

# The definition of alliancing in construction as a Wittgenstein family-resemblance concept

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Received 25 April 2006; received in revised form 22 August 2006; accepted 3 October 2006

## Abstract

There has been increasing interest in the concept of alliancing in construction stemming from the late 1990s. In spite of the fact that project partnering is a widely understood concept, the same is not true for alliancing. By using Nyström's similar approach to define construction partnering, this paper focuses on alliancing and family-resemblance and makes two contributions to the concept of alliancing in construction. The first one is to clearly distinguish amongst *general prerequisites*, *hard (contractual) and soft (relationship-based) elements*, and *goals* when discussing the concept. For the sake of thoroughly understanding what is specific about alliancing, the focus ought to be on the *hard (contractual) and soft (relationship-based) elements*, which are identified through a literature review. The second one is to make use of the German philosopher Ludwig Wittgenstein's idea of family-resemblance when defining the alliancing concept. His idea is that a complicated concept can be understood as a network of overlapping similarities. It is concluded, based on the literature review, that there are two necessary hard (contractual) elements – *formal contract* and *real gain-share/pain-share arrangement*, and three essential soft (relationship-based) elements, *trust*, *long-term commitment*, and *cooperation and communication* in construction alliancing, and that a number of different elements can be added to constitute a specific variant of alliancing. This provides an innovative and useful method to define the vague and versatile concept of alliancing in construction in a flexible and structured way. By doing so, industrial practitioners may find the alliancing sunflower model useful in the procurement phase of a building and construction project, particularly if needed, as a description of the concept and as a common starting point for discussions between a client and a contractor on how to procure a specific alliancing projects, thus avoiding any misinterpretations of what an alliancing project is.

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**Keywords:** Alliancing; Family-resemblance; Construction; Hard (contractual) and soft (relationship-based) elements; Wittgenstein

## 1. Introduction

The emergence of alliancing, like partnering, has received a great deal of attention from industrial practitioners and researchers in the construction industry since the late 1990s [1]. Despite the fact that more and more articles have discussed the characteristics of alliancing, there is still no consensus on the precise and comprehensive meaning of the concept. In fact, alliancing can be characterised as a complex concept where it has been difficult to reach an agreement on a standard type of definition. An explanation

for the increasing number of alliancing definitions is that the concept is yet to mature. If this is true, a comprehensive and conclusive definition of alliancing, which states the necessary and sufficient conditions, will finally arise. However, the reality is just the opposite. It appears that the first step to clearly understand the conception of alliancing is probably to realise that such a definition does not exist for this versatile concept.

Nevertheless, there is still a need for a common conception of alliancing because discussions will be cross-purposed and ineffective if there is not any mutual starting point. The following two examples explain this situation. Firstly, when evaluating different alliancing projects, what do the evaluators comprise in the alliancing concept,

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meaning that do they refer to the same concept? Secondly, when two industrial practitioners have different opinions about the potential with alliancing, are they really talking about the same thing, meaning that do they include the same elements?

The purpose of this paper is to present an innovative and useful method to define alliancing in construction. Earlier studies [2,3] mentioned that the critical success factors of the concept can be determined from reviewed literature. However, similar to Nyström’s [4] approach in defining construction partnering, the first step towards defining alliancing is to distinguish amongst *general prerequisites*, *hard (contractual) and soft (relationship-based) elements*, and *goals* of alliancing. This distinction will make it clear that when the essence of the concept is searched, focus ought to be on the *hard (contractual) and soft (relationship-based) elements*. The second step is to make the use of the German philosopher Ludwig Wittgenstein’s idea of family-resemblance when the relation between these elements and alliancing is defined. This innovative approach will generate a useful method to define different variants of alliancing within the same structure. By doing so, industrial practitioners may find the alliancing sunflower model useful in the procurement phase of a building and construction project, particularly if needed, as a description of the concept and as a common starting point for discussions between a client and a contractor on how to procure a specific alliancing project.

Like partnering, alliancing has been described as a panacea in the unhealthy construction industry. However, it

should be noted that this paper does not set out to evaluate the strength or weakness of alliancing, but it just discusses how alliancing can be defined precisely and comprehensively in a systematic way. On the other hand, it should also be noted that the approach presented here is applicable to both project alliancing and strategic alliancing because the literature review covers both.

**2. General prerequisites, hard (contractual) and soft (relationship-based) elements, and goals**

It has been a more and more popular subject in conducting research by sorting out the major factors of alliancing in order to understand the concept. What has been conducted here applies to the same principle in which the factors mentioned in Fig. 1 are extracted from the alliancing literature. It is concluded, when looking closely at these factors, that they can be classified into three separate groups (Fig. 1).

The general prerequisites are factors, which are not necessary to be unique for alliancing. *Top management support* [2,3,5,6] and *Adequate resources* [2,5] are almost required in all kinds of construction projects. As a matter of fact, when studying these factors, they do not add to our knowledge on alliancing because they are very general. This approach is similar to Nyström’s methodology in defining construction partnering [4].

Clearly, the goals of alliancing are the most vital thing to be pursued. In getting this, it should be helpful to clarify what alliancing is composed of, which is not conducted

