Project Alliances in Kuwait Construction Industry

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ABSTRACT

As a way to of enhancing construction project delivery and improving their construction supply chains, many countries are encouraging their construction industries to embrace partnering. Construction firms in most developing countries are too small to carry out large construction projects alone. Thus, besides partnering between a client and a contractor, there is an incentive for forming alliances between contractors so that the emerging entities can handle large and sophisticated projects that they cannot do individually.

Project Alliance (PA) is an agreement where parties enter into an agreement to work cooperatively and to share risk and reward measured against the performance indicators.

The objectives of this study are to provide a review on PA concept, analyze different aspects of PAs, describe the success and failure factors of PAs in general, investigate the application of those factors on PAs and provide a thorough recommendation on how to deal and set up PAs in Kuwait construction industry.

This study incorporates the components of construction industry (residential, commercial, industrial, infrastructure) in order to provide information that can help implementing PAs in Kuwait.

In this study the data was collected using a questionnaire survey to determine the driving factors and potential barriers of PAs implementation in Kuwait construction industry.

Driving factors for PAs were found to be governmental support to help establish project alliances, trust between all parties, commitments between all parties, collaboration between all parties, and careful team selection.

Top five barriers for PAs were the lack of trust on other parties, hard formation of a single entity, lack of commitment from other parties, lack of early commercial development, and risk challenges. The research will contribute significantly to the fields of partnering by linking various aspects of drivers and barriers and shed light on future work which will examine a better understanding of PAs for the realization of construction projects.

Keywords: Kuwait construction industry, Project Alliances, drivers, barriers.

ÖZ

İnşaat proje tesliminin iyileştirilmesi ve yapım tedarik zincirlerini geliştirmenin bir yolu olarak, birçok ülke inşaat endüstrilerini ortaklığı uygulamalarını teşvik etmektedir. Çoğu gelişmekte olan ülkelerde inşaat firmaları büyük inşaat projelerini yürütmek için çok küçük kalmaktadır. Bu nedenle, müşteri ve yüklenici arasındaki ortaklığın yanısıra gelişmekte olan oluşumların yalnız başlarına başa çıkamadıkları büyük ve sofistike projeleri yürütübilmeleri için yükleniciler arasında da ortaklık oluşturulması için teşvik vardır. Proje Ortaklığı (PO), tarafların işbirliği içinde çalışmaları ve performans göstergelerine karşı ölçülen riski ve ödülü paylaşmaları için anlaşmaya vardıkları bir sözleşmedir.

Bu çalışmanın amacı PO üzerine bir incele sunmak, PO'nı farklı yönlerden analiz etmek, genel olarak PO başarı ve başarısızlık faktörlerini tanımlamak, bu faktörlerin PO uygulamasını araştırmak ve Kuveyt inşaat sektöründe PO oluşturmak ve yürütmek için ayrıntılı bir öneri getirmektir.

Bu çalışma, Kuveyt'de PO uygulanmasına yardımcı olabilecek bilgileri sağlamak amacıyla inşaat sektörü (konut, ticari, sanayi, altyapı) bileşenlerini içermektedir. Bu çalışmadaki veriler, Kuveyt inşaat sektöründe PO uygulamasındaki itici güçler ve potansiyel engelleri belirlemek için bir anket kullanılarak toplanmıştır. PO itici güçleri olarak , proje ortaklığı kurmaya yadrımcı olmak için devlet desteği, tüm taraflar arasında güven, tüm taraflar arasında taahhütler, tüm taraflar arasında işbirliği ve dikkatli ekip seçimi olduğu tespit edilmiştir. PO engelleri olarak diğer taraflar ararsı güven eksiliği, diğer tarafların taahhüt eksikliği, tek bir varlığın

oluşumun zor oluşu, risk zorlukları ve erken ticari gelişme eksikliği ön plana çıkmıştır. Bu araştırma ortaklık alanın çeşitli yönlerine ve uygulamadaki itici güçler ve engellere işaret ederek katkıda bulunacak ve inşaat projelerinin gerçekleştirilmesi için PO'nın daha iyi anlaşılmasını inceleyecek çalışmalara ışık tutacaktır.

Anahtar kelimeler: Kuveyt inşaat sektörü, Proje Ortaklıkları, itici güçler, engeller.

For my honorable father DR. Sharif Hassan my most respected role model

For my mother the light that guided me to success Inayaa

My beloved parents:

I could never reach this point of my life without your faith, support, and continuous encouragement. There aren't enough words in the English dictionary to give you the gratitude you deserve.

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For all uncles, all Aunts

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α   Alpha

σ   Standard Deviation

$\tilde{x}$ Mean

√   Square root

∑   Sum

Chapter 1

INTRODUCTION

1.1 Introduction

Developing the infrastructure is a major priority for the government to cover the demand on the infrastructure facilities, any shortage in those facilities make many contribute on the living style. The governments facing a challenge to provide a better services for its own citizen some of that services are education, health facilities, transportation, clean water gain, sanitation drainage, waste treatment and many so others (ESCAP, 2011).

Increasing of population growth, rapid urbanization and business expansion lead to increase the demand on the infrastructure, create a better environment for business to raise the country that means establish new facilities and developing the old one to cover the shortage, heavy pressure on the government became to establish, manage and finance those entire projects. Public sector cannot finance the required infrastructure alone because that will lead to lack of budget, high taxation on the citizen, new thinking was to make a partnership between the Public and the Private sector to create a better living style enhancing, developing, establishing and manage the infrastructure facilities. The high qualification for the private sector represented in their staff (skilled worker, designer, manager and technology expert) associated them to increase their chance to play a role in the infrastructure project. On the other hand there was a thinking to transfer the full capacity to the private sector to

establish, control, manage the infrastructure in the country in most cases it will not be valid because the private sector target is to meet its own interest and other reasons for that was national security. Subsequently, they meet in the middle of the way the public and private sector the Public sector power strengths was in setting the regulation and the protection of the community on the other hand the private sector power strengths concentrated on finance, management skilled and creative technologies (ESCAP, 2011).

A Project Alliance (PA) is when one owner or more needs to establish a new project or services to make a partnership with the provider (designer, constructor, supplier, manager) to work as one team to deliver the project or the service under a contractual framework on the basis of a sharing the project risk, interest and reward. Faith, trust and open-book are the most important principals of achieving the best outcomes, (Marcus Jefferies G. B., 2006).

To form the PAs careful team selection of efficient partners are needed, when the selection of the team is complete the characteristics of the Alliance describes the target of the project and its costs, performance and reward are also clarified (Ngowi A. , 2006).

1.2 Problem Statement

In immense projects complexity and risks are an obstacle for the delivery of the project, it's hard for one organization (party) to implement immense projects for many reasons (less experience, competition, risks, costs, etc.). PA models used for this circumstance assist to deliver the project with the best quality.

Currently in Kuwait they use a traditional model of partnering to enhance, develop and create new projects; therefore the necessity of project alliances cannot be avoided. Growth rate, high demand on the infrastructure facilities, and fast civilization are heavy pressure on the Kuwait government to meet the needs of the people who use this kind of infrastructure. Kuwait is expected to grow by 15-20 percent in 2016 in the infrastructure project, Plan developments were estimated to reach $123.6B, for the major infrastructure projects, according to investment bank Alpen Capital. In Addition, Kuwait's construction market will outrun Qatar, Oman and Bahrain with the country coming in third in an analysis of the 100 largest construction contracts in the Gulf cooperation country behind the UAE and Saudi Arabia. (Mohammed Sultan Al-Jaber, 2015), it's expected to raise the industry of construction value from $91.5B to $126.2B. Government also focuses on the transportation sector, $6 billion is the expected cost of the new road project under development to improve the road capacity and density, the total length of the road in Kuwait is approximately 600km, the density is around 584 people per Km. The development of the new transportation project includes enhancing the roads and establishing new ones, moreover execution of the city metro system to reduce traffic. (Ministry of Public Works, 2009). However, in large infrastructure projects during 2010-2014 the actual progress in the five year plan was 19% (Abdel-Razzaq, 2015). All the previous information strengthens the important role of partnerships and project Alliances in establishing and developing the major project in Kuwait.

1.3 Scope of the Study

This study provides a review on PA concept and how it has evolved in practice, investigates in the influencing factors on project alliance in Kuwait industry, the study focuses on the barriers that affect this model in Kuwait and the driver's factor

that may affect PA. To provide a thorough recommendation on how to deal and set up PA in Kuwait construction industry, this will be carried out and defines the drivers and barriers factors for PA in Kuwait, at first the PA and how this model works is defined, it will Also evaluate the Benefits and opportunities for PA, identify what are the weaknesses and threats that face PA in general, And the essential structural features of a project alliance. This will help in forming the basic aspects when determining whether to adopt PA.

Furthermore this study aims to supply the different parties (construction company, engineer, consultant, architects, and contractors) with the information of the drivers and barriers, and the benefits of using this model in Kuwait, will help to make a fully understanding on how to have control over the factors that may lead to a problem in early stages of the projects.

1.3.1 Objectives of this Study

The questions raised in this research:

- What are the factors affecting the PAs in Kuwait?
- How these factors contribute to PAs in Kuwait?

The objectives of this study are to:

- Provide a review on PAs concept and how it has evolved in practice.

- Analyze the different aspects included in the concept of PAs.

- Describe the success and failure factors of PAs in general.

- Investigate the application of those factors on PAs.

- Provide a thorough recommendation on how to deal and set up PAs in Kuwait construction industry.

1.4 Methodology

The recommended methodology for this research is quantitative research, which is carried out using a questionnaire survey. The quantitative research methodology was selected because efficient amounts of information can be collected in a short time with low cost, analyzed more scientifically and objectively than the other forms, and it's practical. The sample of the respondent was chosen from the construction industry. Respondents with different specializations answered the questionnaire of this study. The respondents also had different years of expertise and qualification levels in order to reach reliable data from different perspectives in Kuwait construction industry. Google form was used to collect the data, it's more reliable, insures no data will be lost. Google form is easy to answer and to distribute, and it automatically collects the responses of the respondent and transfers it to an Excel sheet. The questionnaire is divided into three sections:

- General Questions about the respondent (A)

- Questions regarding to the barriers of PAs in Kuwait (B)

- Question related to the Drivers of PAs in Kuwait (C)

The first part of the questionnaire contains general questions related to the individual like: level of education, position, qualification level and the year of experience.

The second part contains questions regarding the barriers of PAs in Kuwait. This section investigates the barriers that have a negative impact on the implementation of project alliance in Kuwait, this section helps the reader understand what factors have the most negative impact on the implementation of the project alliance model.

Determining those barriers can help in adopting PAs in Kuwait and to ensure controlling the barriers.

The third part contains the questions related to the drivers of PA in Kuwait which deal with the factors affecting the success of projects that will improve the delivery of projects in construction industry.

Google form questionnaire was used to collect data by sending e-mails to companies who actively operate in the construction industry located in Kuwait. A total of 76 questionnaires were collected.

The methods that were used to analyze the data are as follows:

1. Factor Analysis and Reliability Test.

2. Relative Importance Index (RII) with Mean Score and Standard Deviation.

3. Pearson Correlation Analysis and Significance Test Analysis.

4. Research Hypotheses using the t-test method.

1.5 Limitations

PA is a wide topic. Therefore not all problems about PA can be discussed and not all perspectives can be examined. This study aims to investigate the drivers and barriers of PA in Kuwait construction industry. Questionnaires were sent and collected in Kuwait State from different sectors of public and private. Different types of organizations and specializations responded to the questionnaires.

1.6 Thesis Structure

Chapter 1 includes brief introduction and background of PA in general, definition of the PA and some brief information about the PA. Problem statement is presented to describe the current situation in Kuwait State. Scope and objectives of the study are presented to investigate the factors influencing the PAs in Kuwait construction industry. The study focuses on the drivers and barriers that affect the implementation of PAs in Kuwait. Methodology of the study is presented to collect and analyze the data for this research. Limitations of the study are presented in this research.

Chapter 2 involves the comprehensive literature review in in-depth previous studies about PAs. The difference between risk-sharing and risk-transfer, advantages of PA, benefits, threads and core alliance principles for the PA.

Chapter 3 explains the proposed methodology of the research showing the theoretical framework of the study and describing the way which it will be used to analyze the drivers and barriers for PA in Kuwait construction industry.

Chapter 4 involves the data analysis and discussion of the results, displaying the empirical research, the findings and summarizing the drivers and barriers factors that affect the implementation of PA in Kuwait construction industry.

Chapter 5 contains the conclusion of the research and evaluates if the research met the scopes and objectives set in the first chapter. It also gives recommendations for further studies and for whom it may concern in implementation of PA in Kuwait construction industry.

Chapter 2

LITERATURE REVIEW

2.1 Introduction

Partnering between a client and a contractor is one form of alliance between parties that are not in direct competition with one another. As a way of enhancing construction project delivery and improving their construction supply chains, many countries are encouraging their construction industries to embrace partnering. Some construction projects, such as facilities for oil or natural gas extraction in the middle of a sea are so large and sophisticated that no one firm can undertake them alone. Similarly, construction firms in most developing countries are too small to carry out large construction projects alone. Thus, besides partnering between a client and a contractor, there is an incentive for forming alliances between contractors so that the emerging entities can handle large and sophisticated projects that they cannot do individually. However, alliance between firms that are engaged in similar activities has both cooperative and competitive aspects. While the former enables the firms to leverage their complementary capabilities for common benefits, the latter tend to push the allied firms to engage in competitive racing in learning the capability of the partner(s) for private benefits. Often, when the learning is complete the incentive to continue the alliance ceases and this may lead to its break up.

