

Troubled Construction Projects in Libya Due to Insufficient Risk Management

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Abstract : This paper will focus on troubled projects in construction due to inadequate and insufficient Risk Management. The main objective of the present document is not to propose a radically renewed risk management process, but to attempt a composition of already known processes, at such way that it can be applied by the modern enterprises that deal with the undertaking or/and implementation of constructional work. This paper will try to reveal the main sources for the failure of a construction project due to the lack of risk management in projects, aiming that from now on the risk management matters will be considered more serious and professional. The benefits of risk management are not confined to large or risky projects. The process may be formalized in these circumstances, but it is applicable for all scales of project and procurement activity. It can be applied at all stages in the project cycle, from the earliest assessments of strategy to the supply, operation, maintenance and disposal of individual items, facilities or assets. It has many applications, ranging from the evaluation of alternative activities for budgets and business plans, to the management of cost overruns and delays in projects and programs. Risk management will also provide benefits in better accountability and justification of decisions, by providing a consistent and robust process that supports decision-making. The author examined existing data, results and extensive bibliographies, drew several outcomes and created a checklist for all those who are involved in construction project disasters. The author's expectation is to be realistic; there is not a magic wand that will turn a fiasco into a triumph. However, a more positive outcome is possible, if we see the threats as opportunities and we try to learn from the trouble project.

IndexTerms: Construction, Risk management, PMBOK, Contractor, labour, Material.

I. INTRODUCTION

Risk management is one of the most critical factors in project management practices to verify a project is successfully completed. But, what does "risk" mean? In the last publication of Project Management Book (PMI) is given the following definition for the risk: "Project risk is an uncertain event or condition that, if it occurs, has a positive or a negative effect on at least one project objective, such as time, cost, and quality". Kaplan (1997) expressed risk "as a mathematical combination of an accident's event probability of occurrence and the consequence of that event, should it occur". Risk Management process is a formal process, via which we can achieve identification, analysis and response to risks, throughout the lifecycle of a project, in order to obtain the optimum degree of risk elimination, mitigation and control (Wang and Dulaimi, 2004). Thus, risk management is in direct relation to the success completion of a project. There is a detailed and widely expressed literature about accepted risk management process. A simple, common and systematic approach to risk management, suggested by Turnbaugh (Turnbaugh, 2005), has three basic stages:

- i. Risk Identification – determining the types of risks, identify, and assess the potential risks in the project.
- ii. Risk Quantification – the probabilistic characteristics and the degree of the impacts for their impacts.
- iii. Risk Response and Development Control – defining opportunities for managing changes in risk during the project life cycle.

When dealing with risks, the improvement of a project should also be taken into account; for example to perform the project with fewer resources or to have an advantage from an unexpected window of opportunity. Risks are at the very core of the business: risks and opportunities are linked; there are no opportunities without risks related to them. Thus risks actually raise the value of a project; usually higher risks bring higher opportunities. Since opportunities and threats are seldom independent, they can also be dealt with, at the same time. (Chapman, Ward, 2002). The purpose of the Risk Management process in a wider sense should not solely be to ensure a successful project completion but also to increase the expectations of project goals and objectives (Mills, 2001). It means that project Risk Management should be turned into project uncertainty management (Chapman, Ward 2003).

Risk management is not limited to a few processes, but includes much more in order to have a complete view of the suggested Risk Management process. One of the most crucial decisions in a project relates to the allocation of risks: who carries which risks. Before the decisions of risk allocations are ready to be made, the attitude that Project Managers have towards the risk has to be determined. Before a project starts, every project manager's strategy, as well as the ability to bear and manage risks, has to be known before risks are assigned to them. Besides the above conventional project risk management, which is a procedure of identifying the risks in a project, categorizing them, and planning how to address the most serious ones, there is a new category of risks – called unknown unknown risks- usually known as unk unks. Unknown unknown risks are pertinent to decisions but not included in analysis. You are aware of their existence but you cannot predict them. The more informed one is, the fewer (or more incomprehensible) the unknown-unknowns are. However, unk unks are critical to innovative projects. The fundamental logic of traditional project risk management does not address the novice project, because in novice projects the project plan is an illusion, a simple draft. The fig 1, depicts a Project Risk Management Overview according to PMI organization (PMBOK).