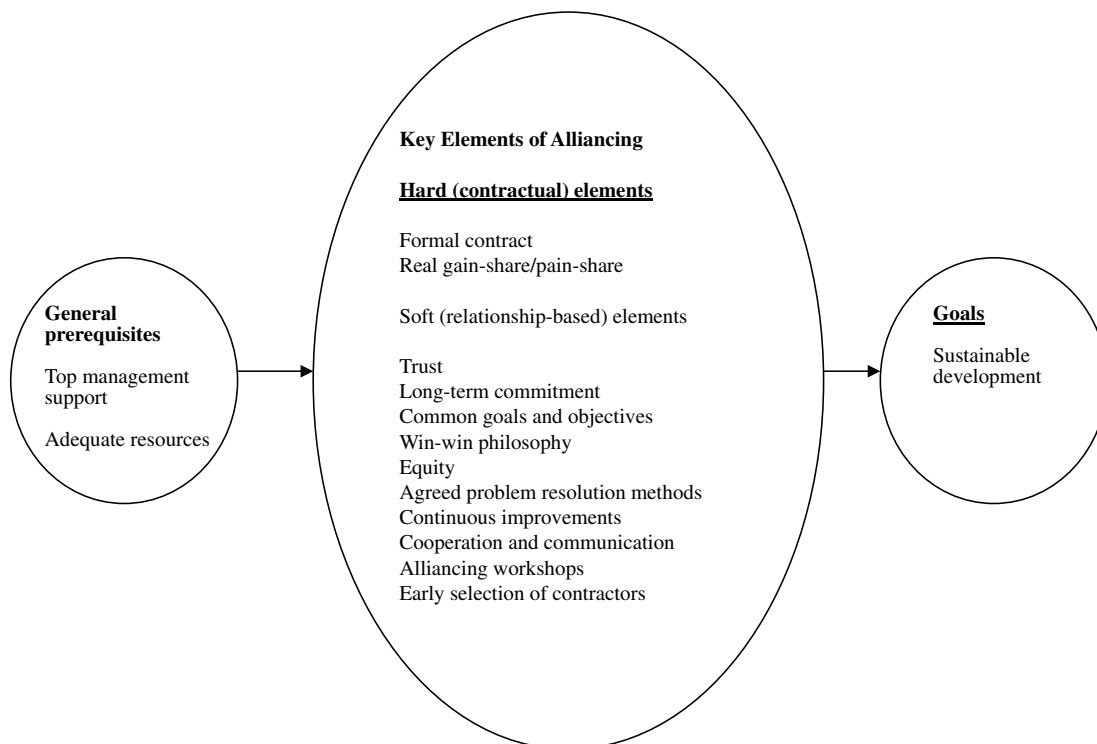


Fig. 1. Distinction of alliancing factors (adapted from Nyström [4]).

by studying the outcome. *Sustainable development* [7–9] ought to be viewed as a desirable goal and outcome of alliancing. Despite the fact that alliancing projects might fail and not lead to sustainable development, we would still label it as an alliancing project if it has characteristics related to hard elements and soft elements mentioned in Fig. 1. Therefore, this paper takes general prerequisites and goals for granted, and focuses on the elements in endeavouring to define alliancing in construction. There are two major types of elements classified in this research. The first type is hard elements and the second one is soft elements. Hard elements here refer to elements that are directly related to contractual and legal features while soft elements are elements directly related to relationship and people. By this classification, hard elements in this research include formal contract and real gain-share/pain-share while soft elements encompass trust, long-term commitment, common goals and objectives, win–win philosophy, equity, agreed problem resolution methods, continuous improvements, cooperation and communication, alliancing workshops, and early selection of contractors. It is of interest to note that agreed problem methods and common goals and objectives are indirectly related to contract clauses or appendices. However, they are still classified as soft elements because they are more related to relationship and people.

### 3. Definitions of alliancing

There are numerous definitions of alliancing and the scope and nature of alliances is reflected in the range of definitions which are in common currency [6]. These definitions can be very broad, such as ‘A relationship between two entities, large or small, domestic or foreign, with shared goals and economic interests’ [10], or ‘organisations with capabilities and needs come together to do business and add value to the other partner, at the same time working to provide a product which enhances society and the capability of the ultimate client’ [11]. Other authors are more specific, for instance, Kwok and Hampson [12] defined project alliancing as ‘a cooperative arrangement between two or more organisations that forms part of their overall strategy, and contributions to achieving their major goals and objectives for a particular project’. Gerybadze [13], however, defined project alliancing as ‘the client and associated firms will join forces for a specific project, but will remain legally independent organisations. Ownership and management of the cooperating firms will not be fully integrated although the risk of the project is shared by all participants’. A common definition of strategic alliancing proposed by Love and Gunasekaran [14] is to ‘establish inter-organisational relations and to engage in collaborative behaviour for a specific purpose’. A strategic alliancing is also seen as ‘an inter-organisational arrangement which usually exists between two companies that extends beyond a specific project and the parties would expect ongoing, mutually beneficial business’ [15].

### 4. Using Ludwig Wittgenstein’s family-resemblance concept to define alliancing

The numerous definitions of alliancing mentioned above show how hard it is to give a concise and comprehensive explanation of the concept. It appears that there is no consensus on which specific elements ought to be included and thus the concept seems to be hopelessly vague. The German philosopher Ludwig Wittgenstein would not agree, and argue that complex concepts are not able to be defined in the traditional way by stating necessary and sufficient conditions because there may not be a single or a very small number of characteristics, that are common for all variants of a concept and thus it cannot be defined in this traditional approach [4]. Instead he considered that there are complicated networks of overlapping similarities among the things that fall under a complex concept [16]. Murphy [17] stated that a Ludwig Wittgenstein’s classical example is the term ‘game’, which is illustrated in such a way that there are a large number of activities featured as games but he argued that a single and common characteristic for all of them is missing. He further elaborated that ball games such as tennis, football, and basketball have rules to be followed. However, there are no rules stated clearly when a boy or a girl just throws a ball in the air. Some elements of the ball games, including rules, competitiveness, and reward and penalty, remain but some fall off, encompassing hard physical work and the ball, when the thought goes to board games. Ludwig Wittgenstein viewed that there is just a complicated network of overlapping characteristics without any common features covering all kinds of games. Such an approach to understand a multifaceted concept is called ‘family-resemblance’ due to the reasoning that it resembles the type of similarity that is able to be found within a family. He further cited the following example to illustrate this family-resemblance concept. A daughter in a family could have the ‘same’ nose as her father while the father and his son have the ‘same’ ears, but there is no feature common to all members of the family. Nevertheless, there is still a bond between them. Clearly, the family-resemblance method defining a versatile concept is more flexible and structured for the reason that it does not restrict the meaning of a concept to a small number of simple characteristics. To conclude, it is preferable to use this innovative method to understand complex concepts that are vague in nature.

### 5. Research methodology

The research method adopted for this paper was to launch a comprehensive review of the literature over the past two decades, and the strategy is to begin by looking at how often different elements are mentioned in descriptions of alliancing and then apply the family-resemblance approach to the result of this quantitative study by

cross-referencing and assessing their importance on alliancing projects. The selection of literature was mainly based on the website of Google Scholar at <http://www.scholar.google.com>. Keywords for ‘scanning’ include alliancing, project alliancing, and strategic alliancing. These terms are well known of having been used in writing papers on alliancing in construction. However, there are too many alliancing papers using these terms. To maintain the efficiency and effectiveness of the literature searching process (i.e. searching the largest number of papers with the highest quality but with the least time spent on the searching process), they were finally searched with a restricted symbol. The procedures for retrieving the alliancing papers are as follows:

- The titles of the articles were scanned with the keywords. Altogether, there were more than 300 articles scanned that contained one of the keywords in their articles’ titles. However, most of them are either not ‘genuine’ construction alliancing papers or closely related papers.

