Abstract

International joint ventures (IJVs) in construction often face a highly complex and dynamic environment because, in most instances, they are formed to build large scale engineering projects. One of the primary requirements of actors in such systems is to reduce the environmental complexity. On an organizational level, many IJVs disentangle their responsibilities by functional separation and delegation of work. On a social level, delegation of work requires trust in the capability and willingness of others to perform their duties without supervision. As such, trust is a mechanism that allows us to reach our goals efficiently within this setting. Trust itself is mediated by communication involving symbolic interaction. Especially during the start phase, IJVs in construction are high-pressure environments without established networks. The intent of this article is to describe the research carried out and the conclusions drawn to determine the role of trust under such conditions.

Keywords: International joint ventures, construction, complexity, trust, culture, system theory

1. Trust as a Social Mechanism

1.1 Introduction

Traffic can be analyzed as a complex system constituted of millions of different subsystems. One such subsystem is defined by the thousands of traffic participants with whom one car driver is involved over a given period of time. It has very specific rules that the participants learn when obtaining a driver’s licence. Signs and signals communicate these rules for specific instances, e.g. a stop sign tells us to bring the car to a complete halt. Each participant plays a defined role in this system: as a driver, a pedestrian, a bicyclist or maybe as a policeman. The efficiency of this system, the ease of traffic flow, however, is not guaranteed by rules and roles. Only because we trust the other driver to halt at a stop sign can we pass through a crossing without reducing the speed.
Trust is central in many human relationships, be it on a personal (dyadic) or societal level. In the past decade a multitude of contributions have been published describing trust in different settings [1, 2, 3]. Trust develops differently in various contexts and the roles and functions it plays differ as well. Accordingly there are also different appropriate research methods.

In this article, we will describe the phenomenon of trust as it appears in IJVs of the construction industry using grounded theory as research approach.

1.2 Approaches towards Trust

1.2.1 Trust as a Rational Choice

According to this line of thought, actors behave in a rational way to maximize their gains. Two of the most influential theories are transaction cost economics and game theory.

In transaction cost economics, two basic assumptions characterize actors: Human beings have a bounded rationality and they tend to behave in an opportunistic manner (self-interest seeking with guile). Moreover, the costs for any one transaction are the sum of production and transaction costs. Transaction costs arise ex-ante (information gathering, negotiation, contract) and ex-post (supervision, conflict solution and re-negotiation). Under these conditions, institutions should be organized taking bounded rationality into account and safeguarding against opportunism [4]. Trust plays no role, mistrust does. Williamson maintains that trust “…is warranted only for very special personal relations that would be seriously degraded if a calculative orientation were “permitted”. Commercial relations do not qualify.” [5]

The prisoner’s dilemma is a well-known example illustrating the approach of game theory [6]. Two men are charged with armed burglary. There is only scant evidence, so that the prosecution depends on the statements of the two prisoners. If both confess the burglary, they will have to serve each five years in prison. Should both remain mute, they will be charged with one year each. If only one confesses, he will go free and the other one will have to serve a 20 year term.

<table>
<thead>
<tr>
<th>Burglar A</th>
<th>Confess</th>
<th>Remain mute</th>
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<tbody>
<tr>
<td>Confess</td>
<td>A: 5</td>
<td>B: 5</td>
</tr>
<tr>
<td>Remain mute</td>
<td>A: 20</td>
<td>B: 0</td>
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When both are questioned without the possibility to communicate, then the dominant strategy for both prisoners is to confess and they both will end up for five years in jail. Prisoner A does in this case not know, how B will behave and he will look at the two possible options: If B confesses, then B is better off also confessing (5 instead of 20 years). If B remains mute, confession brings A a better payoff (free instead of one year in prison). Since the strategies are
the same for both prisoner’s, both will confess and serve five year terms if rationality prevails. The result is clearly not optimal.

For reaching the best possible mutual solution by remaining mute, the prisoners would have to trust each other. In terms of game theory: Under conditions as above, a cooperative strategy is the best solution. Circumstances in which cooperative strategies evolve are especially dependent on the pattern of payoffs and the “shadow of the future” [7]. Payoffs can be such that cooperation is encouraged and repeated games (shadow of the future) also bring about this result.

Criticism to the rational choice approach contends that people do not always engage in conscious calculations nor do they have an orderly set of preferences [8].

