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Alliance Contracting Models in Construction Projects: Leadership and Management

Master thesis

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Abstract

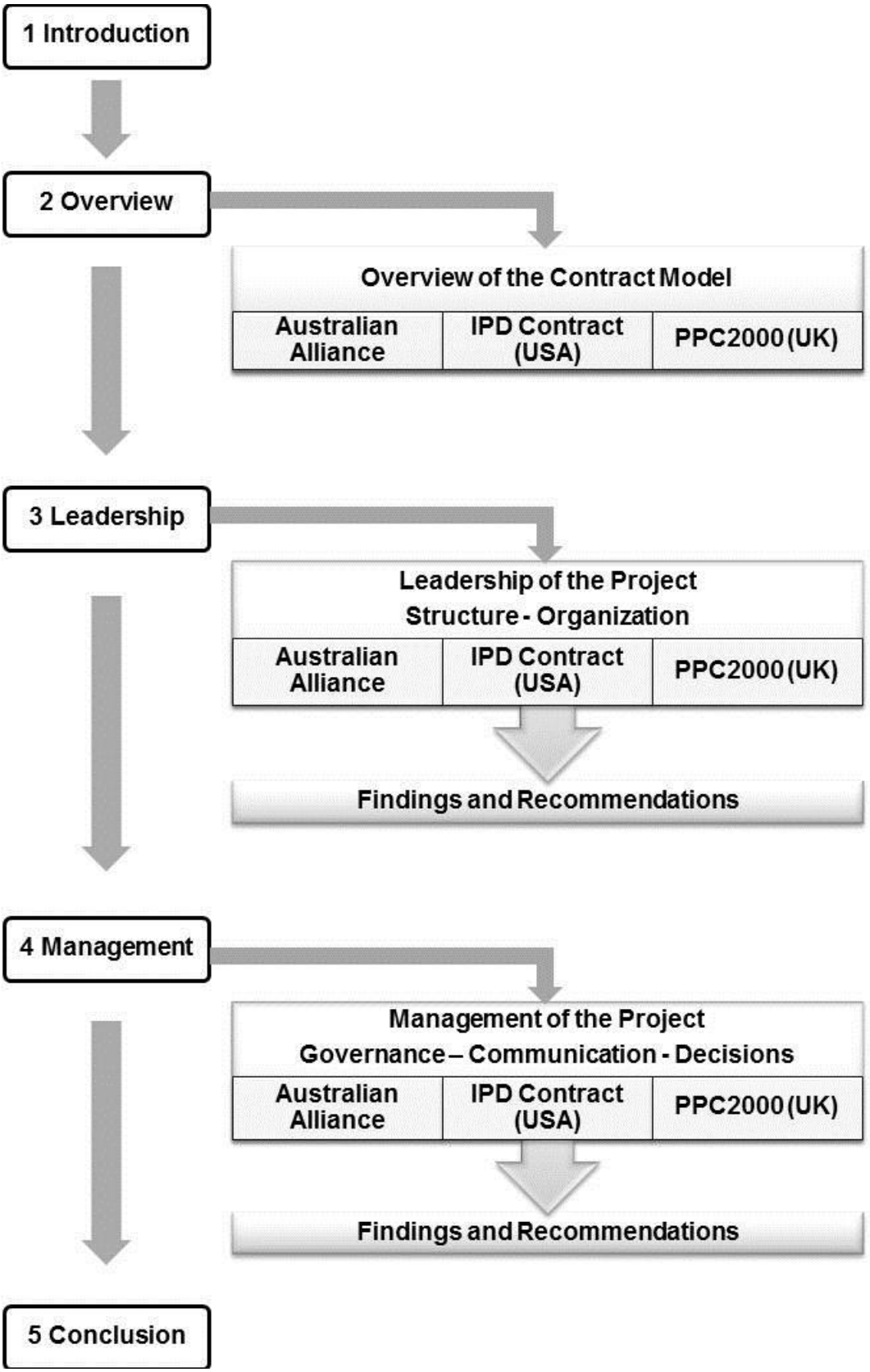
Project Alliancing has emerged as an alternative project delivery method. Project Alliancing is a relational contracting mechanism widely employed to handle complex projects. Alliancing requires all project participants to work as one integrated team by tying their commercial objectives to the actual outcome of the project (mutual gain and pain). It covers the whole process of the project starting from design stage, in some cases starting from development stage, until completion by making use of all participants' inputs during each stage.

Through this study a comparison between the three project Alliancing models (Australian Alliance Models – IPD Models – PPC2000 Model) will be conducted. The study will cover only the aspects of project leadership and project management. By comparing the three main project alliancing models and their project management styles, a list of findings and recommendations will be provided as a result of this study.

The first chapter is an overview of each one of the three project Alliancing models. The second chapter focuses on the leadership structure of the alliance by comparing the methods used in every model. The third chapter focuses on the management of the alliance projects also by comparing different management styles from the three models. A list of findings and recommendations is provided after each chapter. Finally a conclusion at the end summarizes the results of the study.

The project Alliancing introduces new concepts, such as: one integrated management team, collaborative performance, open-book communications, and collective decisions making. How the project administration and leadership should be structured and what is the best management style could be quite different than the traditional construction projects.

Thesis Structure



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List of Abbreviations

NOPs: None owner participants

PAA: Project alliance agreement

TOC: Target outturn cost

VFM: Value for money

ALT: Alliance leading team

AMT: Alliance management team

ADT: Alliance delivery team

IPD: Integrated Project Delivery

CFT: Cross functional team

PPC: Project partnering contract

BIM: Building information system

1 Introduction

The atmosphere in which most of construction projects are executed nowadays usually involves accomplishing complex projects with high number of uncertainties and within limited budget and time. On the other hand, “change” is one of the main characteristics of such projects and seems to be inevitable, whether due to client modifications or project circumstances. In this environment “trust” between different project participants has been proven to have an important role over the project performance and its outcome.

Unfortunately, most traditional contracting forms do not facilitate change or advocate for trust. Such contracts are overwhelmed with legal and financial consequences and penalties statements. These statements lead, as the project progresses, to adversarial relationships and encourage opportunistic behaviors between project main participants. Therefore, individuals will be more concerned with protecting their own interests rather than focusing on the project performance. Moreover, traditional contracts provide limited opportunities for innovative approaches and alternative engineering solutions.

In response to the traditional contracting limitations, Project Alliancing has emerged as an alternative project delivery method. Project Alliancing is a relational contracting mechanism widely employed to handle complex projects. Alliancing requires all project participants to work as one integrated team and it covers the whole process of the project starting from design stage until completion.

Project Alliancing method has been used in several countries all over the world and many different models have been developed. Alliancing started as an alternative project delivery of the oil industry in the United Kingdom in the early 1990s. Soon it was adopted by the Australian government and has been used in several public sector projects. The Australian Alliance Models is very well constructed and all the related contract documents and guides were published by the Australian government. Another project Alliancing model was developed in

the United States under the name of IPD (Integrated Project Delivery). It was also adopted by the American Institute of Architects (AIA). One more model was established in the United Kingdom under the name of PPC2000 (Project Partnering Contract) which was drafted in the year of 2000 by the Association of Consultant Architects (ACA). The alliancing models have been used in many other countries in the world as well; recently in Finland it is becoming very common. Nevertheless, one or a combination of the previous three models is usually used in those countries.

Due to the special nature of project Alliancing, it requires a new set of rules for management. Traditional project management and project organization might not be compatible with the Alliancing aspects. The project Alliancing introduces new concepts, such as: one integrated management team, collaborative performance, open-book communications, and collective decisions making. How the project administration and leadership should be structured and what is the best management style could be quite different than the traditional construction projects.

Through this study a comparison between the three project Alliancing models will be conducted. The study will cover only the aspects of project leadership and project management. The comparison will focus on the similarities and differences between the three models, showing how the project Alliancing is being structured and managed in different countries. By comparing the three main project alliancing models, a list of findings and recommendations will be provided as a result of this study.

2 Overview of Alliance Contracts

2.1 Alliance Contracts (Australian Model)

2.1.1 What is an Alliance?

An alliance is a project delivery method for construction projects in such the owner or owners work collaboratively with one or more service providers such as (planners, designers, construction managers, contractors) in one integrated team in order to accomplish a specific project. In such form all participants work under a contract that aligns their commercial interests with the outcome of the project in which they share all the pain and the gain. All parties are requested to operate under full trust, good faith, integrity and open book policy. All decisions are made unanimously and in the best-for-project manners.[1]

The alliance required forming one integrated team to run the project that consists of members from different organizational backgrounds; however this team should operate as a one body with equal members and take decisions for the best interest of the project only. Therefore, an alliance removes the organizational differences and enhances the trust based relationships between members and in return between organizations.[2]

In the traditional types of construction contracts include responsibilities and risks allocation for different parties. Those contracts are full of financial and legal consequences in case one party has failed in performing their duties. Furthermore, the risk allocation is not always in the best interest of the project rather than the best interest of the owner. Sometimes a big risk is being allocated to weak party that is not qualified to deal with such risk which in return will have a bad influence on the project regardless of the contractual compensations.[3]

[1] (Department of Infrastructure and Regional Develoment (guide) 2015, 9)

[2] (Ross 2003, 1)

[3] (Department of Infrastructure and Regional Develoment (guide) 2015, 9-10)

On the other hand, the key factor of alliance contracts is risk sharing. All project risks are being collectively shared and managed by all the participants. In a pure alliance all participants:

a) Accept collective responsibility for accomplishing the project.
b) Take collective ownership of all the risks (and opportunities) that are involved in delivering the project.
c) Share completely the “pain” or the “gain” of the project depending on how the project ended up comparing to the pre-set targets that were accepted by all of them.[4]

Under an alliance contract all the risks and opportunities are shared equally between the participants, however the financial outcomes are not shared in an equal way between the owner and the none-owner-participants (NOPs). This means that although the risk is collectively shared but there is a limit of the financial losses that the NOPs would undertake. (Fig 01)

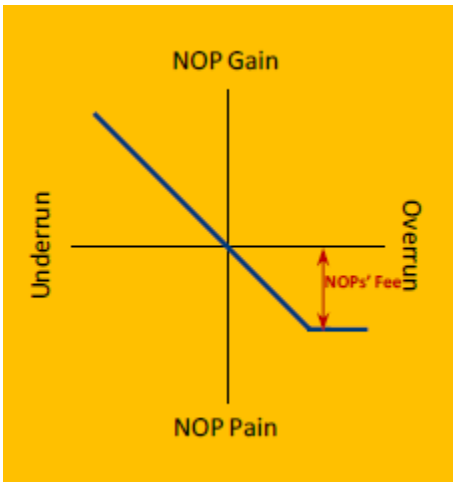


Figure 1 Risk or Reward Model in Alliance Contracts[5]

The alliance contracts work in a complete different way of the traditional ones. In traditional contracts the owner requires a service and describes it properly then

[4] (Ross 2003, 1)
[5] (Department of Infrastructure and Regional Develoment (guide) 2015, 9)

search for service providers who are able to provide it. The service providers estimate their price for the specific service and send their offers. Then the owner and the service provider sign a contract that defines the specific service and the equivalent price. Variations are usually in place in case of any change of the pre-described service. Both sides prepare their own risk assessment from the perspective of their own interest which is not always the best interest for the project. This approach works well when projects do not have many unknowns or unforeseen risks and their outcomes are easily predicted.

However, the more complex projects get the more unknown risks they have. Consequently contractors will have to raise their bidding price in order to absorb all of those risks (whether they actually happen or not) which means that owners will have to pay higher costs for the project. Moreover, if the owners wish to keep some of the risks under their umbrella it might open the way for variation orders which are usually time consuming and eventually lead to cost overrun.

Alliance contracting provides a complete different approach to construction projects. Collaboration between owner and NOPs create an environment of trust and sharing abilities and experiences for accomplishing the project. The integrated team and unanimous decision making enhance the policy of risk sharing in which risks is no longer a burden on the project rather than part of the process. Variations are generally avoided except in specific cases and all the time and effort spent on them is saved. The time and effort of the management team is spent on value-adding activities rather than contractual disputes.[6]

[6] (Department of Infrastructure and Regional Develoment (guide) 2015, 11)

2.1.2 Alliancing Success Factors

According to the guidebook published by the Australian department of infrastructure and regional development (guide to alliance contracting), even though the alliance is created by the owner in order to deliver their objectives however the success of an alliance depends on other aspects. Alliance success factors could be represented as in the following figure. [7] (Fig 02)

- Integrated and collaborative team: project team includes members from the owner side and the NOPs. Those members must operate in one integrated unit taking unanimous decisions for the best interest of the project. Relationships among members should be based on trust and equality.

- Project solution: the way project is planned or designed, the possibilities of procurement, the method of construction and the commercial targets.

- Commercial arrangements: are stated in the project alliance agreement (PAA) in a way that align the interests of different participants to the best benefit of the project.

- Target outturn cost (TOC): it is the estimated cost of designing and constructing the project. It is part of the commercial agreement and should be accepted by all the participants.

[7] (Department of Infrastructure and Regional Develoment (guide) 2015, 12 - 14)

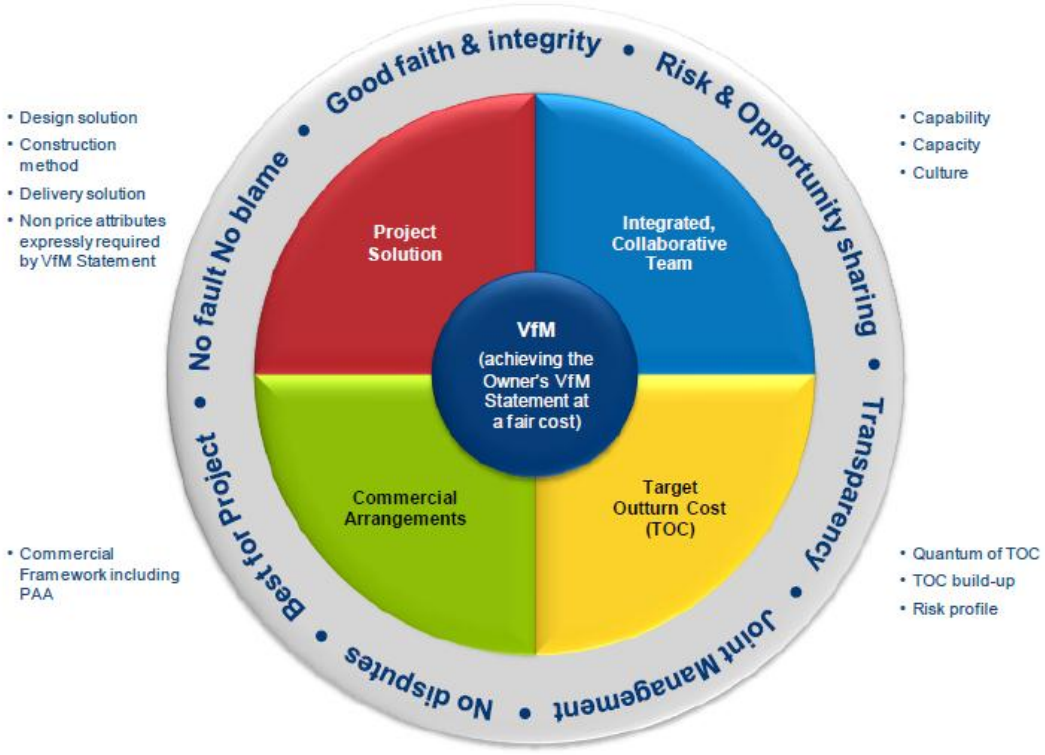


Figure 2 Alliance Success Dynamics[8]

2.1.3 Alliancing key features

In addition to the previous mentioned factors there are also a number of other important aspects and features that distinguish alliance contracts and must be taken into consideration for a successful alliance.[9] (Fig 02)

- Sharing of risk and opportunity: the main aspect of alliance contracts is the "collective assumption of risks" between all participants. Risk sharing instead of risk allocation is the alliance approach where all participants including the owner share all the design and construction risks.
  This approach avoid the misallocation of some risks into the weakest party that might happen in the traditional contracting and in return might have a bad impact of the project outcome.

[8] (Department of Infrastructure and Regional Develoment (guide) 2015, 14)
[9] (Department of Infrastructure and Regional Develoment (guide) 2015, 14-21)

However, owners should pre-check the risk profile of their NOPs during the selection process otherwise they might end up bearing more risks than they expected some of them are not even project related.

- Commitment to "No Disputes": alliance contracts are based on trust and team work, therefore it usually include all participants commitment to "no disputes". It means that all disagreements will be handled internally and none of the participants will have the ability to litigate or arbitrate unless in very limited cases. As a result any claim-oriented behavior will be avoided and the focus will be on resolving any conflicts to the best of the project.

- Best-for-project decision making process: another significant difference of alliance contracts from the traditional ones is that owners are willing to share the risks in exchange for all participants to align their commercial interests with the project interest. Consequently all decisions that are made based on the best-for-project principle.

  According to the National Alliance Contracting Guidelines issued in Australia 2015, all decisions will: "*be made in accordance with the alliance principles developed by the Participants and incorporated in the Project Alliance Agreement (PAA); drive the achievement of all project objectives (as per the Owner's VfM Statement) at a fair cost, where a fair cost is reference to best-in-market pricing; be made in a way that reflects the Participants' behavioral commitments under the PAA (including the Alliance Charter); and fully take into account public sector standards of behavior and protects the public interest*".[10]

- A "no fault – no blame" culture: it is one of the main characteristics of alliance contracts. It means that in case of error, poor performance or none conformity participants will not attempt to blame each other rather

[10] (Department of Infrastructure and Regional Develoment (guide) 2015, 19)

than finding the solution in a best-for-project way. This is very useful for the owner because it encourages all participants not to focus on avoiding the blame by hiding some of the problems.

- Operate in good faith and integrity: to operate under good faith and integrity is a defining aspect of all alliance features. It is usually the culture which characterizes the alliance project till completion. It means for all participants to operate cooperatively and to be fair and honest in communication among them. Furthermore, a good faith culture is expected from all participants even while resolving any disputes.