2.2 Definition of Partnering

The Australian Constructors Association (ACA) defined partnering as:

"A process to establish and manage the relationships between the parties that aim to "remove all barriers; encourage maximum contribution and allow all parties to achieve success", (Infrastructure Partnerships Australia, 2008).

Partnership is arrangement obtaining from recognizing an active way for delivering public infrastructure or services, (Yongjian Ke, 2010).

Partnership is a method if delivery on a contract between the different parties to share the responsibility for the design and construction of the services or projects, the parties share the risk and the reward of the project or that services, work as one entity to the best of the project, (LiYaning Tang a, 2010).

2.3 Working Mechanism

Each sector draws its own benefit according to its interest. Contract made between the parties to insure the good delivery of the project, operational risk in the project are always assumed. (LiYaning Tanga, 2010) In some types of partnering there is a cost for using the service. The cost of the service in particular depend on the users of the service and not by the whole community (taxpayer)just for the people who will use the services will pay for it, In other types private sector finance the project or the service make a capital investment on the agreement of the contract between the public and the private sector but in this type the government collect the fees for using the service by total or divided with the private sector for the percentage they agreed about in the contract. (IMF, 2004) Government may contribute to support the project or the services by provide a financial support for one-time grant to attract the investor from the private sector. The government may provide revenue and support by subsidizes tax or by remove the revenue for a specific time period. (Darrin

Girmesy, 2004). Two essential lead partnering the first one done by the exploitation the private sector experience to delivery of project or services usually it procured by the public sector. (Alhashemi, 2008) The second partnering is that the government doesn't borrow the capital investment to cover the project cost or effort the private sector cover the project and implement it, the process of this way of partnering to use off-balance sheet from the public sectors perspective to finance the delivery of project or even to renew the facility, the public sector intends to repay the private sector through regular payment when the facility done, the finance through the public perspective on-balance. Moreover the public sector will benefit from the regular cash flow for using the service. The public authority makes a contract with the private sector (subcontractor) for continuous maintenance and repair, (Darrin Girmesy, 2004).

2.4 Origins of Partnering

Many years ago partnering has been a way of public tasks implementation widely used in the countries of Western Europe. Implementation of partnering start spread widely in the 1990s, the idea of partnering arise in the period between 1970s and 1980 when the Public authority start to think how to make a reduction in the public debt, the continues economy drop lead to develop this new thinking they start to try to convince and attracted the investor from the private sector to make some developed in the infrastructure, in that period the was not able to distinguish between recurrent and capital expenditures (Cheng, 2009). Private sector purvey an infrastructure that have been negligent from the public sector with no cost for the public community, it was the alternative way from the model was used back then, (Hamel, 1998).

Private investment in public infrastructure appear first time in the 18th century in Western Europe one of the old Partnering project in the 19th century was supplied the drinking water to Paris. Further similar cases were added from not only the European community. Since 1997, the partnering approach has been heavily utilized in England. Specifically, private sector company taking on the responsibility of developing the facilities and more like design, finance, manage the construction, or even operate those facilities, (Li, 2004).

2.4.1 The Development of Partnering in Europe

Back to 1438 The French noble Luis de Bernam was make a fees for the goods transposed on the Rhinez river, Another Example form the old time was in France also for the water distribution in Paris in 1792 its granted to the brothers Perrier by making a contract with the French authority. (Pandian, 2014) The French called this type of work as public works concession. The wide involvement of private capital in public investments has found expanded since the period of the seventeenth and eighteenth centuries until the end of the nineteenth century, when construction of infrastructure project and services (water channels, roads, railways) in Europe and later in America, China and Japan was funded by private sectors under concession contracts, (UNIDO, 2012).

2.4.2 The Partnering in Middle East

When the partnering spread widely around the world in the 1990s the Middle East like any other country influenced by the partnering model and starts to implement it in Middle East country. (Dulaimia, 2010) Al-Manah project in Oman was from the first project done by the partnering model and it was an independent power plant project. Absences of partnering law or government enactment in those countries to underpinning the project it was made in the ad hoc basis, (Keenan, 2011).

In water and power facilities this model proved its effectiveness and how it could be successful. (Alhashemi, 2008)Some other example was Abu Dhabi Water and Electricity Authority Power and Water model, the Oman Power and Water Procurement Company's Power and Eater model, the Bahrain Power and Water model and the Saudi power and water model. These countries mentioned made very successful partnering programs. These models have been tried and tested with the international banking market as its proved it ability. The key of success for the project was because of the good economics, and the type of the project also affected the success of these projects. Equity investors achieve an internal rate of return of at least 13%. Electricity and Water in any country are basic necessary and the demand on it increased rapidly in the past 20 years, (Keenan, 2011).

The government support is very important in these projects (Dulaimia, 2010). The support has taken various forms, but has included Ministry of Finance guarantees, despite the success in some project there is an obstacle faces the partnering s in the Middle East:

1- Lack of political will reduce public sector control over the provision of basic services
2- Political and country risk.
3- Lack of international investor.
4- Lack of partnering experience by some regional government departments.
5- Absence of comprehensive.

All these reasons lead to difficulty to attract private sector investor needed to achieve the right delivery of the project, (Keenan, 2011).

2.4.3 Partnering in Infrastructure

Legally contract between parties, agreements to share the responsibilities to implementation the project and\or management the project, quarry the expertise of each sector to meet the needs of the Public sector through good allocation of (Owhor, 2015):

• Resources

• Risks

• Responsibilities

• Rewards

2.5 Advantages of Partnering

Partnering make easier for the different sector to establish the projects for infrastructure in different areas (energy, power, water, communication, transportation and health facilities) that were made by the Public sector. There are many reasons for developing the partnership:

The Advantages of Partnering:

2.5.1 Value for Money

Value of money is the most effected in partnering and it means to deliver the project in very good quality for less cost, or to deliver the project with the best quality with the same amount of money, (Naoum*, 2001).

There are six primaries for value of money:

- **Risk Transfer**

  The risk of the project will transfer to the other party who able to manage in the best way and at the least cost. Risk transfer focus on the best delivery of the project and developed their expectation of the project (Bing Li, 2007).

- **Output Based Specification**

The project result if it specified correctly the innovation will take place; the output is the product of the project or the service (ESCAP, January 2011).

- **Long Term Nature of Contracts Include the Whole Life Cycle**

After a period of time the Assist need to be maintained and repaired these assist start to cost a lot of money. Long term nature of contracts allow the provider of the service to recover the cost and make a reduction in the annual cost, the supplier of the service will have much more experience in dealing with the business, more than this it make it easier to transfer the technology risk, (Nations, 2011). Long-term contracts make the supplier a wake in order to not lose the contract that to reduce the cost and to enhance the quality.

- **Performance Measurement and Incentives**

Measuring the performance to payment will provide good quality that's happened when delivering the best standards for the project each step of work progress have in return a payment, the government should keep monitoring on the project to reach to the standards and quality in the contract, (Hans Wilhelm Alfen, 2009).

- **Party Management skills:**

Good management skills allow to deliver the project on time, using any partnership model will help the government to improve the management skill and access to new skills. The private sector improved the services level, lower taxation, and better technology that can be transferred to the customer of that service, (Hans Wilhelm Alfen, 2009).

- **Competition**

When the government intends to make a partnership project the competition between private sectors that reflect in the lower cost, great innovation and better quality services.

2.5.2 Cost Efficiencies

Cost Efficiencies are the result of increased of competition, improvement of the risk transfer, merge of the different aspects of the project, and best life costing. Important cost saving can be visible on the long run by making merge between the capital investments and the delivery of services provided. Costs of maintenance are to be calculated in the design process, (Jingfeng Yuan, 2009).

2.5.3 Time to Delivery Savings

Partnership lead to time delivery savings because the party who is in charged to deliver the project in short time and during the schedule to start generate the revenue of the project, gain the experience with the other party. Other reason that the party aim to get benefits and collect the revenue from the project any delay in the project mean much money to spend on the staff, instrument and other that may make a financial impact on the private sector if any delay happened, (Nations, 2011).

2.5.4 Reduction on the Public Treasury

Heavy pressure on the government was before the partnership for financing the infrastructure project; partnership can make a reduction on the Public Treasury and let the government focus to invest on the non-infrastructure project in short term period (Hans Wilhelm Alfen, 2009).

2.5.5 Improved Response to Market Forces

In case of fees paid by users a respond for the market force happened that result to make a great efficiency, like in some transportation facilities the user of these facilities must pay to use it price signal cannot guide the supply and the demand.

2.5.6 Broad Support

Partnership model is widely supported by the government especially in Europe country that because creation of value of money, new source of income (Cheng, 2009).

2.6 Project Alliances

The partnering itself is a wide topic and a wide range and there is many models of partnering. This study will focus on the Project Alliances partnership. As mentioned the partnering start to spread during the 1990s, because of the growing trend in business so collaborative relationship between different parties and sector where needed to delivery of the major project. One of that model was Alliancing between the government and different parties (one or more) to establish new facilities, development and implementation of the major project like (wastewater infrastructure, road, rail, power facilities, electrical facilities and hydroelectricity generation and building).

To form the Project Alliances team careful selection of best partners are needed, when the selection of the team done the characteristic of the Alliance described the target of the project and its cost, performance and risk are arranged sharing of risk and reward also clarified (Ngowi A. , 2006). Then the Alliance team work as one (unified) to meet the team targets from that project under the bases of win-win, the main important attitude to success in the project and reach the target is the trust,

commitment and innovation, (Nygård, 2014). Strategic targets for Alliance-Model involve the following requirements:

- Improvement in the entire industry.

- More open culture and trusting.

- Customer satisfaction.

- Share of knowledge and innovation.

Figure 1: Strategic targets for Alliance-model

The traditional partnering collaboration tried to transfer the risk as much as it can to the other parties, risk transfer in some of the project well be a fault and major danger for the continuity of the project that because the other party lake to manage and arrange the project as it should, the risk transfer if it not managed correctly a huge gap in the project will appear that kind of mistake shouldn't happened in the major project (Alireza, 2014), any temporize in the project mean a lot of cost spent, mutual blame will not solve the problem, the answer key for this kind in such circumstances is the project alliances, while the project alliances delivered the project and

implement it and insure its effectiveness, One of the basis of Project Alliance is the Risk transfer divided it on the all unit so such kind of mistakes in the project will not be able to appear, (Love, Davis, Chevis, & Edwards, 2010) .

Risk Sharing can be used when (ACECO, 2015):

- Numerous complex.

- Unpredictable risks.

- Complex interface.

- Difficult stakeholder issues.

- External complex threats.

- Very tight timeframes.

- High likelihood of scope changes (technological change or political influence in the project).

- A need for owner interference.

- Significant value adding by the owner during the delivery.

- Threats and/or opportunities that can only be managed collectively.

Threaten the success of the project may occur when allocated the risk's to other parties or sectors, sharing the responsibility for all parties lead to success in these circumstances the project target are most likely to be achieved (Commission, 2010), multilateral for delivering the project beneath some form of cooperating arrangement where they all win or all lose together depending on the situation of project outcomes compare with the targets, (Sakal, 2005).

2.7 Essential Structural Features of a Project Alliance

There are different aspects how the structures of the alliance relationship are to be successful in the Project Alliance. Some of that features are (Carolynn Blacka, 2000):

- The responsible parties cooperating to perform the project togetherness ownership of all risk to insure the delivery of the project.
- The owner should pay for the non-owner participants for the services may provide for the project according to the following limb (Matthew, 2005):

  1. Project costs and project-specific overheads reimbursed at cost based on audited actual costs.
  2. A fee to cover the normal profit and the cooperate overheads.
  3. A fair share of pain and gain according the outcomes of the project and the target of the project and the pre-dealing of the parties, under the basis of we all win or we all lose.

- The project decision must be unanimous (typically called the Project Alliance Board ("PAB") or the Alliance Leadership Team ("ALT").
- Day-to-day management of the project where all members are assigned to the team on a best for project basis the party do the job needed without any regard from the other parties, (Ross, 2003).
- The parties should solve the issue faces them in the project without making litigation.

2.8 Core Alliance Principles

Each Alliance group makes its own principles to meet it objective from the project but these following principles are common in the Alliances group: (Ross, 2003)

- All parties even win or even lose.

- Equitable sharing of risk and reward.

- Parallel relationship between the parties it mean each party have an equal say

- Decision must be for the best of project

- No blame culture.

- Open book transaction.

- Innovative thinking with a commitment to achieve outstanding outcomes.

- Clear and honest communities.

- Mutual trust and believe in the other party turn in the project.

The alliance principles is the guide book of the success, best delivery and good quality for any project, also to insure to reach to the goals of the project in order to meet each party benefits from the project implemented, (Alliance, 2012).