1.2.2 Trust as a Sociological and Cultural Phenomenon

Sociologists have been interested in trust for a long time. A rather comprehensive early study of the topic within a framework of functional-structural system theory was published by Luhmann in 1968 [9].1 While Parsons [10] stresses the structural component in his normative system theory, Luhmann is more concerned with function [11]. He describes it as: “Trust in the broadest sense of confidence in one’s own expectations is an elementary fact of social life. Man has admittedly in many situations a choice whether or not to put his trust forward in a certain way. Without any trust, however, he could not leave his bed in the morning” [9]. The same conclusion can be drawn from the introductory example of a traffic system.

According to Parsons, we can only put our trust in people who share the same goals and values. It is the … “feeling” of the solidarity of collective groups” [12]. This excludes trust between different cultural groups who do not share the same values. Luhmann’s focus is quite different as he sees trust on the backdrop of his system theory. According to him, the central characteristic of modern societies is their overwhelming complexity. Complexity describes the multi-layered structure of society, where many levels operate interdependent on each other. This leads to the fact that each individual has many more options of experiences and actions than he can realize. Therefore, reduction of complexity is the main task of modern societies. By constituting systems, such as an IJV with a specific task, we reduce complexity by creating a higher degree of order. Yet the internal complexity of such a system is still not manageable. One further mechanism of complexity reduction is trust. When trusting, we reduce the future complexity, because we choose to consider only a subset of all possibilities, e.g. that a colleague will solve a task satisfactorily in an IJV. As long as we trust in this, we rule out failure and act as if only a positive outcome is possible [9, 13].

Weber sees culture as an autonomous producer of social structure and networks. Both are structured through social action and thus culture is a cognitive category. Elements of culture can

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1 In the English literature most often cited is the translation of two of his books “Vertrauen” und “Macht” as Luhmann, N. (1979). Trust and Power. New York: Wiley. The citations in this paper are based on the German original.
be material (artifacts) or immaterial (values, norms, symbols, language, knowledge). Culture is meaning-making in everyday life. The cultural world is that part of the universe which makes sense to humans [14]. Different societies or groups within one society can be described by their respective cultures. On this cultural level, Fukuyama discerns societies with a low level of general trust from such with a high level. While diagnosing the need for future economic success, he asserts that globalization will require flexible, large-scale business organizations, which can only develop in high-trust societies, such as Japan, Germany and the USA. For him trust is bound to the cultural system of meanings and indispensable for economic success in the future [15].

It should be clear that system theory offers poor explanation when researching trust in simple settings, since complexity is one of its axioms.

1.2.3 Trust as a Psychological State

In such studies, the researchers take it for granted that trust exists and they ask what leads to trust. Cognitive processes and affective reaction are both seen to be such general antecedents [16]. Other antecedents in dyadic trust can be the attitudes of the trustor (disposition, prior experiences, values, motivation) and the trustee (ability, benevolence, integrity) [17, 18].

While the psychological approach gives us a basic understanding of human behavior with regard to trust, it often neglects the context of specific situations.

2. Research Methodology

IJVs can be described by contextual turbulence and performance ambiguity [19], thus by complexity. Most IJVs in construction – international construction joint ventures, or ICJVs – are formed to implement mega-projects, which exceed the capabilities of single companies. Recent examples of such projects are the Channel Tunnel, the Great Belt Link and the Øresund Link. We can easily assert that there is high task complexity. ICJVs are formed by a network of contractual relations between a minimum of two construction companies, design firms, and the organizational network of the client. Again, we can with ease establish the condition of structural complexity. The same holds true by definition of the ICJV for cultural complexity. For all these reasons, it seems imperative to interpret IJVs in the framework of system theory.

Managers plan, organize, staff, direct and control their ICJVs by building them up, running them and dissolving them once the task is fulfilled. Then they move on to their next ICJV. It seems plausible that managers going through these repetitive cycles, perceive, interpret and evaluate their physical, social and institutional world by forming mental frames through interaction. Knowledge thus is produced by this group and becomes intersubjective. This is a constructivist view of epistemology [2].

This constructivist view matches well with the understanding that ICJVs form a specific culture. Weber, based on Kant, strongly advocates that social and cultural research cannot follow the
approach of the natural sciences, where laws suffice to describe a static environment following a
directly observable causality. A better approach is to discover phenomena as interpreted within
the framework of the members of the focal cultural group [20].

