Designing Risk on International Projects

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ABSTRACT
In all construction contracts, the issue of risk is paramount – the risk of force majeure events such as weather, strikes, material shortages, monetary changes, and more. Most construction projects are time constrained because of the immediacy of the need and the cost of money over time, and both of these pressures magnify disruptions due to unmanaged risks.

Frequently, international contracts rely upon a close working relationship between the Design Professional and the Customer. In such cases the Design Professional must understand the goals, objectives, constraints, and use of the project if they are to provide the leadership required. This intimate relationship enables the design professional to understand the Customer's implied needs. The Customer's relationship with the Constructor(s) is often less intimate, and more transactional, and as a result the Constructor(s) have little time to understand the Customer's goals and objectives. In fact, often the Customer will relegate these types of communications to the Design Professional to function as their agent.

This paper will address identification of risks and how contract structures can affect the efficacy of that effort. It will also discuss the types of leadership skills and authority that a Design Professional should have to manage risks on an international project. And, it will provide a Risk Map to assist in codifying risks. Combined, the above considerations constitute what this paper calls designing risk, as part of risk planning.

KEYWORDS: Risk Management, Project Management, XLQ, Temporary Project Organizations

INTRODUCTION

According to a study commissioned by the United States Department of Defense (2005) (Pg. 8 & 9): "The owner has the ultimate responsibility for identifying, analyzing, mitigating, and controlling project risks, including acceptance of the project risks, or modification, or termination of the project—all of which are project risk management activities. If the owner is going to have a cooperative, integrated project team, the entire team has to share the objective of risk reduction for every member of the project, rather than delegating the responsibility to one participant who may have incentives to impose risks on the other project members." The report says that the Customer's representative, the Design Professional, must then shoulder these responsibilities.

Chapman and Ward (1997) describe Risk Management Process (RMP) from the UK Ministry of Defense (MoD). In utilizing this process, the authors state that the identification and ownership of risk is to be performed before designing the contract structure to be utilized.

According to Ward (1999) the effectiveness of risk management is substantially dependent upon the capability and experience of the party undertaking the design of the program, and their ability to identify a full range of risks including: construction, finance, legal, environmental, political, engineering, design, and etc. Ward also rightly contends that this applies to each party, and to the project team as a whole. The author states that Customers often, through their Design Professional will seek to transfer risk to a Constructor through a firm fixed-price contract, only to discover that the Constructor cannot manage the risk.

Datta (2001) states that appointing a Design Professional that is external to the Customer may not ensure successful risk management, depending upon the experience, and structure of the project team. Datta's research showed that early identification of risk is critical to project success.

Pavlak (2004) describes the need for creativity and multiple viewpoints in planning for risks: Customer, Design Professional, Constructor, etc. Pavlak's article suggests the use of multi-firm tiger teams to attack unrecognized risks, and these teams require: trust and respect, uninhibited conflict, commitment, accountability, and common goals. This paper argues that all of these are aspects of the design of risk systems based on contract structure, the capability of the Design Professional, and the establishment of common goals and objectives through the risk mapping process.

This sampling of the research on risk indicates that the Customer owns the risks, and sheds the risk to participants based upon a formal or ad hoc plan, through their agent or representative – normally the Design Professional. The research also shows that the structure of the contract, the abilities of the Design Professional, the identification of the risks, and the allocation of the risks are critical components of designing risks on projects.

Contract structures vary widely depending upon the abilities, appetites for risk, risk identification, and the economic conditions of the participants. They also vary by culture (corporate and social), by location, by regulation, and by building codes. With these

considerations, and the brief citations, forming the context for managing risks, this paper will present three aspects of designing risk on international projects.