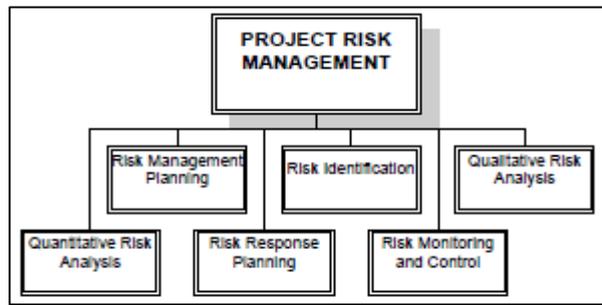


Fig 1, Project Risk Management overview

II. RISK MANAGEMENT IN CONSTRUCTION

Most of the organizations have recognized the increasing importance of risk management, and have therefore established risk management departments, in order to control the risks they are, or might be exposed to. The construction industry, perhaps most of all other types of organizations, is plagued to risks , but according to Thompson and Perry, (Thompson and Perry, 1983) “these risks are not dealt with adequately due to the poor performance and increased costs and time delays”. The construction industry is one of the most dynamic, risky, challenging fields. Risk is inherent in every construction project. Its clients are widely associated with the meaning and the existence of risk management, due to the nature of construction activities, processes, environment, and organization structure. Risk in construction has been the object of attention because it has direct relation to time and cost overrunning associated with the construction project. It is generally known that those within the construction industry are continuously faced with a variety of unknown, unexpected, frequently undesirable and often unpredictable factors .The need to manage risks into construction industry is related to all professionals and groups (client groups, design teams, project management team, contractors, etc.) in the construction industry which are concerned with cost, time and quality. There are two basic types of construction projects across the world: that of public sector project and private sector project. Generally, the management processes of public sector construction projects have more specific characteristics than those within of the private sector. Public sector projects normally have more complexity than private sector. In the same way, there are many differences among the legal environment of public sector construction projects around the world. Before an organization takes the decision to undertake a construction project, it is essential to develop a proper appraisal of the project. In case of a commercial development, an assessment must be made of the business advantages of the project, including various constraints and risks which are involved in. For a public project, the output of the project will be concerned by the financial analysis, rather than the return of the investment. For this reason, the conceptual phase of a new construction project is very important, since all decisions taken in this phase, have a significant impact on the final cost of the project. It is also the phase at which the greatest degree of any potential uncertainties about the future is encountered.

- **Fundamental Construction Risks and Uncertainties**

The construction business, like any other business, is risky. However, construction business includes more risks due to the involvement of many parties, such as owners, contractors, sub-contractors, suppliers and many others. Furthermore, construction projects due to their uniqueness and built, is inherent in many risks. They also involve many people from different cultures, and different countries and though their size and their complexity increase more and more the risk factors. If in this one adds in the political, social and economic conditions where the project is undertaken, there is bigger need to develop a sufficient and adequate risk management plan. Construction companies in order to protect their business and their interests, seek to find methods to which are more effective. Specifically, when they take part in overseas construction projects, where there are numerous uncertainties and risks in a project, they adopt new forms of co operations. One of them is the Joint Ventures and strategic alliances see fig 2. Although this type of organization reduces some business risk, it also presents others factors that could affect the project performance. Among all these factors, are financial, government policies, economic conditions. To alleviate these risk factors, an efficient risk management process must be developed from the Joint Venture partners.