Core alliance principles	All parties even win or even lose
	Equitable sharing of risk and reward
	Parallel relationship between the parties it mean each party have an equal say
	Decision must be for the best of project
	Open book transaction

Figure 2: Core Alliance Principles

2.9 Opportunities and Risks

Positive results from the experience of using the Project Alliance have been found until now. This model has assisted to reduce the project cost, speed the implementation process and many so other. The degree of certainty of success is not always high, the parties compare the possible benefits and the possible of loss while establishing for new project. There is a benefits point as well as weakness point for any project, (Love, Davis, Chevis, & Edwards, 2010).

2.9.1 Benefits and Opportunities

The Project Alliance have many of benefits and opportunities Some of them are as followed according to the Queensland Government Chief Procurement Office, (Office, 2008).

- High performance created when the environment of the project is good.

- All parties reach their objective from the project.

- Mutual responsibility for managing risk.

- Innovation and high performance.

- Helps build ability to develop for all parties.

- Quick project Implementation.

- Collaborative between the staff assist transfer the information, knowledge to acquisition more experience for the staff and the unit as whole.

- The Project Alliance procedure decreases the need of the contract management.

- If the project meet its goals and where success making a partner with the same parties for new future project will increase that due to the good reputation that each party take for the other and the trust for other party.

- Project risks are realizable from all parties, the decision on the project basis on inclusive know-how.

- Cooperation improves innovation opportunities.

2.9.2 Weaknesses and Threats

Despite the success of the Project Alliances and positive reflections to the society and the partners in the alliance, reduction in cost and faster implementation of the projects. There are weaknesses and threats that may harm the project success, stop as an obstacle in face of meeting the target for the partner. When the parties start to work on a new project or condition earlier experience's must be never disregard only when it is a must, there is no guaranteed success or failure of the project, so the owner and partner make a comparison between the potential success and failure case while establishing new project, (Lahdenperä, 2009).

- The cooperating model, share risk decrease possibility to seek recompense for others party mistakes, (Ross, 2003).

- Insurance may not covering any damage caused other alliance partner to another in the unit, (Alireza, 2014).

- The model requires commitment by partners' upper management that may be a challenge amid the daily rush.

- The challenge for this model is that the partners should make a commitment to each other that hard to do among the daily rush.

- Maintaining of Alliances take a lot of resource and effort.

- This model is built on the personal trust that may be hard to do.

2.10 Features Related to Structural Arrangements

The features related to structural arrangements are an essential ingredient in order to provide the best results for Project Alliances. The following subtitles explain these features one by one.

A) Joint Agreement

Alliance project task includes planning and implementation tasks, the owner traditionally promotes the project. The parties enter into single joint multi-actor contract instead of several bilateral contracts, (Ross, 2003).

B) Joint Organization

The alliance organization mission is to comprise the partner people in the organizations, including the owner's. Project decisions implementation are take jointly by different parties. All related task are calculated in the cost estimate covers. The project target cost is defined to include the items of various parties and is consequently the total cost of the project, (Ross, 2003).

C) Risk Sharing

The traditional partnering collaboration tried to transfer the risk as much as it can to the other parties, risk transfer in some of the project well be a fault and major danger for the continuity of the project that because the other party tries to manage and arrange the project as it should be The risk transfer if it not managed correctly creates a huge gap in the project that will appear and that kind of mistake shouldn't happen

in the major project, (Rahat A. (., 2014). Any delay in the project means a lot of cost spent and mutual blame will not solve the problem. The answer key for this kind of problem in such circumstances is the Project Alliances. While the project alliances deliverer the project and implement it and insure its effectiveness, One of the basis of Project Alliance is the risk transfer divided it on the all units and so such kind of mistakes in the project will not be able to appear, (Love, Davis, Chevis, & Edwards, 2010).

2.11 Features Related to Nature of Collaboration

The features related to nature of collaboration are an essential ingredient in order to provide the best results for project alliances. The following subtitles explain these features one by one.

A) Trust

Trust between the parties in the project is the most important essential to meet the target of the projects. It hard to reach to benefits and a model based on the risk sharing is nothing without the mutual trust. The trust is a human behavior that taking time to build, and if the trust is not built between the parties, the thread of project will start, (Matthew, 2005).

B) Commitment

Incorporation of the alliance's targets, solution of faced problem and improvement of passes are possible when all parties are committed to the work. (Marcus Jefferies G. B., 2006).

C) Cooperation

Project alliance brings the key partners to a project under a joint and several contracts with the intent of improving and increasing the parties' mutual cooperation and interaction: they are the key factors considering the workability of the alliance. Efforts can be made to improve the preconditions for efficient operations and information exchange by joint space arrangements and information systems as well as prearranged decision-making principles (Manley, 2002).

2.12 Success Factor of Alliance

The success factor in the construction industry is to be able to deliver the project on or before the schedule, at the calculated budget or below, at the same quality and specification. So for project Alliance there is a factor for success, some of them are as follows, (Marcus Jefferies G. B., 2006):

1. **Best for project attitude:**

    All team members should follow the attitude of the best for project to all stages of project until it done.

2. **Formation of a single entity:**

    All individual organization makes one entity and removes their entire name; make just one name for the Alliance.

3. **Pre-project workshops & planning workshops:**

    Pre-project workshops meeting before the client workshop enhances the work environment. Good relationship and build a trust.

4. **Continuous facilitator involvement:**

    Early facilitator involvement in the project establish powerful Alliance unite.

5. **Careful team selection & project specific team alignment:**

   To achieve the target of the project, selection of the team member should be on the bases of the good performance and skills.

6. **Right personnel for project:**

   The right person for the job increases the chance to make the correct decision, open mind creative.

7. **Web-based management program:**

   Help the management and the parties involved in work to check the updates in the project, and manage resource share knowledge.

8. **Integrated alliance office:**

   Head office gathering all parties in the Alliance

9. **Staging of project & stretch targets:**

   Dividing project to stages allow faster reflection to the result.

10. **Benchmarking & continuous performance monitoring:**

    To gain success of the project and continues development of the project.

11. **Early commercial development:**

    To insure the skilled necessary to achieve the performance needed that by the early commercial framework.

12. **On-going workshops including site personnel:**

    Ongoing Workshop is important during the project life for identifying the role of the staff and the Alliance as general.

13. Participants with past working relationships:

The choosing of Past working relationship enhances the working environment that because the natural of their work are known, in addition they save time, effort to communicate with them because of the past experience.

2.13 Kuwait Infrastructure

Officially State of Kuwait, country located in Western Asia bounded by Iraq and Saudi Arabia from the north east of Arabian Peninsula, with a total area of 6,880 sq mi. Capital city is Al-Kuwait, or Kuwait City. Total population of Kuwait is around 4.1 Million (1.2 million are Kuwaitis, 2.8 million expatriates) (wikipedia, 2015). The status of Kuwait have warm climate and dry inland and humid along the coast, low sandy region. 80% of the total populations are Arab, Kuwaitis citizen have high per capita income, no taxation for the citizen, and enjoy a lot of social services. Since the development of the oil industry, many foreigners start to go to Kuwait to find their chance to work in Kuwait that makes it attractive for the people around the world to live and work. The official language is Arabic, Kuwait currently ranked is the seventh in connection with the most populated cities around the world. Growth rate, high demand on the infrastructure facilities and fast civilization a heavy pressure on the Kuwait government to meet the need of the people how use that kind of infrastructure. Expected to grow by 15-20 percent in Kuwait in 2016, Planed developments were estimated to reach \$123.6bn, with major infrastructure project currently in the pipeline, according to investment bank Alpen Capital. In Addition, Kuwait's construction market will outrun Qatar, Oman and Bahrain with the country coming in third in an analysis of the 100 largest construction contracts in the Gulf cooperation country behind the UAE and Saudi Arabia. (Mohammed Sultan Al-

Jaber, 2015). It's expected to raise the industry of construction value from $91.5bn to $126.2bn. Government also pays attention to the transportation sector, $6 billion is the worth of the new road project under development to improve the road capacity and density. The total length of the road in Kuwait is approximately 600km and the density is around 584 people per Km. the development of the new transportation project include enhancing of the road and establishing new one, moreover implementation of city metro to reduce the traffic. (Ministry of Public Works, 2009). However, in large infrastructure project during 2010-2014 the actual progress in the five year plan was 19% only from the planned (Abdel-Razzaq, 2015). There are positive signs of progress in the new development plan 2015 and 2020. All the previous information strengthens the major important role of the partnership and the Project Alliance to establishing and development the major project in Kuwait, the Partnership Technique Bureau of the State of Kuwait who in charge for the development of the infrastructure in Kuwait among each other published in its report the projects map for the facilities which will be developed or the facilities already have been started under the Vision for the State of Kuwait – Kuwait 2035. Some of that project are as follows:

- **Kuwait Metropolitan Rapid Transit System (KMRT) in Transportation.**

Plane of urban development was necessary to drive the economy progress; the implementation of the modern urban transportation system will help to define the direction of public transportation in the future. The KMRT planed total length 160 Km, contain 69 stations, the operational speed of 90kph and the maximum speed of 100kph, 5 phases of the project the first phase are expected to finish in 2020.

- **Kuwait Failaka Island (KFIP) Development in Real Estate.**

The project aim to transport into leading state in art leisure and tourism destination, the project planned to contain hotels and parks.

- **Al Abdaliyah Integrated Solar Combined Cycle (ISCC) in Power.**

The project aim to develop the first solar thermal power plan. The total capacity will reach 280MW and solar contribution reach 60MW. Other benefit of this project is the fuel saving, reduction of the CO_2 emissions and stable continuous power generation. Kuwait have been always realized the importance role of the infrastructure project. In the vision of the Kuwait State the project that will implement in the future is:

Transportation:

- Kuwait Metropolitan Rapid Transit System (KMRT).

- Kuwait National Rail Road (KNRR).

Real Estate Development:

- Services and Entertainment Center – Egaila.

- Expired Contracts of Properties Established on State-Owned Real Estate.

- Commercial, Educational, Cultural and Entertainment Center in Abdulla Alahmad Street.

- Kuwait Failaka Island Development.

- Rest Houses and Doha Chalet's Service Centers.

Power and Energy:

- Al Abdaliyah Integrated Solar Combined Cycle (ISCC).

- Az-Zour North IWPP.

- AlKhairan IWPP.

Water & Wastewater Management:

- Umm AlHayman WWTP.

Solid Waste Management:

- Municipal Solid Waste Treatment Facility – Kabd Location.

Kuwait government cannot alone establish new projects even of the existence of good finance (Public Treasury), due to the large infrastructure projects executed during 2010-2014. The actual progress in the five year plan was 19% only from the planed, and the main problem in the construction project process was the delay in the work stages. Less of the commitment and trust between the parties in the project even of the good financed that consequents to drive the project to dangerous zone for success (Programme, 2012). In addition the delay in phases of the project mean higher cost, effort and making new plans to make a preparation in the project. Moreover, in the partnering model one of the basis is risk transfer. Each party tries to transfer the project risk to the other party, that make less of commitment and trust then the delay of the project. The key to overcome of those kind of problem is the Project Alliance to create a better environment for work. The risk sharing in the project alliance will insure that each party fully understand its responsibility and turn to deliver the project to safety and the alliance work as one unit to drive the success and collect their benefits from the project, and there is no winning party in the alliance, all win or all lose.

2.14 Drivers and Barriers of Project Alliances

When a project is established the owner or funder of the project must search for the project in order to identify the drivers (factors the help improve and sustain the project) and barriers (factors that are obstacles that may be faced during the project) to improve the percentage of the projects success.

2.14.1 Barriers of Project Alliances

The Barriers of Project Alliances are divided four sections. Each section provides a question that was used in the questionnaire which is shown in the Table 1.

Table 1: Barriers Source for Questionnaire

Question	Reference
Personal barriers	
Lack of trained staff	(Alireza, 2014)
Lack of understanding project alliance benefits	(Alireza, 2014)
Lack in project Alliance experience	(Alireza, 2014)
Lack of Project alliance applying technique	(Chris Clifton, (2006))
Lack of trust on other parties	(Matthew, 2005)
Process barriers	
Party prefer risk transfer than risk sharing	(Alireza, 2014)
Risk challenges in the project	(Love, Davis, Chevis, & Edwards, 2010)
Lake of commitments for the other parties	(Marcus Jefferies G. B.)
The cooperating model, share risk decrease possibility to seek recompense for others party mistakes	(Ross, 2003)
Project Alliance model build in mutual trust and that hard to do	(Marcus Jefferies G. B., 2006)
Business and market barriers	
Unclear return investment	(Yelin Xu, 2011)
Doubts about the payment arrangement	(Sakal, 2005)
Lack of top management	(Ross, 2003)
Lack of early commercial development	(Marcus Jefferies G. B., 2006)

Technical barriers	
Lack of continuous performance monitoring	(Marcus Jefferies G. B., 2006)
Wrong team selection & project specific team alignment:	(Marcus Jefferies G. B., 2006)
Absent of Pre-project workshops & planning workshops	(Marcus Jefferies G. B., 2006)
Hard to formation of a single entity	(Marcus Jefferies G. B., 2006)
Absent of best for project attitude	(Rahat A. , Organizational Barriers for Adopting Project Alliancing , 2014)

2.14.2 Drivers of Project Alliances

The driver's factors of Project Alliances this study were chosen and shown in Table 2.