- Transparency; “open-book” documentation and reporting: all participants in the alliance should commit to an “open-book” policy. Where all documentations and reports are available for all other participants to review and audit if needed. This is very important in terms of reimbursed costs calculation, in such NOPs are expected to have a very good record of all project activities which need to be paid by the owner. Also owners should have their own professional experts whom are able to review and audit such documents, monitor the TOC, and reimburse NOPs accordingly. On the other hand, owner’s open-book record makes it easier for all NOPs to understand why certain decisions must be taken for the best interest of the project.

- A joint management structure: forming an alliance includes forming one integrated management team. These management team/teams should include member from all participants and according to their abilities and experience. In such arrangement all decisions are taken collectively and unanimously and all members have equal votes.

2.1.4 History of Alliance Contracting

The alliance concept has evolved since it was first introduced in the North Sea offshore oil industry in the early 1990s as a method to share the risk of complex, costly projects among all the stakeholders. Prior to this time, owners had tried a number of different approaches to enhance collaboration and risk sharing between themselves and their design consultants and construction contractors. One of those was the use of partnering workshops in the early 1990s.[11]

In the early 1990's British Petroleum (BP) had an oil reserve project in the North Sea with difficult situation and with a lot of competition in the world. It became clear to them that a new approach must be adapted to reduce project costs. As a result they decided to depart from the traditional business strategies (competitive bidding and risk allocation contracts). As John Martin, BP manager, states: "an even more radical formula was called for, a complete departure from the usual style of oil industry contracting, on which required a step change in behavior. The adversarial relationships between oil companies, contractors and suppliers had to be confined to the history books – we believe that only by working in close alignment with our contractors could we hope to make a success".[12]

Project alliancing was firstly adapted by the infrastructure industry in Australia, since their projects usually involve high risks and many unknowns. Experts started to notice that traditional contracting is not very effective in such project and the need for an alternative method arose. The first alliance projects in the early 1990s were established based on a non-price tendering procedure and relied on participants' commitment to trust, good faith, and open book policy. From 1995 to 1998, the alliance process became more sophisticated and the idea of best-for-project decisions emerged.[13]

[11] (NCHRP "National Cooperative Highway Research Program" 2015, 5)
[12] (Sakal 2005)
[13] (Department of Infrastructure and Regional Develoment (guide) 2015, 26-28)

Australia is considered the pioneer country in adapting this method with almost over 400 Alliance Projects that have been accomplished so far. In the UK as well there were many successful alliance project that have been executed in the past years, Probably the most successful integrated project delivery is the British Airport Authority's (BAA) Heathrow T5 Project Management Agreement. Many other examples of the alliancing could be found in other countries such as: New Zealand, the Netherlands, and USA.

In the recent years, alliance is becoming more common in Finland as well. Many successful project alliances have been established. The first Project Alliances by Public Procurement in Finland was the Finnish Transport Agency and University of Helsinki. And so far over 20-25 projects have been done using the alliance approach.[14]

2.1.5 Differences between traditional contracting and alliancing

The main difference between traditional contracting and alliancing is that in alliancing all participants' interests are tied to the outcome of the project. Some might say that even in traditional contracting that is true however the perspective of each party in which they define project outcome is different. This usually creates a conflict of interest and an adversarial behavior that might divert the main focus of all participants from the project into their own goals.

On the other hand, construction projects have become more dynamics recently where "change" seems to be a defining characteristic. In traditional contracts change has a bad influence on the project, often leads to a long process of variation orders and eventually to time and cost overrun. However, alliance contracts are designed to facilitate change easily. Change is considered part of

[14] (Saarinen 2014)

the process and is being handled as way of optimizing project outcomes rather than an obstacle.[15]

Another huge difference is the culture of the project. In traditional contracts rights, obligations, and even relationships between participants are stated clearly in the contract. Any diversion from any party will subject them to legal and arbitrational consequences, which the contracts usually are full of. On the contrary, alliance contracts advocate trust and tone of their main aspects is “no dispute” which creates a better more positive environment in the project based on trust and best-for-project behavior.

Moreover, studies have shown that opportunistic behavior is significantly decreases when using project alliancing as a delivery method. In which client and NOPs are working together cooperatively in order to realize the project and to overcome the risks. Whereas, in many traditional forms of contracting, the level of distrust among parties, together with the continuous close supervision of the construction work, easily leads to a very adversarial environment facilitate opportunistic behavior. In which, participants might have some hidden agenda apart from the project goals despite of the enormous amount of legal consequences that traditional contracts usually have. However, this does not mean that it is guaranteed for all participants in an alliance to adapt a cooperative attitude; in fact this is an important aspect that employers need to ensure that all project members are aware of and performing accordingly. [16]

Most of the construction industry has settled to the fact that there is no better way of conducting business, especially because traditional contracts have been used for ever so far with acceptable results. However, there are visionary groups convinced that there is still a place for improvement. These groups have tried to develop new ways of contracts addressing the problematic issues that exist in

[15] (Sakal 2005)
[16] (Voordijk, Dewulf and Laan 2011)

the traditional ones. One of the best examples of such new innovative contracting methods is project alliancing.[17]

2.1.6 Differences between partnering and alliancing

Partnering is defined as a management approach to make team working across organizational boundaries possible. Its main components include mutual objectives, agreed problem resolution methods, and an active search for continuous improvements. Construction Industry Institute Australia (1996) suggests a partnering approach is developed to run in parallel with a traditional construction contract in order to provide guidelines to the relationship between the organizations.[18]

Confusion between partnering and alliancing is often common in the construction industry. The most significant distinction between partnering and alliancing is described by Walker & Hampson as:

"*With partnering, aims and goals are agreed upon and dispute resolution and escalation plans are established, but partners still retain independence and may individually suffer or gain from the relationship. With alliancing the alliance parties form a cohesive entity, which jointly shares risks and rewards to an agreed formula*"[19]

Another main difference between partnering and alliancing is that partnering only ties the commercial interests of the partners but it does not state the way of achieving this interests or the relationships between them. On the other hand, in an alliance all participants are expected to act in one integrated team and good-faith is not a behavior by choice but it is a contractually binding statement. In alliance trust, integrity, and transparency are defining aspects of the project and

[17] (Sakal 2005)
[18] (Rowlinson and Cheung 2004)
[19] (Walker and Hampson 2003)

all participants commit to work according to these qualities the moment they enter an alliance.

Furthermore, disputes resolution is different between partnering and alliancing. While partnership may decrease the number of disputes in project but it will not eliminate them completely. Partnering contracts still have legal statements in terms of dispute resolution and still have the possibility to litigate and arbitrate. However, the essence of alliance contracts is “no disputes, no litigate, and no arbitrate”. Participants of an alliance work together in order to resolve any problem in a best-for-project way before it escalates.[20]

[20] (Rowlinson and Cheung 2004)

2.2 IPD Contracts (USA Model)

2.2.1 What is an IPD?

IPD or “Integrated Project Delivery” is defined according to the AIA “The American Institute of Architects” in their published IPD Guide issued in 2007 as: “A project delivery approach that integrates people, systems, business structures and practices into a process that collaboratively harnesses the talents and insights of all participants to optimize project results, increase value to the owner, reduce waste, and maximize efficiency through all phases of design, fabrication, and construction.”[21]

IPD approach could be applied to a variety of contractual forms and IPD teams include member beyond the traditional (owner – designer – contractor). The main aspect of IPD teams is efficiency and effectiveness; teams are created since early design stage and maintained throughout the whole project until handing over.

The main differences between IPD and traditional project delivery could be summarized as the following[22]:

- **Teams**: traditional teams are fragmented and assembled only when needed, intensively hierarchal and strongly controlled. Whereas IPD creates integrated teams consist of members from all project stakeholders, assembled at the early stage of the project, collaborative and open.
- **Process**: traditional projects have linear, distinct, and segregated process where knowledge is gathered only as needed and not openly shared. Whereas IPD process is concurrent and multi-level, with early contribution

[21] (AIA (The American Institute of Architects) 2007)
[22] (AIA (The American Institute of Architects) 2007, 1)

of knowledge by all stakeholders and openly shared information in a trust based environment.

- **Risk**: traditional risk management is based on risk distribution and transfer, in which risk is individually handled by project parties. Whereas the main aspect of IPD projects is risk sharing and collectively managing.
- **Compensation / Reward**: traditional way of contracting forces individual perusing of reward where everyone aims for maximum profit with minimum effort. Whereas IPD contracts align individual goals of all parties to the overall outcome of the project.
- **Communications**: even though many traditional projects are using BIM technology but it is not mandatory and most likely only 2d or 3d technologies are being used. Whereas IPD mandates the usage of BIM for communication and design and also encourages the 4d and 5d technology as well.
- **Agreements**: traditional agreements encourage unilateral behavior and are drafted based on risk allocation principles. Whereas IPD agreements encourage, promote, and support multi-lateral behavior in which risk sharing and collaboration are fundamental.

2.2.2 IPD Principles[23]

- **Mutual respect and trust**: in IPD projects all the stakeholders (owner, designer, contractor, sub-contractors, consultants, etc.) agree to work collaboratively in a trust based environment and they commit not to breach this trust.
- **Mutual benefit and reward**: all participants of an IPD project benefit from their early involvement and their expertise which contribute to project design and execution. All participants goals are tied to the overall outcome of the project therefore the rewards are shared.

[23] (AIA (The American Institute of Architects) 2007, 5-6)

- **Collaborative decision making**: decisions are always made for project best interest and consequently to all participants benefits. Decision making process is carried out collaboratively and till a certain extent unanimously.
- **Early involvement of key participants**: in IPD projects key participants are involved right from the early phase of design. Their knowledge and experience are utmost useful for early decisions where less information are available.
- **Early goal definition**: project goals are defined early with the help of participants' early involvement. Project goals are in line with each participant commercial interest.
- **Intensified planning**: IPD approach recognizes that increasing effort in planning will result in better execution. At the same time, taking advantage of the participants' early involvement IPD produce better quality design and planning.
- **Open communication**: IPD promotes an open communication policy based on trust and respect among all participants in a no-blame culture and internal disputes resolution process.
- **Appropriate technology**: IPD approach encourages the usage of cutting edge technologies. Especially in terms of information sharing and exchange. BIM software is mandatory for all participants including sub-contractors.
- **Organization and leadership**: IPD leadership is carried out by one integrated team that includes members from all participants. Roles and responsibilities are clearly defined and distributed among member in a best-for-job manner however without creating any barriers. Teams' communication and coordination is vital to project success therefore IPD developed many methods to guarantee that. Also trust, honesty, and collaboration are the main aspects of an IPD project and all participants must commit to them.

2.2.3 IPD Elements and Outcomes

(Fig 03)

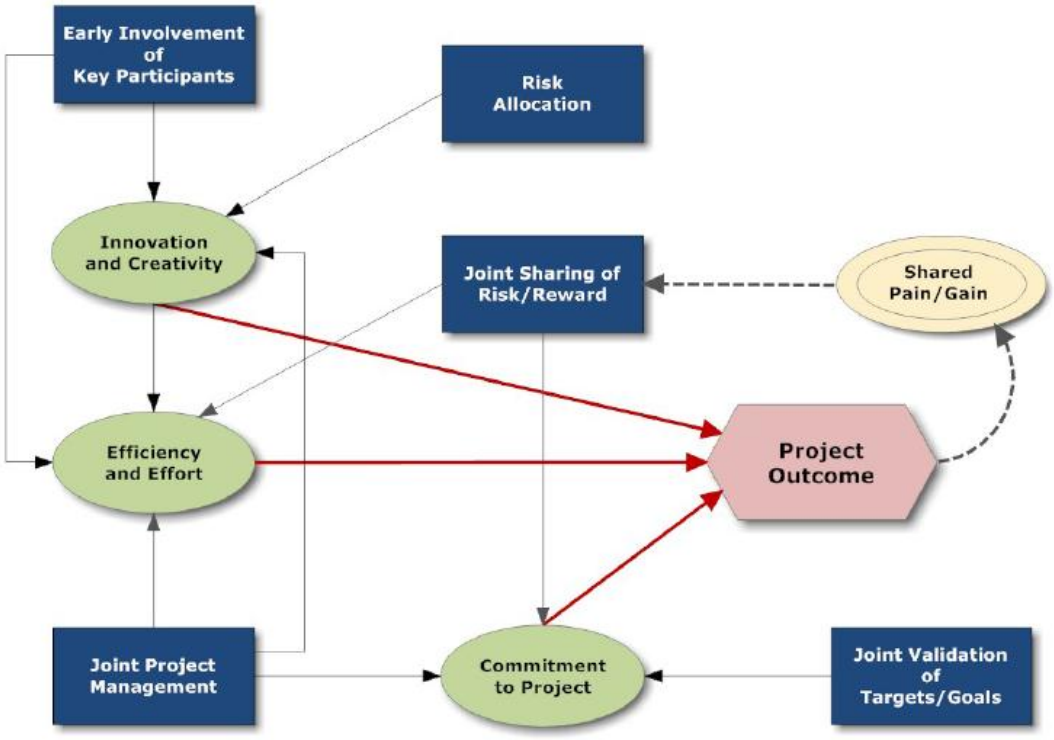


Figure 3 IPD Elements and Outcomes[24]

2.2.3.1 Early involvement of Key participants

Key participants are the ones who have great influence on the project and its outcomes. They are different from one project to another according to each project special nature and conditions. Key participants may include in addition to (owner – designer – contractor): MEP contractor, steel erector, curtain wall contractor, special equipment provider, operator, facility manger, and end user.

Key participants early involvement is one of the main aspects of IPD. The broad and diverse knowledge and experience that those participants bring are very important, and incorporating them in the early design decisions will result in a

[24] (Ashcraft, The IPD Framework 2012, 5)

better and more efficient design solutions. Also the diversity in participants' viewpoints will enhance performance and facilitate more innovation and creativity.[25]

2.2.3.2 shared risk/reward based on project outcome

IPD agreement ties participants profit to the overall outcome of the project. Participants' compensation is not merely a result of an individual amount of work executed rather than a proportion of the total profit of the project which is only accomplished through project success.

Tying participants' commercial interests to the project outcome discourages any selfish or opportunistic behavior. Participants realize that selfishness in IPD project equals self-defeating. Moreover, the risk sharing concept encourages all participants to work more collaboratively, giving useful advices to each other's because one's success means everyone's success. The main goal of each participant in an IPD project is optimization of the whole project not only single systems or elements.[26]

2.2.3.3 Joint project control

In order to achieve joint project control an efficient communication and coordination between all parties must be established. Each party should be able to present their own perspective while at the same time listen to the others perspectives. Joint project control is the essence of IPD in which the project transfers from "their project" into "out project" according to all parties.

The IPD projects are managed by one integrated team that consists of member from all the key participants in the project. Decisions are always made for the best interest of the project and in the most collaborative manners. Team

[25] (Ashcraft, The IPD Framework 2012, 5)
[26] (Ashcraft, The IPD Framework 2012, 6)

members are chosen based on their skills and competence regardless of their organizational background and decisions are taken unanimously.[27]

2.2.3.4 Reduced liability exposure

The main reason for reducing liability exposure is to enhance communication, encourage creativity, and minimize excessive contingency planning. Waiving liability to a certain extent reduces the fear of failure which is the corner stone for team members' suggestions in a creative project.

Reducing liability also saves the extra costs which are usually reserved for contingency allocation. In traditional projects there is always an extra cost added to the total cost for risk management. Moreover, liability waiver also reduces a litigation cost which is merely an enough reason.[28]

2.2.3.5 Jointly developed targets

Jointly developed targets are the first task which all parties of the project carry out and are the first real expression of the collaborative nature of an IPD project. Jointly developed targets are documented, signed by all parties, and later provide scale for determining the financial compensation of each party.

Since targets of the project are jointly developed and agreed on by all parties, each party owns those targets and commits to accomplish them successfully.[29]

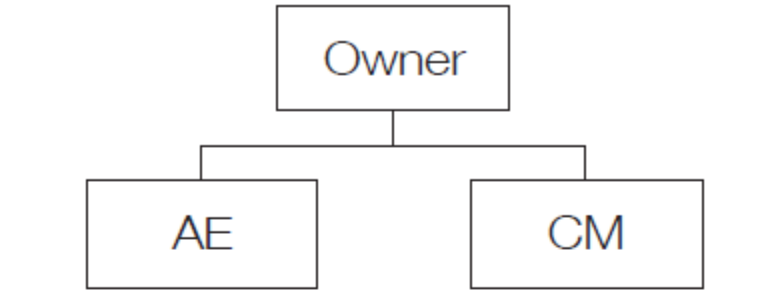
2.2.4 Integrated Agreements

The IPD agreement is a multi-party agreement, in which the main idea is to align the interests of multi companies together in order to operate as a one company.

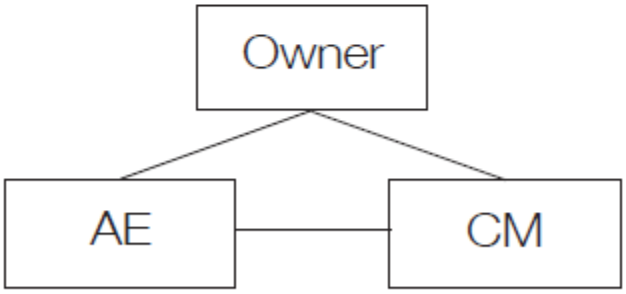
2.2.4.1 Legal relationships among the core team

[27] (Ashcraft, The IPD Framework 2012, 7-8)
[28] (Ashcraft, The IPD Framework 2012, 9)
[29] (Ashcraft, The IPD Framework 2012, 10)

In traditional contracts the owner has independent contracts with the designer, contractor, project manager, and other project parties (Fig 04). Even though the work of all parties is somehow overlapped, however their contractual responsibilities are only towards the owner and not towards each other's. Eventually type of contracting will create a degree of conflicts and self-interests and prevent full collaboration.



With the usual project delivery processes, the designers and builders have separate contracts with the Owner, although they have many interdependent responsibilities to deliver a single project.



With IPD, the designers and builders often sign a single multi-signiture agreement that defines mutual responsibilities.