Given this background and considering the additional fact that no research has previously been
carried out, we used ethnographic interviews [21] to gather data and grounded theory [22] to
evaluate and to extract theory from the data [23]. In an inverse order to the presentation in this
paper, reading of the relevant literature followed data analysis to assure an unbiased approach.

We conducted 35 interviews in the winter of 2003 in Thailand and Taiwan. The interviewees all
had experience as managers in at least one, and in the majority of cases, in several ICJVs. They
came from nine different national cultures and represented ten different parent companies. The
interviews lasted on average more than one hour and one of the focuses was on the phenomenon
of trust. The resulting model of trust in ICJVs is developed in the following chapters.

3. Components of Trust

Trust is definitely a major concern in ICJVs. As one project manager put it: “I think it’s very
important when you have a joint venture with one or more than one partner – we have four
partners. And I think this was our success, that we trusted each other after a while. We had
conflicts, but there was, I want to say, almost absolute trust.” It is surprising to listen to a
project manager who just finished a large scale project on time, according to contract, and with
a satisfying profit that he considers the success to be the level of trust achieved in this particular
ICJV.

While discovering the relevant phenomena in the gathered data, we will first describe the trust
process, then the objects of trust, and finally the consequences of trust.

3.1.1 The Trust Process

Many of the interviewees describe the workload at the beginning of a large scale project as
overwhelming. Before the ink has dried under the contract and while the clock is ticking away
on contract time, the network between client, designer, contractors, subcontractors, suppliers,
authorities, and the public has to be set up, a design encompassing more than a million items has
to be proposed, detailed and approved. Planning (quantities, qualities, resources, budgets,
subcontracts, suppliers, management plan, safety plan, contract administration, master schedule,
production technology, production facilities, accounting system, office organization…),
organizing (structure, responsibilities, resources), and staffing (local, foreign, skilled labor,
unskilled labor, engineers) of the project overlap each other. Procurement of the lead items,
installation of the production facilities, and training of the workforce follow shortly afterwards.
All this must be achieved while the initial engineering team in charge of these tasks is going
through the usual phases of forming, storming, norming, and performing. A project manager
phrased it as follows: “But what happens at the beginning of a project in most joint ventures is,
...they have won a large project which will have a turnover and a staff that will be equivalent to
most medium sized companies. Medium sized companies develop in most cases from small companies, their procedures develop as the company develops, their staff develops as the company develops and so it’s a long process that is controlled. What happens in the start of these projects is that you suddenly have to throw a medium to large company together with no procedures, no processes, no understanding, no trust and you throw it into being as an operational organization on day one. And so you have a situation where nobody really knows what the other person is doing, why they are doing it, how they are doing it and even if they should be doing it. And that is the big difficulty in managing these joint ventures because you are suddenly creating a large company on day one and expecting it to operate with the efficiencies of a large company without having any of the benefits of the development time.”

Such is a typical description of what Luhmann calls a complex system.

It seemed in all but one case impossible to set up a hierarchy as an organization structure, which concentrates the workload at the top. Instead all ICJVs described (except one) chose a functional organization, thus creating subsystems with the responsibility to break down the assigned partial task complexity. This is all the more astonishing since many of the interviewees represented East Asian countries (Japan, South Korea, Thailand and Taiwan) where according to the findings of Hofstede [24] and Mintzberg [25] a high uncertainty avoidance and a high power distance would typically lead to a hierarchy. The only exemption using a hierarchy was by a Korean company which had responsibility of a comparatively small contract (around 300 million US$), while the other contracts involved volumes of approximately 1,000 million US$. The given explanation was always that the workload and synchronicity of tasks demanded functional separation. In this case quite clearly the situational determinants had a stronger influence on organization than culture.

The problem of functional separation of tasks is of course the integration towards a solution. This requires under the given circumstances teamwork and trust between members for efficiency. One of the few options to get to grips with the overwhelming complexity is to use trust as a mechanism for reduction.

As one manager put it: “I think what you do, you take trust, you trust everybody at the outset and then you look for the exceptions... I think that’s a very general approach. I think it’s a general approach for everybody who worked overseas. People that have not worked overseas would tend to have the reverse, okay?... Those that can’t trust, quickly get overloaded with work. They end up doing everything themselves.” If trust is then not reciprocated the consequences are immediate and harsh, the above cited manager would then immediately fire the employee.