Table 2: Drivers Source for Questionnaire

Drivers of project alliance	
Best for project attitude	(Marcus Jefferies G. B., 2006)
Formation of a single entity	(Marcus Jefferies G. B., 2006)
Pre-project workshops & planning workshops	(Marcus Jefferies G. B., 2006)
Continuous Facilitator involvement	(Marcus Jefferies G. B., 2006)
Careful team selection & project specific team alignment:	(Marcus Jefferies G. B., 2006)
Right personnel for Project	(Marcus Jefferies G. B., 2006)
Web-based management program	(Rahat A. , Organizational Barriers for Adopting Project Alliancing , 2014)

Integrated Alliance office	(Marcus Jefferies G. B., 2006)
Staging of project & stretch targets	(Alireza, 2014)
Benchmarking & continuous performance monitoring	(Marcus Jefferies G. B., 2006)
Early commercial development	(Alireza, 2014)
On-going workshops including site personnel	(Marcus Jefferies G. B., 2006)
Participants with past working relationships	(Rahat A. , Organizational Barriers for Adopting Project Alliancing , 2014)
Trust between all parties	(Marcus Jefferies G. B., 2006)
Commitments between all party	(Alireza, 2014)
Collaboration between all party	(Marcus Jefferies G. B., 2006)
Mutual responsibility for managing risk	(Love, Davis, Chevis, & Edwards, 2010)
Innovation and high performance	(Ross, 2003)
Government support help to establish Project Alliances	(Cheng, 2009)
Competitive pressure	(Alireza, 2014)
Culture change	(Alireza, 2014)
Promote a guidelines for project alliance model	(Marcus Jefferies G. B., 2006)
Client demand on the facilities	(Alireza, 2014)

Chapter 3

METHODOLOGY OF RESEARCH

3.1 Introduction

Methodology used to obtain the results is explained in detail in this chapter. The method of collecting the data and the type of information needed to evaluate the results for the Project Alliances in Kuwait construction industry and to find the most significant drivers and barriers which affect implementation of Project Alliance development.

3.2 Questionnaire Survey

Questionnaire is designed in a way to create a full understanding about the most significant drivers and barriers of the project that affect the implementation of Project Alliances in Kuwait.

The questionnaire is divided into three sections:

- General Information Questions (A)

- Questions regarding to the barriers of implementing PAs in Kuwait (B)

- Question related to the drivers of PAs in Kuwait (C)

First section of the questionnaire contains general information questions. This section is used to obtain personal information about the respondents like: level of education, years of experience, personal occupation, and sector type.

Second part contains questions regarding to the barriers of PAs in Kuwait. This section investigates the factors that have a negative impact on the implementation of PAs in Kuwait. This section also helps to understand what factors have the most negative effects on the delivery of the projects.

Third part contains questions related to the driving factors for PAs in Kuwait. It determines which factors have the most efficiency and what factors can improve the project delivery under Kuwait's work environment.

3.3 Methodology of Analysis

The questionnaire is divided to 3 three parts. Part (A) can involves analysis using the Pie Charts because as it discusses the personal information. In the other parts (B) and (C) are analyses are done using the following tests: mentioned below:

- Factor Analysis and Reliability Test

- Relative Importance Index (RII)

- Pearson Correlation Analysis

- Hypothesis Testing (T-Test Method)

3.3.1 Factor Analysis and Reliability Test

Factor analysis and reliability test is used to check the reliability of internal consistency along with the homogeneity of the data used. Classical Test Theory utilizes Cronbach's α (alpha) Where, alpha (α) is depending on the averaged interaction among variables within each individual factor. Cronbach's α (alpha) ranges from zero to one, zero means that no interaction or consistency between the variables, one means that variables depend on each other and there is a high consistency between them directly (Nunnally, 1978). The acceptance rule of is shown in Table 3:

Table 3: Cronbach's Alpha

Cronbach's α (alpha)	Internal Consistency rank
α < 0.5	Unacceptable
0.5 ≤ α < 0.6	Poor
0.6 ≤ α < 0.7	Questionable
0.7 ≤ α < 0.8	Acceptable
0.8 ≤ α < 0.9	Good
0.9 ≤ α	Excellent

To get a fair correlation and consistency Table 1s show that the minimum value for the Cronbach's α should be 0.7 or more.

3.3.2 Relative Importance Index (RII)

To make a fully understanding for each and related significance of each factor, RII is used. Basic factors are the mean and the standard deviation.

$$\bar{x} \ (mean) = \frac{\sum x}{n} \quad \& \quad \sigma \ (Standard \ Deviation) = \sqrt{\frac{\sum_{i=1}^{n}(\bar{x} - x_i)^2}{n}}$$

Where:

n: The total number of respondents or answers received.

x: The relative value of the respondent's answer.

The method of the RII is to rank each answer in order. This is used in the multi-selection questionnaire. This method is more accurate and reliable and what is

obtained from this test is called Relative Importance Index. The ranked order presents the significant respondent perception to the answer. The ranking is between 1 to 5, number one referring to the strongly disagree and number 5 for to the strongly agree:

$$RII = \frac{\sum w}{w_{highest} \; x \; n}$$

Parameters:

W: Weight/ rank of each answer between 1 to 5 where 1 represents Strongly disagree and 5 represents Strongly Agree.

$w_{highest}$:The highest weight/ rank that can be obtained which is 5

n: The total number of respondents or answers received.

3.3.3 Pearson Correlation and Significance Test Analysis

Pearson correlation (r) is a simple linear correlation. This method helps to estimate the significance level of the relationship between the variables. The range of the correlation coefficient between -1.00 to +1.00, +1 is a sign or indication of perfect positive relationship, -1 is indication of perfect negative correlation, while 0 indicate that there is no relationship between the variables, Table 2 illustrates the relationship for other value between +1 and -1 and also it's an indicate for the strength between the variables.

Table 4: Strength of Correlation Value Range

Correlation Coefficient (r)	Degree of Acceptance
-0.3 ≤ r ≤ 0.3	Weak
-0.7 ≤ r < -0.3 or 0.3 < r ≤ 0.7	Moderate
-1 ≤ r < -0.7 or 0.7 < r ≤ 1	Strong

Significance Test Analysis

Significance Test is used after the Pearson Correlation test to detect if there are any real statistically relationships between two variables. The Significance Test method is to assume hypothesis depending on the PPMCC sign.

If the sign for the correlation coefficient (r) was positive (+) the following hypothesis are assumed to test the data if there is a positive relationship:

$$H_0: \rho = 0 \quad \text{and} \quad H_1: \rho > 0$$

While if the correlation coefficient (r) sign was negative (-) the following assumption will follow:

$$H_0: \rho = 0 \quad \& \quad H_1: \rho < 0$$

Significance value indicates by $\rho - value$, if the P value was under or equal 0.05 that indicate for two-tail test to use for the statistical significant test.

3.3.5 Hypothesis Testing (T-Test Method)

Statistical Package for the Social Sciences (SPSS) software was used to test the hypothesis. The Paired Differences test will be applied on the hypothesis to test it.

Chapter 4

DATA ANALYSIS AND DISCUSSION

4.1 Introduction

In this chapter the questionnaire responses were examined and analyzed to reach the empirical results of this research. The data analysis process comprises the identification, classification and communication of the data in a way to deduce a theoretical or correlation of data present.

The first part of this chapter is about the personal information of the respondents. Graphs and tables were used to present the data of this section. The main segments are part B and C of the questionnaire survey which analyzed using the tests mentioned below:

- Relative Importance Index (RII) part (3).

- Pearson Correlation Analysis part (4).

- Hypothesis Testing (T-Test Method) part (5).

4.2 Personal Information

The personal information section in the questionnaire was to measure if the author met the target category for the research, and to check the diversity of the respondent. The personal information was just for scientific reasons.

4.2.1 Qualification Level

These questions were related to the respondent qualification level as shown in Figure3. The choices were composed to BSc, M.S, PhD and other (people who

doesn't have a degree), the higher one was BSc followed by M.S., then PhD to other. The highest one were BSc that is related for the type of organization the questionnaire distributed in. The target was to distribute the questionnaire to the companies operating in the construction industry, not for the university or others.
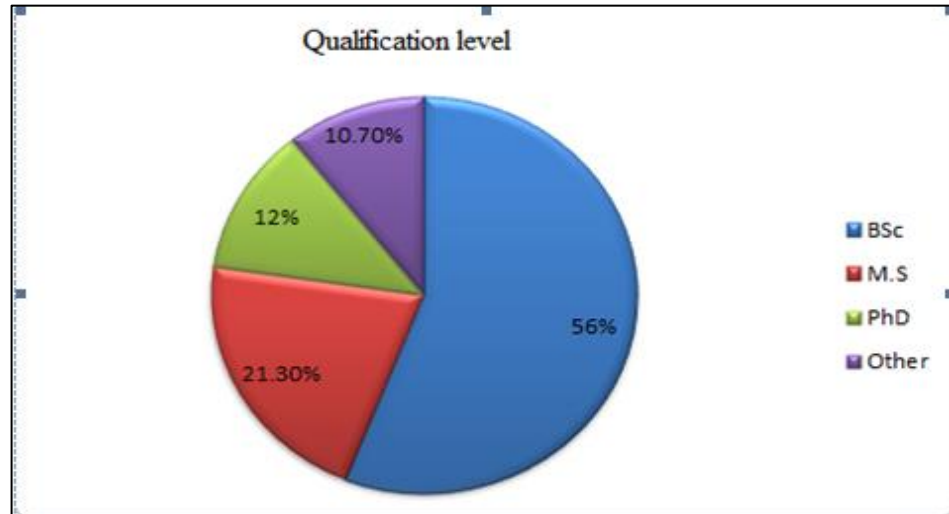
Figure 3: Qualification level

4.2.2 Years of Experience

As shown in Figure 4 44% from the respondent was 0-5 years of experience followed by 5-10 years of a percentage of 33.3%. From 10-15 years of experience were 17%, and the last one was above 15 takes a percentage of 5.30%. That's related to the respondent working years in this field.
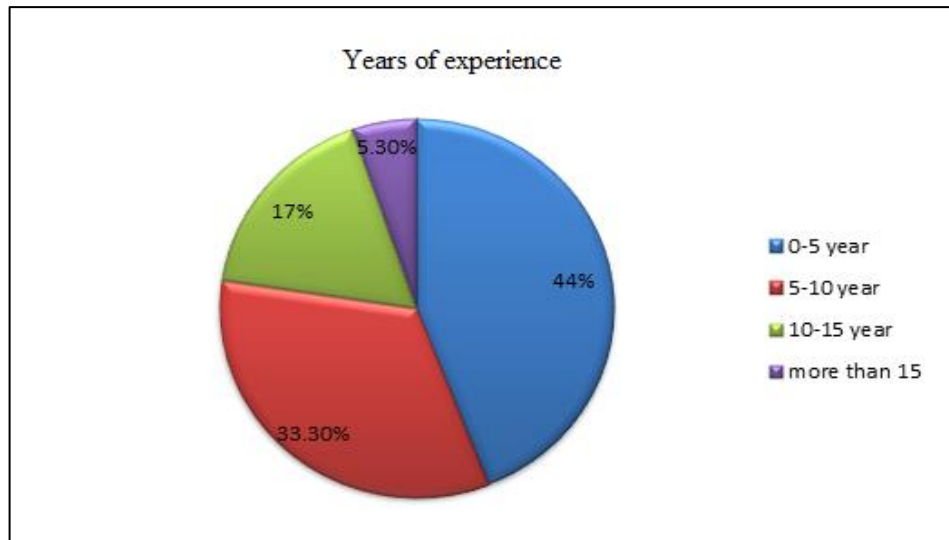
Figure 4: Years of Experience

4.2.3 Sector of the Organization

58.7 % of the respondent works in private organization and 41.3% work in public organization as shown in Figure 5. The questionnaire as mentioned targets the company or the sector that operate in the construction industry. The highest value were for the private sector followed by the public sector.
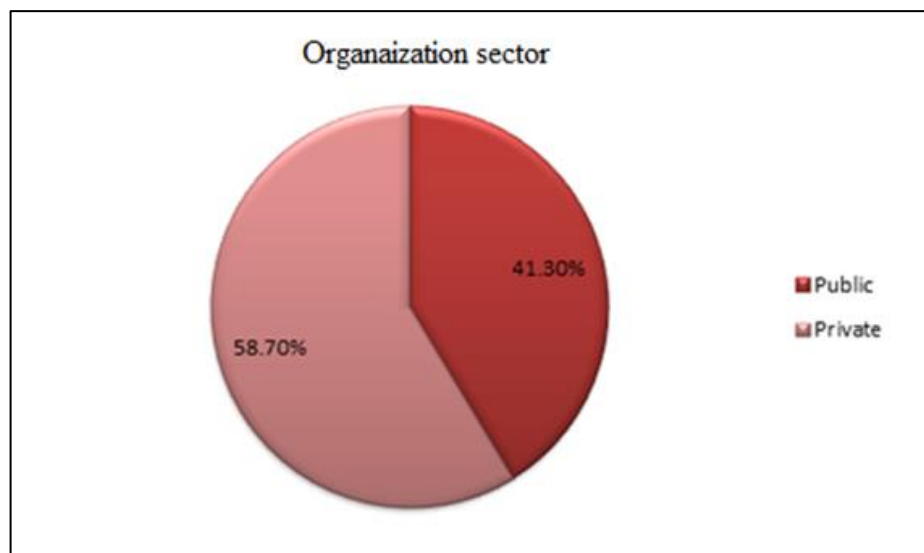
Figure 5: Organization Sector