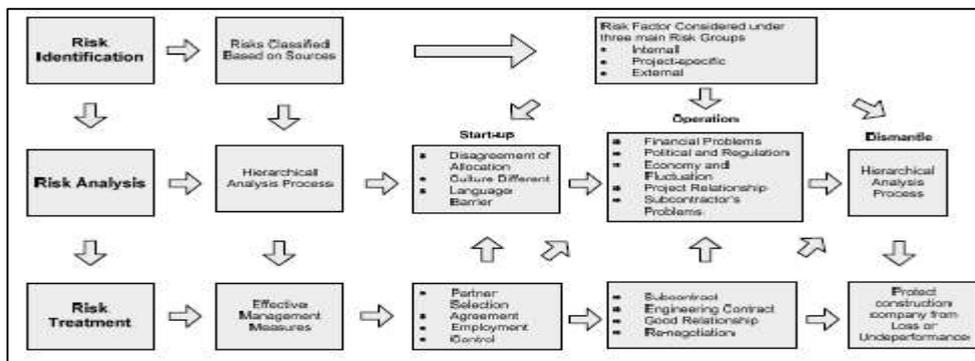


Fig 2, Risk Management Model for Joint Ventures Construction Company

- **Risk Identification**

This is the first stage in a risk management process. Many people believe that it is the most important stage in this process, because if you don't know the risk, you cannot react efficiently; meaning, either to take the necessary actions in order to deal sufficiently with the threat, or to exploit the opportunity. The goal of the risk identification is to identify

exhaustively all significant sources of risk in a project, as well as the causes of them. Simply speaking, risk identification is trying to identify “causes and effects” (what could happen and what would be next) or the reverse, “effects and causes” (what outcomes

must be avoided or encouraged). The process by which risk identification is accomplished is varied between organizations but usually include one or more of the followings: interviews, brainstorming sessions into risk teams, site visits and a large volume of data from previous experience. The risk catalog contains all risks that company has faced in the past, as well, may be presented in the future. In particularly developed organizations, it is possible to meet the methods of confrontation that were used when they had dealt with risk, as also the outcomes of their actions. In the process of risk identification in a project, it is necessary to analyze the different sources of risks present in a project, as well as the different classification of risks. The results of risk identification methods are usually some unstructured lists of dangers, having any relation with the project.

In these lists, the potential risks appeared isolated, out of any frame and they don't give the general picture of threats within the project. Such creation of lists will make it easier for the risk manager to visualize risks and to deal with them in a systematic way. It is proposed that the risk factors can be categorized in three main groups:

- a) Internal risks, means things that the project team can control or influence, such as scope of the project, resource assignments, production costs, etc.
- b) Project- specific risks, means unexpected things during the construction project that leads to time or cost overrunning or in lower level in performance.
- c) External risks, means things that are beyond the control of the project team, such as financial, government actions

A broad list and an impact list Table (1) and Table (2) Construction risk by their impact.

Technical	Social
Construction	Economic
Legal	Financial
Natural	Commercial
Logistics	Political

Table (1) Typical Construction risks

Dynamic vs. Static
Corporate vs. Individual
Internal vs. External
Positive vs. Negative
Acceptable vs. Unacceptable
Insurable vs. non-Insurable

Table (2) Construction risk by their impact

Cohen and Palmer (2004) found that risks are determined at the early stages of a project and mainly in planning, although impacts of them are not seemed until construction phase. Their lists of typical construction risk are presented in Table 3.

Changes in project scope and requirements
Design errors and omissions
Inadequately defined roles and responsibilities
Insufficient skilled staff
Force majeure
New technology

Table (3) Typical risk sources in construction projects

The complexity in construction projects emerged from two basic sources: independence of tasks and uncertainty. Uncertainty has four main sources: unfamiliar management with local policy and environment, lack of detailed specifications about the tasks at the construction site, lack of uniformity of materials, work and teams and unpredictability of environment. The most characteristic paradigm of a structured risk allocation is the Risk breakdown Structure (RBS). The RBS defines as a hierarchical structure of risk sources in a project, in which every lower level of it contains a specific risk group. It is an open, flexible and easily updateable structure, in which all types of risks can be classified and categorized, and finally helps the risk grouping for better cause-effect determination.