- Important but missed articles were identified from cross referencing of cited studies. Less related articles were excluded. For example, some papers just include a small section with little significance on alliancing, which could not be judged to be a relevant paper (Fig. 2).

Finally, 14 relevant and important reports, books, and articles from scientific journals and conference proceedings on alliancing in construction were identified. They constitute the empirical base of the study. By using the content analysis method in this research, fourteen elements in total have been crystallised from the analysed materials. The authors do not usually use the exact terms in describing the same characteristics because they have already been referred to the same meanings. The analysis of the 14 literature identified led to the result presented in Table 3. A ‘tick’ in Table 3 shows that the writer has mentioned this element as a vital part of the alliancing concept. Based on the reviewed literature, *formal contract* and *real gain-share/pain-share* are the most vital hard (contractual) elements while *trust*, *long-term commitment*, and *cooperation*

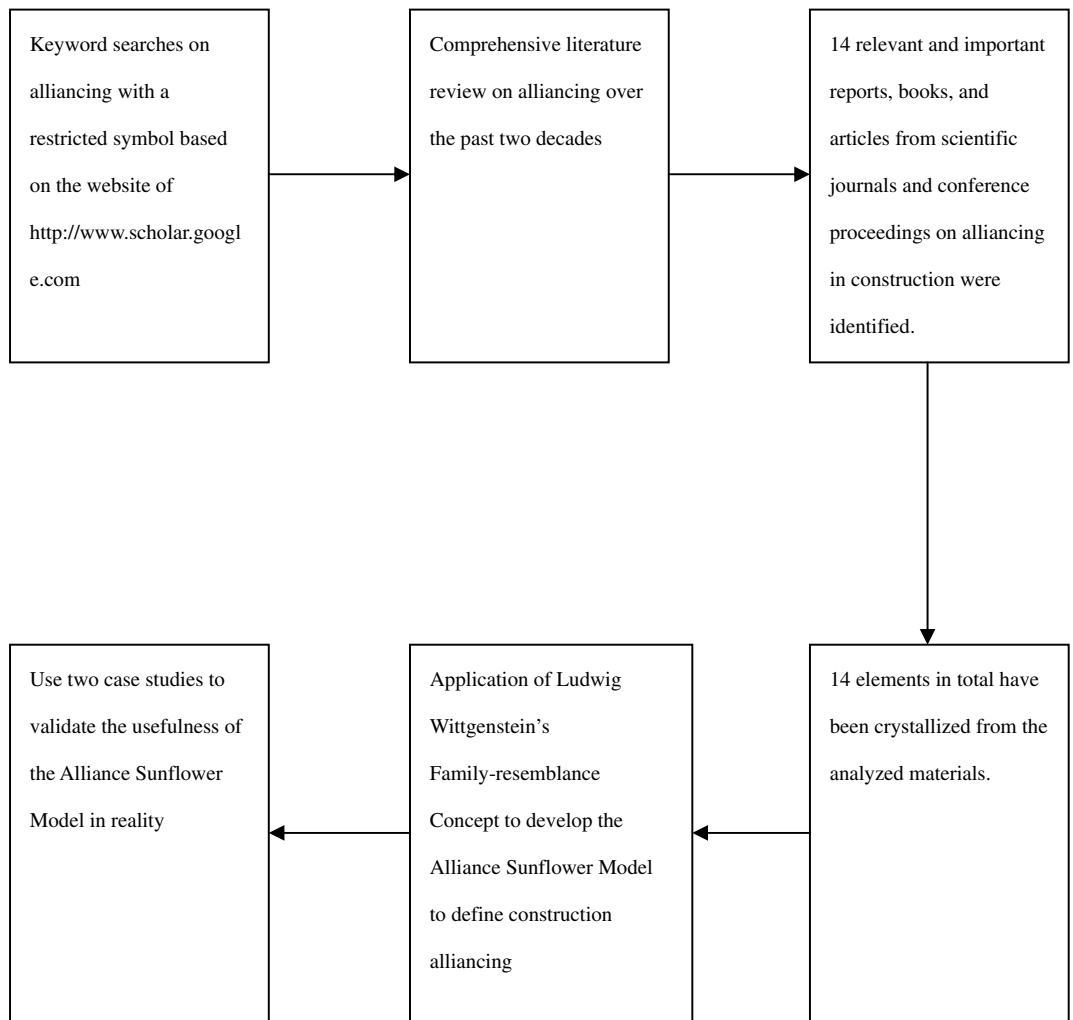


Fig. 2. Research process adopted in this study.

Table 1  
Definitions of partnering and alliancing (from various sources as stated below)

	Definitions
Partnering	The CII (USA) (1991) defined partnering as ‘a long-term commitment between two or more organisations for the purposes of achieving specific business objectives by maximising the effectiveness of each participant’s resources. This requires changing traditional relationships to a shared culture without regard to organisational boundaries. The relationship is based on trust, dedication to common goals, and an understanding of each other’s individual expectations and values’ [30] The CIB (UK) (1997) defined partnering to be ‘a structured management approach to facilitate team working across contractual boundaries . . . it should not be confused with other good project management practice, or with long-standing relationships, negotiated contracts, or preferred supplier arrangements, all of which lack the structure and objective measures that must support a partnering relationship’ [31]
Alliancing	United States Trade Centre (1998) defined alliancing as ‘a relationship between two entities, large or small, domestic or foreign, with shared goals and economic interests’ [10] Nicholson (1996) defined alliancing as ‘organizations with capabilities and needs come together to do business and add value to the other partner, at the same time working to provide a product which enhances society and the capability of the ultimate client’ [11] Kwok and Hampson (1996) defined project alliancing as ‘a cooperative arrangement between two or more organizations that forms part of their overall strategy, and contributions to achieving their major goals and objectives for a particular project’ [12] Gerybadze (1995) defined project alliancing as ‘the client and associated firms will join forces for a specific project, but will remain legally independent organisations’ [13] Love and Gunasekaran (1999) defined strategic alliancing as ‘to establish inter-organisational relations and to engage in collaborative behaviour for a specific purpose’ [14] Peters et al. (2001) defined strategic alliancing as ‘an inter-organisational arrangement which usually exists between two companies that extends beyond a specific project and the parties would expect ongoing, mutually beneficial business’ [15]

and communication are the most important three soft (relationship-based) elements in construction alliancing because they are cited with the highest frequencies by the authors. In addition, although not all the authors use the exact terms of ‘formal contract’ and ‘real gain-share/pain-share’ to describe alliancing, it seems that these concepts are implicit in these papers. The next section will briefly present all elements that constitute the whole ‘alliancing family’ in that they are always described in the literature. Then, the application of family-resemblance approach to the alliancing concept will be described (Tables 2 and 3).