4.2.4 Number of Workers in the Organization

Number of the workers in the organization is shown in Figure 6. 0-15 has a value of 41.30%, more than 100 is 18.7%, from 16-30 is 17.30%, from 31-50 has a value of 12%, and from 51-100 is 10.70%. This is related to the company itself, if it was a large or small company.
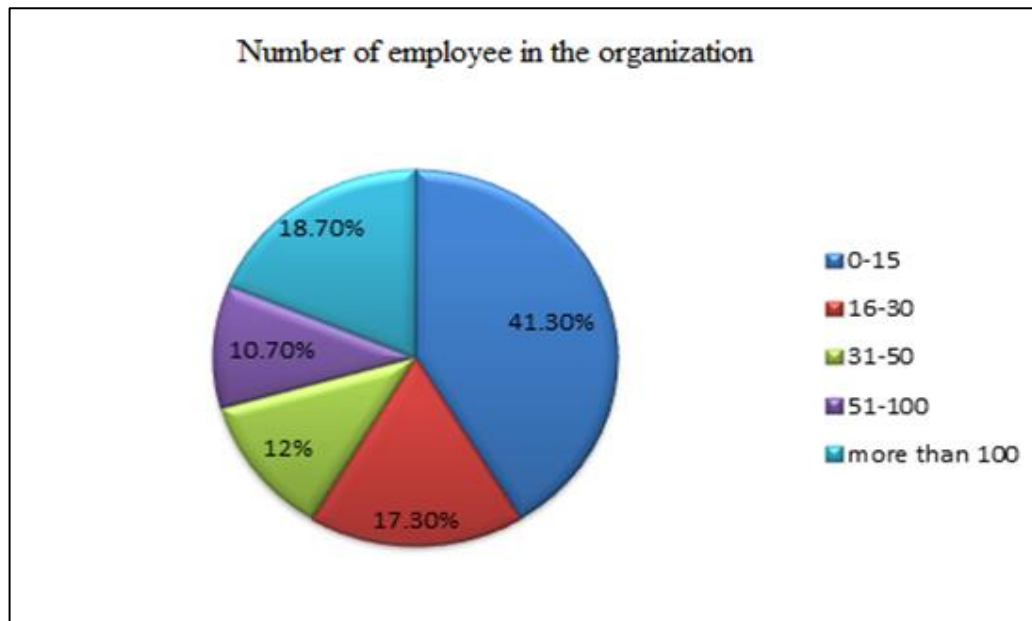
Figure 6: Number of Employee in the Organization.

4.2.5 Position in the Organization

Majority of the respondents were engineer having a value 44%, the manager 21.30% the contractor 14.70%, other 9.30%, Architect 6.70%, and Owner 4%. This number shows the diversity of the respondents and it also related to the respondents specialty and their positions in the organization.
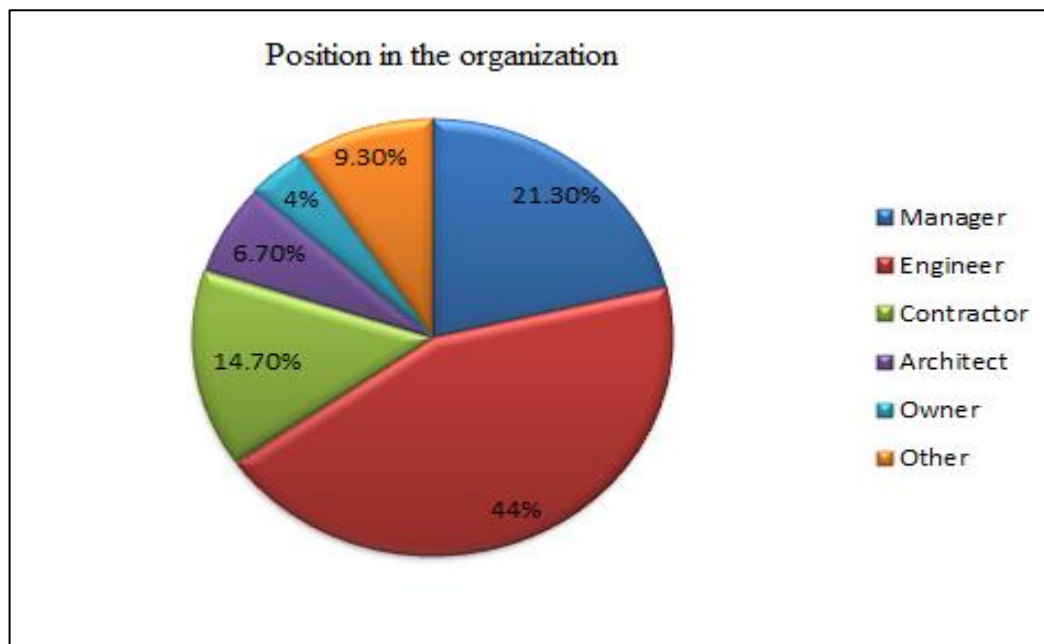
Figure 7: Position in the Organization

4.2.6 Specialization of the Organization

The respondents were 42.70% for construction, 18.7% for management. 14.70% infrastructure, 13.3% for transportation.10.70% other as shown in Figure 8. This is related to the organization specialization and the questionnaire was distributed in different specialty companies to increase the reliability of the data.
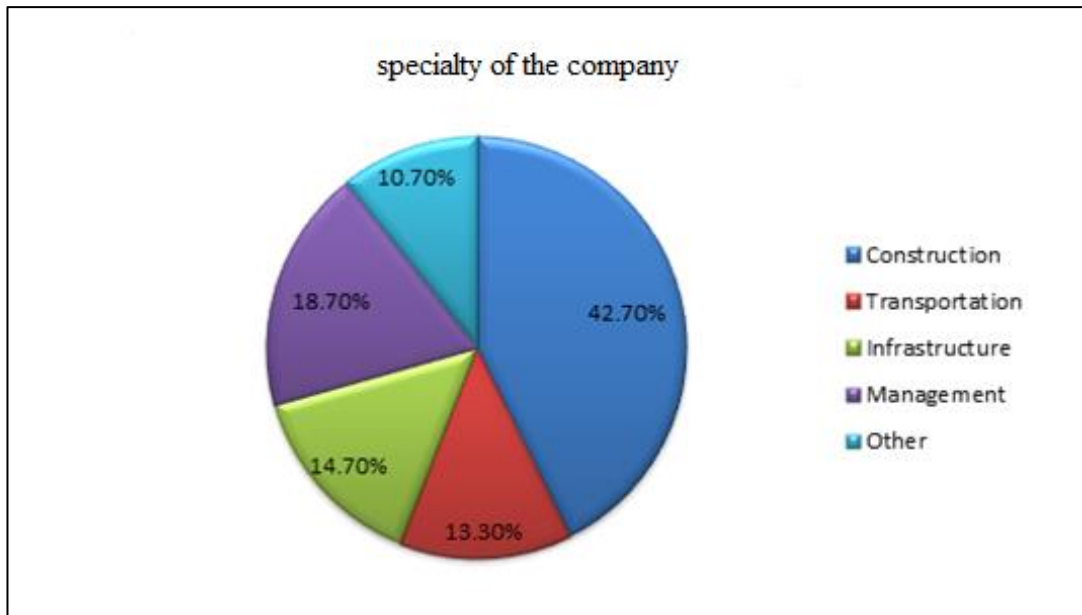
Figure 8: Specialty of the Company

4.2.7 Experience with Project Alliance Model

The answer responds in this question were 46.7% they have experience with Project Alliances and 53.3% doesn't have any experience with Project Alliances as shown in Figure 7. This is related to the respondent if he have has a previous experience with the Project alliance Alliances or not.
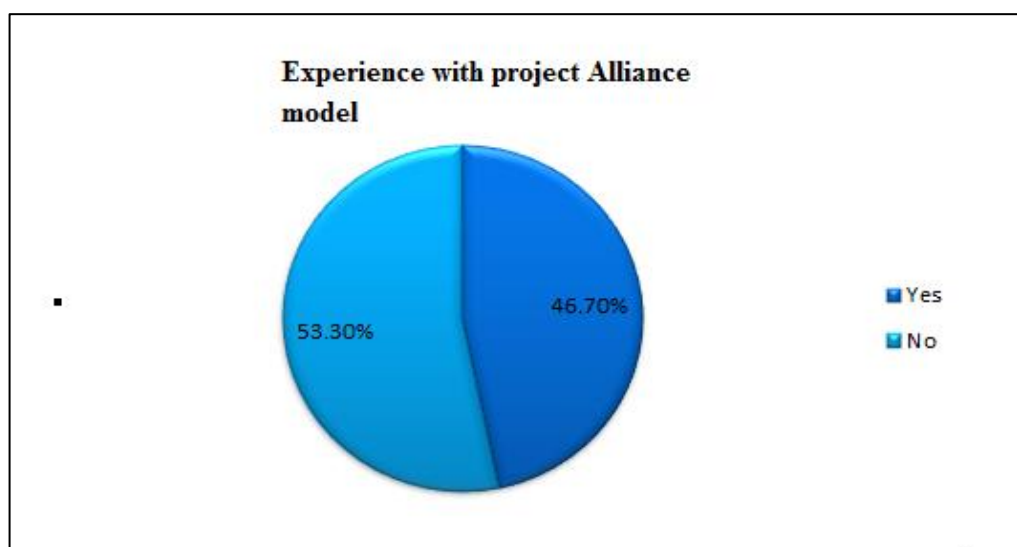
Figure 9: Experience with Project Alliance Model

4.3 Factor Analysis and Reliability Test (Cronbach α)

4.3.1 Cronbach α for Personal Barriers

Cronbach α has been determined using SPSS program and it was calculated as 0.768 and this is an acceptable indicator for the reliability for the factor. Table 5 shows the loadings for all the factors for of the Personal Barriers.

Table 5: Cronbach Alpha for Personal Barriers

Personal Barriers	Loadings	Cronbach's alpha
Lack of trained staff	0.683	0.768
Lack of understanding project alliance benefits	0.793	
Lack in project Alliance experience	0.797	
Lack of Project alliance applying technique	0.756	
Lack of trust on other parties	0.558	

The Cronbach's alpha for the Personal Barrier is 0.768, and the loadings for each variable is as follows: lack in project alliance experience has a loading value of 0.797, lack of understanding project alliance benefits has a loading value of 0.793, lack of Project Alliance applying technique has loading value of 0.756, lack of trained staff has a loading value of 0.683 and lack of trust on other parties has a loading value of 0.558.

Three of the loadings have values above 0.7 and two of them have a value below 0.7. The Cronbach's alpha is 0.768 and this is acceptable in terms of reliability.

4.3.2 Cronbach α for Process Barriers

Cronbach α has been determined using SPSS Program and it was calculated as 0.732 and this is an acceptable indicator for the reliability of the factor. Table 6 shows the loadings for all the factors of the Process Barriers.

Table 6: Cronbach Alpha for Process Barriers

Process barriers	Loadings	Cronbach's alpha
Party prefer risk transfer than risk sharing	0.648	0.732
Risk challenges in the project	0.725	
Lack of commitments for the other parties	0.601	
The cooperating model, share risk decrease possibility to seek recompense for others party mistakes	0.766	
Project Alliance model build in mutual trust and that hard to do	0.731	

The Cronbach's alpha for the Process Barriers is 0.732, and the loadings for each variable is as follows: cooperating model, share risk decrease possibility to seek recompense for others party mistakes has a loading value of 0.766, project alliance model build in mutual trust and that hard to do has a loading value of 0.731, risk challenges in the project has a loading value of 0.725, party prefers risk transfer than risk sharing has a loading value of 0.648 and lack of commitments for the other parties has a loading value of 0.601.

Three of the loadings have values above 0.7 and two of them have a value below 0.7. The Cronbach's alpha is 0.732 and this is acceptable in terms of reliability.

4.3.3 Cronbach α for Business and Market Barriers

Cronbach α has been determined using SPSS Program and it was calculated as 0.715 and this is an acceptable indicator for the reliability of the factor. Table 7 shows the loadings for all the factors of the Business and Market Barriers.

Table 7: Cronbach Alpha for Business and Market Barriers

Business and market barriers	Loadings	Cronbach's alpha
Unclear return investment	0.837	0.715
Doubts about the payment arrangement	0.836	
Lack of top management	0.619	
Other model are enough	0.568	
Lack of early commercial development	0.553	

The Cronbach's alpha for the Business and Market Barriers is 0.715, and the loadings for each variable is as follows: unclear return investment has a loading value of 0.837, doubts about the payment arrangement has a loading value of 0.836, lack of top management has loading value of 0.619, other model are enough has a loading value of 0.568 and lack of early commercial development has a loading value of 0.553.

Two of the loadings have value above 0.8 and three of them have a value below 0.7. The Cronbach's alpha is 0.715 and this is acceptable in terms of reliability.