Figure 4 Traditional vs. IPD contracts (Legal Relationships)[30]

[30] (Thomsen 2008, 9)

2.2.4.2 Incentives and goals

IPD contracts usually define clear project goals with measurable results. These goals include of course the traditional cost, time, and quality, but also may include safety, sustainability, small business support, local materials procurement, and local labor participation. Other goals such as honesty, trust, and collaboration might not be measurable. Therefore, some owners will evaluate them subjectively.[31]

At the same time, owners may define some financial incentives in order to motivate performance. The incentives may include:

Contingencies: the core team shares one contingency pool. As a result, each member will be encouraged to help other members to avoid any problem, which eventually all participants will benefit from the unused contingencies funds.

Profit: all participants profit is linked to the project outcome. If the project is successful then everybody will share profit according to a predetermined ratios, but if the project fails then also everybody will suffer from the consequences.

Bonuses: the owner may include some bonuses for meeting or exceeding goals.

2.2.4.3 Constraining litigation

IPD contracts have no clear statement relinquishing the owner right of litigation; most owners will not give up this right. However litigation is unlikely to happen in IPD projects. In IPD contracts all participants agree to inform each other early regarding any problem or dispute a try to avoid it. Nevertheless, in case of dispute, there is a well-constructed disputes resolution procedure within the IPD contract. The next step will be to hire a neutral third party as an arbitrator. Litigation is only the last resort.[32]

[31] (Thomsen 2008, 11)
[32] (Thomsen 2008, 12)

2.3 Project Partnering Contract PPC2000 (UK Model)

2.3.1 What is a PPC2000?

PPC2000 is the standard form of multi-party partnering contract for construction projects. The contract form was drafted by David Mosey[33] after it was launched by Sir John Egan, chairman of the construction task force. PPC2000 provides guidance for any partnering process and can be applied in any jurisdiction.[34]

The main differences between PPC2000 and other contract forms are:

- PPC2000 integrates all project teams under one multi-party agreement
- PPC2000 integrates the contractor as early as possible

Integrated team

The PPC2000 multi-party agreement creates one integrated project team consisting of all the participants of the projects. The owner, the designer, the constructor and even some specialists and subcontractors may be part of such agreement. Placing all participants at the same level and binding them under the same terms and conditions is very useful to unify their targets and avoid any possible conflicts that might affect the project.[35]

Early involvement

The PPC2000 concept adopts the contractor early involvement method. The main contractor, sometimes even subcontractors and specialists, are being integrated in the project since the design development stage.

[33] Professor David Mosey PhD is Director of the Centre of Construction Law and Dispute Resolution at King's College London, a position which he took up in May 2013 after 21 years leading the Projects and Construction team at solicitors Trowers and Hamlins LLP.
[34] (Mosey and Saunders 2005)
[35] (Mosey and Saunders 2005)

The early integration of contractors can benefit the project in several aspects, such as:[36]

- Involve in the design development.
- Prepare value engineering alongside the design.
- Provide value management by proposing alternative solutions.
- Contribute to the risk management analysis.

2.3.2 Key features of PPC2000

2.3.2.1 Multi-party approach

PPC2000 integrates the owner, the designer, and the constructor in one multi-party agreement. These partners should also establish one team for jointly managing the project. Subcontractors, consultants, and other service providers may also be part of the agreement if the project requires.

Integrating all participants in one agreement under the same terms and conditions has great benefits to the owner. Rather than creating several two-party contracts with each participant individually, this reduces the possibility of any contractual gaps. Moreover, the owner is not requested anymore to be the interface platform between all project participants. The multi-party approach creates direct contractual relationships between the participants, which provide an opportunity for them to depend on each other's.[37]

2.3.2.2 Integrated process

The PPC2000 provides a very good opportunity to use the knowledge and experience of the constructor during the design development stage. Since the constructor is already on board it is easy to integrate them also in the design process. The constructor may provide a valuable opinion in design review and

[36] (Mosey and Saunders 2005)
[37] (David Mosey - PPC2000 Guide 2003, 6)

propose useful alternative engineering solutions that might reduce the risks of the project significantly.

At the same time, the constructor benefit from their contribution in the design development greatly. They have the possibility to affect the project design and planning to match their preferable method of working and their distribution of resources during the construction stage. Moreover, since PPC2000 uses an open book policy, the owner and the constructor will be able to build up their own price estimation and integrate their profit for the project during that stage.[38]

2.3.2.3 Joint controls

The PPC2000 introduces different methods of project control. Considering that the project is being managed by one integrated management team. Also it covers the management and control of both pre-construction and construction phases.

The pre-construction phase is governed by the “partnering timetable” which summarizes all the roles and responsibilities of the partners and their tasks during the time before the project is being mobilized at site. Whereas the “project timetable” covers the construction stage, it describes the roles of the partners and their duties towards each other’s and the project. Both documents must be developed by collectively by all the partners and they should be considered as part of the contract documents.[39]

Another important tool of controls is the signed agreements. The PPC2000 contains four main types of agreements which are:

1. Project Partnering Agreement

Immediately at the end of tendering and negotiation stage and after the project partners have been selected, a project partnering agreement must be signed. This feature has been introduced with the PPC2000. At least the owner, the constructor and the designer at this point are needed to form the multi-party

[38] (David Mosey - PPC2000 Guide 2003, 6)
[39] (David Mosey - PPC2000 Guide 2003, 7)

agreement. There are still possibilities of other parties to be part of this agreement such as subcontractor or special service providers, if they are identified at this stage and if they are needed according to the project requirements.[40]

The “partnering agreement” usually contains, till a certain level of details, the following documents:

- The project brief or purpose provided by the client.
- The project proposal provided by the constructor.
- The initial client budget.
- The constructor agreed overhead and profit.
- The project KPIs and elated targets.
- The role of consultants and specialists if existed.
- The partnering timetable.

This agreement shall govern all project activities of all project participants during the stage before the actual work starts at site.[41]

2. Joining Agreements

At any stage after forming the PPC2000 project and signing the partnering agreement new partners may join the project through a joining agreement. The joining agreement should state the role of the new partnering team member and it should be signed by all the partnering team members of the project. New partners may be subcontractors, consultants, specialists, or service providers. The joining agreement is also used for replacing an existing partnering team member in accordance with the partnering agreement conditions. A joining agreement can be formed at any time during the pre-construction or the construction phase of the project.[42]

[40] (David Mosey - PPC2000 Guide 2003, 10)
[41] (David Mosey - PPC2000 Guide 2003, 11)
[42] (David Mosey - PPC2000 Guide 2003, 11)

3. Pre-possession Agreement

The PPC2000 allows after the signature of the partnering agreement to start some activities on site prior to the official commandment date. Therefore, the pre-possession agreement is drafted for this purpose. This agreement should contain information about the job needed to be executed, the time frame of execution, and the agreed price. Nevertheless, this agreement does not grant the constructor the unconditional commencement to the project. The constructor might still be asked to leave the site up on the owner instructions and in accordance with the partnering agreement conditions.[43]

4. Commencement Agreement

Once the project is ready to be commenced on site a commencement agreement must be drafted and signed. Project partners must fulfill all the pre-conditions according to the partnering agreement. The design should be ready (to a certain level), the price framework should be established, and the project time table should be developed.[44]

The signature of the commencement agreement contains a confirming statement by all the partners that “the project is ready to commence on site”. It is important that all partners to take the responsibility of this task.

When the partners sign the commencement agreement they commit to execute the project till completion. Termination of contract shall only be permitted under the terms and conditions of the partnering agreement. During the period of this agreement, the constructor commits to carry on the project according to the agreed design and the owner commits to compensate the constructor according to the agreed price.[45]

[43] (David Mosey - PPC2000 Guide 2003, 11)
[44] (David Mosey - PPC2000 Guide 2003, 12)
[45] (David Mosey - PPC2000 Guide 2003, 13)

2.3.3 Aspects of the PPC2000 Model

1. Collaborative working

The main aspect of PPC2000 model is the collaborative working in between all project partners in order to accomplish the project goals and objectives more efficiently. Partnering team members should be able to perform in such environment otherwise they are not qualified to be part of such contract.[46]

2. Project processes

The PPC2000 model is a project delivery method that covers the entire process of the project including planning, procurement, and execution. The model provides guidance and recommendation throughout the whole project.[47]

3. Added value

The PPC2000 is a two stages contract pre-construction and construction. All goals and targets in both stages are being developed collectively between the partners. The goal is to establish a project in which all partners are benefiting from its achievement within the planned targets, also benefiting more from exceeding those targets which provides added value for their time and cost.[48]

4. Supply chain management

The PPC2000 model creates direct contractual relationships between all parties in the supply chain process of the project. The contract is also being managed by a team that consists of members of all the parties. This team provides more comprehensive management views of the project since all the supply chains parties are involved.[49]

[46] (Arup Project Management 2008, 37)
[47] (Arup Project Management 2008, 37)
[48] (Arup Project Management 2008, 37)
[49] (Arup Project Management 2008, 38)

5. Dispute prevention

The PPC2000 aligns all partners' interests with the final outcome of the project, which means that taking best-for-project decisions by the partners will eventually be for their own benefit. This helps to eliminate any conflict of interests and any dispute in return. Besides, the core group which is the authority of taking project decisions is formed by all the project partners and it should only take related project decisions by consensus.[50]

6. Early dispute resolution

The PPC2000 has a well-established dispute resolution procedure within the project. It is in the best interest of all partners to resolve any dispute as early as possible. The core group of the project shall be responsible of resolving any conflicts or disputes and all partners shall comply.[51]

7. Risk management

In PPC2000 projects risks are shared. All partnering members take the responsibility of all project risks. The involvement of the constructor during the planning and design stage will also reduce many of the risks and improve the responses.[52]

8. Performance management

The PPC2000 provides innovative tools for measuring performance. The performance is not only in terms of achieving project goals and objectives but also the ability of the partners to perform as one integrated team and take best-for-project decisions collectively and unanimously.[53]

[50] (Arup Project Management 2008, 38)
[51] (Arup Project Management 2008, 39)
[52] (Arup Project Management 2008, 39)
[53] (Arup Project Management 2008, 40)

3 Leadership of Alliance Contracts

3.1 Leadership of the Australian Alliance model

According to the Australian Alliance Contracting guide, one success factors of an Alliance project is to have one integrated management team. This team should consist of members both from the client organization and all the NOPs. Team members selection should be done in a way of choosing the best candidate for the best position regardless of their organizational background. The members shall operate in a trust based environment and shall always take unanimous decisions for best of the project.

3.1.1 Leadership structure

Right after forming the alliance and signing the PAA by the owner and the NOPs, a leadership structure should be established. The structure might be different from one project to another however in general terms it should consist of the following groups (Fig 03):

- Owner and NOPs corporations
- Alliance leadership team (ALT)
- Alliance Manager (AM)
- Alliance management team (AMT)
- Alliance project team (APT)

Each one of these groups should include members from all the participants. Members' selection shall be done according to each member qualifications that are best for the position and best for the project in return. The PAA allows those groups to manage the project and take collective decisions in the best interest of the project.[54]

[54] (Department of Infrastructure and Regional Develoment (guide) 2015, 22-24)

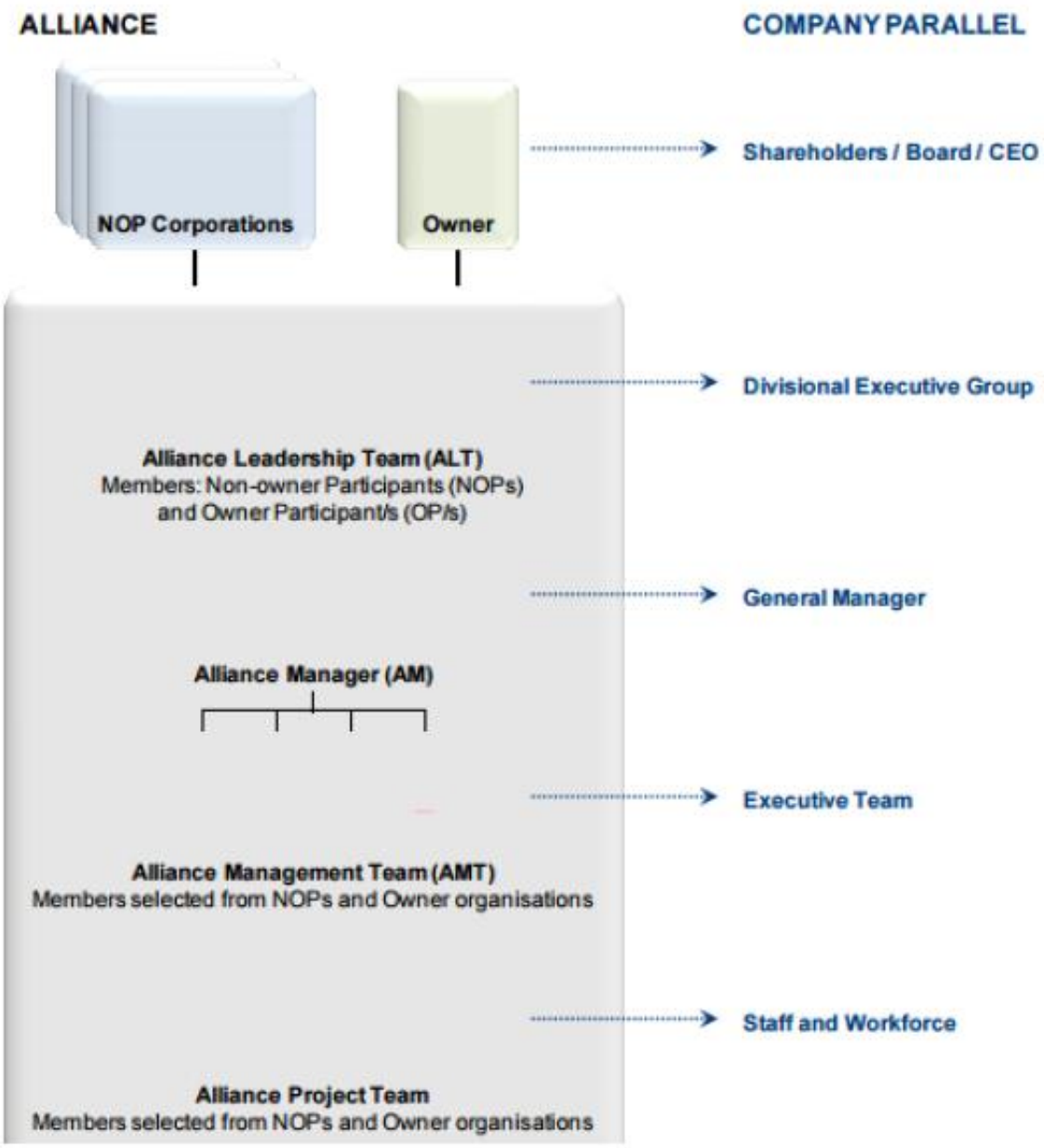


Figure 5 Typical Alliance Leadership Structure[55]

[55] (Department of Infrastructure and Regional Develoment (guide) 2015, 23)

A fundamental feature of the alliance contracts is that all decisions must be taken unanimously by the (ALT). Each member of the alliance leadership team (ALT) will be entitled of casting an equal vote in the decision making process. However, and due to the fact that the owner is the one financing and eventually owning the project, there are certain decisions that require further approval by the owner. These types of decisions will be written in details in the agreement (PAA) and all participants will follow.[56]

3.1.2 Leadership Organization

3.1.2.1 Alliance Leadership Team (ALT)

- **Establishment**

At the beginning of the projects all participants (Owner and NOPs) will establish the (ALT). The (ALT) shall include representatives from all participants each of them is a senior member of their organization. Each participant must be at all times represented by at least one representative on the (ALT).

Each participant should guarantee that their representative will remain the same for the whole duration of the project. Any replacement of a representative during the project period must be approved by the (ALT). The new representative must also be approved by the (ALT) and must be at the same level of experience and have the same qualification of the previous representative.[57]

- **Chairperson**

The owner participant must also appoint a chairperson from their side. The chair person will act always as a representative of the owner organization and will have a permanent seat on the (ALT).

[56] (Department of Infrastructure and Regional Develoment (guide) 2015, 24)
[57] (Department of Infrastructure and Regional Development (PAA) 2015, 24)

- **Duties of (ALT)**

The duties of the alliance leadership team must be set in the alliance agreement. For example: the Water Corporation of Western Australia (Water Corp) have issued a Capital Alliance Governance Manual in 2010 which summarize the duties of the (ALT) as following:

- Duty to act honestly;
- Duty to exercise reasonable care and diligence;
- Duty not to make improper use of information;
- Duty not to make improper use of position; and
- Fiduciary duty.

In order to carry on those duties, every (ALT) member should be familiar with the owner vision and the owner (VFM) as well as the alliance agreement and the governance structure.[58]

- **Scope of the (ALT) role**

The (ALT) basic role in the alliance project is to ensure that alliance run as efficient as possible in compliance with all the terms and conditions of the (PAA).

Therefore, generally the (ALT) deals mostly with matters such as:

- Policy;
- Alliance culture; or
- Substantial issues or activities.

The (ALT) are the one who understands the owner (VFM) and must lead the whole project accordingly. Their role is to provide guidance and directions to the other teams of the project.[59]

[58] (Water Corporation of Western Australia 2010, 12)
[59] (Water Corporation of Western Australia 2010, 12)

3.1.2.2 Alliance Manager

The (ALT) will select and appoint one person under the title of alliance manager. The responsibilities of such manager are to lead and manage (AMT), report directly to the (ALT), and to take the responsibility for direction of all the managers in the (AMT).

The (ALT) must set from the beginning the level of authorities which the alliance manager has and shall also perform periodic assessment to ensure that the manager is fulfilling all of the requirements and needs of the position. The alliance manager must report exclusively to the (ALT).[60]

3.1.2.3 Alliance Management Team (AMT)

The (ALT) will also form the alliance management team. The (AMT) includes members from all the participants and the selection process is best for the job process. The (AMT) is directed and managed by the alliance manager.