First, this paper will discuss the relationship between the parties on a project and the affect that the contract structure has upon managing risks. The paper assumes that the Customer is the key decision maker, and hires a Design Professional to prepare the design documents, the contract documents, and the design of the structure of the Temporary Project Organization (TPO) (Mintzberg 1983; Toffler 1997; Winter, Smith et al. 2006; Grisham and Srinivasan 2007 (Pending)). At one extreme, the autocratic approach of competitively bid public project, the Customer mandates the TPO in the General and Special Conditions. This may be implicit in the communication protocols described, and/or explicit in the contractual relationships defined. At the other extreme, on negotiated design-build projects the participants will jointly engage in the design of the structure of the TPO. Thus a design-build project is participatory, and the parties have an opportunity to decide what type of organization will be utilized on the project, how communications will be conducted, how knowledge will be shared, and how risk will be managed.

Second, this paper will discuss the cross-cultural Leadership Intelligence (XLQ) (Grisham 2006) that is necessary for a Design Professional to lead the design of a risk management plan for an international project.

Third, this paper will then describe a Risk Map for the identification of risks as described in the Project Management Body of Knowledge (PMBOK) (2004), the Association of Project Managers Body of Knowledge (APM) (2006), and the International Competence Baseline (IPMA) (2006). The number of risks on an international project is seemingly endless, and therefore often goes unmanaged. This paper proposes a way to winnow down and codify the risks, during the design process, so as to actively manage the critical ones, and passively manage the remaining ones.

CONTRACT STRUCTURE

As noted by Pavlak, trust and open communications between the participants of a project are of paramount importance in the identification and planning for risk. In this same conference, the issue of contract structure has been covered with regard to communications (Grisham and Srinivasan 2007 (Pending)), so we refer those interested in more details on this topic to that paper.

The structure of the contract can encourage or discourage open communications, and this in turn will determine the successfulness of the risk identification. If the TPO is designed so that all communications are funneled through the Design Professional, then the other participants will know that there are private conversations and meetings held between the Customer and the Design Professional that the other participants are not privy to. This can lead to mistrust between the participants. Knowledge is power, and there must be an atmosphere of trust if participants are to willingly share information (Grisham and Walker 2005). Furthermore, projects can be transactional for some participants and long-term relationships for other participants, depending upon the type of project and the structure of the contract. The long-term favors relationship

based contract models. For example, a Customer who is a power producer in Saudi Arabia may favor a transactional approach with a Constructor, but would prefer a long-term relationship approach with an equipment supplier.

There is also the consideration of when the participants are invited to share their ideas about risk on a project. If the participants are part of a design-build contract structure, then they will most often be involved early in the initiation or planning phase of a project, long before the execution phase. This builds relationships and a culture of commitment, along with a *Team* culture, communications, and cooperation. It also provides buy-in by the participants, and most importantly builds trust. The identification and planning of risk is best developed after relationships have been created on a project.

An understanding of the corporate culture, values, and attitudes relating to sustainability are essential to understand context for risk. If the contract structure does not enable the participants on a project to be part of the initiating and planning phases, it impacts the trust, and communications, but equally importantly it eliminates the essential context for the discussions. Often it is the case on international projects that the Design Professional may have won the project with the Customer through negotiations and a long-term relationship based on a design-build contract, and will have to acquire the services of a transactional Constructor.

The first consideration in designing risks is to have a contract structure that nurtures communications and trust, and anticipates early participation in the project life cycle. The next step has to do with leadership, and the abilities of the Design Professional to take advantage of the contract structure to nurture the commitment of participants. In such cases the levels of customer satisfaction aimed at by the two entities could vary widely, resulting in a conflict of acceptance of risk mitigation measures (and costs thereof). The Constructor could be always viewing the Design Professional with a sense of mistrust that the later is trying to over please the Customer at the expense of the former. This would present great difficulties in arriving at a mutually agreeable risk management philosophy for the project.