- RISK QUANTIFICATION

There are many criteria that are used to establish the level of the risk in a construction project, if it is high or low, such as the probability of occurrence, the potential impact or severity and others. According to William (1993), "the risk is broken down into two main criteria: a) the probability, which is the possibility of an undesirable occurrence, and b) the impact, which is the degree of significance and the scale of the impact on other activities if the adverse thing occurs". Using a mathematical formula, a risk can be described as follows:

$$R=P \times I$$

where R is the degree of the risk, within [0,1], P is the probability of the risk, within [0,1] and I is the impact, within also [0,1]. Risks are rated at three degrees of urgency:

- Low – treated as routine business
- Medium – risk can negatively affect or preclude an organization from meeting a commitment
- High – risk could preclude delivery or completion of project

From the above formula, it can be seen that the degree of risk is around 0 if the probability of incidence is little or the impact of the risk is small. In contrast, if the impact of the risk or the probability is high, then degree of the risk will be high. It is important to rate risks because we can study them, prioritize and report them based on their impacts and probabilities. Risks rated as medium receive more attention than low risks until the threat in the project is removed. High-rated risks should be addressed instantly and should be tracked until they can be downgraded. There are two main ways in which somebody can evaluate risk probability: subjective analysis and objective analysis. Subjective analysis means to estimate directly the risk factor. But in order to achieve it, it needs skill and inspection. Although construction projects are unique, it is quite often that risks for which there is previous

experience. Objective analysis is another method which is used widely to assess the probability of the risk factor. However, in this case, historical data is required. Many times, this application is unfeasible, especially for large and international construction projects, because these are usually unfamiliar and unique, and it is difficult to find comparable information. The fig 4, shows an overview of project risk assessment.

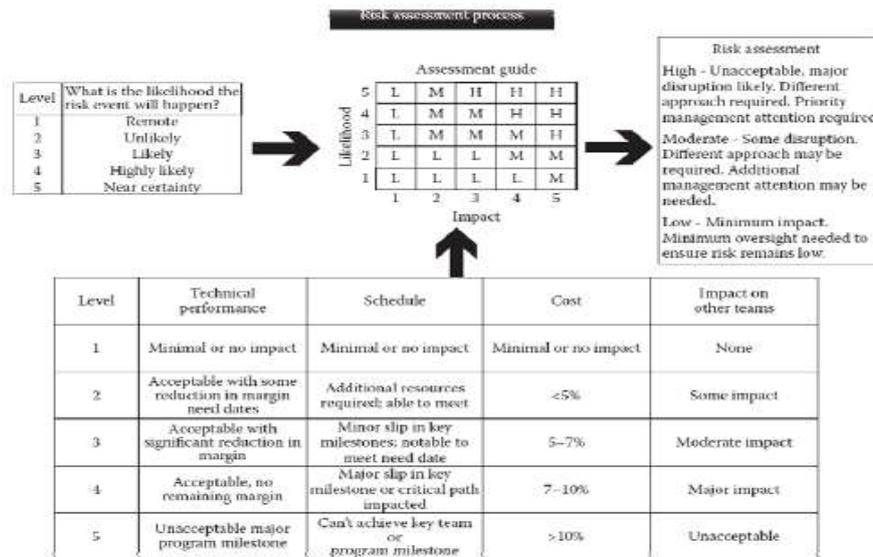


Fig 4, Project Risk Assessment

Risk Response and Development Control

Thus, the last stage of risk management, risk response and development control appears to be the most considerable stage in the whole process. According to PMBOK, “Risk Response is the process of developing options, and determining actions to enhance opportunities and reduce threats to the project’s objectives”. There are four major risk-management techniques: i) form and mitigate, ii) alter and allocate, iii) influence and renovate institutions and iv) diversify through portfolios. When risks are endogenous, meaning that they are specific and controllable- the best strategy is to mitigate them using the classical risk management. On the other case, when risks are specific but outside the control of any partner, the most proper strategy is altering and allocating using contracts or financial markets.