**6. Key elements of project alliancing and strategic alliancing**

*6.1. Formal contract*

A key difference between partnering and alliancing stated by Manley and Hampson [18] is that the former runs alongside standard contracts, having no contractual force itself, whereas alliancing arrangements are expressed in

contractual form. While alliancing is both a relationship management system and a delivery system, partnering is not a delivery system. Hence, one can have an alliance contract, but there is no partnering contract, only a partnering charter. McGeorge and Palmer [6] viewed that alliancing is somewhat akin to the slogan of the three musketeers ‘All for one and one for all’ in that alliancing could be described as partnering underpinned with economic rationalism given that alliance partners coalesce into a virtual corporation in which agreed profit and loss outcomes are contractually binding on all parties [1,2]. Rowlinson and Cheung [19] pointed out that a project alliancing agreement is legally enforceable while Hauck et al. [20] also stated that the project alliancing ‘agreement’ is a legally binding contract and, therefore, legally enforceable.

*6.2. Real gain-share/pain-share*

Walker et al. [2,8] analysed that with alliancing, there is a ‘joint’ rather than ‘shared’ commitment. Parties agree on

Table 2  
Major similarities and differences between partnering and alliancing (from various sources as stated below)

	Partnering	Alliancing
Major similarities	They both derive results through relationship. Both of them emphasize on relationship and people. Both of them intend to develop a high level of collaboration between parties. Both of them are one form of relationship contracting. Their objective is similar, that is, to partner with a good team [1,2,8]	
Major differences	It runs alongside a traditional standard contract and is just a partnering charter, having no contractual and legal force itself [30,32] No real gain-share/pain share arrangement [30,32]	It is a formal alliance contract that is legally and contractually binding [2,6,19,20]  With real gain-share/painshare mechanism: if one party in the alliance under-performs, then all other alliance partners are at risk of losing their rewards (profit and incentives) and could even share losses, and vice versa according to the agreed project gain-sharing/pain-sharing model [2,8]

Table 3  
Key elements of project alliancing and strategic alliancing

Papers/Elements	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	Formal contract	Real gain-share/pain-share	Trust	Long-term commitment	Common goals and objectives	Win-win philosophy	Equity	Agreed problem resolution methods	Continuous improvements	Cooperation and communication	Alliancing workshops	Early selection of contractors	For a single project only	For at least two projects
<i>Project alliancing</i>														
Kwok and Hampson [12]					✓					✓			✓	
Hampson and Kwok [7]		✓	✓	✓				✓		✓			✓	
Abrahams and Cullen [21]		✓	✓			✓				✓				
Walker [1,2]	✓	✓	✓	✓	✓			✓	✓	✓	✓			
Manley and Hampson [18]	✓			✓			✓			✓		✓	✓	
McGeorge and Palmer [6]	✓	✓												
Walker et al. [8]	✓	✓	✓	✓	✓	✓			✓	✓	✓		✓	
Rowlinson and Cheung [19]	✓												✓	
Hauck et al. [20]	✓	✓	✓		✓		✓			✓			✓	
Alchimie and Phillips [24]		✓	✓	✓						✓				
Thorpe and Dugdale [26]			✓	✓	✓				✓					
Total number of hits for a certain element	6	7	7	6	5	2	2	2	3	8	2	1	6	
<i>Strategic alliancing</i>														
Howarth et al. [23]			✓											
Hampson and Kwok [7]		✓	✓	✓				✓		✓				✓
Lendrum [27]				✓	✓	✓								
Walker et al. [1,2]	✓		✓					✓	✓	✓				✓
Peters et al. [15]														✓
Rowlinson and Cheung [19]														✓
Hauck et al. [20]														✓
Total number of hits for a certain element	1	1	3	2	2	1	0	2	1	2	0	0		5
Gross-total	7	8	10	8	7	3	2	4	4	10	2	1	6	5



their contribution levels and required profit beforehand and then place these at risk. If one party in the alliance under-performs, then all other alliance partners are at risk of losing their rewards (profit and incentives) and could even share losses according to the agreed project pain-sharing/gain-sharing model. Abrahams and Cullen [21] defined project alliances as ‘an agreement between entities which undertake to work cooperatively, on the basis of a sharing of project risk and reward, for the purpose of achieving agreed outcomes based on principles of good faith and trust and an open book approach towards costs’. Hauck et al. [20] mentioned that as an alliance of talented professionals pooling resources to achieve the project goal, they develop the project price target through design development with agreed risk and reward sharing arrangements. Agreement on a risk and reward formula where an open-book accounting approach is undertaken to determine cost reimbursement together with agreed and verified site management costs to establish a base target cost. The firm’s corporate profit (usually determined from audited figures over an agreed period) is placed as an ‘at risk’ element to ensure that the agreed project costs are met. A bonus reward mechanism to be shared by all parties is jointly established to encourage further innovation and excellence. Therefore, the agreed project cost can only be determined when the alliance partners have been selected. McGeorge and Palmer [6] emphasised that alliancing differs radically from partnering in respect to risk and reward sharing. In partnering the client still ultimately purchases a product (usually a building) which is produced, albeit in a spirit of mutual co-operation, with the design and construction teams. In alliancing the virtual corporation produces the product with each member of the corporation sharing risks and rewards. The characteristics of successful strategic alliances proposed by Hampson and Kwok [7] are trust, commitment, interdependence, cooperation, communication and joint problem solving. The interdependence here

implies sharing risks and rewards. A classical alliancing gain-share/pain-share scheme is shown in Fig. 3.