During the early stage of the project the owner might suggest some personnel to undertake positions on the (AMT), however those are also subject to change after the review process by the (ALT) once it is formed.[61]

The total number of members on the (AMT) is different from one project to another and it will also be determined by the (ALT) and stated in the alliance agreement. However, it must be guaranteed that all participants of the project are represented at least by one representative on the (AMT).

The (AMT) shall manage the project in accordance with the governance plan and responsibility matrix and it is the participants duty to ensure that their representatives are well informed of those documents. Moreover, it is also the participants duty to ensure that their representatives exercise proper diligence in performing all the aspects of the project.[62]

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[60] (Water Corporation of Western Australia 2010, 13)
[61] (Water Corporation of Western Australia 2010, 13)
[62] (Department of Infrastructure and Regional Development (PAA) 2015, 28)

- **Change in membership of (AMT)**

The membership of the (AMT) can only be changed or amended with the approval or the (ALT).

In order to achieve the purpose of the alliance culture in the project it is very important that all participants guarantee (as much as possible) that each person who has been appointed as a member of the (AMT) to remain on this position until the end of the project or at least until the point when the (ALT) decides that they are not required anymore.

Note: a new provision has been included in the latest revision of the alliance contract template issued by the Australian Government in 2015 that state: *"If a member of the AMT ceases to be a member without approval, the Project Owner may determine that any costs incurred by the Participants in replacing that member (including any costs incurred in familiarizing the replacement member with the Project) will not be reimbursed under the Agreement."*[63]

3.1.2.4 Alliance Project Team or Delivery Team (APT)

Subject to the requirements of each project and in accordance with the terms of the alliance agreement the (APT) members will be selected by the alliance manager. The (APT) sits under the (AMT) and reports directly to it.

It is very important that the (APT) team to include members from each participant in the project (owner and NOPs). This balanced distribution of resources will encourage inter-organizational learning and will fulfill the main aspect of alliance contracts model by creating one integrated team.[64]

The owner may propose some personnel to be members of the (APT) (including new personnel aiming to gain the required experience) and that must be taken into consideration by the alliance manager during the selection process.

[63] (Department of Infrastructure and Regional Development (PAA) 2015, 28)
[64] (Water Corporation of Western Australia 2010, 15)

The (APT) perform their duties under the management and guidance of the (AMT) and (ALT). Their roles and responsibilities should be clearly stated in the project governance plan and the responsibility matrix. It is the duty of all participants to ensure that their representatives on the (APT) are well informed of these documents and that they are performing their duties with the required diligence for all aspects of the work.

- **Change in membership of (APT)**

The membership of the (APT) can only be changed or amended with the approval or the (ALT) and the (AMT).

In order to achieve the purpose of the alliance culture in the project it is very important that all participants guarantee (as much as possible) that each person who has been appointed as a member of the (APT) to remain on this position until the end of the project or at least until the point when the (ALT) and (AMT) decide that they are not required anymore.

Note: a new provision has been included in the latest revision of the alliance contract template issued by the Australian Government in 2015 that state: *"If a member of the APT ceases to be a member without approval, the Project Owner may determine that any costs incurred by the Participants in replacing that member (including any costs incurred in familiarizing the replacement member with the Project) will not be reimbursed under the Agreement."*[65]

More essential positions are also proposed in the Water Corporation of Western Australia (Water Corp), Capital Alliance Governance Manual, issued in 2010, as the following:

[65] (Department of Infrastructure and Regional Development (PAA) 2015, 29)

3.1.2.5 Other Members

- **Relationship manager**

The relationship manger is appointed by the owner ad usually is a member from the owner organization. The responsibilities of a relationship manger are to facilitate communication between the owner, the alliance, and all the external stakeholders.

The relationship manger may be a member of the (AMT) and should work closely on day to day activities of the project (hands-on-management). The relationship manger reports directly to the alliance manager.[66]

- **Finance Manger**

The finance manager is appointed by the owner and is responsible for all financial and accounting matters, and also provides advice to the (ALT) on financial management.

The finance manager should report directly to the alliance manager, must attend all (ALT) meetings, and may be a member of the (AMT).[67]

- **Engineering Interface Manager**

The engineering interface manager is usually appointed by one of the NOPs and belongs either to the (AMT) or the alliance delivery team.

The engineering interface manager ensures proper engineering interface are maintained with the owner, ensures that all technical requirements are approved by the owner, and provides advice to the engineering team.[68]

[66] (Water Corporation of Western Australia 2010, 14)
[67] (Water Corporation of Western Australia 2010, 14)
[68] (Water Corporation of Western Australia 2010, 14)

3.2 Leadership of the IPD (Integrated Project Delivery) Contract (USA Model)

3.2.1 Leadership Structure

IPD as any other collaborative contracting model starts from the fundamental concept of collaborative project leadership and decision making. However, IPD model still gives the owner a dominating role in the process. The main idea behind IPD contracts is to harmonize the collaborative management with the needs and desires of the owner. Considering that ultimately the owner is the one who is funding the whole project and the one who is going to live with the outcome. As a result the IPD contract should create a balance between the owner right to full control and the collaborative decision making which is the main aspect of such contract form.[69]

On the other hand, the owner role in IPD project differs from other contracts forms. The owner in an IPD project must me completely involved in the work though out the whole phases of the project, not merely as a reviewer or approver, but more as an active participation in design and construction process. Thus, the owner in IPD projects has a leading role. The owner must continuously convey their visions to the other participants and make sure that they have understood it correctly which only could be achieved through their active participation and communication with the other parties.[70]

The general concept of IPD project leadership is based on teams. Teams must be formed from the beginning of the project; those teams must integrate members from all project parties. Therefore, it guarantees the early involvement of all parties from early stages of the project. Moreover, team process facilitates the best-for-project decision making easily.[71]

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[69] (O'Connor 2009, 44)
[70] (Ashcraft, The IPD Framework 2012, 25)
[71] (Ashcraft, IPD Teams: Creation, Organization and Management 2011, 1)

3.2.1.1 IPD Project Committees

IPD projects are lead and managed by committees. Every committee is formed by member from all project participants or at least the key participants which are: owner, designer, and Contractor. However, in some projects there could be member from other parties included such as special designers, consultants, and sub-contractors.

The structure and number of those committees are different from project to another according to project needs and requirements. Generally there will be two levels of committees the senior management team and the project management team. (FIG 04)

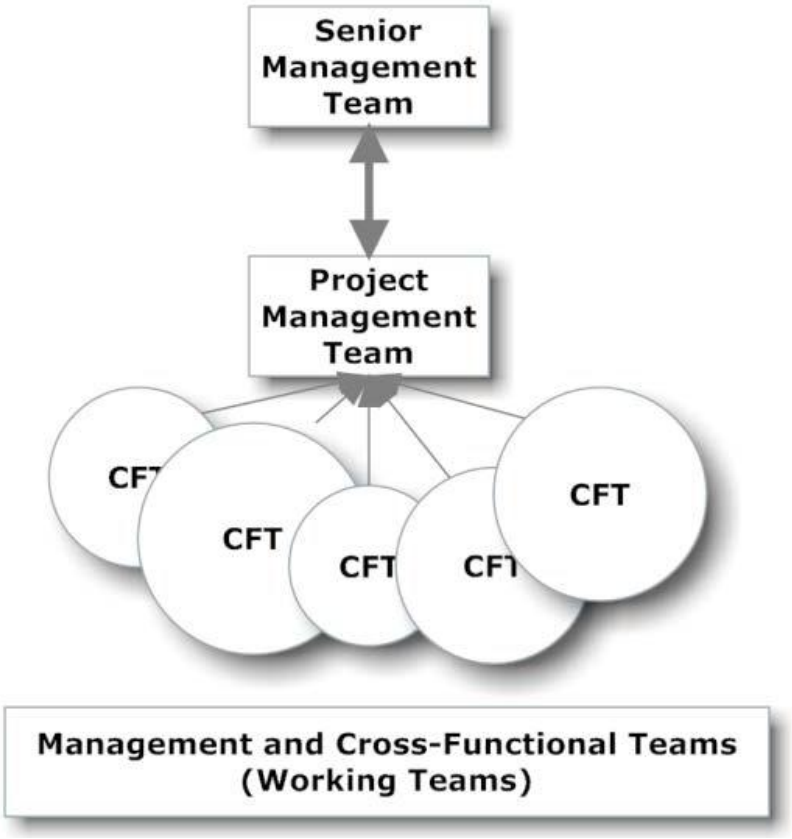

Figure 6 IPD Leadership Structure[72]

[72] (Ashcraft, IPD Teams: Creation, Organization and Management 2011, 2)

Members of these committees may be key personnel with a different job titles in their organizations. However, once they are part of and IPD management team they must form a **virtual organization** that operates as one body. The project management committees have responsibilities that cover the entire project from start to end. Their main duties are[73]:

- Establishment of Project Goals
- Provision and Allocation of Resources
- Financial Oversight
- Selecting Members of Functional Teams
- Mentoring of Team Members
- Contract Administration (Change Orders, Amendments)
- Dispute Resolution

3.2.1.2 Types of Committees

There may be several committees[74]:

- An Executive Committee or Senior Management Team (SMT) may deal with global matters such as project delivery strategy, reallocation of team resources, changes in direction or major problems. They might function as the “court of last resort” for strategic decisions or conflicts.
- An Operations Committee or Project Management Team (PMT) may deal with day-to-day design coordination, a master milestone schedule, the budget, requirements compliance and quality control, minor change orders.
- The Field Coordination Committee or the Project Implementation Team (PIT) adds Construction Superintendents and Project Managers for the currently active subcontractors to manage short-interval “pull” schedules, submittals and RFIs.

[73] (Ashcraft, IPD Teams: Creation, Organization and Management 2011, 2)
[74] (Thomsen 2008, 14-15)

- **Project Executive Team**

The project executive team shall take decisions and manage the project in a way that all parties involved will achieve the project objective successfully. The project executive team may delegate some of their duties into the project management team if it was for the best interest of the project. The project executive team is not responsible for supervising any party employees or has the authority of directing them nor will be responsible for their failure.

The project executive team must consist of one representative from all the key participants of the projects which are (owner, designer, and contractor) in addition to any other participant that is necessary to be included according to each project special conditions.

The project executive team shall only take unanimous decisions. If the team under any circumstances failed to reach a unanimous decision then the matter will be treated as a dispute resolution which will be discussed later.[75]

- **Project Management Team**

The project management team is responsible of implementing all decisions and directives made by the project executive team or by the owner. The project management team shall be handling the day to day management of the project including all activities of time, cost, and quality control. The project executive team is not responsible for supervising any party employees or has the authority of directing them nor will be responsible for their failure.

The project management team must include one representative of each participant of the project. Once it is formed it shall operate as one integrated team in a collaborative environment, in which all members will use their knowledge and experience to achieve project goals and objectives.

[75] (The American Institute of Architects AIA 2009, 3)

The project management team may also include some non-voting members. They might be from special project participants whom their unique expertise or skills will be in good use for the project.

The decisions made by the project management team must be unanimous and subject to further review and approval by the project executive team. If the management team under any circumstances failed to reach a unanimous decision then the matter will be transferred to the executive team.[76]

3.2.1.3 Team Composition

As mentioned before one integrated team must be created to manage the IPD project. This team shall include members from all participants. As in any other construction project, certain sets of skills must be available in team members in order to achieve a successful project. The traditional skills which include general technical knowledge, administrative skills are very important. However, the special nature of IPD projects require broader set of qualities, such as: honesty, interpersonal skills, communication skills, ability to work in a collaborative environment, and decision making capabilities.

A good team composition approach is to start by selecting two or three members that provide the required technical skills, evaluate their leadership and interpersonal skills, and then add more members to complete the team.[77]

The composition of the team is also determined by the general nature of the project. In projects that require high level of innovation and problem solving, team member should be chosen based on their creativity and innovation skills. On the contrary, in projects where routine works are mostly executed, such innovative teams might not be the best option and more moderate teams will carry on the job in a better way. Also innovative teams tend to be self-managed and self-motivated which also require choosing proper managers for them.

[76] (The American Institute of Architects AIA 2009, 4)
[77] (Ashcraft, IPD Teams: Creation, Organization and Management 2011, 5)

Another important point is that teams should include members with different backgrounds, opinions, and experiences. Therefore, it is highly recommended to include members from trade contractors, end-users, and operation personnel even at the early stages of the project. Each will bring different perspective into the design process. Not only this diversity will enhance the design but also will create a collaborative environment where organizational barriers are gone.[78]

As stated before, technical and administrative skills might be enough for a traditional construction project but not in an IPD project. Personalities should also be taken into consideration when selecting team members in an IPD project. The dominant approach of operating in construction projects is command-and-control and it makes such a huge shift transitioning into the collaborative approach which IPD require. Some people are not able to operate collaboratively and some others may need proper training. This is certainly the responsibility of each organization, willing to take part in an IPD contract, to establish training programs for their employees. Finally it is also important that any members that are not showing willingness to operate collaboratively must be eliminated in order to undermine the team performance.[79]

Note: It is possible for companies with personality's data to choose their best representative in an IPD projects based of them. **The Myers–Briggs Type Indicator (MBTI)** which is a, *"introspective self-report questionnaire claiming to indicate psychological preferences in how people perceive the world around them and make decisions" (Wikipedia),* might be a useful tool to determine one's ability to work in a collaborative environment. Especially in cases such as IPD projects where performance and outcome are correlated directly to team members personality's traits.[80]

[78] (Ashcraft, IPD Teams: Creation, Organization and Management 2011, 4)
[79] (Ashcraft, IPD Teams: Creation, Organization and Management 2011, 4)
[80] (Ashcraft, IPD Teams: Creation, Organization and Management 2011, 5)

3.2.2 Leadership Organization

3.2.2.1 Teams Organization

The structure of IPD teams is usually done according to the project size and technical characteristics. The project size will affect the team size and the individual scope of each team member. The technical characteristics will affect the teams' structure approach and overlapping.

The main basic approach, which is more or less applicable for most projects, is to establish an interdisciplinary core team that consists of the key participants of the project. Rather than creating multiple teams, it is more efficient to start with one core team and to add members from other organizations as the project progresses. This allows continuity and keeps the total active number of team members at a manageable level. Moreover, it facilitates the application of a collaborative behavior right from the beginning and later on added members will follow the same pattern. Within the core team cross-functional working teams will be created for better management of the project.[81] (Fig 05)

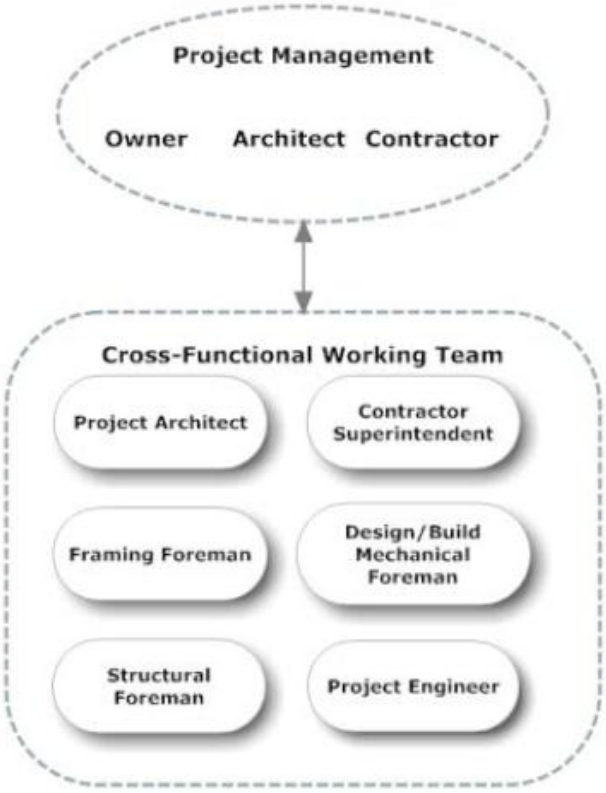

Figure 7 IPD Core Team Structure[82]

[81] (Ashcraft, IPD Teams: Creation, Organization and Management 2011, 6)
[82] (Ashcraft, IPD Teams: Creation, Organization and Management 2011, 6)

Nevertheless, in large size projects, one integrated team is not enough to manage the whole project. In this case teams must be structured differently however with maintain the basic idea of one compact integrated team with no responsibilities gaps and with easy coordination.

Two approaches for large projects may be used according to each project specific conditions[83]:

- Geographic based teams: the divisions might be buildings, wings, floors, phases, or others. (Fig 06)

  Area teams need to be provided with an overall approach where all teams must follow the same approach and must coordinate properly among each other's.

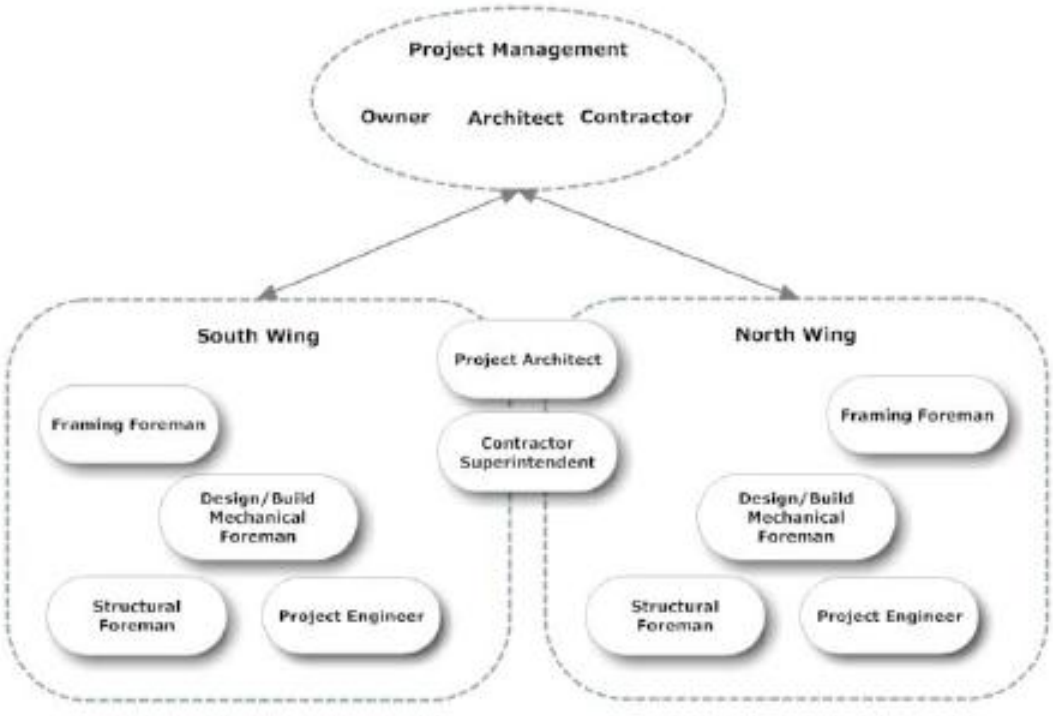

Figure 8 IPD Teams (Geographic Based)[84]

[83] (Ashcraft, IPD Teams: Creation, Organization and Management 2011, 7)
[84] (Ashcraft, IPD Teams: Creation, Organization and Management 2011, 8)

- Systems based teams: systems as structural, MEP, architectural, and so on. (Fig 07)

  Such divisions create teams with high knowledge in specific systems but at the same time create additional coordination effort and reduce diversity among each team.