Troubled Risk management in Construction

Every project manager during his career will deal with a project that for many reasons fails to achieve its preliminary outcome in requisites of time, cost and/or quality. On occasions, the failure, or more accurately, the disaster of a project is a mystery, while all things are going well, something comes from “out of the blue” and upsets the whole picture of the project. In some cases, unforeseen events appear during the project life cycle and scupper it; but at most cases the disaster of the project is due to poor management, poor communication or lack of project definition. An important thing we have always to consider is that, in most cases, project disasters is not equal to total collapse organization and rarely leads to the termination of careers. What seems like a disaster, it is very possible, if we approach it in the right way, not only able to survive but also become a new opportunity of success. Most people do not have the willingness to recognize and accept that a disaster has happened. There are several explanations for this attitude; most of them refer in the Table (1).

Table (1). Explanations toward project disaster

Cause	Notes
Political	In politics is almost unheard to admit a failure in a project, due to the political cost that it may have in their careers.
Image	The protection of managers profile and the potential negative impact inside the organization, leads to an attempt of hiding the actual disaster itself and presents a criticism on the disaster management.
Ignorance	Lack of knowledge and experience can lead to missing the warning signs and the senior manager may have no idea that the project is in trouble.
Denial	Denial is the natural tendency to understate problem, when mainly reporting to a superior or a client. Also, it can denote a false hope that things will fix themselves or an illusion that a magic wand will turn the backfire into a triumph.
Blame	This is another type of denial, when people don't accept liability and they believe that outer forces drive to the disaster.

Furthermore, it is clear that often there is interaction between these categories, and each project manager should always have in mind that there are two types of project managers: those who have already been involved in a disaster, and those who will be involved in the future.

III. METHODOLOGY

Although the attitudes of construction organizations towards risks and uncertainties are generally known, little information is available concerning the use of risk management as a systematic tool within the organization. To evaluate attitudes and skills in risk management, a comprehensive multiple-choice questionnaire survey was adopted for this survey. The questionnaire survey was distributed to construction organizations associated with the Libyan market. To ensure that all the respondents have completely understood the questionnaire design, an interview was conducted with each respondent to explain the main goal of this survey, especially towards identifying risk types and the necessary management actions for controlling these risks. The questionnaire was divided into three sections. In the first section, it is concerned with general information for the company, such as the type of the construction company required, and the culture of the organization. The second section is concerned with the significance of different risk categories; and the third part is related to the practical actions for handling these risks. The completed answers were accumulated either personally, or via emails and faxes. Sixty questionnaires were sent, and a total of 55 were returned, resulting to a response rate of 92%. From the received questionnaires 44 could be used for analysis. The effective rate is considered tolerable and comparatively lofty for the construction industry.

- *Comments on the Questionnaire*

A total of 23 risk management measures were listed in the questionnaire for the risk factors and they were assessed for. Column 1 of Table (2) presents the most significant risk types included in the questionnaire without any specific order. These risk types were based on: a) extensive literature review and b) discussion with the key experts who participated in the survey.

Table (2) . List or results in the survey

Risk Types	Risk Significance			Risk Allocation		
	Not at all	Significant	Important	Owner	Contractor	Shared
Permits and ordinances	15%	64%	21%	76%	14%	10%
Lack of Scope of work definition	28%	32%	40%	73%	18%	9%
Delays in obtaining site access	18%	61%	21%	55%	25%	20%
Labor, material and equipment availability	0%	23%	75%	0%	97%	3%
Labor and equipment low productivity	0%	32%	68%	0%	95%	5%
Defective design	0%	24%	76%	55%	18%	27%
Changes in work	18%	60%	22%	75%	12%	13%
Unforeseen site conditions	8%	80%	12%	24%	75%	1%
Unexpected inclement weather	35%	65%	0%	8%	73%	19%
Quality problems of material	21%	41%	38%	0%	76%	24%
Changes in governments laws and regulations	17%	52%	31%	38%	37%	25%
Labor strikes and disputes	39%	55%	6%	0%	96%	4%
Accidents during construction	30%	64%	6%	0%	90%	10%
Inflation and changes in prices	26%	50%	24%	7%	72%	21%
Contractors' incompetence	8%	21%	71%	78%	11%	11%
Change order negotiations	5%	92%	3%	21%	6%	73%
Delays in third parties	4%	21%	75%	18%	60%	22%
Lack of coordination with subcontractors	6%	23%	71%	0%	94%	6%
Delays in resolving disputes	8%	70%	22%	29%	18%	53%
Delayed payment to contractor	0%	18%	82%	77%	11%	12%
Poor quality of work	8%	42%	50%	0%	87%	13%
Financial failure	0%	12%	88%	7%	21%	72%
War threats and political instability	36%	29%	46%	30%	0%	70%

- *Survey results*

The important results of this survey are summarized below. The approach toward allocation and significance of each risk are in a few words reviewed for each one.