### 6.3. Trust

Walker et al. [2] stated that alliancing is based upon a need for trust to generate commitment and constructive dialogue, and trust is part of an outcome from negotiation. Actually, trust is bound up with past experience both directly with the person(s) concerned and indirectly, through projected or anticipated experiences, thus trust is an intensely emotional and human phenomenon. Fig. 4 illustrates a model of the range of influences that can affect the perception of trust. Walker et al. [8] pointed out that the alliance team’s formation of a management group as a true joint management group with democratic membership ensures that trust and commitment is truly encouraged and manipulation discouraged by the system of alliancing was a vital feature. Hampson and Kwok [7] proposed trust as an important element of successful strategic alliances as well as successful business relationships. Howarth et al. [23] believed that no successful strategic alliances can be developed without trust. Trust in a strategic alliance also includes the concept of reciprocity, which implies a long-term focus, the acceptance that obligations are mutual, and room for adjustment if one partner is suddenly placed in a compromising position. Hauck et al. [20] agreed that trust and integrity are essential for true collaboration during the collaborative process while Alchimie and Phillips [24] viewed project alliancing as ‘an integrated high performance team selected on a best person for the job basis; sharing all project risks with incentives to achieve game-breaking performance in pre-aligned project objectives; within a framework of no fault, no blame and no dispute; characterised by uncompromising commitments to trust, collaboration, innovation and mutual support; all in order to achieve outstanding results’.

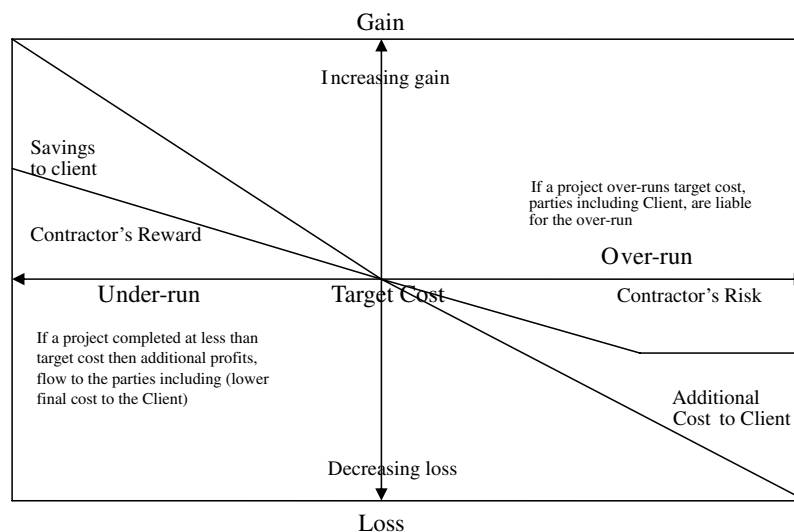


Fig. 3. Typical model of gain-share/pain-share mechanism [22].

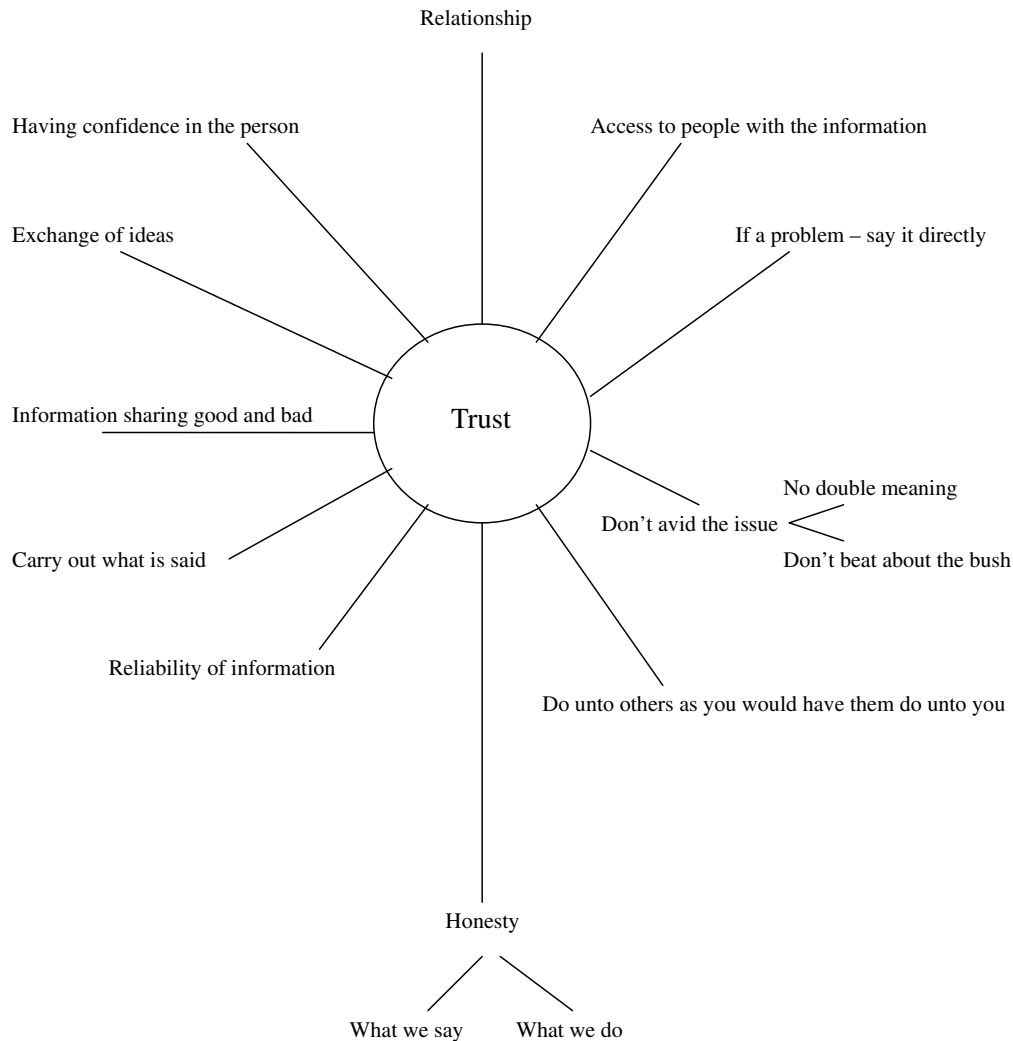


Fig. 4. Elements of trust [25].