XLQ

Leadership is the critical component for successful projects. On complex multi-cultural multi-firm projects there will need to be leadership skills displayed on multiple levels, starting with the Design Professional. This is the case in flat organizations (those with few people between the lowest worker and the highest), and certainly is the case in TPO's as efficiency is critical in a competitive environment. A leader who wishes to nurture the cooperation, communication and commitment on risk identification in a dynamic environment needs a high degree of XLQ, since a TPO is a blend of different societal, organizational, and individual cultures and values. A leader must understand these different levels of culture; how they intertwine; and, how to blend them in such a way as to create a *Team* culture (Grisham and Fellows 2007 (Pending)).

Recent research (Grisham 2006) defined leadership as the ability to inspire the desire to follow, and to inspire performance beyond expectation. The desire to follow, in this context, means that the

project will want to adopt the same *Team* cultural values displayed by the leader. The leader supports the *Team* members by encouraging the opportunity to perform beyond the members perceived capabilities, within their cultural comfort zone. This is important if the dialogue relating to risk identification is to be open, and fruitful.

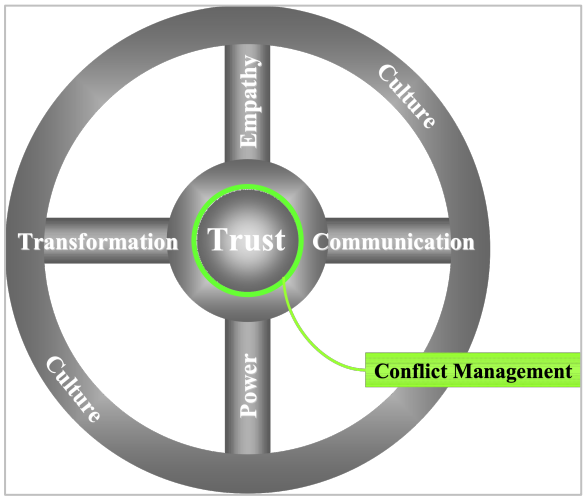

Figure 1 shows the dimensions of XLQ, with trust being the hub, and conflict management being the lubricant. The results of the research substantiated the hypothesis that there are leadership characteristics that are effective regardless of the cultures of the individuals and various participants. In this previous research, culture was defined by Darlington (1996) who quoted a definition of culture by Margaret Mead (1955)(Note – The Darlington reference was from the 1951 version of the 1955 reference from Mead) as (Pg. 33): "a body of learned behavior, a collection of beliefs, habits and traditions, shared by a group of people and successively learned by people who enter the society." Substitute the word team for society, and the definition is appropriate for this paper.

Transformation is required if the various firms or organizations are to feel comfortable adapting their existing procedures to blend with those of the other participants. The judicious exercise of position power by the Design Professional is required in the empowerment of the various Project Managers from each of the participant firms and organizations. Empathy is required to show that the leader has a demonstrable, and immutable, concern for the viewpoints of the other participants in the TPO.

Lastly, to nourish and grow a *Team* culture requires effective, open, persistent, and patient communications. *Team* cultures coalesce around a Design Professional who can establish, and articulate, goals and objective, and who can inspire the team to strive for values that may exceed those of the individual participants. One of the many ways of nurturing this growth is through storytelling (Grisham 2006). In TPO's there is often little time to grow a *Team* culture, and the use of metaphor and storytelling by the Design Professional, and well as by the team about the Design Professional, can accelerate the development of a *Team* culture.

To build and nurture a *Team* culture in a TPO requires that the leader possess and utilize all of the XQL dimensions shown in Figure 1. If the various participants feel like a team, then they will be able to develop a more intimate relationship, and this will enable an open and

productive identification and planning for the risks confronting the project.

With an appropriate contract structure in place, and a strong leader, the next step is to consider how best to identify the risks on the project.

RISK MAP

The key to the identification of risks on construction projects is to keep a firm focus on the most important risks, and actively mange them. To do this first requires a way to identify the risks, filter, analyze, plan, and control them throughout the course of the project. This paper will focus on the identification and the filtering processes.