4.3.4 Cronbach α for Technical Barriers

Cronbach α has been determined using SPSS Program and it was calculated as 0.776 and this is an acceptable indicator for the reliability of the factor. Table 8 shows the loadings for all the factors of the Technical Barriers.

Table 8: Cronbach Alpha for Technical Barriers.

Technical barriers	Loadings	Cronbach's alpha
Lack of continuous performance monitoring	0.761	0.776
Wrong team selection & project specific team alignment	0.610	
Absence of Pre-project workshops & planning workshops	0.804	
Hard to formation of a single entity	0.651	
Absence of best for project attitude	0.789	

The Cronbach's alpha for the Technical barrier obtain is 0.776, and the loadings for each variable is as follows: absence of pre-project workshops & planning workshops has a loading factor of 0.804, absence of best for project attitude has a loading factor of 0.789, lack of continuous performance monitoring has loading factor of 0.761, hard to formation of a single entity has a loading factor of 0.651 and wrong team selection & project specific team alignment has a loading value of 0.610.

One of loading has value above 0.8 and two of them have a value above 0.7. The others have a value below 0.7. The Cronbach's alpha is 0.776 and this is acceptable in terms of reliability.

The entire groups has an acceptable value for the reliability, some factor have loading values below 0.7, but as total in groups all of them are above 0.7. The questionnaire respondents' answer were reliable based on the value obtained from the questionnaire. The highest value of the Cronbach's alpha for the groups was 0.776 by the Technical Barriers, followed by the Personal Barriers of having a value of 0.768, the Process Barriers having a value of 0.732, and the Business and Market Barriers having a value of 0.715.

4.3.5 Cronbach α for Drivers of Project Alliance

Cronbach α has been determined using SPSS Program and it was calculated as 0.923 and this is an excellent indicator for the reliability of the factor. Table 9 shows the loadings for all the drivers of Project Alliance.

Table 9: Cronbach Alpha for Drivers of Project Alliance

Drivers for project Alliance	Loadings	Cronbach's alpha
Best for project attitude	0.512	0.923

Formation of a single entity	0.414	
Pre-project workshops & planning workshops	0.617	
Continuous Facilitator involvement	0.700	
Careful team selection & project specific team alignment	0.428	
Right personnel for Project	0.755	
Web-based management program	0.614	
Integrated Alliance office	0.625	
Staging of project & stretch targets	0.707	
Benchmarking & continuous performance monitoring	0.520	
Early commercial development	0.588	
On-going workshops including site personnel	0.428	
Participants with past working relationships	0.663	
Trust between all parties	0.619	
Commitments between all party	0.627	
Collaboration between all party	0.646	
Mutual responsibility for managing risk	0.671	
Innovation and high performance	0.699	
Quick project Implementation	0.537	
Government support help to establish Project Alliances	0.702	
Competitive pressure	0.625	
Culture change	0.587	
Promote a guidelines for project alliance model	0.611	
Client demand on the facilities	.529	

The highest value was the right personnel for the project with a value of 0.755, Governmental support to help establish Project Alliances with a value of 0.702, Continuous Facilitator involvement with a value of 0.700, Innovation and high performance with a value of 0.699, Mutual responsibility for managing risk with value of 0.671, Participants with past working relationships with a value of 0.663, Collaboration between all parties with a value of 0.646, Commitments between all parties with a value of 0.627, Competitive pressure 0.625, Integrated Alliance office with a value of 0.625, Trust between all parties with a value of 0.619, Pre-project workshops and planning workshops with a value of 0.617, Web-based management

program with a value of 0.614, Promote a guidelines for project alliance model with a value of 0.611, Early commercial development with a value of 0.588, Culture change with a value 0.587, Quick project Implementation with a value 0.537, Client demand on the facilities with a value 0.529, Benchmarking and continuous performance monitoring with a value 0.520, Best for project attitude with a value 0.512, Best for project attitude with a value 0.512, Careful team selection and project specific team alignment with a value 0.428, On-going workshops including site personnel 0.428, and Formation of a single entity with a value 0.414.

4.4 Relative Importance Index (RII) Test

As mentioned in the methodology, the RII test was used to check the significance with the mean value and standard deviation. The value of each factor is measured using SPSS. If any value of RII is below 0.7 it will be rejected and if the mean is below 3.5, it is called to be rejected.

4.4.1 Barriers to Project Alliance

First part of the analyzed factors is Barriers to Project Alliance. The value for each factor was calculated as shown in the Table 10. The RII value show is between (0.613-0.808).

Table 10: Barriers to Project Alliance RII

Rank	Barriers	Mean	Std	RII	Group RII
Personal Barriers					
1*	Lack of trust on other parties	4.039	1.038	0.808	**0.764**
8*	Lack in project Alliance experience	3.829	1.100	0.766	
11	Lack of trained staff	3.789	1.087	0.758	
13	Lack of understanding project alliance benefits	3.750	1.156	0.750	
15	Lack of Project alliance applying technique	3.697	1.21	0.739	

	Process Barriers				
3	Lack of commitments for the other parties	3.934	0.957	0.787	
5	Risk challenges in the project	3.908	1.035	0.782	0.768
8*	Project Alliance model build in mutual trust and that hard to do	3.829	1.088	0.766	
10	Party prefer risk transfer than risk sharing	3.816	1.186	0.763	
14	The cooperating model, share risk decrease possibility to seek recompense for others party mistakes	3.710	1.093	0.742	
	Business and Market Barriers				
4	Lack of early commercial development	3.921	0.935	0.784	
7	Lack of top management	3.855	1.041	0.771	0.724
17*	Unclear return investment	3.645	1.208	0.729	
19	Doubts about the payment arrangement	3.605	1.120	0.721	
20	Other model are enough	3.066	1.350	0.613	
	Technical Barriers				
1*	Hard to formation of a single entity	4.039	1.113	0.808	
6	Wrong team selection & project specific team alignment	3.868	0.984	0.774	0.761
12	Absence of Pre-project workshops & planning workshops	3.776	1.138	0.755	
16	Absence of best for project attitude	3.684	1.235	0.737	
17*	Lack of continuous performance monitoring	3.645	1.283	0.729	

The most significance factors of Barriers to Project Alliance were the lack of trust on other parties, and hard to formation of a single entity with RII value as 0.808 and Mean average value as 4.039. Lack of trust on other parties is a Personal barrier while hard to formation of a single entity is a Technical barrier.

The second factor of barriers to Project Alliance was lack of commitments from other parties (Rank 3) with RII value as 0.787 and Mean average value as 3.934. Lack of commitments from other parties is a Process Barrier.

The third factor of Barriers to Project Alliance was Lack of early commercial development (Rank 4) with RII value as 0.784 and Mean average value as 3.9210. Lack of early commercial development is a Business and Market Barrier.

The fourth factor of barriers to Project Alliance was Risk challenges in the project (Rank 5) with RII value as 0.782 and Mean average value as 3.908. Risk challenges in the project is a Process barrier.

The fifth factor of Barriers to Project Alliance was Wrong team selection & project specific team alignment (Rank 6) with RII value as 0.774 with a Mean average value as 3.868. Wrong team selection & project specific team alignment is a Technical Barrier.

All the factors have RII values more than 0.7 and Mean values above 3.5 except the factor Other model are sufficient with a RII value as 0.613 and Average Mean value as 3.066.

In group RII, Process Barriers has the highest value as 0.768, Personal Barriers as 0.764, Technical Barriers as 0.761 and Business and Market Barriers as 0.724.

Table 11 shows the RII for each factor, standard deviation, means, group, group rank and overall rank for all the factors of the Barriers. The factors have been explained in detail in previous table for each section.

Table 11: Order of Barriers of Project Alliance

Group	Group Rank	Overall Rank	Barrier	Mean	Std.	RII
1	1	1	Lack of trust on other parties	4.04	1.038	0.808
4	1	1	Hard to formation of a single entity	4.04	1.113	0.808
2	1	3	Lack of commitments for the other parties	3.93	.957	0.787
3	1	4	Lack of early commercial development	3.92	.935	0.784
2	2	5	Risk challenges in the project	3.91	1.035	0.782
4	2	6	Wrong team selection & project specific team alignment	3.87	.984	0.774
3	2	7	Lack of top management	3.86	1.042	0.771
1	2	8	Lack in project Alliance experience	3.83	1.100	0.766
2	3	8	Project Alliance model build in mutual trust and that hard to do	3.83	1.088	0.766
2	4	10	Party prefer risk transfer than risk sharing	3.82	1.186	0.763
1	3	11	Lack of trained staff	3.79	1.087	0.758
4	3	12	Absence of Pre-project workshops & planning workshops	3.78	1.138	0.755
1	4	13	Lack of understanding project alliance benefits	3.75	1.156	0.750
2	5	14	The cooperating model, share risk decrease possibility to seek recompense for others party mistakes	3.71	1.093	0.742
1	5	15	Lack of Project alliance applying technique	3.70	1.211	0.739
4	4	16	Absence of best for project attitude	3.68	1.235	0.737
3	3	17	Unclear return	3.64	1.208	0.729

			investment			
4	5	17	Lack of continuous performance monitoring	3.64	1.283	0.729
3	4	19	Doubts about the payment arrangement	3.61	1.120	0.721
3	5	20	Other model are enough	3.07	1.350	0.613

Lack of trust on other parties and Hard to formation of a single entity can be seen as major barriers preventing the implementation of Project Alliances. In order to successfully implement Project Alliance, a new specific guidance is needed if the parties have little or no experience in promoting Project Alliance. To assist parties with Project Alliance, practical information have to be provided, for example new approaches for increasing the trust on other parties will make it more effective for Project Alliance. Also implementing new guidelines and methods are required to know how to deal with other parties to meet the Alliance needs.

4.4.2 Drivers of Project Alliance

Second part of the analyzed factor is Drivers of project alliance the value for each one calculated and shown in the table (12) the RII value is between 0.716-0.847.

Table 12: Drivers of Project Alliance

Overall Rank	Drivers	Mean	Std	RII	Group RII
1	Government support help to establish Project Alliances	4.237	1.018	0.847	
2	Trust between all parties	4.184	1.23	0.837	
3	Commitments between all party	4.171	1.1	0.834	
4	Collaboration between all party	4.039	1.205	0.808	
5	Careful team selection & project specific team alignment	3.961	1.0125	0.792	
6*	Benchmarking & continuous performance monitoring	3.868	1.159	0.774	
6*	Mutual responsibility for managing risk	3.868	1.010	0.774	
8	Formation of a single entity	3.855	1.151	0.771	0.765
9	Best for project attitude	3.842	1.084	0.768	
10*	Integrated Alliance office	3.816	1.104	0.763	

10*	Staging of project & stretch targets	3.816	1.092	0.7631	
12	Early commercial development	3.803	1.317	0.762	
13*	Pre-project workshops & planning workshops	3.789	1.111	0.758	
13*	On-going workshops including site personnel	3.789	1.075	0.758	
15	Innovation and high performance	3.776	1.229	0.755	
16	Client demand on the facilities	3.763	1.198	0.753	
17	Participants with past working relationships	3.75	1.257	0.75	
18	Continuous Facilitator involvement	3.697	1.265	0.739	
19	Quick project Implementation	3.684	1.146	0.737	
20*	Competitive pressure	3.658	1.172	0.732	
20*	Culture change	3.658	1.114	0.732	
22*	Right personnel for Project	3.618	1.166	0.724	
22*	Promote a guidelines for project alliance model	3.618	1.264	0.724	
24	Web-based management program	3.579	1.158	0.716	

The most significance factor of Drivers of Project Alliance were Government support help to establish Project Alliances (rank 1) with RII value as 0.847 and Mean average value as 4.237.

The second significance factor of Drivers of Project Alliance was Trust between all parties (rank 2) with RII value as 0.837 and Mean average as 4.184.

The third significance factor of Drivers of Project Alliance was Commitments between all party (rank 3) with RII value as 0.834 and Mean average value as 4.171.

The fourth significance factor of Drivers of Project Alliance was Collaboration between all party (rank 4) with RII value as 0.808 and Mean average value as 4.039.

The fifth significance factor of Drivers of Project Alliance was Careful team selection & project specific team alignment (rank 5) with RII value as 0.792 and Mean average value as 3.961.

Table 12 shows the RII values for each factor, standard deviation, means and overall rankings for all the factors of the drivers. The factors have been explained in detailed.

Government support help to establish Project Alliances is seen as a major driver for the successful implementation of Project Alliance in order to reach for the best delivery for the project. The second major driver was Trust between all parties. There is a need of open book environment, new technics to raise the trust on other parties and also new guidelines and methods to know how to deal with the other parties will make it more effective for the Project Alliance.