- Permits and ordinances :The results indicate that the owner should be responsible for this risk. Contractors do not consider this risk as important.

- Lack of Scope of work definition: If the goals of the project are wrong or unclear then the risk should be undertaken by the owner. It is absolutely essential to have clear requirements and objectives of the project, otherwise it can easily lead to problems.
- Delays in obtaining site access: This type of risk should be delegated to the owner. Owners tend to rush projects for saving money and time, but this one can be very dangerous and might jeopardize project objectives.
- Labor, material, equipment availability: The results indicated that this risk belongs to the contractor.
- Labor, material, equipment low productivity: It is one of the most important risks for the contractors.
- Defective design: According to the survey the owner must assume this risk. The design might not be complete it, may include lots of mistakes or it may not even be constructible.
- Changes in work: The owner should be the only responsible for this risk.
- Unforeseen site conditions: The results of the survey indicated that this risk should be allocated by contractors.
- Unexpected inclement weather: This type of risk should be shared between owner and contractor.
- Quality problems of material: Although it is referred as risk with low importance, it was found to be the responsibility of the contractor.
- Changes in government laws and regulations: The survey shows that owner can best handle this risk.
- Labor strikes and disputes: The results assign contractors for this risk.
- Accidents during construction: This is the most significant risk for the contractors. Only contractors must assume this risk.
- Inflation and changes in prices: The survey shows that the allocation of this risk depends on the economic conditions of the country. If the inflation rate is high, or increases the owner tends to assume more of this risk and the importance increases; as the inflation rate is low, then the contractors are more willing to undertake this risk and the importance decreases.
- Contractors' incompetence: The survey shows contractors to handle this risk better.
- Change order negotiations: This type of risk is shared between owner and contractor.
- Delays in third parties: The results of this survey indicate a shift from owner to shared risk.
- Lack of coordination with subcontractors: The results gain shows a shift from owner to shared risk also contractors assign high importance to this risk.
- Delays in resolving disputes: The results denote a shared risk.
- Delays in payment to contractor: The results indicate that owners assume this risk.
- Poor quality of the work: The survey indicates that contractors assign this task to themselves. They also consider it of high importance, after the risk concerning accidents during construction.
- Financial failure: Like inflation, this risk depends on the economic conditions of the country. In a period with strong economy, contractors are willing to accept the risk, otherwise contractor desires a sharing approach.
- War threats and political instability: The survey indicates that it is a sharing risk.

- Attitude to risks

Of the respondents their attitudes towards risks are summarized in the fig 5.