Lester (2007) sets forth four basic techniques for identifying risks. The first is brainstorming, where he notes the advantage being a rich harvest of ideas, and the disadvantage being the time and resources required. Second is the prompt list or check list. In this case it requires less time, but the disadvantage is that it runs the risk of looking to past experiences rather than the current project. Third is the Work Breakdown Structure (WBS) which is quick, but the potential downside is that it potentially limits the number of risks identified. Lastly is the use of experts such as a Delphi Panel, where the advantage is the depth of experience and knowledge mobilized, but the disadvantage is the cost and time required. As suggested by Lester, there is no one best technique to identify risks under all circumstances.

The Delphi Technique is useful on large complex projects, but for most projects a two step process is suggested that starts with a prompt list, and is followed by a brainstorming session. This paper recommends an approach where the individual parties assess their individual *business* risks first. The Design Professional leader then assembles and codifies the *business* risk list from each of the participants into a single risk register for the project. This preliminary project risk register will be organized from a prompt list of *project* risk categories. *Project* risks can be co-mingled with *business* risks, and the prompt list helps participants to think about the overlaps between *project* and *business* risks. This preliminary risk register can then provided to each participant firm or organization.

Step two is to convene a meeting with the leaders of each participant firm or organization for a brainstorming session. The timing of this session is dependent upon when the Constructors become involved: at execution for a competitively bid contract, and perhaps during initiation for a design-build contract. This is normally done as an agenda item for the Joint Project Planning Session (JPP) (Wysocki and McGary 2003), or the project kick-off meeting. The purpose of the meeting is to create a project risk register, to discuss who is in the best position to manage the risk, and to perform a preliminary analysis or ranking of the risks into those that will be actively managed and those that will be passively managed.

Attachment 1 provides a mind-map (Buzan 1993) of risk considerations for a business and an project. It provides a Risk Map that organizes risks into *business* risks, and *project* risks. It is intended to show the complexity and potential for overlaps between *business* risks and *project* risks. For example, consider the Business Internal -

Technical - Technology risk (top right on the chart). Consider an equipment manufacturer with leading edge technology that is not mature. There is a business risk to the firm that the technology will fail in operation, and that risk will of course be considered from the business perspective. There is also a potential project component of the risk under Customer Satisfaction – Project Product (center left). On many projects there are penalties for delay in opening (placing the facility into operation by a contract requirement date), and for performance shortfalls. The Design Professional and the Constructors on the project are at risk for potential penalties if the equipment fails. So this is one case where *business* and *project* risks co-mingle; there is many more depending upon the project. In such a case, the equipment supplier has ownership for the risk, and for the penalties associated, and may elect to purchase insurance to transfer the risk, and/or spread the liability arising out of such risks.

Using the same example, what about the risk that the design or construction of the foundation results in poor performance due to excessive vibration? This could be a Customer Satisfaction issue, but it will more likely be Conflicts – Coordination issue (bottom left). Normally in practice, such issues are handled on a to-each-their-own basis. This means that if the root cause of the failure cannot be perfectly determined each party shares the penalty in proportion to their share of the project. This is usually highly debated and never easy to come to a mutually acceptable conclusion. The risk management process for the project should also adequately address how to move the project ahead in case of lack of quick resolution leading to a stalemate situation. Otherwise the fallout of even one such case itself would be enough to jeopardize the rest of the project.

Yet another ticklish issue for risk management planning is the share of project risk when a number of parties are involved especially in a consortium style of implementation of design-build projects. In such scenarios some partners are likely to have a very little share of the project (both value as well as work wise). In case a failure in their portion of the project impacts the performance of other partners as well as the overall project, the damages could be far exceeding the total contract value of the partner who is the root cause for the overall failure. Under these circumstances it would be very difficult for that partner to bear the whole impact of the damage. Possibly the other major partners may have to bear a significant portion of the damages even though they are not directly at fault for the failure in question. As such, finalization of risk owning and damages sharing mechanism is always a very sensitive topic and needs thorough professional and experienced handling. A complete discussion of risk management, and the complete application of Attachment 1 is beyond the scope of this paper, but the above example should provide a portal for the considerations portrayed in this attachment.