4.5 Radar Chart for the Barriers

A) Radar Chart for the Personal Barriers

Figure 10 shows the Radar Chart results of Personal Barriers for implementation of Project Alliance. The most significant personal barrier is the lack of trust followed by lack in project alliance experience, lack of trained staff, lack of understanding the project alliance benefits, and lack of project alliance applying technique. The personal barriers group RII category was number two after the process barriers.
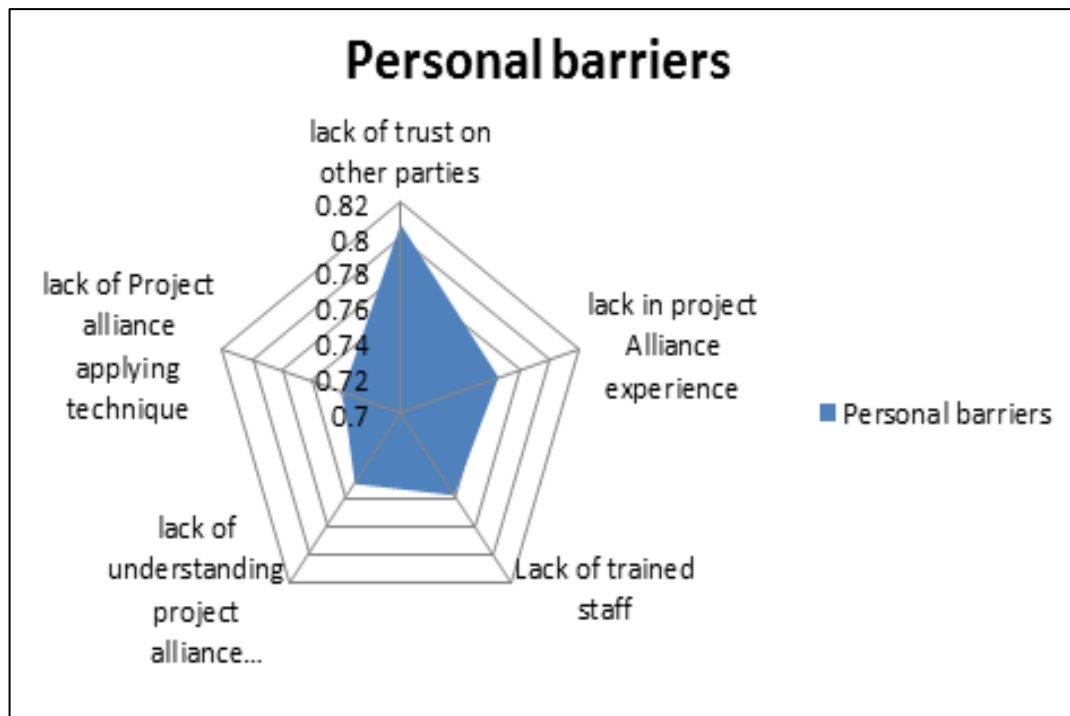
Figure 10: Radar Chart for Personal Barriers.

B) Radar Chart for the Process Barriers

Figure 11 shows the Radar Chart results of Process Barriers. The most significant process barrier is the lack of commitments take number one of this category, followed by risk challenges in the project, project alliance model build in mutual trust and that hard to do, party prefer risk transfer than risk sharing, and the cooperation model, share risk possibility decrease possibility to seek recompense for others party mistakes.
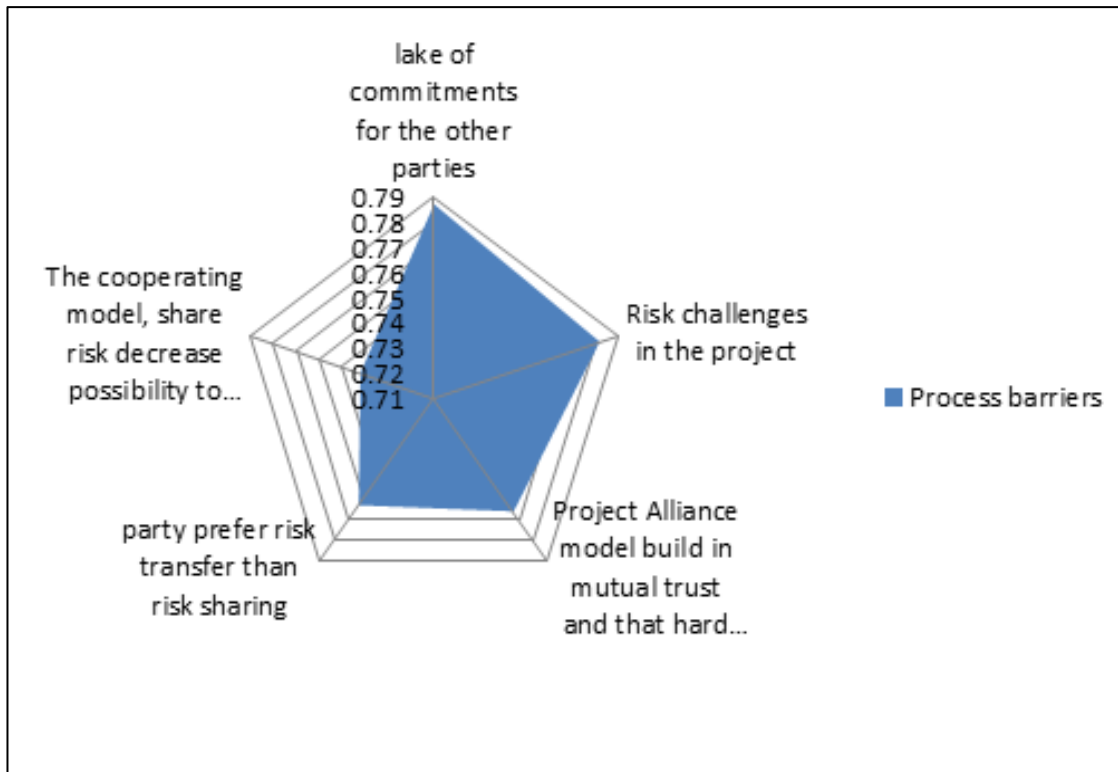
Figure 11: Radar Chart the Business and Market Barriers

C) Radar Chart for the Business and Market Barriers

Figure 12 shows the Radar Chart results of the Business and Market Barriers. The most significant business and market barrier is for early commercial development, followed by the lack of top management, unclear return investment, doubts about the payment arrangement, and other model are enough.
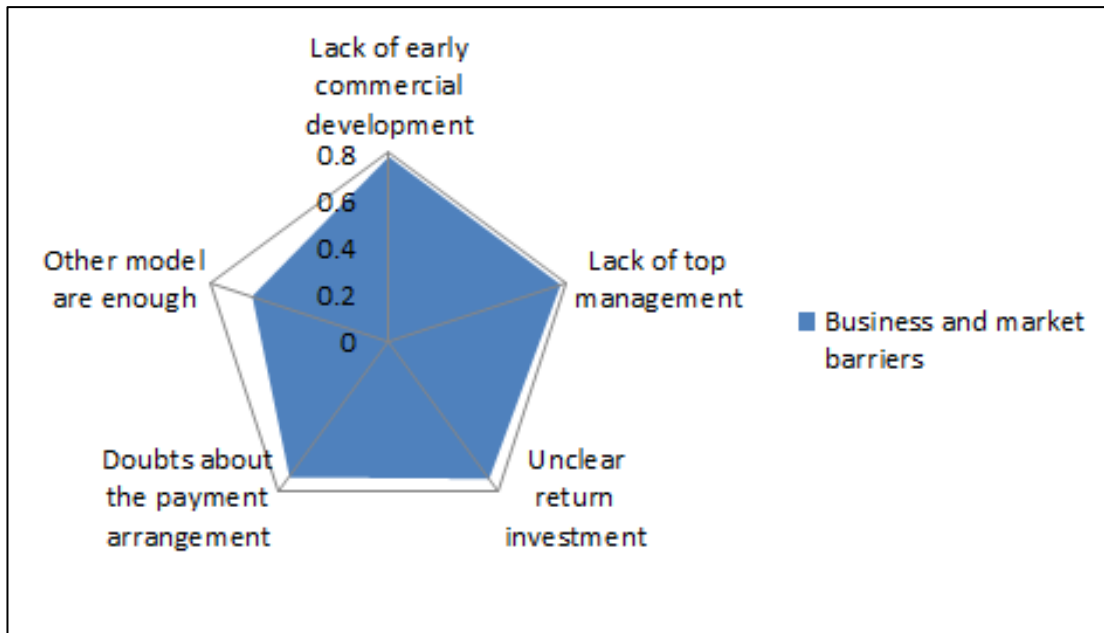
Figure 12: Radar Chart for the Business and Market Barriers

D) Radar Chart for Technical Barriers

Figure 13 shows the Radar Chart results of the Technical Barriers. The most significant technical barriers is hard to form a single entity, followed by wrong team selection & project specific team alignment, absence of pre-project workshops & planning workshops, best for project attitude, and lack of continuous performance monitoring.
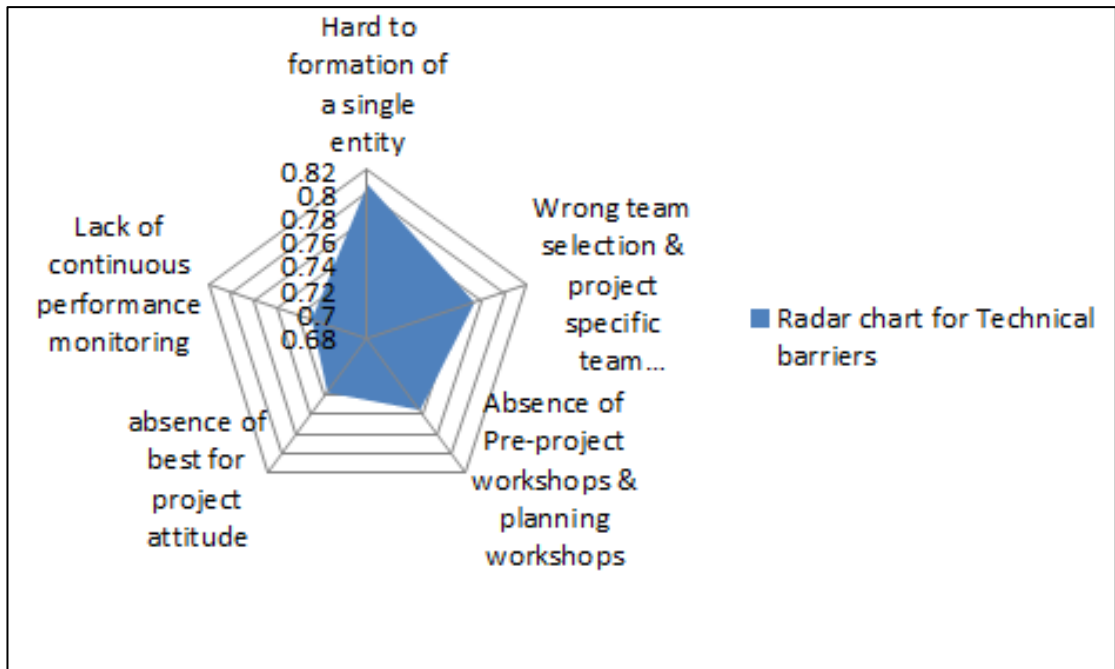
Figure 13: Radar Chart for Technical Barriers

E) Radar Chart for Top Five Drivers

Figure 14 shows the most significance Drivers of Project Alliance. Government support help to establish Project Alliances is ranked as 1st. Trust between all parties is ranked 2nd. Commitments between all parties is 3rd. Collaboration between all parties is ranked 4th and Careful team selection & project specific team alignment is ranked 5th.
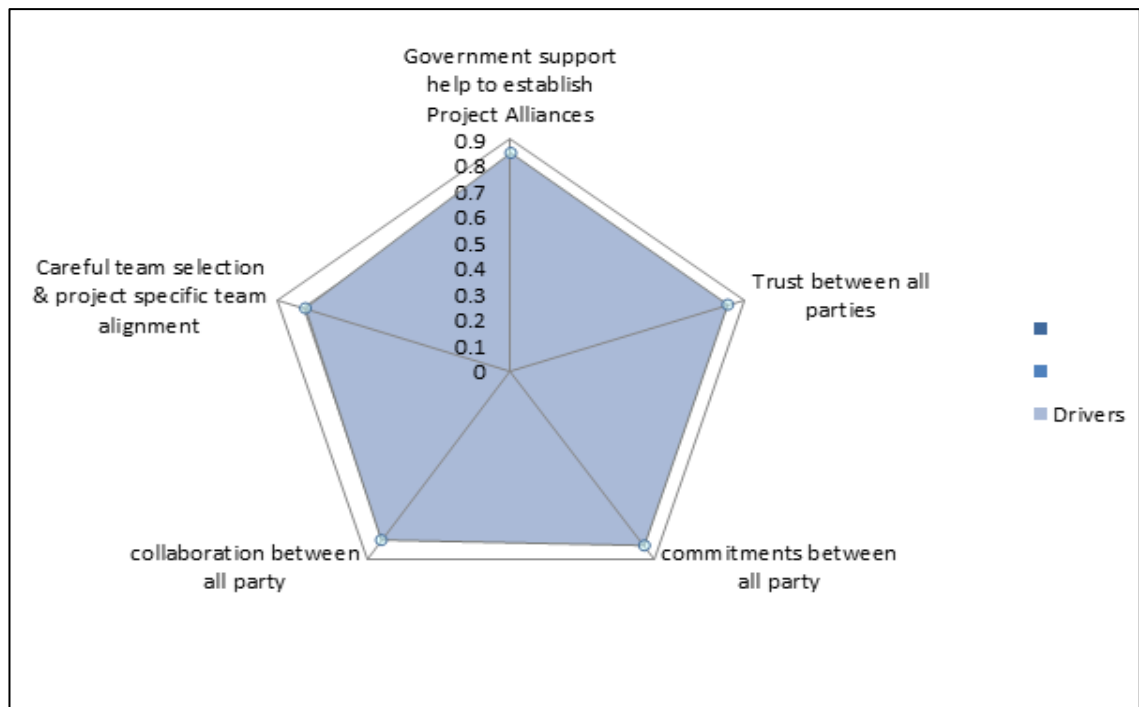
Figure 14: Radar Chart for Top 5 Drivers

4.6 Pearson Correlation and Significance Test

Pearson Correlation is a test used to check if there is a positive or negative relation between the top five barriers and drivers of project alliance found from RII test and ranked:

- If the P-value less than or equal to 0.05 the relation between variables is significance.