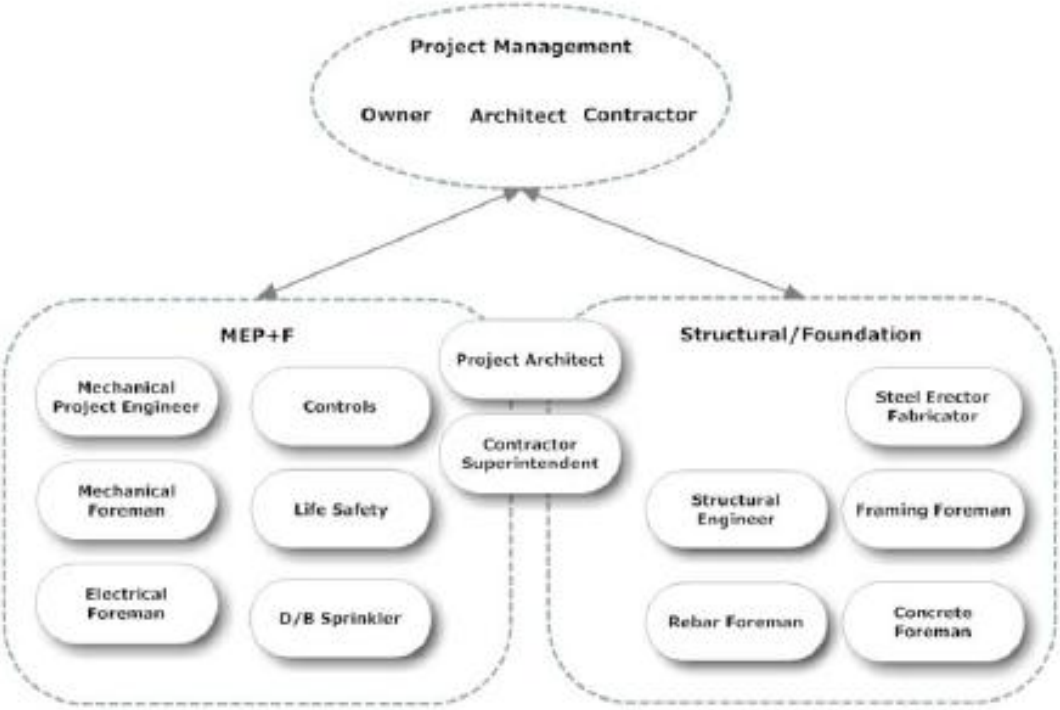

Figure 9 IPD Teams (Systems Based)[85]

Team's coordination could be done through "**big room**" approach, with regular meetings that include interrelated teams. Another way to enhance coordination is to ensure that design information is public and available for everybody.

[85] (Ashcraft, IPD Teams: Creation, Organization and Management 2011, 8)

3.2.2.2 Teams Size

There is no strict rule regarding team size however team size should always matches the task. Teams with too many members might be good in finding alternative solution but they are less efficient in taking decisions. On the other hand, teams with small number of members might be lacking skills and diversity.

A good rule of thumb is keeping team members between five and nine. Consequently, if a task is too large for one team it should be divided into subtasks.[86]

3.2.2.3 Cross-Functional Teams

IPD teams must be interdisciplinary and cross-functional. Interdisciplinary means that members are with different skills and experience. Cross-functional means that members are handling different responsibilities.

For example: a design phase team composed of architects, engineers, and contracts managers is interdisciplinary. But it is only cross-functional when this team handles duties beyond the design phase, duties such as cost management, scheduling, construction and commissioning the work.

Cross-functional teams have been proven their efficiency in manufacturing and software design. Boeing, Toyota, IBM and others have successfully used this approach.[87]

[86] (Ashcraft, IPD Teams: Creation, Organization and Management 2011, 9)
[87] (Ashcraft, IPD Teams: Creation, Organization and Management 2011, 10)

3.3 Leadership of the Project Partnering Contract - PPC2000 (UK Model)

PPC projects are managed by one integrated team that consists of members from all the parties whom have signed the partnering agreement. Team structure and members are subject to review and change in accordance with the partnering terms and conditions.[88]

Team members shall work together in the basis of trust, honesty, and fairness and shall take collaborative decisions for the best interest of the project. Team members shall work according to their roles and responsibilities which are defined in the partnering agreement and compatible with their competence and experience.[89]

3.3.1 Leadership Structure

3.3.1.1 Partnering team Pre-PPC2000

PPC projects offer a chance for important changes in the traditional roles and responsibilities of team members. Parties' contribution and their proper timing in the project are determined by added value each party bring to the project and not as traditionally an assumed hierarchal positions.

It is common for client and other partners to start working together prior to signing the PPC2000 agreement. During this stage the project brief is being drafted and the initial budget is estimated. Clients may partner during this period with design consultant, cost consultant, contractors, specialists, etc. A simple letter of agreement is sufficient during this stage in which all parties bind themselves into signing the PPC2000 agreement later.

[88] (David Mosey - PPC2000 Contract 2003, 3)
[89] (David Mosey - PPC2000 Contract 2003, 3)

It is highly recommended to start assembling the team by appointing a partnering advisor, whether the client is undertaking this role or not. The partnering advisor first task is to facilitate the creation and development of the partnering team. [90]

3.3.1.2 Partnering team members

The main partners in a PPC2000 project are the client and the constructor. They will be identified in details in the project partnering agreement. Partners may also include many other parties according to each project specific conditions.

Consultants; include all parties providing design or other services to the client, may be listed as partnering members and in such case they shall sign the partnering agreement or another joining agreement.

Specialists; include all parties providing works or services to the constructor, may be listed as partnering members and in such case they shall sign the partnering agreement or another joining agreement.[91]

3.3.2 Leadership Organization

The project partnering member will establish a core group for managing the project. Core group member need to be carefully chosen, based on their skills, experience, seniority, awareness of the project, and their ability to work collaboratively with other members. It is very important that all core group members to understand that their duties are to make decisions for the project benefit and not only for their own organization benefit.[92]

Core group is the corner stone which determine the success or failure of the PPC2000. If the core group members fail to reach consensus, of course PPC2000 continue to govern the project and each party is still responsible to deliver their contractual duties. However, if the core group fails to reach consensus repeatedly the main aspect of the PPC2000 is not being achieved.

[90] (David Mosey - PPC2000 Guide 2003, 8)
[91] (David Mosey - PPC2000 Guide 2003, 21-22)
[92] (David Mosey - PPC2000 Guide 2003, 23)

Also this might be an indication of a wrong selection of the core group members.[93]

Core group members are listed by name in the partnering agreement in addition to method of replacement during any stage of the project and subject to approval of all partnering members. Each party shall ensure that their representatives whom are core group members shall always attend group meeting and actively participate in the decision making process.[94]

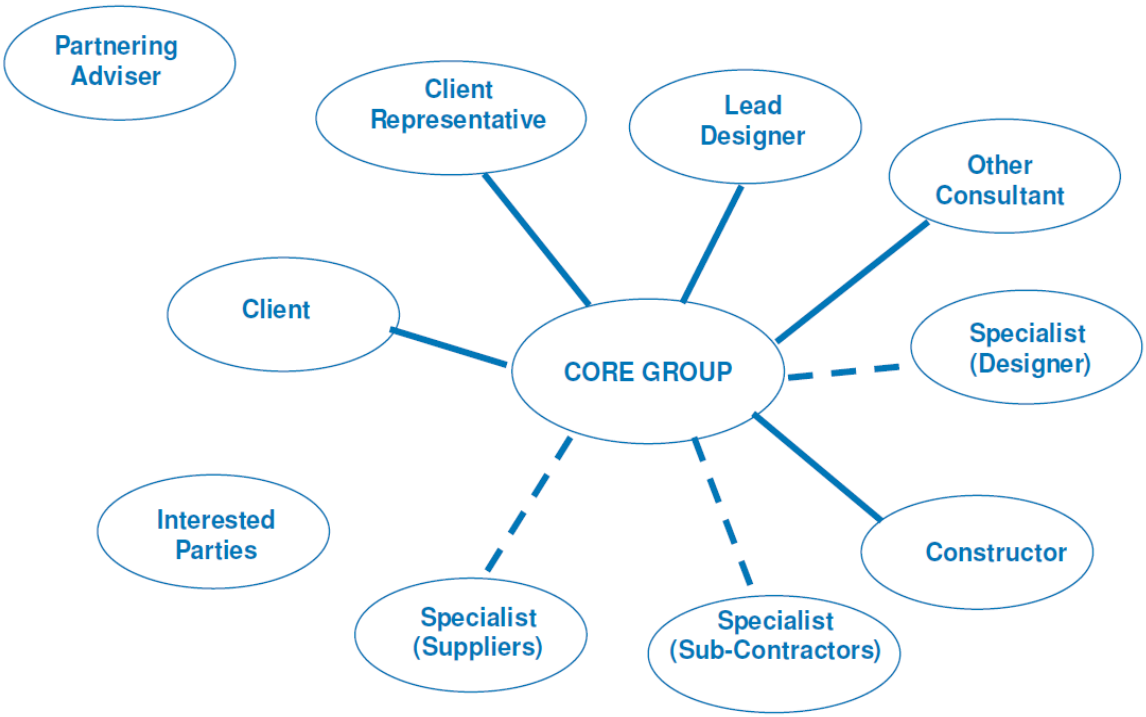

Figure 10: PPC2000 Core Group Structure[95]

[93] (David Mosey - PPC2000 Guide 2003, 23)
[94] (David Mosey - PPC2000 Contract 2003, 5)
[95] (Breyer 2016, 40)

Typical parties in Core Group include (Fig 10):[96]

- Client Representative
- Architect
- Structural Engineer
- Mechanical and Electrical Engineer
- Environmental Consultant
- Quantity Surveyor
- Other Consultants

3.3.2.1 Client representative

Client representative (project manager in the 2015 revision of the contract PPC2015) is appointed by the client, usually is part of the client organization, and acts as the Project Manager. Client representative shall be a partnering team member. Client representative has the authority to represent the client in all matters except for the core group membership, and also accepts the duties of acting constructively in accordance with the partnering terms.[97]

The role of client representative is to:[98]

- Represent the client in all matters except core group membership.
- Act fairly in performing client directions in accordance with partnering terms.
- Facilitate the integrated design, procurement, and execution of the project in accordance with the partnering documents.
- Supervise the execution of the project with the help of other partnering team members.

[96] (Breyer 2016, 42)
[97] (David Mosey - PPC2000 Contract 2003, 7-8)
[98] (David Mosey - PPC2000 Guide 2003, 26)

- Monitor the involvement and contribution of other partnering team members to the project matters such as value management and risk management.
- Give instructions to the constructor in compliance with the partnering documents.

3.3.2.2 Partnering adviser

Partnering adviser is an independent adviser whom provides support and advices to all the partnering team members (together or individually) regarding matters related to partnering process, partnering relationships, and partnering contract.[99]

The partnering adviser may be appointed before the PPC2000 agreement is signed, however shall not be a partnering team member. One of the main duties of the partnering adviser is to properly select and form the partnering team members. Moreover, the role of a partnering adviser is to:[100]

- Draft and review the partnering documents.
- Select and form the partnering teams.
- Prepare the project partnering agreement and any other joining agreements.
- Provide constructive advice to all partnering team members.
- Attend meeting of the core group as the members find it necessary.
- Assist in dispute resolution in accordance with partnering terms.

The partnering adviser could be replaced at any time of the project for an appropriate reason only by the decision of the core group.[101]

[99] (David Mosey - PPC2000 Guide 2003, 26-27)
[100] (David Mosey - PPC2000 Contract 2003, 8)
[101] (David Mosey - PPC2000 Contract 2003, 9)

3.4 Findings and Recommendations

3.4.1 Leadership Structure

1. All Alliance projects are supposed to be governed by one integrated team that consists of member from all organizations which form the alliance and sign the alliance agreement. This is one of the main features of the project Alliancing concept. However, the level of detailing and involvement of the teams might be different from one model to another.

2. Different Alliance models have different leadership structure. The Australian Alliance Model divides the management teams into three different levels (Lead team, Management team, Delivery Team). The IPD Model Also proposes three teams (Senior team, Project Team, Working Team). On the other hand, the PPC2000 have a different structure where only one (Core group) is formed for managing the project.

3. Leading or Senior or Executive team is usually the highest authority of an alliance project and shall take all the strategic decisions. This team consists of one representative of each alliance participant (or only the main participants), usually a senior member, and each member has an equal vote in the decisions making process. Decisions among this team are only being taken unanimously.

4. In the Australian Alliance Models the lead team or ALT is the team running the whole project. However, in the IPD and PPC2000 Models an Owner Representative position is part of the structure as well. The owner representative has the authority to contradict any project decision and to give direct instruction to the contractor.

5. The leading or executive team may also include non-voting members, such as specialists or consultants in order to help with the decision making process.

6. An alliance manger (project manager) is usually appointed to lead and manage the whole project. The alliance manager is the linking point between the senior committee and other project committees. The alliance manager may be from any of the participants' organizations and shall report directly to the senior team. The alliance manager may or may not be a member of the senior team.

7. Some alliance models suggest that the project manager position might have more than one person to occupy it throughout the project duration according to project requirements in each stage. For example, project requirement are quite different between design development stage and execution stage. The participants might even agree on a rotation system for the project manager position, however excessive change is not also much recommended.

8. The project team or the management team is the one actually managing the activities of the project. It also should include members from all participants. Although this team does not take any strategic level decisions but the management team members are responsible of taking plenty of decisions that determines the daily course of the project.

9. Finally the working teams or the delivery teams are responsible of the actual work on the operational level of the project. Usually those teams are not authorized to take decisions rather than report all the issues and comply with the instructions. There are several teams operating on this level and divided according to their tasks, in the IPD Model they are called

cross-functional teams. Although their tasks may seem individual, however they should work with high level of communication in order to achieve the project goals.

10. The Alliance models recommend keeping team sizes at the minimum that are fit for the task especially the working teams. Therefore, for large size projects it is recommended to divide the project for zones or sections for better management. Sections might be divided based on the task or the location. Even though sections have different management teams, however high level of communication between those teams is still required.

11. The PPC2000 has no integrated teams for the operational level. In this model the actual works are being handled individually by each project participants according to their roles and responsibilities. Only the management of the project is carried out collectively thorough one integrated team called the core group.

12. Another position (a non-voting position) that might be found in alliance projects is the relationship manager or the partnering advisor. The person occupying this position is responsible of the organization of the alliance project and the relationships between all participants. This position is very important especially when the project includes participants with no previous experience in alliance models. The alliance adviser is a non-voting member of the senior team and its main duty is to facilitate the alliance process and help all participants to be active alliance members.

3.4.2 Leadership Organization

1. Selection of team members is not only based on their skills and experience but also based on their personalities. Alliance team members should be able to work collaboratively with members from different organizations, share information among them, and take best-for-project decisions.

2. Many alliance projects depend on conducting some workshops with each potential participant during the tender stage. During these workshops team members should demonstrate that they have the required qualifications to work within an alliance project. Requirements such as collaborative behavior, communication skills, exchanging information, thinking beyond their own scope, and collective and unanimous decisions making. The result of these workshops has a great effect in the participant selection process.

3. Assigning members to positions is being done in best-for-job manner, regardless of the organizational background of the members. There are no specific procedures for such selection; it is only based on discussion and suggestions by all the participants. Of course there should be a minimum set of requirements of each position that any possible candidate must comply with them.

4. In all Alliance models the first step, even before signing the agreement, is to form the senior management team. This team will be responsible of creating the other required teams to manage the project. The client has the right to propose some personnel; however they will be subject to the senior team review and approval once it is formed. From that point, the senior management team will handle all project related matters.

5. The Australian Alliance Model states that senior team members are obligated to appoint replacements in case they were not available for meetings. The rule is that all participants should be represented in decisions making meetings. On the other hand, the PPC2000 Model has no such statement and decisions are being taken only by the attending members.

6. The working teams or the delivery teams, which may be one team or several teams, are responsible for the day-to-day activities. This team is formed by choosing members from all participants in a best-for-job manner.

7. It is best to keep the management teams in a minimum size (fit for the job); therefore the large projects may be divided into smaller zones for better management and control.

8. All participants must commit to maintain the same team members throughout the whole project, any team members' replacement is subject to the senior team approval.

9. The project management teams may start with limited team members and expand later to include more members whom become part of the alliance through joining agreements.

4 Management of Alliance Contracts

4.1 Management of the Australian Alliance Model

As discussed in the previous chapter, Alliance contracts should be structured in a way that aligns the commercial interests of the various participants with the final outcome of the project. Part of this goal might be achieved through the well-defined legal and contractual obligations of the participants in the PAA, in addition to the participants' selection process and teams building that should guarantee one integrated team of the project. Nevertheless, establishing a successful management plan of the project has also a huge effect on achieving the project goals and objectives.