#### 6.4. Long-term commitment

Hampson and Kwok [7] proposed that commitment is one of the key characteristics of successful strategic alliances as well as successful business relationships. Walker et al. [2] emphasised that trust and commitment underpins the three essential elements of alliancing (mutual objectives, problem resolution, and continuous improvement). They added that commitment is the physical and mental manifestation of the concept of trust. It means that another party will take this trust on board and 'live up to' the spirit of the bargain by probably committing more personal pride and obligation to 'do the right thing' than would otherwise be the case. Walker et al. [8] supplemented that the delivery management plan of the National Museum of Australia Project was established on the basis of an alliance concept. The core principle of alliancing was to achieve a positive outcome for all alliance members including both the client (also an alliance member) through shared commitment to a common goal of project realisation delivering best value to the client and acceptable

reward outcomes to alliance members. The assumption made is that all parties can achieve a win-win situation provided that they work together to help each other to gain not only a realistic reward for their input but to gain a competitive edge in the market as a result of their experience on this milestone project. Thorpe and Dugdale [26] also agreed that successful alliance contracting requires commitment by both parties to achieving common goals. Alchimie and Phillips [24] referred project alliances are characterised by uncompromising commitments to trust, collaboration, innovation and mutual support in order to achieve outstanding results. Lendrum [27] regarded that for the purpose of making alliances successful, all parties have to agree on the objectives and share the principles' process and general information to gain a partner's initial and ongoing support and commitment.

#### 6.5. Cooperation and communication

Kwok and Hampson [12] described project alliances as a cooperative arrangement between two or more organisa-



tions that form part of their overall strategy, and contributes to achieving their major goals and objectives for a particular project. Hampson and Kwok [7] stressed repeatedly that cooperation and communication is a key element of successful alliances. Abrahams and Cullen [21] opined that working cooperatively between entities is an important element for alliancing parties to succeed. Walker et al. [2] stated that alliancing is founded upon team spirit and the honesty associated with notions of trust, commitment, and the application of power and influence. Excellent and effective communication is essential for successful relationship building. Both Hauck et al. [20] and Walker et al. [8] pointed out that the intense integration of alliance partners through the whole collaborative process requires excellence in communication at a personal level, at a business level, and at operational level. This general requires a quantum leap in the use of shared information technology (IT) systems and information processing integration. Alchimie and Phillips [24] also agreed that cooperation and collaboration are vital elements for successful alliances.

#### 6.6. Common goals and objectives

Project alliancing is described as a cooperative arrangement between two or more organisations that forms part of their overall strategy, and contributes to achieving their major common goals and objectives for a specific project [12]. Walker et al. [2,8], using the National Museum of Australia Project as an example, explained the core principle of alliancing was to achieve a positive outcome for all alliance members through shared commitment to common goals and objectives of a project realisation delivering best value to the client and acceptable reward outcomes to alliance members. Thorpe and Dugdale [26] viewed that alliance contracts are best suited to contracts that require innovation and commitment to achieving common goals. Hauck et al. [20] also agreed that common goals and objectives are key elements for successful alliance contracts.

#### 6.7. Win–win philosophy

Lendrum [27] mentioned that in order for alliances to be successful, all parties have to agree on the objectives and share the principles processes and general information to gain your partner's initial and ongoing support and commitment. The contractor must be involved to ensure a win–win long-term relationship. Walker et al. [8] defined an element of alliances was that joint budget and cost/time committed targets established through an alliance board represented by key senior project champions from each alliance member and the owner/client. This implies a win–win philosophy behind. The definition suggested by Abrahams and Cullen [21] that 'an agreement between entities which undertake to work cooperatively, on the basis of a sharing of project risk and reward, for the purpose of achieving agreed outcomes...' also implicitly contains a win–win philosophy.

#### 6.8. Equity

Manley and Hampson [18] studied that one of the alliancing features is an equitable risk-reward balance that aligns the commercial interests of the parties. Hauck [20] agreed that the foundation of the collaborative process for project alliancing is equity between parties.

#### 6.9. Agreed problem resolution methods

Walker et al. [2] stressed that the three essential elements of alliancing, including (1) mutual objectives; (2) problem resolution; and (3) continuous improvement, are underpinned by trust and commitment (Fig. 5). Problem and dispute resolution procedures adopted in alliancing provide for the types of problem to be defined and reasonable timeframes for resolution stipulated. The reason for escalating a dispute may be hardening of diverse positions or may simply be a result of the party not being authorised to commit required resources to resolve the dispute. In cases where a dispute is escalated unnecessarily, the person escalating the dispute may not be appreciated by his peer groups. This provides a self-regulating mechanism for ensuring that problems are indeed resolved at the lowest possible level. Hampson and Kwok [7] also proposed that joint problem solving method is a key element of the successful alliances. A standard problem resolution flow chart is shown in Fig. 6.

#### 6.10. Continuous improvements

Walker et al. [2,8] observed that an essential element of alliancing was continuous improvement in that performance is measured and analysed to provide knowledge

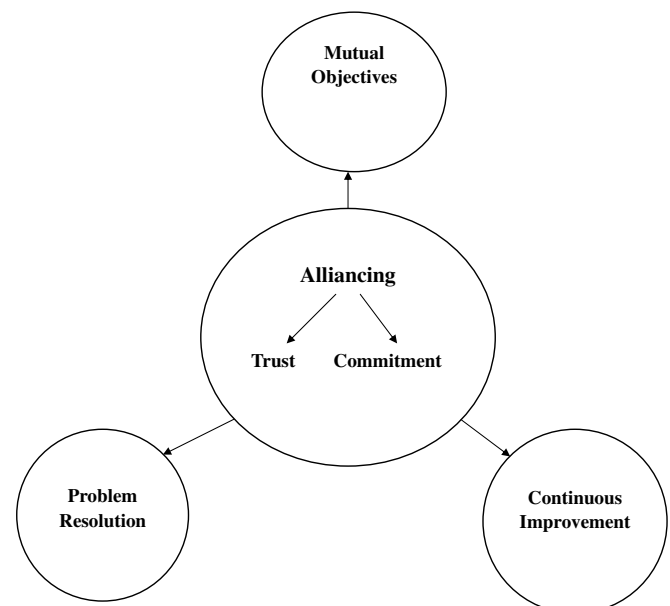


Fig. 5. Essential elements of alliancing (adapted from [2]).