Because trust is seen as so important, many managers explained that they would signal trust to their partners from the very beginning: “We do not expect them that they have to trust us. We have to prove ourselves that we are, what do you call it, to be...trustworthy.” This trustworthiness is then signaled repeatedly to the other parties. Again and again the same procedures will be repeated until trust is firmly established and then continuously reinforced. For example, a party in charge of the communication with the client, will shortly discuss the
contents of each letter before posting with all other parties of the ICJV until they send a return
signal, that this procedure needs no longer to be observed.

These findings (immediate trust and active signaling of trustworthiness) are not in accordance
with the available literature on IJVs in industries outside construction. Fryxell et al. found that
formal control mechanisms produce better performance in the early stages and that their
efficiency declines with the duration of the of IJV [19]. Shapiro proposed that trust would
develop slowly and build up from minor to major transactions thus requiring more and more
trust. [26].

On this background the described behavior seems to be irrational. This, however, neglects the
basic difference between ICJVs and IJVs. ICJV-systems consist of three groups and contractual
relations among them (client, partners, joint venture). In addition, they have to fulfill a written
contract in a given time. They have project character. IJV-system, to the contrary, comprise only
two groups (partners, joint venture) and they have neither a written fully specified contract to
fulfill, nor a finite budget (the budgets are annually agreed), nor a time limit. Instead, success of
IJVs is often measured by the duration of existence.

ICJVs resemble in the initial phase an adhocracy with high pressure on results. Power which is
equivalent to hierarchy is not an adequate mechanism to reduce complexity because of the
workload, rules are not an adequate mechanism because they first have to be established, so the
only remaining mechanism is trust and to this managers of ICJVs revert. Benjamin Franklin
once said: “We must all hang together or assuredly we will all hang separately.” While choosing
to hang together there still is the possibility not to hang after all. This describes the attitude
towards trust in the initial phase of an ICJV.

The described form of trust can be called a necessitated general trust. It has no time to develop
and it is not rooted in face-to-face experience. It is quite obvious that under such circumstances
managers prefer to work with people from previous projects in which they have personal trust
(history-based trust [27]). This we will call developed face-to-face trust which builds up rapidly
in this environment. We would expect that necessitated general and developed face-to-face trust
are to a certain degree complementary. The latter replaces the former over time. In the words of
a project manager: “It [face-to-face trust] doesn’t develop instantaneously. You know, it’s
something that, I would say, feeds on itself. You develop a little bit of trust and people start
believing in each other and then it really rapidly increases. But it doesn’t take much of a hiccup
to put you back to square one.”

Luhmann uses the idea of a threshold in connection with trust that was formed in the field of
psychology of perception [9]. A zone of benevolence envelops trust and reprimanding action is
only taken, if the trustor perceives that the trustee has left this zone. The data suggest that for
necessitated general trust this zone of tolerance is rather small and consequences drastic
(termination of cooperation). For the developed face-to-face trust the zone is somewhat larger (it
takes a “hiccup”) and the consequences not as severe (after a break-down, work continues and
trust-building starts anew). Here, it is important to keep in mind that ICJVs operate for rather
short periods, approximately four to five years on average. This limits the growth of the zone of benevolence. Figure 1 illustrates the time-dependent development of both, necessitated general and developed face-to-face trust.

![Figure 1: Trust Process](image)

Two annotations are still required: First, for necessitated general trust different national backgrounds within the ICJV are of little importance. For developed face-to-face trust, however, it seems easier to build this within the own culture. “Of course, it’s always easier to build up trust in your own environment, that’s very clear. So I think, within the German group it should be easier and the Japanese within the Japanese group it should be easier...” The overall influence of national cultures is, however, not seen as determining by the same German project manager. Second, the data describe only the behavior directly within the ICJV. Neither trust in the relationship between partners nor between the ICJV and the client follow necessarily the same path.

### 3.1.2 Objects of trust

Whom or what do people trust in ICJVs? First of all they place their trust in people. This is not surprising, given the description in chapter 3.1.1 of the start phase: There is not much else, no institutions, little history. Because of necessitated general trust, managers feel it is important that the people they have to trust should be competent and experienced. Experience is easy to check by looking and the records, competence is deducted from experience. An answer to the question, what is needed to get a team started on a project, is: “First trust, second is from previous experience these people know that they are competent... So if they worked together already it makes it much quicker to get a team together.”