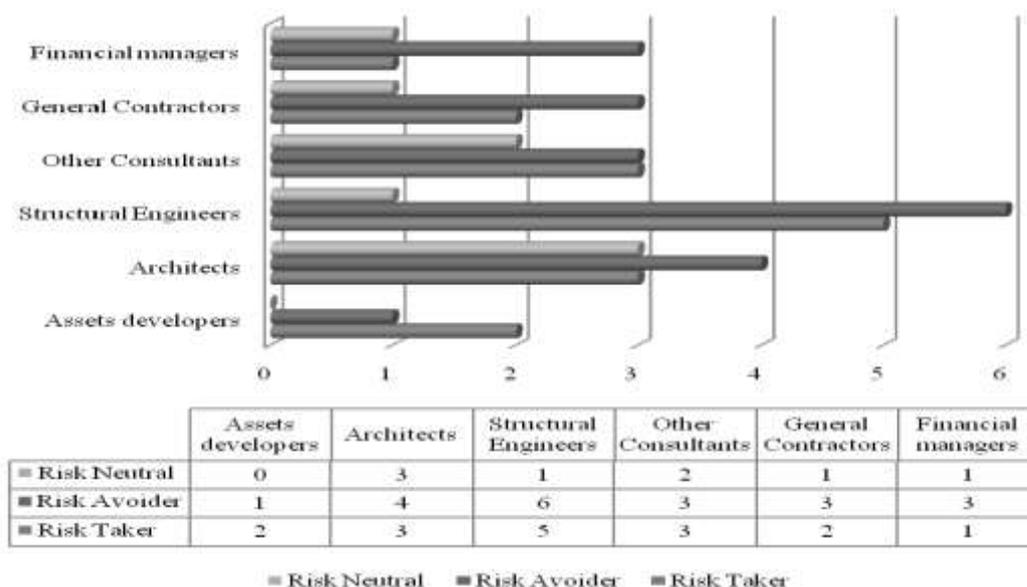


Fig.5: Attitudes towards risks

IV. Discussions, Recommendations

Guidelines how to recover a project.

Many people have a theory that there are no obstacles in a project, only opportunities. Perhaps the most valuable merit in a troubled project is the chance to learn from it. Unfortunately, people who have been involved in a disaster, prefer to forget it the sooner. This is a terrible waste of experience, because the lessons you'll take can help you to improve your knowledge and can easily help you avoid the next disaster.

It is very important to jog our memory that if we want to learn from a disaster, we must avoid having blame culture inside the organization; otherwise the identification of root causes for the problem will not be attainable. The defensive behavior will not help to discover the truth for the problem. There are four main guidelines in order to recover a project. These are; do nothing, start the project from the beginning, declare crush, assess and carry on. Of course, there is always the alternative of getting it exact in the right place. It is important to mention that all these four strategies are not supported by all projects. In some cases, we must use other methods to approach the phases of the project. We should keep in mind that just because the project is in trouble does not mean that everything in it goes wrong. A common point which applies to all these strategies is to keep away from getting lawyers implicated as a means of resolving a disaster unless if they are considered necessary. As in divorce, once lawyers are actively involved in a dispute, it is implausible to come across a harmonious and victorious ending.

- *Do nothing*

Although it is difficult to work, it seems to have been tested in many projects. It generally happens when people believe that the trouble is not happening or because they are too bemused to think of anything. If the project disaster is due to an external event, such as weather conditions, then the most probable is that we cannot do anything.

- *Start the project from the beginning*

This means to throw away everything implemented to date, keeping, of course the lessons learned. It is costly, extravagant and requires elastic timetable. It is used mainly, on projects in which are not on the critical path for overall delivery.

- *Declare crush*

Accepting the disaster in a project is not as dreadful as it sounds. By accepting the situation, you give the chance to communicate effectively with other people in the project team and find solutions. The main disadvantage is that it is very easy to start blaming everyone here. But all disasters are not someone's fault, and even it is true, as we have already mentioned, it is not an effective strategy to blame someone, or even more to punish them. If you do it, then you lessen the opportunities to build the organization onto lessons learned.

- *Assess and carry on*

Assess and carry on means that you can identify any event that is out of control and so you cannot carry on in the same way. This is the best approach, and it is the most used. Also, it gives the capability to combine the advantages of declaring the crush strategy with starting the project from the beginning.

- *Getting exact in the right place*

The most important thing for a project is to enter it from the beginning in the right place with a clear knowledge of its requirements. The implementation decisions should be taken by people with previous experience and congruent knowledge. Following this guideline will reduce the number of project disasters. Project disaster is a mixture of command and thinking, where you don't have clearly and effectively defined the goals of it and/or you have put wrong people to handle it.

- *An ongoing risk monitoring*

In order to eliminate the possibility for a troubled project, an alternative author's suggestion is to develop an ongoing risk management process embedded into an effective project planning. Effective project planning, besides of the "normal" activities (stakeholders involvement, identification of project objectives and goals, and so on) is consisted of one more activity: The design for the performance measurements of objectives, the development of strategies and the remediation approach, in order to implement, monitor, optimize and shut down remedies.