While a Design Professional does not need to know the internal risk for each firm, she/he does need to know if each firm has an active risk management program. If they do not, then the Design Professional may need to spend more time with the firm suggesting how they may begin thinking about risks, otherwise the brainstorming sessions will be non-productive.

Attachment 1 also provides a way to help segregate the *business* risks from the *project* risks. For example, consider a project that has six major participants. Each participant could procure their own insurance coverage for shipping and for the project site, and incorporate the costs into their price. This inevitably results in coverage gaps, and disparities in premiums and deductibles. The Customer could make a project decision to provide blanket coverage for the project, but that would require a business evaluation based on the changes required in their policies, and the additional premiums.

Another major point presented in Attachment 1 is to distinguish project risks from project management risks. Design Professionals are not perfect, nor are any of the other participants in a project. So estimates, schedules, quality control, scope will all be subject to some variations. Informal polling of Project Management Professionals (PMP) candidates over a four year period has indicated that most people feel their accuracy on the above issues is 80% to 90%. Using the 80% figure, there is the risk that the schedule duration for the overall project is wrong, and that a 400 day project could in reality be a 480 day project. How would one manage such a risk, and how many such project management risks are there? This paper suggests that these risks be covered by contingency, good (not perfect) planning, continual monitoring, effective communications, and solid leadership, not as part of a risk management plan.

Lastly there is the group of risks under Conflicts. All projects have them, and they must be managed. However these considerations are better managed in the same way as suggested for project management risks. For example, the scope risk is one that can be handled by the production of a scope-split document that manages the breakdown of the overall project scope. There will of course always be items that are missed or unallocated, but again, the contingency fund approach is recommended to deal with these items.

CONCLUSION

The structure of a contract (from competitively bid to design-build) will dictate the boundaries of the relationships between the parties, and may limit the likelihood that the TPO will meet the goals and objectives of the project. The XLQ of the Design Professional will determine the efficacy of the relationships between the participants, and their trust in the Design Professional, and the other participants. The Risk Map serves as a tool to assist the participants in separating their internal *business* risks from the *project* risks, and it provides a systematic way to codify the project risks and facilitate effective risk planning.

Once a project risk register has been assembled, then the participants can, ideally jointly, assess the probability and impact of each risk. Each risk can then be compared to the risk propensity benchmark for the project. Risks that exceed the benchmark need active management and those below it passive management. Of course this may change over time as new risks emerge, and others expire.

It is important to keep project management risks separated from the risk management plan, for they are too numerous to handle in a risk management format. Moreover, participants who do not have the expertise to perform the work manage the risks, are themselves a risk

that should be eliminated through a proper prequalification process.

This paper sketches out a model that is different from others in the research in that it looks at risk as a **design** process. The Customer is responsible for all of the risks and for the subsequent allocation of the risks to participants. Many, if not most, Customers must procure this design service for others, and that is often the Design Professional. Once the macro risks have been identified, the Customer and Design Professional select a contract format ranging from firm fixed-price competitively bid to a cost-plus design-build arrangement (these two extremes are selected to illustrate the points in the paper, and not intended to describe the incredible array of potential structures utilized in practice). In selecting a contract structure, the options for joint risk identification are determined. In the most flexible and effective format the Customer, Design Professional, and Constructor will jointly identify the risks, and determine who is in the best position to manage the risks. The use of the risk map provided in this paper, can help in keeping the efforts focused on limiting the risk to those that are manageable, and not part of ongoing business operations.

The experience and XLQ of the Design Professional can add greatly to the difficult task of convincing Customers that the structure of the contract and the ability for the participants to jointly evaluate and accept risks is an essential ingredient in successfully managing risks. By embarking on such an approach, trust and a *team* culture can be created. The design of risk on international projects should be considered as a professional service that requires the same blend of engineering and art that a Design Professional brings to all aspects of the profession.

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Attachment 1 - Risk Map