- If the P-value more than to 0.05 the relation between variables is not significance.

4.6.1 Pearson Correlation and Significance Test Analyses for the Barriers

Top five factors were lack of trust on other parties, hard to formation of a single entity, lake of commitments for the other parties, lack of early commercial development and risk challenges in the project. The significance of the relation is indicated by the p-Value.

Table 13: Pearson Correlation and Significance Test Analyses

		1	2	3	4	5
Lack of trust on other parties	$\frac{Correlation}{\rho - value}$	1.00 -	---	---	---	---
Hard to formation of a single entity	$\frac{Correlation}{\rho - value}$	0.506** 0.000	1.00 -	---	---	---
Lack of commitments for the other parties	$\frac{Correlation}{\rho - value}$	0.298 .009**	0.328** 0.004	1.00 -	---	---
Lack of early commercial development	$\frac{Correlation}{\rho - value}$	0.292* .011	0.388** 0.001	0.382** 0.001	1.00 -	---
Risk challenges in the project	$\frac{Correlation}{\rho - value}$	0.388** 0.001	0.501** 0.000	0.277* 0.016	0.406** 0.000	1.00 -

Table 13 shows the results of Pearson Correlation analysis of the factors. Coefficient of correlations (r) are moderate for all correlations between variables, majority of interaction p-value is 0.01 or below. The result of this test shows that there is a positive correlation between the top barriers.

5.6.2 Paired Correlations for the Drivers

Paired Correlation is a test used to check if there is a positive or negative relation between the top four drivers of Project Alliance found from RII test and rankings. Top four factors were trust between all parties, commitments between all parties, collaboration between all parties and government support help to establish project alliances. The significance of the relation is indicated by the P-Value.

Table 14: Paired Correlations

	Trust between all parties	Commitments between all parties	Collaboration between all parties	Government support help to establish Project Alliances
Trust between all parties	1.00 -			
Commitments between all parties	0.321** 0.005	1.00 -		
Collaboration between all parties	0.553** 0.000	0.468** 0.000	1.00 -	
Government support help to establish Project Alliances	0.455** 0.000	0.428** 0.000	0.492** 0.000	1.00 -

This test is used to show that the top four drivers are related to each other. Table 14 shows that all drivers are significantly positively correlated. P-value is less than 0.05 for all the factors. The result of this test shows that there is a positive correlation between the top drivers.

4.7 Hypotheses Testing and Paired Correlations

Five hypotheses were developed to test different factors of Project Alliances in Kuwait. It is needed to detect if there is any significant correlation between those factors based on RII test. The hypotheses were as follows:

- Null hypothesis= H0

- Alternative hypothesis =H1

4.7.1 First Hypothesis

First hypothesis will examine if there is any significant correlation between governments supports help to establish project alliances and trust between all parties. The hypotheses will be as follows:

- H0: Government's support help to establish project alliances discourage trust between all parties.

- H1: Government's supports help to establish project alliances encourage trust between all parties.

Table 15: First Hypothesis

	Paired Differences			t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean			
Government support help to establish Project Alliances & Trust between all parties	-0.355	1.411	0.162	-2.194	75	0.031

Table 15 shows the results from the t-test. The significance (2-tailed) obtained from paired samples test is 0.031 which is lower than the significance level of 0.05. Therefore, it is necessary to reject the null hypothesis (H0). The test shows there is significant interaction between governments supports help to establish project alliances and trust between all parties. That is a strong evidence how it's necessary for the government role in Project Alliance to build a trust between the alliance team in order to achieve the goals of the alliance. The government can prepare a new legislation encouraging the different parties to work together in one team.

4.7.2 Second Hypothesis

Second hypothesis will examine if there any significant correlation between Trust between all parties & Commitments between all parties. The hypotheses will be as follows:

- H0: Trust between all parties decreases the commitments between all parties.

- H1: Trust between all parties increases the commitments between all parties.

Table 16: Second Hypothesis

	Paired Differences			t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean			
Trust between all parties & Commitments between all parties	-0.329	1.248	0.143	-2.298	75	0.024

Table 16 shows the results from the t-test. The significance (2-tailed) obtained from paired samples test is 0.024 which is less than the significance level of 0.05. Therefore, it is necessary to reject the null hypothesis (H0). There is significant interaction between Trust between all parties & Commitments between all parties. If the trust builds between the parties then the commitments will increase because the alliance team makes the first step to success and that is to build the trust, if the parties start to believe in each other and work in open book environment, the result of project alliance will increase.

4.7.3 Third Hypothesis

Third hypothesis will examine if there any significant correlation between Trust between all parties & Collaboration between all parties the hypotheses will be as:

- H0: Trust between all parties decreases collaboration between all parties.

- H1: Trust between all parties increases collaboration between all parties.

Table 17: Third Hypothesis

	Paired Differences			t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean			
Trust between all parties & Collaboration between all parties	-0.276	1.103	0.126	-2.184	75	0.032

Table 17 shows the result from the t-test. The significance (2-tailed) obtained from paired samples test is 0.032 which is lower than the significance level of 0.05. Therefore, it is necessary to reject the null hypothesis (H0). There is significant interaction between Trust between all parties & Collaboration between all parties. Involving true and regular communication between the project alliance teams enhance the working environment. Thus building trust is the key for the true collaboration which is the basis for Project Alliance.

4.7.4 Fourth Hypothesis

Fourth Hypothesis will examine if there is any significant correlation between Lack of trust on other parties & Hard to formation of a single entity. The hypotheses will be as follows:

H0: Lack of trust on other parties decrease's the difficulties to form a single entity.

H1: Lack of trust on other parties increases the difficulties to form a single entity.

Table 18: Fourth Hypothesis

	Paired Differences			t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean			
Lack of trust on other parties & Hard to formation of a single entity	0.368	1.422	0.163	2.258	75	0.027

Table 18 shows the results from the t-test. The significance (2-tailed) obtained from paired samples test is 0.027 which is less than the significance level of 0.05. Therefore, it is necessary to reject the null hypothesis (H0).

There is significant interaction between Lack of trust on other parties & Hard to formation of a single entity. Lack of trust is harmful for the Alliance team also for

the organization. It affects negatively the productivity of the work and also for the continuity of the work. The results show that lack of trust is the main reason blaming the other party about job mistakes which cause destruction for the entity in project alliance.

4.7.5 Fifth Hypothesis

Fifth Hypothesis will examine if there is any significant correlation between Lack of trust on other parties & Lack of commitments for the other parties. The hypotheses will be as follows:

H0: Lack of trust on other parties' lags to Lack of commitments for the other parties

H1: Lack of trust on other parties leads to Lack of commitments for the other parties

Table 19: Fifth Hypothesis

	Paired Differences			t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean			
Lack of trust on other parties & Lack of commitments for the other parties	0.329	1.399	0.160	2.050	75	0.044

Table 19 shows the results from the t-test. The significance (2-tailed) obtained from paired samples test is 0.044 which is less than the significance level of 0.05. Therefore, it is necessary to reject the null hypothesis (H0).

There is significant interaction between Lack of trust on other parties & Lack of commitments for the other parties. Lack of commitments in work means delays, reschedules and additional cost for the project.

Chapter 5

CONCLUSION

5.1 Introduction

This chapter comprises three sections. The first section is an introduction to the chapter. The second section includes the conclusion involving the results of the questionnaire that was analyzed in chapter four. The third section contains the recommendations for further studies.

5.2 Conclusion

As shown in this research, Project Alliance is crucial in Kuwait construction industry to increase the performance of the projects, increase efficiency, and to have more efficient managers leading the projects. The significant drivers and barriers for the Project Alliance in Kuwait were evaluated from the questionnaire survey. Government support to help establish Project Alliances, Trust between all parties, Commitments between all parties and Collaboration between all parties were the top among twenty four (24) drivers. The governmental support for the project to help establish the Project Alliance was ranked first. There is evidence showing the important role of the barriers for Project Alliance as evaluated in chapter four. The top barriers in ascending order are Lack of trust on other parties, hard formation of a single entity, Lack of commitments to other parties, Lack of early commercial development and Risk challenges in the project among twenty (20) barriers. Full understanding of these barriers will help to improve Project Alliances, and to solve problems faced during implementation.

This research met its aims and objectives. The most important drivers and barriers were identified and a set of tests were used to analyze them according to the questionnaire responses. The Pearson Correlation and Significance test analyses for the barriers and barriers show that they are significantly correlated (positively) between each other. Five hypotheses were tested, reliability and validity were supported.

5.3 Recommendations

This research examines one aspect of Project Alliance in Kuwait state, which is the Drivers and Barriers for implementing Project Alliances in the Kuwait industry. Further studies in other aspects of Project Alliance are needed to cover all dimensions of Project Alliance in Kuwait like:

- Project Alliance strategies

- Project Alliance models

- Project Alliance organizational structures

- Project Alliance performances.

Other recommendations for further studies are:

1. The authorities in Kuwait public sector who are specialized in partnering approaches may consider the results of this study to assist in establishing Project Alliance and enhance the adoption in Kuwait construction industry.

2. Future researchers can focus on the managements skills required for alliance leaders.

3. Specific project types for example alliancing in transport large scale infrastructure projects can be investigated.

4. New perspectives of price competitiveness in Project alliance can be considered for further study.

5. New researches can be done conducted using other types of methods like interviews and case studies in order to overcome the handicaps faced in questionnaire survey.

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APPENDIX

Appendix A: Research Questionnaire

Project Alliance in Kuwait Construction Industry (2015-2016)

This questionnaire is designed for the people who work in the construction industry of Kuwait to measure the factors affecting the Project Alliance Implementation and Success.

<u>Section 1 Personal information</u>

1	Qualification level	a)BSc b)M.S c)PhD d)Other
2	Years of experience	a)0-5 b)5-10 c)10-15 d) more than 15
3	Organization Sector	a)Public b)Private
4	Number of employee in the organization	a)0-15 b)16-30 c)31-50 d)50-100 e)more than 100
5	Position in the organization	a)Manager b)Engineer c)Contractor d)Architect e)Owner f)Other
6	What is the specialty of the company you work at?	a)Construction b)Transportation c)Infrastructure d)Management e)Other

7	Do you have any experience with project Alliance model?	a)yes b)No			

Section 2 Barriers to Project Alliance

Barriers to Project Alliance	Strongly Disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly Agree 5
1-Lack of trained staff					
2-lack of understanding project alliance benefits					
3-Lack in project Alliance experience					
4-lack of Project alliance applying technique					
5-lack of trust on other parties					

Personal Barriers

Barriers to Project Alliance	Strongly Disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly Agree 5
1-Party prefer risk transfer than risk sharing					
2-Risk challenges in the project					
3-Lack of commitments for the other parties					
4- Cooperating model, share risk decrease possibility to seek recompense for others party mistakes					
5-Project Alliance model build in mutual trust and that hard to do					

Business and market barriers

Barriers to Project Alliance	Strongly Disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly Agree 5
1-Unclear return investment					
2- Doubts about the payment arrangement					
3-Lack of top management					
4-Other model are enough					
5- Lack of early commercial development					

Technical barriers

Barriers to Project Alliance	Strongly Disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly Agree 5
1-Lack of continuous performance monitoring					
2-Wrong team selection & project specific team alignment:					
3.Absens of Pre-project workshops & planning workshops					
4- Hard to formation of a single entity					
5-Absens of best for project attitude					

Section 3 Drivers of project alliance

Drivers of Project Alliance	Strongly Disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly Agree 5
1-Best for project attitude					
2-Formation of a single entity					
3-Pre-project workshops & planning workshops					
4-Continuous Facilitator involvement					
5-Careful team selection & project specific team alignment:					
6-Right personnel for Project					
7-Web-based management program					
8-Integrated Alliance office					
9-Staging of project & stretch targets					
10-Benchmarking & continuous performance monitoring					
11-Early commercial development					
12-On-going workshops including site personnel					
13-Participants with past working relationships					
14-Trust between all parties					
15-Comitmmets between all party					
16-Colabration between all party					
17-Mutual responsibility for managing risk					
18-Innovation and high performance					
19-Quick project Implementation.					
20-Government support help to establish Project Alliances					

21-Competitev pressure					
22-Cultural change	81				
23-Promote guidelines for project alliance model					
24-Client demand on the facilities					