4.1.1 Governance

The governance plan should be prepared prior to commencing with the alliance. In general, it is the owner duty to have a project governance plan since the owner is the one who initiate the alliance and finance the project. Most owners, who have repeatedly worked with alliance contracts, create their own master governance plan which they alter and develop from one project to another.

Project governance plan should consist of all the rules, relationships, and systems which determine the whole process of the project. It states the objectives, powers, obligations, and limitations of the alliance.[102]

It is widely acknowledged that a good governance plan is one of the main factors of any project success, however the special nature of alliance projects which consist of multiple parties agreement require a different governance arrangement. In other words, the governance plan should be carried out in two different levels:[103]

- Outside the alliance
- Inside the alliance

[102] (Water Corporation of Western Australia 2010, 8)
[103] (Department of Infrastructure and Regional Develoment (guide) 2015, 100)

4.1.1.1 Governance outside the alliance

This plan describes the relationship between the alliance and the owner as an organization; it includes also the management of any other external parties who are involved in the project but not part of the alliance.

Several models are available depending of the nature and size of the project and the experience level of the owner. The following three alternatives are suggested by the Australian alliance contracts guide:[104]

- Alternative 1: is used where the owner is well experienced in alliance contracts and the project is not too complex, in which the project is being managed within the owner existing organization structure.
- Alternative 2: is used for more complex projects, in which the owner may require to be advised by another agency that has better knowledge and experience in alliance contracting.
- Alternative 3: is used for particular and very large projects, in which the owner establishes an independent legal organization for the purpose of managing the alliance project.

The followings are some general principles of an effective external governance plan as stated in the official alliance contracting guide issued by the Australian Department of Infrastructure:[105]

- The involvement of any external agency to carry out some works in the project does not release the alliance participants from the accountability of the project result.
- The contractual agreement for collaborative project management and decision making within the alliance should be respected by all external agencies involved in the project.
- There should be clear identification of the decisions that require a final determination by the owner.

[104] (Department of Infrastructure and Regional Develoment (guide) 2015, 119-124)
[105] (Department of Infrastructure and Regional Develoment (guide) 2015, 101)

- The owner and other key stakeholders should be always informed of the progress through reports on predetermined key factors.

4.1.1.2 Governance inside the alliance

The special nature of the alliance projects that include multi parties working together in one integrated team and taking collective decisions for the best interest of the project introduce many complexities for governance within the alliance. The first step should be preparing an effective and project tailored governance plan which must be part of the contract documents alongside with the PAA. The governance plan may be prepared by the owner or developed by the alliance team; nevertheless it should be reviewed and accepted by the alliance lead team.[106]

The alliance governance plan is quite similar to the governance plan of other traditional construction projects in terms of design development and construction monitoring. One significant difference is that alliance projects pay more attention to non-cost KPIs, since better achievement of the project means better money value for all participants.[107]

The followings are some principles that can be found in alliance governance plans and they are based on the *ASX corporate governance principles and recommendations*[108]:

- Establish stable foundation of management and supervision.
- Establish the management boards to add value.
- Promote collective and collaborative decision making.
- Guarantee integrity and honesty in financial reporting.

[106] (Department of Infrastructure and Regional Develoment (guide) 2015, 102)

[107] (NCHRP "National Cooperative Highway Research Program" 2015, 51)

[108] The **ASX Corporate Governance** Council **Principles** and Recommendations ("**Principles** and Recommendations") were introduced in 2003. ... It brings together various business, shareholder and industry groups, each offering valuable insights and expertise on **governance** issues from the perspective of their particular stakeholders

- Make timely disclosure and establish an early warning system.
- Protect the rights of all stakeholders.
- Manage the risk collectively.

In order to achieve those principles, the governance plan should clearly state the roles and responsibilities of the project committees. It should also determine the relationships among them and the ways of communication and reporting.[109]

4.1.2 Communication and Meetings

As discussed earlier the alliance contract includes three different levels of management (ALT: alliance lead team, AMT: alliance management team, ADT: alliance delivery team). In order to perform the governance plan in the most efficient way an effective communication and reporting system must be established and followed. That includes frequent meetings, progress reports, early warnings and collective problems solving.

Usually the PAA states clearly the required meeting and reports within each committee. However, it is also the duty of a relationship manager to establish and facilitate an effective communication system within the alliance and outside the alliance with the other stakeholders.[110]

4.1.2.1 Communication

The followings are some principles and recommendations for more efficient communication system as mentioned in alliance governance plans[111]:

- As a general rule the alliance relationship manager is the key person responsible for communication and reporting inside and outside the alliance.

[109] (Water Corporation of Western Australia 2010, 9)
[110] (Water Corporation of Western Australia 2010, 16)
[111] (Water Corporation of Western Australia 2010, 17)

- The members of the ALT select the information that should be passed on to the AMT.
- The point of contact between the ALT and the AMT should be the alliance manager.
- The alliance manager should ensure that all information transmitted from the ALT to reach all members of the AMT.

4.1.2.2 Meetings

Meetings frequency and general agendas are usually determined in the PAA. All participants must commit to always be represented in the meetings. Therefore, ALT members are obligated to name an alternative person to substitute them in case of major circumstances that prevented them from attending the meeting. The replacement member should be also approved by the ALT in advance.[112]

The intervals and content of meetings might be different from one project to another according to each project requirements. For example: in the governance plan of the Water Corporation of Western Australia which is the official governance plan approved by the Australian Department of Infrastructure for guidance, the following meetings and reporting structure is established (Fig: 10):

- Alliance Lead Team (ALT): meeting at least one time every month.
- Alliance Management Team (AMT): meeting at least once every week and prepare a monthly report submitted to the ALT.
- Alliance Delivery Team (ADT): meetings are organized in a sub-department basis and as required. One overall report is prepared and submitted to the AMT weekly.

Control reports should cover all the aspects of the project such as: cost, time, quality, resources, environment, and risk monitoring.[113]

[112] (Department of Infrastructure and Regional Development (PAA) 2015, 25)
[113] (Water Corporation of Western Australia 2010, 19-20)

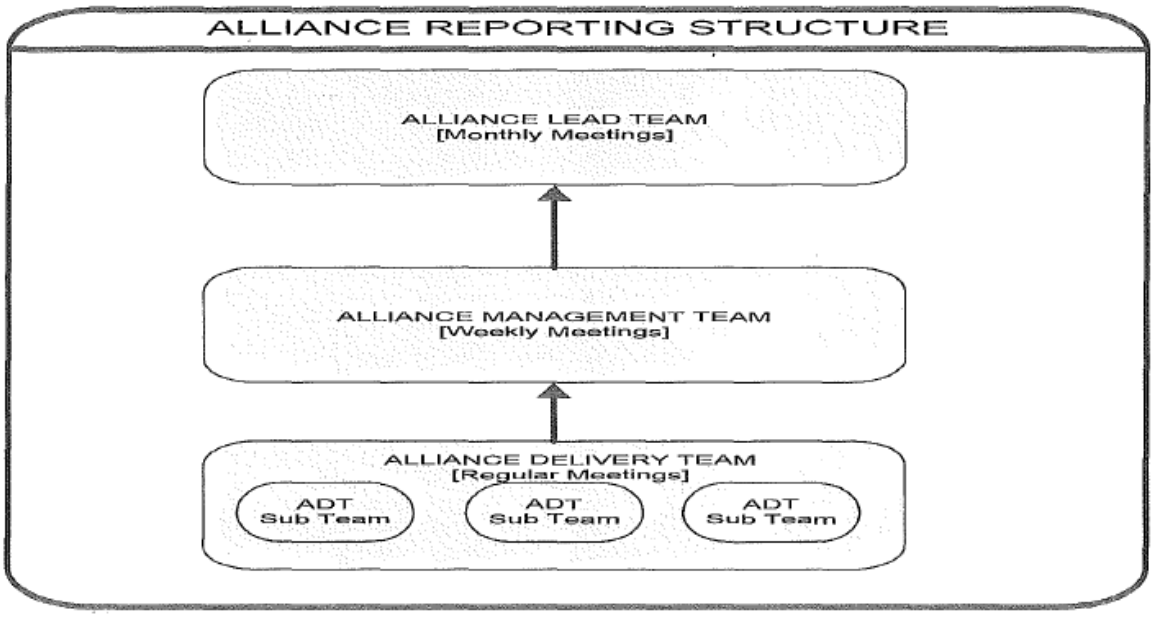

Figure 11 Alliance Reporting Structure[114]

4.1.3 Decisions making

One of the alliance contracts fundamental principles is the best-for-project decision making procedure. This procedure is based on the condition of aligning all participants' commercial interests with the overall outcomes of the project. Ultimately, the best for project decisions taken by all participants will improve their own best interests as well.[115]

In general, best-for-project decisions mean that those decisions should:[116]

- Be in compliance with principles and objectives developed by the participants and stated in the alliance agreement (PAA).
- Support the owner VFM statement and achieve project goals at a fair price, best-in-market pricing.
- Be made in a way that express participants commitment to the alliance.
- Consider the public sector standards and interests.

[114] (Water Corporation of Western Australia 2010, 19)
[115] (Department of Infrastructure and Regional Develoment (guide) 2015, 18)
[116] (Department of Infrastructure and Regional Develoment (guide) 2015, 19)

One of the alliance principles that are clearly stated in the PAA and accepted by all participants is the following: "*Participants have a peer relationship where each Participant has an equal say in decisions for the Project*"[117]. Therefore, all decisions of the project must be made collectively and unanimously.

Once the alliance project is commenced and the alliance lead team (ALT) is formed, this team shall undertake the decisions making responsibility in accordance with the PAA directives. With the exception of some predetermined decisions that shall still need further approval by the owner. The decisions made by the ALT should be unanimous and binding for all participants, this is what all participants commit to the moment they enter an alliance. Therefore, it is essential that all participants must be represented on the ALT and their representatives must be present at all the ALT meetings.[118]

The project alliance agreement (PAA) states that decisions by the ALT can be made only when[119]:

- One representative of each participant of the project is present at the ALT meeting.
- The decision is completely unanimous.
- The decision is in compliance with the PAA.

As mentioned before, all decisions taken by the ALT must be adhered to by all the project participants. However, if a certain decision includes violations of laws or public regulations the participant has the right to object giving a written statement of their objection. The statement should include a detailed description of the decision and the pertaining law. Consequently, the ALT must meet and take further decisions for the matter.[120]

[117] (Department of Infrastructure and Regional Development (PAA) 2015, 78)
[118] (Department of Infrastructure and Regional Develoment (guide) 2015, 19)
[119] (Department of Infrastructure and Regional Development (PAA) 2015, 25)
[120] (Department of Infrastructure and Regional Development (PAA) 2015, 26)

4.1.3.1 Decisions reserved for the owner

Even though the alliance is one integrated project formed by multiple participants, however the owner still bears the biggest share of risks since the owner is financing the whole project. And even though project decisions are taken collectively and unanimously, some matters must be decided by the owner.

The matters where the ultimate decision is left for the owner are usually defined in the project agreement PAA. All participants must be aware of those matters and must accept and comply with the owner decisions regarding them once they sign the PAA. The owner decision matters are different from one project to another, according to the PAA template provided by the Australian Department of Infrastructure the following decisions are reserved for the project owner[121]:

- Decision to suspend all or part of the project.
- Decisions that have a significant impact on the owner VFM statement.
- Decisions that require legal action, litigation or third party claims.
- Decisions to make subcontracts in the form of sub-alliance.
- Decision to terminate the alliance agreement.
- Decisions that are clearly stated in the agreement regarding any other matters.

[121] (Department of Infrastructure and Regional Development (PAA) 2015, 27)

4.2 Management of the IPD (Integrated Project Delivery) Contract (USA) Model

The IPD projects are usually governed by an integrated management teams that operate in different levels according to the project requirements. The structure and selection of those teams is well defined from the beginning of the project. However, the performance and monitoring of the teams is also crucial for achieving project goals. Similar to the Australian alliance model the IPD contracts also consist of a management plan which is called (the IPD Framework).

4.2.1 Governance

The governance plan or the IPD framework is part of the contract documents and it is developed mutually by all participants. The framework determines roles and relationships of all participants in addition to their works and actions as the project progresses. The framework should be able to align participants' interests with the final outcome of the project and lead participants into always making best for project decisions. As effective framework should ultimately create a collaborative environment in the project, encourage creativity and reduce waste.[122]

The IPD framework has two distinguished levels, macro and micro. The macro level framework consists of the project structure and contract terms. The micro level framework describes the processes of implementing the project. In general, the macro framework should include the goals, objectives, roles and relations, and project metrics and it is part of the IPD contract. The micro framework deals with more operational matters such as design, construction, communication, and information trading. Both the macro level and micro level frame works form the governance plan of the IPD projects.[123]

[122] (Ashcraft, The IPD Framework 2012, 1)
[123] (Ashcraft, The IPD Framework 2012, 1)

The IPD framework should be designed to guarantee the achievement of project goals by utilizing the aspects of an IPD contract in terms of collaborative behavior and collective decisions making. The IPD framework objectives are:[124]

- Facilitate effective communication and collaboration among project participants and encourage initiatives.
- Align individual goals of the participants with the final outcome of the project.
- Establish a system of rewarding of any behavior that improves project value.

4.2.1.1 Framework development

The IPD framework should be drafted in a way that matches the specific project requirements and management structure.

A. The contract negotiation stage (macro framework)

Usually the macro level framework is developed during the contract negotiation stage which later will be part of the IPD agreement. During this stage all participants should be able to discuss clearly their own goals and objectives of the project and therefore the agreement and the framework will be drafted to accommodate all of those objectives and to align them with the project outcome. It is important that all discussions must be with high level of trust and transparency, even at this early stage, otherwise the common goals will not be achievable. Normally, the negotiations at this stage require the presence of an attorney.[125]

The result of this stage in addition to the macro framework is also the IPD prime agreement for the main participants and the IPD joining agreements for the subcontractors and consultants.

[124] (Ashcraft, The IPD Framework 2012, 3)
[125] (Ashcraft, The IPD Framework 2012, 19)

B. The design process stage (micro framework)

The micro level framework is developed during this stage by the project teams which had been formed from all the participants. It is the first integrated task of those teams and the first test of their ability to work collaboratively and take decisions that are in the best interest of the project regardless of their organizational background.[126]

There is countless number of issues that might be discussed and agreed on during this stage. The teams are basically drafting a road map of how the project should proceed. Some of the issues are:[127]

- Which tasks should be performed and when and where?
- Who should undertake and support which task?
- What is the best method of scheduling the works?
- How communication is established? How to guarantee the distribution of information?
- How should the implementation teams be organized? Does the project need to be divided?
- What is the protocol of using the BIM models? How the modeled information will be shared? How the non-modeled information will be integrated?
- How to facilitate collaboration and collective decision making?
- When should design process stop and design be final? What are the possibilities of introducing alternatives?
- How will value engineering precede parallel to design? How will cost information be integrated with design processes?

[126] (Ashcraft, The IPD Framework 2012, 23)
[127] (Ashcraft, The IPD Framework 2012, 23)

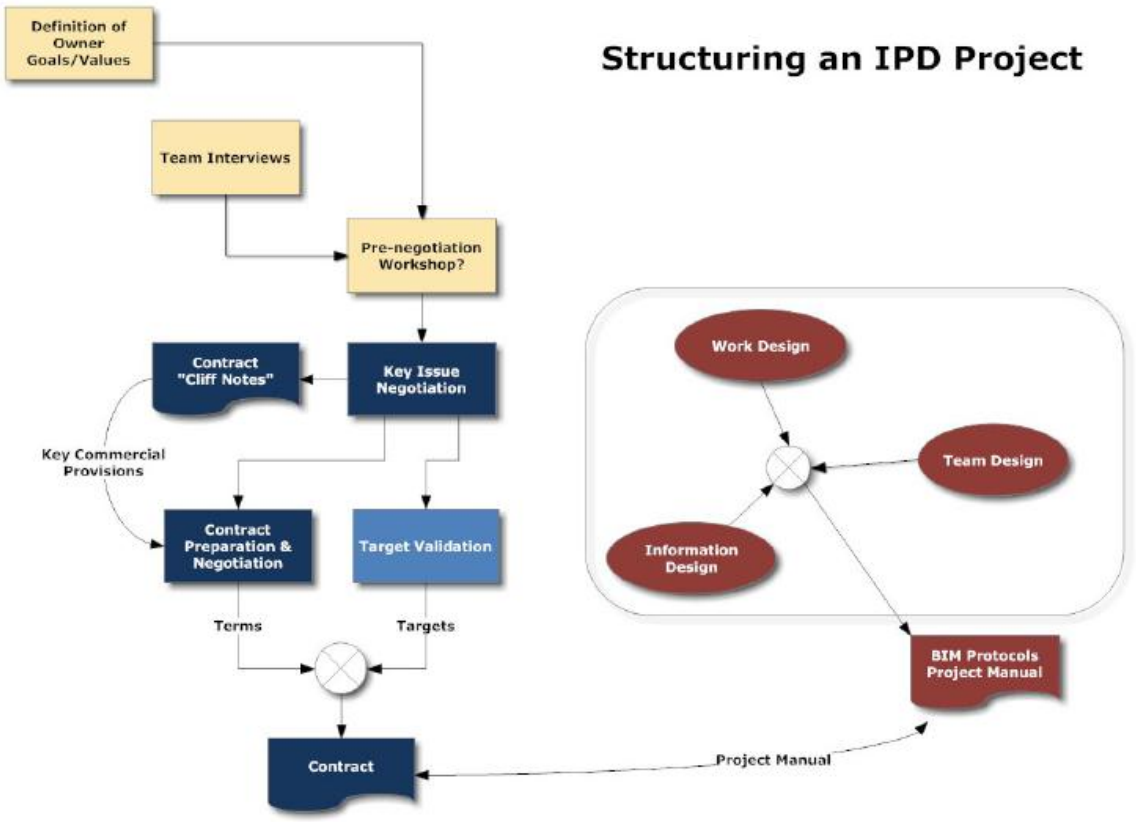

Figure 12: IPD Framework Development[128]

(Fig 11) represents the whole procedure of an IPD project, starting from the pre-negotiation stage which is very important especially when dealing with participants with no previous experience of IPD. The contract negotiation stage in which all project targets should be established and the result of this stage will be signing the agreement including the macro framework. Afterwards, project teams should commence with design workshops and at the same time start developing the project micro framework. The length and complexity of each stage and the participants' involvement may vary from one project to another according to each project requirements.[129]

[128] (Ashcraft, The IPD Framework 2012, 24)
[129] (Ashcraft, The IPD Framework 2012, 24)

4.2.2 Communication and Meetings

All of the IPD experts consider the information exchange to be one of the most important key factors of the project. The way information created, distributed, and stored is fundamental to ensure that project teams are working as one integrated body and taking best decisions for the project.