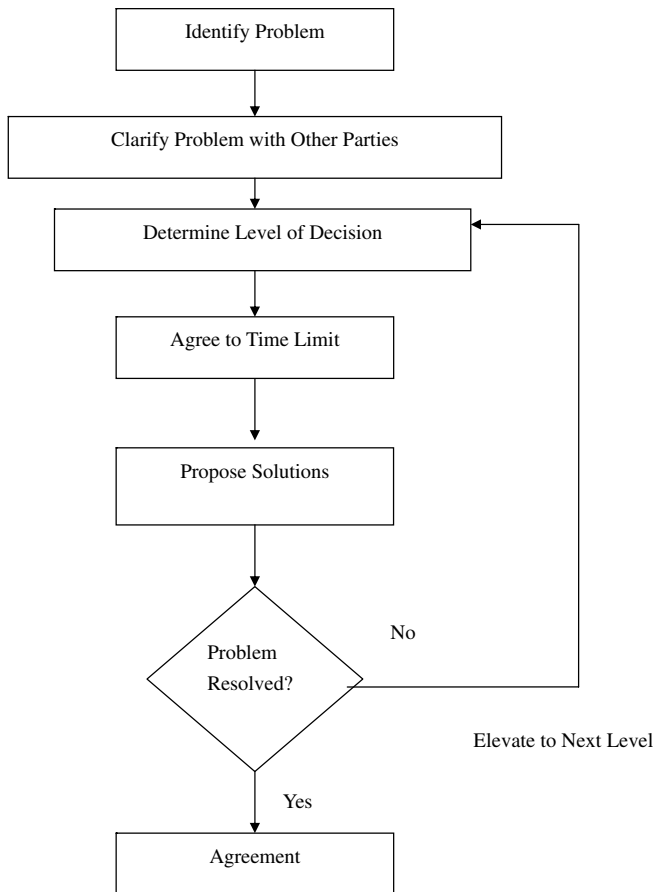


Fig. 6. Problem resolution flow chart [28].

about how improvement can be achieved continuously. There must be a commitment to learn from experience and to apply this knowledge to improve performance. Thorpe and Dugdale [26] addressed a vital element of alliance was continuous improvement, so as to achieve results on time and to full specification requirements, while innovation will always be required to improve the current process.

#### 6.11. Alliancing workshops

Walker et al. [2,8] pointed out that the interviewing process to derive a shortlist of potential alliance members requires sophistication and judgement of a client as does the facilitated workshops. This means that alliancing workshops are a useful tool to help select capable construction alliance partners.

#### 6.12. Early selection of contractors

Manley and Hampson [18] regarded that one of the most innovative elements of alliancing contracting is the early selection of contractors based on factors other than price. The client chooses contractors most able to provide value-for-money, with reference to:

- (1) technical expertise and experience,
- (2) whether the contractor would be trustworthy, cooperative and flexible,
- (3) current commitments,
- (4) project alliance experience,
- (5) safety record,
- (6) industrial relations record,
- (7) financial and management resources,
- (8) relationships with sub-contractors and suppliers,
- (9) quality and time record,
- (10) claims and dispute record,
- (11) environmental management,
- (12) risk management and
- (13) insurance claims [29].

## 7. Analysing alliancing by using Ludwig Wittgenstein's family-resemblance concept

### 7.1. The alliancing sunflower

The results presented in Table 1 show that there are some common features on alliancing as identified from the reviewed literature. 'Formal Contract', 'Real Gain-share/Pain-share', 'Trust', 'Long-term Commitment', and 'Cooperation and Communication' appear to be the most vital elements for construction alliancing since at least 50% of the reviewed articles have cited these elements when defining the alliancing concept. In addition to this, these concepts are always implied indirectly by the other writers. Therefore, they could be interpreted as core elements for construction alliancing. In fact, that a slight change or widening has to be made of the family-resemblance theory for the sake of using it as an innovative and useful method to define alliancing. Instead of simply having a network of overlapping similarities, there are five common characteristics and besides that an overlapping network of similarities. The resulting analysis of the alliancing concept can be described as a 'sunflower' because there must be a centre containing the five common elements to all alliancing designs, combined with the other important elements as mentioned in Fig. 1 surrounding it. These elements can be seen as petals of the sunflower. Something is then to be defined as alliancing if it firstly contains the core components and secondly, some of the petals, but there is no specific petal or set of petals that they must contain. Therefore, adding different sets lead to different variants of alliancing. The sunflower as an entity can be seen as the base for portraying the whole 'family' of all alliancing variants (Fig. 7). Furthermore, 'formal contract' and 'real gain-share and pain-share' can be defined as hard elements because they involve contractual arrangement in nature while 'trust', 'long-term commitment', and 'cooperation and communication' can be defined as soft elements because they are related to relationship and people.

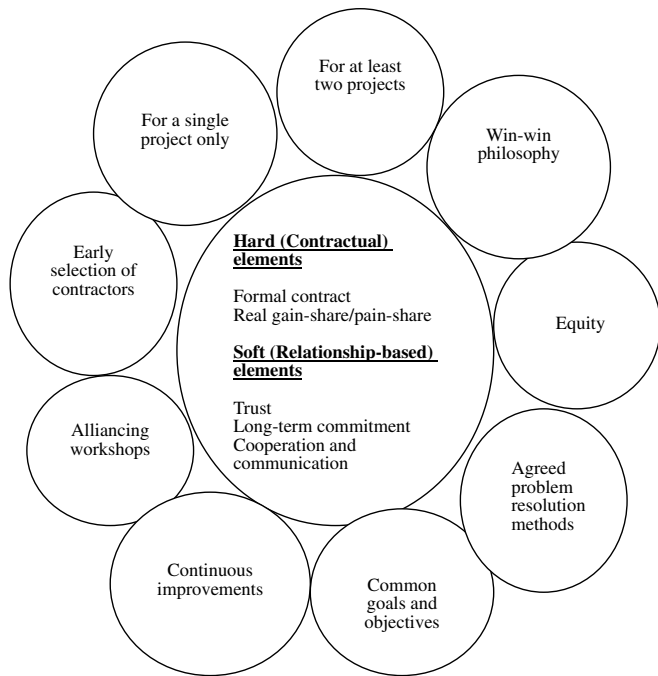


Fig. 7. Alliancing sunflower model containing all the key elements of alliancing (adapted from [4]).