Most managers want to work with the “right people”, especially with people they know. They stress the concept of “right people” in such words: “They must be experienced, they must have the knowledge to do such work...” or: “What kind of people? Okay, I would like to have people who are competent in their area from the technical point of view, whether as construction managers they should have experience in the execution of the work, engineering manager should have experience in the design. Okay, that’s very clear, I think.” Experience and
competence are mentioned over and over again, and to repeat this, it does not sound surprising considering that an overwhelming workload has to be taken care of.

Trust is also placed into groups. An example is the distribution of work between people from different national cultures, in the words of a Thai manager: “I trust the Germany for the technical, but I trust Thai people for they solve the problems with the [public] authority.”

And finally trust is limited to small groups and to specific issues: “Yes, trust is...I mean, it doesn’t go from the top to the very, very last person, but I think the senior people in a joint venture, they have to trust each other to a certain extent otherwise it makes it difficult, I think. But there probably will be a couple issues where you cannot trust, but you can deal with that. But there should be a general trust that you work together.”

All these conclusions from the data are in accordance with the existing research [1]. A slight difference seems to be the emphasis put on experience and competence.

3.1.3 Consequences of trust

Trust reduces complexity and therefore the individual workload for two reasons. First, the energy required for controls is minimized. Second, it helps build up a team. A team is tackling separate tasks simultaneously. If there is no need – because of trust – for additional controls, then there is a substantial net saving in time. “Trust is extremely important. If you don’t have trust, the joint venture has difficulties to operate because the whole time too much energy and effort is spend on watching what each partner is doing and not devoting it to the outcome of the project.”

Consequently, people must forgo opportunistic behavior in their daily work. It seems that the losses by an inefficient team are perceived to be greater than the individual gains through opportunistic behavior. The “game” of ICJVs is played repeatedly and the “shadow of the future” looms as large as negative experiences in the past (“shadow of the past”). In addition, the payoff matrix favors cooperation. There were no complaints found in the data about occasional opportunistic behavior, let alone wide-spread opportunism. This contradicts Williamson [4], but not game theory [6]. Yet, trust does not eliminate conflicts. Conflicts of interest arise from a different source than mistrust. So they are existing in trustful environments as well. On the influence of trust a project manager observed: “Yes, yes it [work] gets more simple. You also have conflicts, of course, because you have different opinions, but it saves time, because if you do not trust each other, then you never know what they are doing, you have to find out where they want to go and so on, trust is just important.”

4. A Model of Trust in ICJVs

The discussion of the components of trust in the previous chapter allows us to build a model of our understanding of the trust process (cf. Figure 2).
On the vertical axis, a high workload becomes manageable through trust. Personal competence and experience are important antecedents, opportunism is not seen as a rational choice. Trust facilitates team building, thus the possibility of synchronized task solution, and the resolution of upcoming conflicts. In addition, trust sharply reduces the need for controls. Taken together, trust allows more work to be done in a given period of time.

On the horizontal axis the time-dependence of the process is depicted. The positive influence of prior knowledge among colleagues and the need for active signaling of trustworthiness are shown.

5. Conclusions

The most pressing problem of ICJVs is the complexity of the assigned task. To reduce this complexity and thereby to create a much higher degree of order requires a lot of energy. This energy is the workload perceived by managers in ICJVs. In analogy of what happens in a driving school of the introductory example, ICJV managers learn what are effective solutions to this problem as they move from one project to the next and as they work together in a team and communicate with each other. This is a process of sensemaking and creates a mutual understanding of meaning [28].

In this school, ICJV manager learn that their only chance of success is trust: A willingness to extend trust and to signal trustworthiness from the very first day. We termed this “hang-or-die”
form of trust “necessitated general trust”. It seems to be an idiosyncratic form that is only found in high-pressure environments without established networks. The managers need this trust to perform, but they prefer the personal or face-to-face trust that develops with time. Accordingly they stress their inclination to work with people they know from other projects. If that is not possible, they demand that the others are experienced and competent.

Trust has several beneficial effects. It helps build teams, where trust acts as a bond of tying people together. It reduces energy otherwise required for controls. It helps in cases of conflict. Overall, it reduces task complexity.

We thank all the unnamed interviewees, who answered our sometimes probing questions with unrelenting openness and trust. They made us feel how they see it.

References