The IPD information management is usually organized according to the following considerations:[130]

- Create a common platform of understanding.
- Access information by the personnel who require it, when it is required.
- In progress information should be shared also within teams.
- Structure the information to suit all project teams.
- Short but effective communication methods.
- Data with actions must have a source of credibility.
- Data should be archived properly.

IPD contracts mandate the usage of BIM technology for project design at the minimum. Therefore, setting up a BIM information system is also one of the tasks that should be done right at the beginning. According to IPD concept, the usage of BIM models facilitates the communication and information sharing more effectively. However, there is still an amount of non-modeled data that also needs an effective information system.

4.2.2.1 Communication

In order to design an effective information system for IPD projects, four main aspects are to be considered:

1. Communication flow

The communication flow should be designed to match the project and the participants requirements. It determines the paths in which information flow and

[130] (Ashcraft, The IPD Framework 2012, 12)

weather it is a direct flow from the creator to the recipient or an intermediate point is required. Also the time frames for those processes.[131]

As mentioned earlier, even in progress information are shared in IPD projects and sometimes multiple team members have the authority of modify it. The authorization and permissions should be also predetermined and once the data are to be considered final or action, someone should bear the responsibility of this action and this someone should be indicated through the system. Moreover, information system should differentiate between communication data that are not necessary needed for project records and the official project data that must be stored and archived properly.[132]

2. Communication infrastructure

The communication infrastructure deals with the arrangement of project teams and the physical tools used for communication. Organizing the project teams in site offices has proven to be of a great effect on the efficacy of communication, this applies for all construction projects not only IPD. However, it has a greater effect in IPD project considering the degree of collaboration and information sharing required. For example: Big room approach is currently used in many IPD project and other integrated delivery methods as well. This approach provides one big room for individuals and teams to conduct meetings, discussions, and workshops for better communication and problem solving.[133]

IPD projects also encourage the usage of advanced technology in terms of communication. Since the usage of BIM models is mandatory it is very easy to utilize tablets and smart phones in the information systems. Moreover, these devices may be used later in execution stage and even in facility management.[134]

[131] (Ashcraft, The IPD Framework 2012, 13)
[132] (Ashcraft, The IPD Framework 2012, 14)
[133] (Ashcraft, The IPD Framework 2012, 14)
[134] (Ashcraft, The IPD Framework 2012, 15)

3. Building Information Modeling

The usage of BIM technology is a contractual requirement in IPD projects. All participants must familiarize themselves with BIM software and be able to receive and send information via the shared platform. Currently, it is only mandatory to use BIM in design process but it is also very encouraged to use BIM for construction stage and later on for facility management.[135]

4. Financial modeling

Although IPD projects claim to deliver project value that exceed only cost but cost control is still of high importance. Coast control starts right from the beginning after establishing the project goals. In parallel with design process cost control should be done and cost for alternatives as well. Financial modeling goal is to provide continuous feedback of cost impact of different design and construction alternatives. It is considered one of the tools of making decisions in IPD projects. And finally, it should determine whether the project was accomplished within the cost targets or not.[136]

4.2.2.2 Meetings

IPD projects have three different management teams working on three different levels. Accordingly each team will have their meetings on different intervals and with different agendas. However, all meetings should be stated in the agreements and all participants commit to be represented all the times in meetings especially when decisions are required.

For example the following information about teams meetings is found in the IPD draft agreement used by the Hanson Bridgett[137] law firm in California:

[135] (Ashcraft, The IPD Framework 2012, 16-18)
[136] (Ashcraft, The IPD Framework 2012, 18)
[137] Hanson Bridgett is a US-based, full service law firm with more than 150 attorneys in offices throughout Northern California. https://www.hansonbridgett.com/

1. Project management team (PMT):

It is stated that the PMT conducts two types of meetings (regular and special). Also it is required to appoint a (meeting facilitator) who will be responsible for communications for meetings and for the preparation and distribution of the minutes.[138]

Regular meetings: the IPD agreement states that the PMT shall have regular meetings minimum every week. The meetings shall include PMT members and the senior representatives of some participants if required. All PMT members are obligated to attend meetings; if a member is unable to attend he/she should provide a replacement member. Project matters should be discussed such as design, execution, cost control, and time and scheduling.

Special meetings: special meetings are held by the request of one or more PMT members for discussion of urgent matters. The agreement states that a minimum of three days' notice should be given ahead along with a description of the purpose of the meeting.

Direct communication: the IPD projects encourage all PMT members and other team members to communicate directly in order to efficiently manage all project matters. However, decisions will only be taken during official meetings and with the attendance of all members.

2. Project implementation team (PIT)

The project implementation team will be formed and directed by the PMT, and will include representatives from all subcontractors, consultants, and other firms who are not part of the IPD agreement but the other joining agreements. The PIT shall meet regularly to discuss day-to-day activities of the project. The PIT is not authorized to take decisions, however their feedback is the basis of all decisions made by the PMT.[139]

[138] (Hanson Bridget LLP 2009, 4)
[139] (Hanson Bridget LLP 2009, 6)

4.2.3 Decisions making

The main concept of IPD projects is the collective decision making. The IPD management teams might have a leadership role. This role may be passed around by members in accordance with project requirements in every stage of the project. However, the decision making is a process that all members participate in equally.[140]

The team which handles the decisions making responsibility in the IPD projects is usually the project management team PMT. The only way of making a decision within the PMT is unanimous decisions as stated in the IPD agreement. However, if the PMT members were unable to reach a unanimous decision then the PMT will refer to the senior management representatives for the matter. The senior representatives will attempt then to make a unanimous decision, however if the consensus was not reached then the decision will be taken by majority of votes.[141]

Nevertheless, the IPD agreement still gives the owner the right to oppose decisions on the non-owner participants, through issuing a written owner's directive to the PMT. If the owner's directive will have any consequences on the project predetermined cost or time then the participants are entitled to further adjustments.[142]

PMT decisions that affect cost, time, design, or resources shall be documented in writing as a PMT directive. PMT directives must be signed by all PMT members and then distributed to all concerned parties in the project. Any other decisions taken by the PMT shall be documented in the minutes of meetings and considered bindings to all participants. Decisions that might affect the

[140] (Ashcraft, IPD Teams: Creation, Organization and Management 2011, 17)
[141] (Hanson Bridget LLP 2009, 5)
[142] (Hanson Bridget LLP 2009, 5)

predetermined time or coast of the project shall be referred to as change orders and documented for further adjustments.[143]

The following diagram shows the decision making flow as suggested by Hanson Bridget Law Firm in their published IPD Framework in 2012:

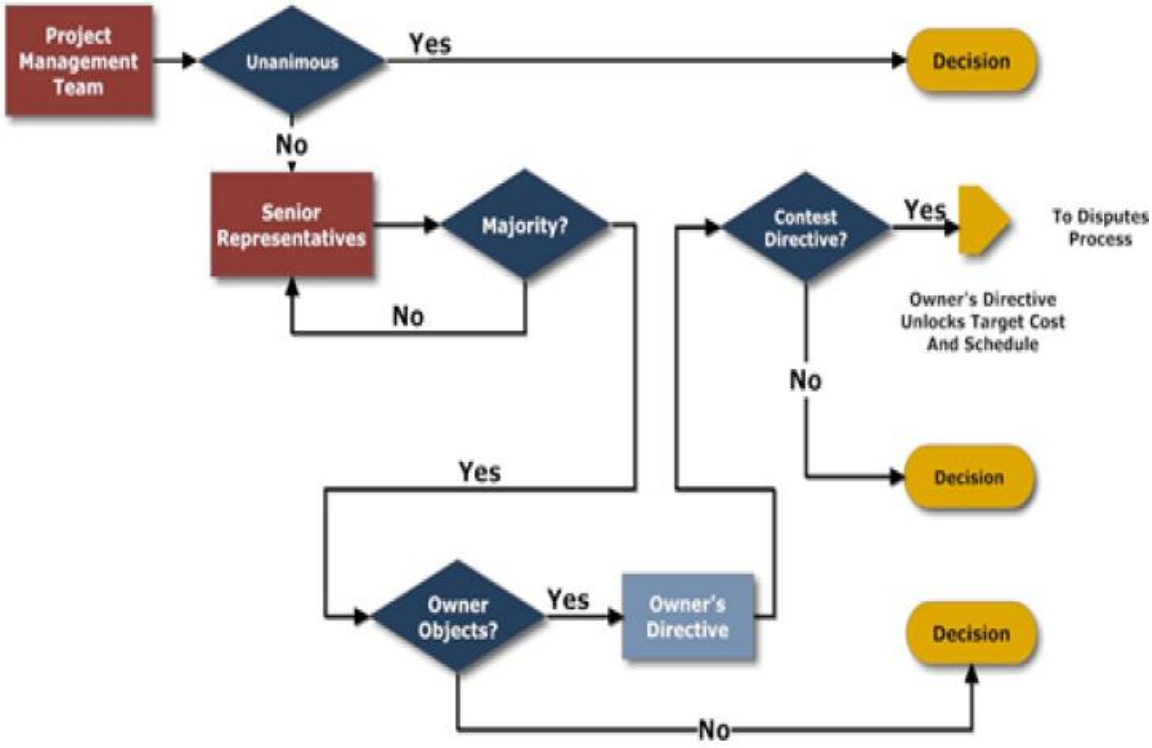

Figure 13: IPD Decision Making Flow[144]

[143] (Hanson Bridget LLP 2009, 6)
[144] (Ashcraft, The IPD Framework 2012, 8)

4.3 Management of the Project Partnering Contract PPC200 (UK Model)

The PPC2000 as any other alliance model contract has also one integrated team of all participants performing in a joint management procedure. The project is mainly governed by the core group which consists of member from all project participants and by the client representative (project manager) that is appointed by the client.

4.3.1 Governance

The PPC2000 projects are governed according to a team-based control. In which all participants should develop the project timetables (working plans) and agree on the targets for specific periods of time. This approach allow for more understanding of project requirement in every stage and in return for more realistic and achievable targets.[145]

Another important tool of control that is usually used in the PPC2000 projects is the signature of the four project agreements according to each stage, which are:[146]

- “Project Partnering Agreement”: create the project and establish the partnering team.
- Joining Agreement”: introduce the new partnering members.
- “Pre-Possession Agreement”: give the authority for work on site.
- “Commencement Agreement”: commence the project on site.

The PPC2000 divides the project into two main phases pre-construction and construction. Each phase has its own management requirements according to the project activities and for each phase a timetable should be developed.[147]

[145] (David Mosey - PPC2000 Guide 2003, 7)
[146] (David Mosey - PPC2000 Guide 2003, 7)

A. The “partnering timetable” which covers all project activities in the pre-construction phase. (Fig 14)

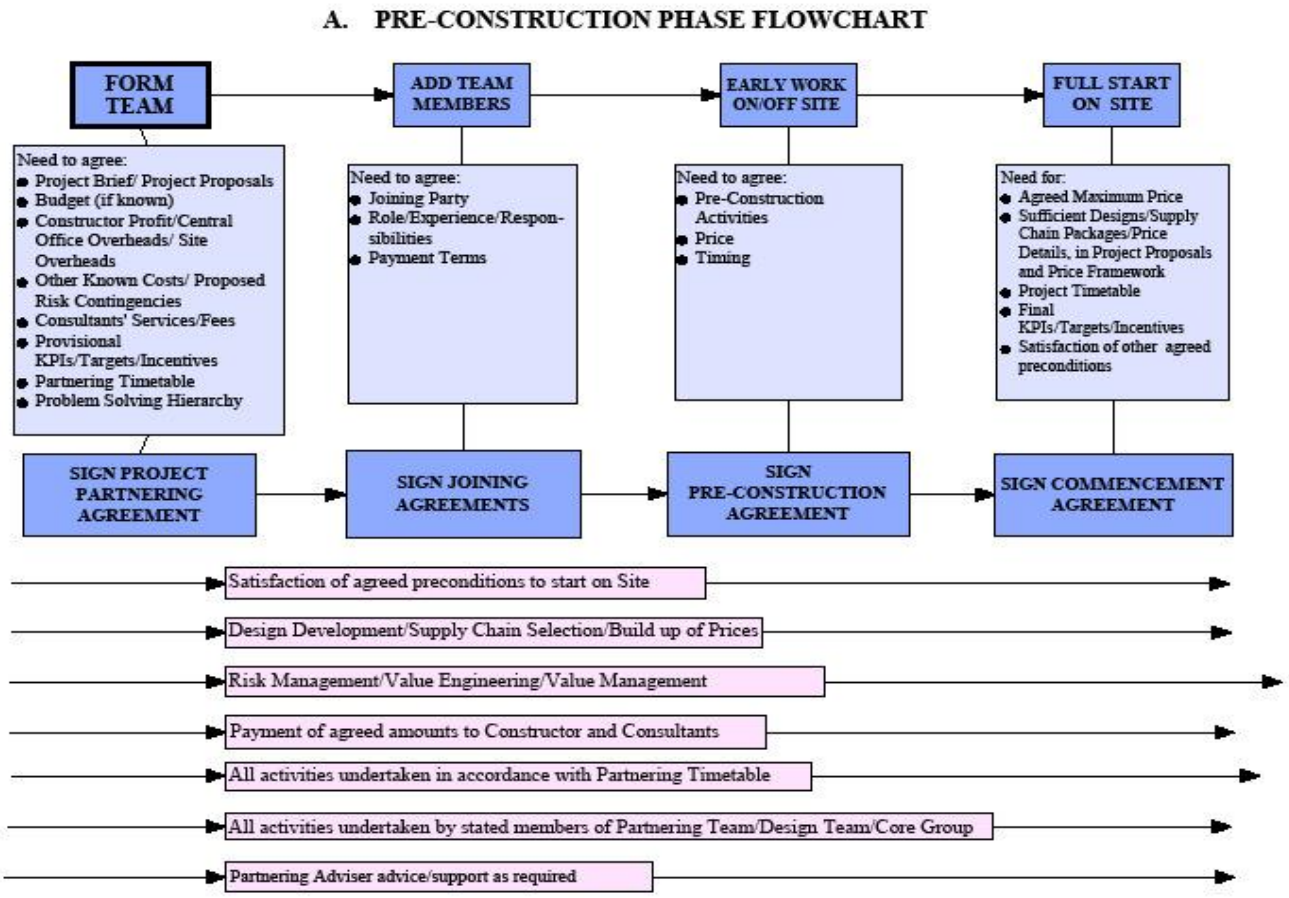

Figure 14: PPC2000 Pre-Construction Phase Flow Chart[148]

The core group and the owner representative (project manager) are the decision makers in the PPC2000 projects. As mentioned before the leadership of the core group might change according to the project requirements. In the pre-construction phase it might be useful give the leadership to the designer sometimes.

[147] (David Mosey - PPC2000 Guide 2003, 7)
[148] (David Mosey - PPC2000 Guide 2003, 87)

B. The “project timetable” which covers the activities during construction on the job site. (Fig 15)

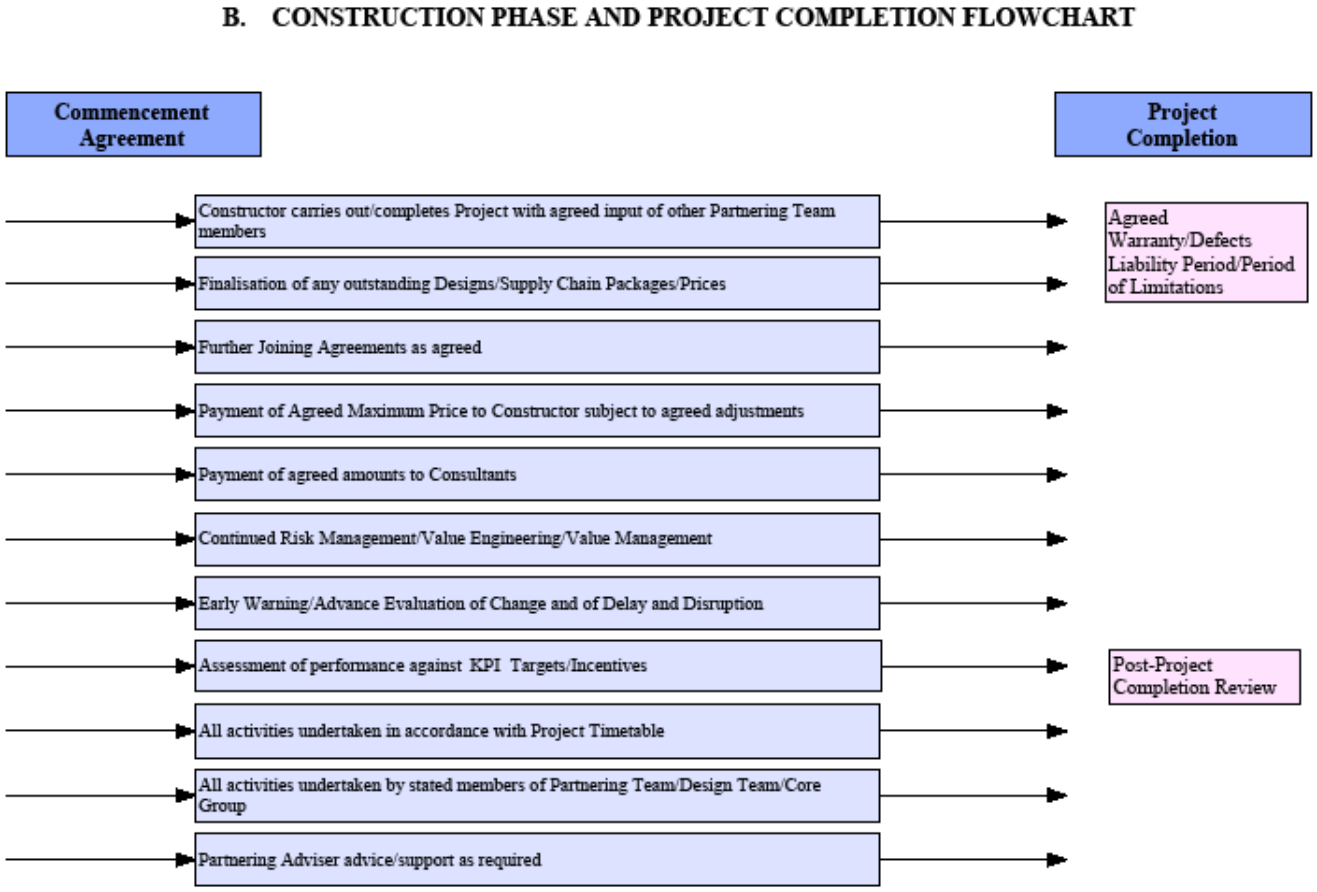

Figure 15: PPC2000 Construction Phase Flow Chart[149]