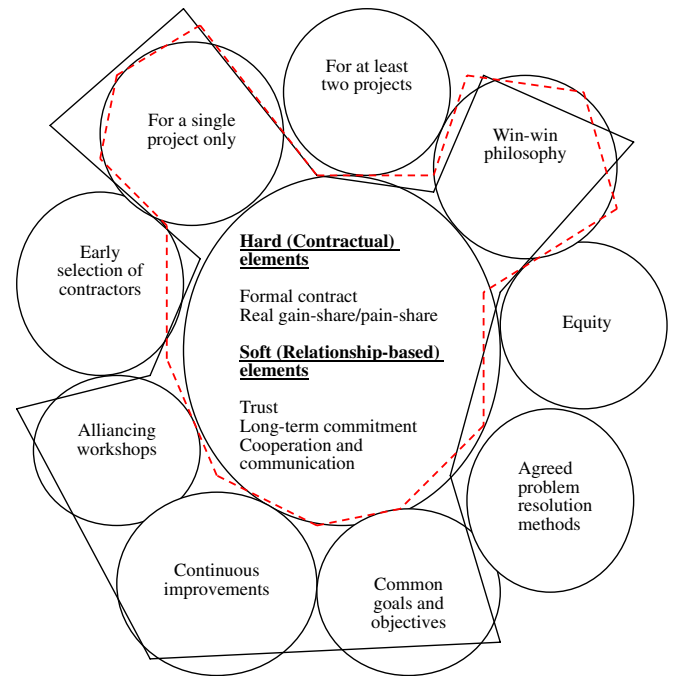


Fig. 8. The applied alliancing sunflower model. Legend: Full lines for Australian National Museum Project, dotted lines for Wandoo B Offshore Oil Platform.

### 8. Application of the Ludwig Wittgenstein’s family-resemblance concept

The above-mentioned structure facilitates a practical application of the somewhat vague concept of family-resemblance. Various designs of alliancing projects can be captured within the same structure, which is indicated by the following two instances:

The first instance is taken from Walker et al. [2,8] who described Australian National Museum Project. Besides the core elements, this alliancing project included: (1) win–win philosophy; (2) continuous improvements; (3) common goals and objectives; (4) facilitated workshops; and (5) a single project only. The variant of alliancing is illustrated by the set of elements within the full line in Fig. 8. The second instance is also taken from Walker et al. [2] describing Wandoo B Offshore Oil Platform. Again, besides the core elements, this alliancing project encompassed (1) win–win philosophy and (2) a single project only. This variant of alliancing is explained by the set of elements within the dotted red line in Fig. 8. The figure shows that although both projects ‘apparently’ are alliancing projects, they are put together by different sets of ‘alliancing petals’.

### 9. Discussion

Two major contributions have been made in this paper. The first one is to clearly distinguish amongst general prerequisites, hard (contractual) and soft (relationship-based) elements, and goals when analysing the alliancing concept. The second contribution is the recognition of alliancing as

a complicated concept and that such a concept is hard to define in the standard way by giving necessary and sufficient conditions. An innovative and useful approach developed from Ludwig Wittgenstein is proposed in defining this complicated concept by looking for a network of overlapping similarities. This is applied to the alliancing literature, where it was found that the core elements were always included in descriptions, ‘formal contract’, ‘real gain-share/pain-share’, ‘trust’, ‘long-term commitment’ and ‘cooperation and communication’. Besides these core elements, there was an overlapping network of the other elements. However, there are some limitations in this study. Firstly, it does not explain how different the effects are when analysing different types of alliancing projects. Various combinations of the alliancing ‘petals’ should, therefore, be tested and evaluated. In addition, it does not analyse how each specific element can be designed and the relationship between the petals on a more theoretical model.

### 10. Significance and value of alliancing sunflower

During the past two decades, more and more clients have adopted alliancing approach to procure their building and construction projects. With the time going by, the development of alliancing in construction becomes complex, and it is quite difficult to define what a construction alliancing project is, and industry practitioners and academics are always confused with the concepts and definitions of construction alliancing and construction partnering. By adopting the idea of family-resemblance, an Alliancing

Sunflower Model has been proposed. This model provides an innovative and useful framework to define the vague and versatile concept of alliancing in construction in a more flexible and structured way. Practitioners may find the alliancing sunflower useful in the procurement phase of a building and construction project, particularly if needed, both as a description of the concept and as a common starting point for discussions between the client and the contractor on how to procure a specific alliancing project, thus avoiding any misinterpretations of what an alliancing project is. With a better understanding of this complicated concept, it could help identify critical success factors for alliancing projects and develop a best practice framework for managing alliancing projects.

## 11. Conclusions

To sum up, there are two major contributions in this paper. The first one is to clearly distinguish amongst *general prerequisites, hard (contractual) and soft (relationship-based) elements*, and *goals* when discussing the concept. For the sake of thoroughly understanding what is specific about alliancing, the focus ought to be on the *hard (contractual) and soft (relationship-based) elements*, which are identified through a literature review. The second one is to adopt Ludwig Wittgenstein's philosophy of family-resemblance in defining the alliancing concept. It is concluded, based on the literature review, that there are two necessary hard (contractual) elements – *formal contract and real gain-share/pain-share arrangement*, and three essential soft (relationship-based) elements, *trust, long-term commitment, and cooperation and communication* in construction alliancing, and that a number of different elements can be added to constitute a specific variant of alliancing. The two contributions provide an innovative and useful approach to define alliancing, which can be of use to both the research community and the industrial practitioners. The alliancing sunflower facilitates further research in evaluating alliancing as more precise hypotheses can be formulated, for example, which effects are related to specific variants of alliancing and not to alliancing in general. Various combinations of the alliancing 'petals' can be tested and assessed. Further research can also look closer at how each specific element can be designed and the relationship between the petals on a more theoretical model, for questions like 'are certain elements more closely linked?' or 'are certain elements more difficult to combine?' Future research in these areas will help construct a more rigorous theoretical model and a clearer understanding of alliancing concept.

## Acknowledgement

The work described in this paper was fully supported by a grant from the Research Grants Council of the Hong Kong Special Administrative Region, China (RGC Project No. PolyU 5158/04E).

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