visit the country of manufacturing to see the materials used in the project. Whenever the materials were accepted by this staff, there was no need to approve them again upon delivery. Other companies are waiting till the delivery of the goods on the border and most of the time, their item were reused and cost them a lot of money and time. Further, the project helped the government in providing electricity to some neighborhoods in Sulaimani city. Thus, the project received the great support from the government. For example, they facilitate the procedures of payment and acceptance documentation and also they help the staff of the company to operate the substations;
all the technical obstacles were eliminated by the government. In addition, due to strong relationship between the government and Plan Company, the delivery and entry of materials were easy and also the acceptance after completion of each item of the work was also easy. For example, the entry of electrical machines needed 20 days on the border for the purpose of approval and entry while by the support of the local government; they reduced the time period to only 6 days. This was very helpful in saving time for the project and let the project finish on time.

**Eighth: Maintenance of the project**

In Building and installing Eleven Electrical Substation Project (transfer electrical high voltage 33KVA to 11KVA project. The company could sign the maintenance contract with the government; this is another sign of success to the company because the company did not fill the tender for this purpose but rather awarded directly by the government. Moreover, there were many special technicalities used in the project, the government had to give the maintenance to the same company which helped the company to maintain their expert staff for a wide range of period and also the company earned profit. As the result, the company became the great competitor in the market. However, for the Degalla Dam Project, Due to difficulties in implementing the project and the recentness of the area, they were unsuccessful in winning the maintenance of the project. Moreover, the frequent change in the oil price has a negative impact on the market price of materials. For example, during the implementation of the project, the steel bar reinforcement is increased dramatically from 500 USD to 1100 USD per ton which has negative impact of the total profit of the project which caused an extra cost by the company to implement the project as scheduled. In addition, concrete price also increased from 40 USD to 60 USD during the project period.
Ninth: the change in work breakdown structure (WBS)

Degalla Dam project has been classified and broke down into detailed parts in the document of Work Breakdown Structure. The work breakdown structure visually defines the scope into manageable sections that a project team can understand, as each level of the work breakdown structure provides further definition and detail. Figure 1(below) depicts a sample work breakdown structure with three levels defined.\textsuperscript{14} The work breakdown structure has a number of benefits in addition to defining and organizing the project work. A project budget can be allocated to the top levels of the work breakdown structure, and department budgets can be quickly calculated based on each project's work breakdown structure. By allocating time and cost estimates to specific sections of the work breakdown structure, a project schedule and budget can be quickly developed. As the project executes, specific sections of the work breakdown structure can be tracked to identify project cost performance and identify issues and problem areas in the project organization.\textsuperscript{15}

This is the WBS detail of the project:


\textsuperscript{15} Ibid.
The staff was not followed the steps of the works and they ignored many details in the WBS.

On the other hand, in Building and installing Eleven Electrical Substation Project (transfer electrical high voltage 33KVA to 11KVA project, despite having a detailed WBS, the staff was also followed the instruction properly and implemented every part of it. The work break down structure of the project is taken from plan company is very well organized as so implemented very well which make the project successful.
**Tenth: Communication factor**

Communication is the most important component within any project. The success of most projects, whether handled by a dedicated project team or a cross-departmental team, depends upon a set of crucial communication skills and techniques. In Degalla Dam Project, due to the far location of the project from Sulaimani city, the communication between inside office members and the members of the side who implemented the project was not easily conducted. This led to misunderstanding in communication management and faults in decision making. When there is not a proper communication tools between the staff of the project, there is a risk of multiple source of decision. The similar problem happened in building Substation project but not by the same scale.
Part two

External factors

In this part, the comparison of some reasons out of Plan’s hand which had a negative role will be made. They include external competitors, market price, the decrease in resources and seeking external expertise.

First: competitors in the market

Although the area of dam construction is quite new, many companies tried to gain the project despite the fact of having little knowledge in the area. The companies expected too much profit out of these kinds of new projects. The companies were unaware of the difficulties of the project when they ended up with huge loss. The companies had to spend too much money as they did not expect a lot of incompetency between the project theoretically and the implementation. Having many companies competing for awarding the tender has led to the decrease in the bill of quantity and Plan Company had to offer a very cheap price to conduct the project. This, however, was not a problem for plan company while implementing the Building and installing Eleven Electrical Substation Project as they have specialization in building substations.

Second: frequent change in the market price during implementing Degalla Dam project

The frequent change in the oil price has a negative impact on the market price of materials. For example, during the implementation of the project, the steel bar reinforcement is increased dramatically from 500 USD to 1100 USD per ton which has negative impact of the total profit of the project which caused an extra cost by the company to implement the project as scheduled. In addition, concrete price also increased from 40 USD to 60 USD during the project period.
Moreover, differences and fluctuation in exchange rate were another factors behind the failure of the project as %90 of our economy if from Oil export, thus the price of Oil decreased from 105$ to 40$ that make our Dinar depreciate and dollar appreciate because of supply of dinar more that Demand of Dinar and foreign currency (Dollar) decreased in the Kurdistan region market that make all import thing that we bring from outside country is raised. Thus, generally this has an effect on our project. The company had to pay extra money to fill this gap. This was not an issue during the implementation of the Building and installing Eleven Electrical Substation Project

**Thirds: The decrease of resources (Human & Materials)**

During the implementation of the Degalla Dam, there was a deficit in human and materials that caused the lack in implementation and time schedule. The company faced a serious challenge when some employees left the project without advance notice to the company. For instance, the main civil engineer of the project left the company three months before completing the project. In Electric substation project, the shortage in staff was an issue as well but not by the same scale as it was in Degalla Dam project.

**Fourth: Joint venture with foreign company in the filed**

The Company signed a Joint venture agreement with one of the biggest company in the world in this field which is known as ABB Company. This could help Plan Company to deal with the obstacles and technical problems during the implementation and the maintenance of the Building and installing Eleven Electrical Substation Project. Having Joint venture will combine skills and experience in implementing a project. In this regard, Kumarasamawy has indicated that “the increasing magnitude, complexities and risk associated with major construction project have
brought together organization with diverse strength and weakness to form joint venture to collectively bid and execute projects.”

**Recommendation**

- The company shall review its strategic planning before the commencement of any project by focusing on enhancing the weaknesses and identifying the reasons that led to failure in any project implemented by the company.
- Emphasizing on implementation rather than having a literal plan
- Identifying project management knowledge areas and monitoring the implementation of each area and updating them if required step by step during execution of the project which might lead to success of the whole project.

- The company shall conduct trainings for newly accepted staff.

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17 Available at [https://www.pinterest.com/osarez/pmbok/](https://www.pinterest.com/osarez/pmbok/)
- The project management plan shall be well written and planned before the commencement of the project. The company can take advantage from the experience of other companies working in Kurdistan region.

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