The governance of the construction phase in PPC2000 projects depends on the “early warning” system. In which team members are expected continuously to review the project and foresee any problems. Then openly and collectively discus the problems and find the appropriate solutions in timely manner and for the best interest of the project.[150]

[149] (David Mosey - PPC2000 Guide 2003, 89)
[150] (David Mosey - PPC2000 Guide 2003, 7)

4.3.2 Communication and Meetings

The PPC2000 states in the agreement that all partnering team members should work as a one integrated team to manage the project. Their communication should be based on trust, fairness, and collaboration for the best interest of the project. The main partners who are part of the partnering agreement should establish an efficient communication system right from the negotiation phase and develop it more thoroughly during later stages. The other partners who may join the project later with joining agreement should also be integrated in the same communication system.[151]

4.3.2.1 Communication

Exchange or information: the PPC2000 agreement commits all partners to work together in one integrated team and share all project related information in an environment of trust, transparency, and collaboration. All team members are expected to perform in such manner and this ability is one of the important criteria in team member's selection process.[152]

Methods of communication: as in any other construction project, PPC2000 provides many communication forms that cover all the required information exchange in the project among the partners. Information such as: decisions, submissions, notices, instructions, approvals, and opinions. The PPC2000 agreement states that all types of communications must be in writing (unless an appropriate agreement was signed for the usage of e-mails). Written communications are considered effective from the date of delivery.[153]

Further Cooperation: PPC2000 agreement encourages further communication among the team members of the project. The parenting team members are expected to establish an office information sharing system and to be granted

[151] (David Mosey - PPC2000 Contract 2003, 3)
[152] (David Mosey - PPC2000 Contract 2003, 5)
[153] (David Mosey - PPC2000 Contract 2003, 5)

access to each other's data networks and databases (of course subject to a proper confidentiality agreement).[154]

Early warning: the PPC2000 projects should develop an early warning system as per the agreement. Each tea member is obligated to notify the other members whenever a matter that might be of a threat to the project is spotted. Matters might be of their own scope or others scope and might be of any aspect of the project. The notification should be done in writing and preferably with a proposed remedy or solution to the matter. Once such notification is submitted, the core group shall set a meeting to discuss the matter and agree on the best course of action.[155]

The early warning system represents an important test of the performance of all team members in terms of their level of trust and collaboration. It resembles the understanding of team members that their care and responsibilities exceed their own scope of work. PPC2000 claims that an efficient early warning system is of great value of the project especially for avoiding any adversarial reactions to problems among the team members.[156]

4.3.2.2 Meetings

- Core group meetings

According to PPC2000 agreement, core group members are obligated to attend the regular meetings. Meetings schedule and intervals should be agreed within the core group members and in accordance with the project requirements. The client representative may attend the core group meetings willingly or up on the request of one team member. The core group members may also decide to invite other members to their meetings such as subcontracts or specialists as they see

[154] (David Mosey - PPC2000 Contract 2003, 6)
[155] (David Mosey - PPC2000 Contract 2003, 6)
[156] (David Mosey - PPC2000 Guide 2003, 24)

required. All meetings shall be properly documented and minutes will be distributed to all members.[157]

Core group members are also entitled to call for special meetings whenever needed. A minimum 5 working days notice should be given in writing to other group members and to the owner representative. The notice should include the reason for the special meeting and the agenda.[158]

- Partnering team meetings

Partnering team members will have several types of meetings throughout the project. Meetings intervals and agenda may vary from one stage to another in accordance with project requirements. The regular partnering team meetings must be established and stated in the partnering agreement. However, members are also entitled to call for special meetings with a minimum 5 working days notice period and a written notice letter. All meetings shall be properly documented and minutes will be distributed to all members.[159]

- Client representative

The PPC2000 agreement grants the client representative the authority to organize meetings and workshops within the core group or the partnering teams. Meetings may be for any related matter and in accordance with the partnering documents. Also they may be for value engineering, value management, and risk management. Meetings may include other parties if needed. The result of such meetings may be proposals or other documents that team members should submit to the client representative for approval.[160]

[157] (David Mosey - PPC2000 Contract 2003, 5)
[158] (David Mosey - PPC2000 Contract 2003, 5)
[159] (David Mosey - PPC2000 Contract 2003, 6)
[160] (David Mosey - PPC2000 Contract 2003, 7)

4.3.3 Decisions Making

- Core group decisions

The PPC2000 states that all core group decisions must be taken during the core group official meetings (regular or special). The basis of decisions making in core group should be consensus of all core group members attending that meeting.[161]

Consensus is defined as "*unanimous agreement as a result of reasonable discussion*". The voting will be done by the attending group members; however the decision is binding for all the members. Once the decision is made all project members shall comply and members have no right of objection for the reason of non-present.[162]

- Partnering team decisions

Similar to core group, partnering teams decisions are also made on the basis of consensus of all attending team members. And once the decision is made all project team members should comply.[163]

- Client representative instructions

The PPC2000 agreement grants the client representative the authority of issuing written instruction directly to the constructor. Such instructions may include requests of testing, rectifications, or replacement of any works in accordance with the contract documents. The constructor is obligated to carry on these instructions immediately. Nevertheless, if the instructions will affect the project predetermined cost or time then the constructor is entitled for further adjustments.[164]

[161] (David Mosey - PPC2000 Contract 2003, 5)
[162] (David Mosey - PPC2000 Guide 2003, 24)
[163] (David Mosey - PPC2000 Contract 2003, 6)
[164] (David Mosey - PPC2000 Contract 2003, 8)

4.4 Findings and recommendations

4.4.1 Governance

1. All types of collaborative based contracts share the same view of the high importance of the governance plan for the project success. Particularly considering the special nature of alliance projects and their non-cost goals which exceed the traditional project goals. Most of the contract models consider the governance plan as a contractual obligation and request all participants to sign it before it is attached to the contract documents.

2. The governance plan should be tailor made to match each project settings, structure, requirements, and goals. Taking into consideration the cooperative and collaborative environment which should be created in order for the alliance projects to achieve their full potentials.

3. The governance plan first goal is to align all participates individual commercial interests with the final outcome of the project. Secondly, it should be designed to facilitate the alliance aspects of collaborative management and unanimous decision making for the best interest of the project.

4. The governance plan should determine the roles and responsibilities of all project members, their tasks and obligations towards the project and towards each other's, and the way they should perform those tasks. The governance plan in alliance projects is not only about managing the cost, time, and quality of the project but also about creating a culture of collaboration and trust which ultimately is what the alliance concept is really about.

5. Different contracts models have different approaches in terms of constructing the project governance plan. The Australian Alliance Model suggests that the owner organization should have their own governance plan which fits to their project vision and requirements. This might be useful for owners who know exactly their abilities and will decide on their level of involvement in the project accordingly. However, once the alliance is created this plan must be reviewed by the alliance lead team ALT and it will not be considered final until it is approved by all team members.

6. The Australian Alliance Model also proposes the development of two governance plans, one for governance within the alliance and one for governance outside the alliance. The outside governance plan is a very useful tool in dealing with subcontractors, consultants, and other service providers. Since the alliance is forming one integrated body representing the project, all participants should realize that their individual actions are also representing the whole alliance and for that reason the external governance plan is useful.

7. The IPD Model divides the governance plan or the project framework into two distinguished stages macro & micro. The macro framework should be established during the contract negotiation stage because it contains all the basic goals and targets of the project and all participants should be fully aware of those targets before they sign the agreement. Once it is finalized the macro frame work shall be signed and attached to the contract documents.

8. The micro framework on the other hand, is usually developed during the design development stage and it is developed by the project teams after they have been established. The micro plan includes in detailed all project

related matters that concern with executing the project and the relationships between team members.

9. IPD contracts mandates the usage of BIM technology, therefore a BIM protocol manual might also be required. This manual will define the roles, responsibilities and authorities regarding the project design models.

10. The PPC2000 Model also consider the governance of the project of high importance, however this model relies more on signed contractual agreements to determine the roles and responsibilities of team members. The partnering agreement which consists of the main partners and the joining agreement for any further partners who might join the project later.

11. The PPC2000 Models suggest the usage of project timetable as a governance plan and divides the project into two phases for better management. The pre-construction phase and the construction phase. Project timetables should be developed by all team members and should be monitored and reviewed continuously.

4.4.2 Communication and Meetings

1. All alliance contracts models consider efficient communication among the project team members to be very important. Communication is the only method in which team members can really express their trust towards each other's and their ability to operate as one integrated team, which is the main purpose of alliance contract concept.

2. Alliance contracts models require different types of communication skills. Team members must be able to openly share and receive information not only within their own organization but also with all other participants in the project. This ability should be one of the selection criteria for team members and for NOPs as well. Many projects consist of intensive workshops with the nominated NOPs personnel during the tendering stage. The NOPs personnel must proof their ability of team work and collaboration with other participants in order to be selected for an alliance project. Other projects held seminars and workshops after forming the alliance in order to educate the team members on the best behavior in an alliance project.

3. The Australian Alliance Model relies so much on the alliance manager in communication. The alliance manager is the linking point between the lead team and the management team. The alliance manager should have high communication skills and ensure that information is reaching the right person in the right time.

4. IPD Model requires the management team to establish a well-constructed communication system right at the beginning of the project. The system should describe clearly the way information is created, exchanged, and received. It concerns a lot with the source of information and the person responsible for it. Also in IPD projects in-progress information is shared, however once the data is final then it shall have a source.

5. IPD projects promote the usage of advanced technology which applies also on the communication methods. Devices such as tablets and smart phones are being utilized in IPD projects. A well-established data sharing system in the project is also recommended for sharing and recording project data.

6. IPD Model mandates the usage of BIM technology. The collaborative BIM models are commonly used. This method requires a predetermined protocol of usage which defines the authorities of team members in terms of altering and modifying the models.

7. The PPC2000 Model promotes a communication system called “early warning”. All project team members are obligated to give written notifications regarding any problems that they may foresee. The problems may be within the member scope or not. According to PPC2000 Model this system is efficient to avoid any future conflicts and at the same time it is a test of team member’s performance and their vision beyond their own organization.

8. All alliance models also encourage direct communication between team members in the project. Direct contact and communication is a good way of team members to gain each other’s trust and operate as one integrated team. Nevertheless, it is also very important to properly record and document everything.

9. One common approach of communication in alliance projects is the “**Big Room**” approach. This approach provides a big meeting room in the project, in which all different teams can hold their meetings and workshops whenever needed. Meetings are being held openly and participation of all team members is always encouraged.

10. Alliance projects have many management teams within the project. Each team has its own meeting needs. All regular meetings should be stated in the contract agreement. Participants should also commit to always be

represented in the meetings. Special meetings are still possible up on the request of any team member.

11. Many alliance projects have a special position for the person responsible of setting up and monitoring the communication system. In the Australian Alliance Model it is called the “relationship manager” in the PPC2000 Model is the “partnering advisor”. These types of contracts need high level of communication among team members in order to achieve their goals.

4.4.3 Decisions Making

1. Alliance contracts have two main aspects of the decision making process. Firstly, all decisions made by the project participants must be best-for-project decisions. Secondly, the process of making decisions must be in collective and collaborative manners.

2. The best-for-project decisions are guaranteed usually by aligning the commercial interests of every participant with the final outcome of the project. Consequently, by making best-for-project decisions participants will be making decisions for their own benefits as well. However, it requires an effort from the NOPs in order to fully adapt to this concept especially participants who are new to the alliance contracts

3. Some alliance contracts provide a reward system for the NOPs. By achieving added value to any project targets participants can actually

receive actual gains and increase their profit. Even though, one of the alliance contracts concepts is the shared gain and pain. However, NOPs need more encouragement in order to fully adapt to this thinking mechanism.

4. The Australian Alliance Model states that all project decisions shall be made by the alliance lead team ALT which must consist of members from all participants. Each member shall cast one equal vote and decisions will only be made in a unanimous way and when all members are present. Therefore, all participants are obligated to always be represented in the ALT meetings; each member has to appoint a replacement in case of no attending. Team members shall continue their discussion and debating until reaching a unanimous decision. Both the owner and the NOPs have equal roles in the decision making process.

5. The IPD Model still gives greater role to the owner. In this model decisions are being made by the project management team which must consist of members from all participants. The project management team can only take unanimous decisions. If the management team was unable to reach a unanimous decision then the matter will be transferred to the senior team. The senior team can take unanimous decisions or decisions by majority. However, the decision shall still be reviewed by the owner representative. The owner representative has the authority to change any of the senior management team decisions.

6. The PPC2000 Model states also that decisions are only taken by consensus during the meetings of the project core group which must consist of members from all participants. However, in this model decisions are being taken only by the attending members of the core group meeting.

Moreover, the non-attending members have no right afterwards to object any of the decision's taken by the core group.

7. Both the IPD and PPC2000 models give also the owner representative the power of giving direct instructions in the project. NOPs are obligated by the contract to follow those instructions. Nevertheless, if the instructions will lead to any change of the predetermined time or cost then the NOPs are entitled for further adjustments.

8. Reaching a unanimous decision is considered to be one of the factors of assessing a successful alliance. Repeated failure in the decisions making process is an indicator of a dysfunctional alliance in which participants have not fully captured the main concept of being part of an alliance and they are still thinking merely about their own benefits.

5 Conclusion

Project Alliancing is a relational contracting method widely used to handle complex projects. An Alliance project is created by the owner and the non-owner participants after signing a multi-party agreement to accomplish the project. Project Alliancing requires all project participants to work as one integrated team and it covers the whole process of the project starting from design stage, in some cases starting from development stage, until completion.

Project Alliancing is suitable for almost all types of construction projects; however it shows greater results in complex projects with enormous funds and high risks. Besides, it requires an owner with a certain level of knowledge and experience in order to form and be an active member on an Alliance project. The selection of non-owner participants is carried out through a non-price tendering procedure. The nominated participants should acquire skills beyond the traditional construction projects requirements.

Considering the unique nature of the Alliance projects, they require a new set of rules for management. Traditional project management and project organization are not compatible with the Alliancing aspects. The project Alliancing introduces new concepts in the construction industry, such as: one integrated management team, collaborative performance, open-book communications, and collective decisions making.

The Alliance projects are being governed by integrated teams. The teams consist of members from all the participants in the project. Teams are structured in multiple levels. The top level contains the senior management team which is the highest authority of the project. The senior team duty is to develop the project goals and objectives and to take all the strategic decisions of the project. The senior management team usually consists of one senior member of each participant of the project. The second level contain the project management team, their duties are to manage project activities and processes in accordance with the contract documents. The project management team also consists of

members from all the participants of the project and they are working as one team regardless of their organizational backgrounds. The last level contains the delivery team or teams. The delivery teams are the execution teams of the project working on an operational level. According to each project size and complexity, there may be one delivery team or multiple teams. Also each Alliance project has a project manager. The alliance manager may or may not be a member of one of the teams but its main duty is to link all the teams together. An Alliance advisor or consultant is also recommended, especially when the alliance have participants with no previous experience is such contracting model. The Alliance advisor has an important role at the early stage of the project in determining the roles and relationships of the project teams and members.

The governance plan of each Alliance project is developed collectively between all the participants. The governance plan should determine clearly the roles and responsibilities of all the team members. The governance plan is a very important document of the Alliance projects and once it is finalized it will be considered as part of the contractual documents. Each project has different governance requirements; however there are some common features for Alliance project management. The goal of a good governance plan is to integrate the different project participants in one team by aligning their own commercial interest with the final outcome of the project. Therefore, team members will perform based on a best-for-project policy which eventually will be for their own benefits. The governance plan should also create a collaborative environment in the project based on trust and mutual respect. In such environment team members should be able to exchange confidential information freely (open-book policy). Active communication between team members is highly important. Approaches such as “early warning” and “big room” are being used to improve communication. The project Alliancing will only reaches its potential when team members are thinking beyond their own scope of work and actively communicating with the other members in order to act in the best interest of the project.

The decisions making process is of high importance in Alliance projects. There are two main aspects of the decisions in the Alliance. The first aspect is best-for-project decisions which will only be achieved when team members perform beyond their organizational boundaries and believe that by acting in the best interest of the project they are actually acting in their own best interests as well. The second is unanimous decision making. Although some Alliance agreements still gives the owner the authority of enforcing decisions but the ultimate goal of the project Alliancing is for all the participants contribute in the decision making and to reach decisions by consensus. The ability of participants to take unanimous decision after a process of discussion really proofs that the project Alliance has reached its full potentials.

Project Alliancing is still a relatively new concept worldwide in construction projects. Nevertheless it has great benefits when it is being used correctly. The main point is that project Alliancing requires a huge change in the thinking and mentality of all project members comparing to the traditional way of contracting.

Declaration of Authorship

I hereby declare that the attached Master's thesis was completed independently and without the prohibited assistance of third parties, and that no sources or assistance were used other than those listed. All passages whose content or wording originates from another publication have been marked as such. Neither this thesis nor any variant of it has previously been submitted to an examining authority or published.

Date

Signature of the student

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