The main difference from the traditional project planning is that this design is practiced throughout the project, and not just in the beginning phases. The new project planning is iterative process during all the project lifecycle, till the closeout phase. One of the elements of the new project planning design is the ongoing risk monitoring of the project. Simply, each step of the project implementation should be documented. Furthermore, risks need to be monitoring in order to ensure that any possible change in the project do not alter the risk priorities. Finally, risk identification and assessment should be reviewed to ensure that any new or emerging risks are not identified and managed. To achieve all the above, it requires a risk management assessment applied with a contingency plan in order to accelerate post disaster management. Such plans should be also reviewed and tested frequently. It is obviously that it's needed also documentary updates (eg new procedures, legislation, etc) as well as seminars and workshops Author recommends that the above mentioned Risk Management Checklist should become an integral part and document of any construction Project Plan, be reviewed – negotiated and approved by both the Project Manager and the high-level Management and finally be countersigned by both sides. In this way, Risk Management is brought on a higher level of importance for the Project (in comparison with the classic Risk Management Plan, which is binding only for the Project Team)and is being recognized as a common tool for both the Project Team and the Project Organization. In this way, Risk Management becomes an element of organization philosophy and strategy.

What we avoid to do?

Up to now we have referred to causes of risk disaster, therapies and recover strategies. In this section we will give more emphasis on the negative, what not to do. These negative approaches are: execute nothing; lie about it; quit; break the contract; charge the

subcontractors; and charge the client. You should be careful when you decide to choose one of the above strategies in order to recover the project.

- *Execute nothing*

The “do nothing” approach includes complete inactivity; carrying on the project, as it was planned, and hope it all comes in the right way at the end. It is close to the strategy of avoid accepting the real facts in the project. But, for a Project Manager it is a situation which helps him to transfer bad news to his boss or client. At the point, you are sitting back and wait for everything to be fixed magically. On the other hand, “do nothing” is a perilous approach, because it spends a lot of time till someone accepts the foreseeable and its consequences before corrective action is taken. The longer the problems are disregarded, the harder it becomes to resolve them.

- *Lie about it*

In this strategy, you don't reveal the truth of a problem, and you hope to fix it before it can no longer be hidden and the truth discovered. The pros of this approach is that it absorbs the intensity of the project and gives it a little time interval; this strategy is especially used when we want to avoid a loss of face. On the other hand it is not a good method, because if it reveals before the problem has been fixed, it will then usually destroy working relationships. Also, when bad news is learned, those who had concealed it can never recoup any respect and trustworthiness. Experience shows that it's better to tell the truth to the client together with a plan of how you consider to fix it, rather than not tell them the truth.

- *Quit*

The Project Manager or the senior manager is replaced by others. In cases, this change happens very unexpectedly, within few minutes' decision. This kind of approach is attractive because, you provide a scapegoat for the disaster. Also, it shows towards clients that something is being done; and now we have new faces in the team, so the project will be secure. Nevertheless, this type of approach will not improve or fix the problem in project in the longer term. Especially if the Project Manager is not responsible for the disaster, it is unlikely to be the appropriate solution. Furthermore, bringing new management to the team, will create a negative impact on the morale of people and also it demands a new forming stage in team building, so the performance of the whole team will be decreased significantly.

- *Beak the contract*

In simple words, that means to put a stop in the development of the project and let lawyers get on with it. The only effective thing, using this approach, is that if the project was continued it would be devastating for the company. Also, it allows resources to move in other projects; improving their morale, because they can help other projects to achieve their goal. Breaking a contract is not something simple. The only people who are certain to win are the lawyers. Even if the organization gets definitely of the disaster, it will probably break the working relationship with the client. New business with the same client is unlikely in the future. The reputation of the organization may be negatively affected by this strategy and in the end the cons from this approach are more than the pros. The smartest thing is to take good legal advice before breaking any legal contract.

- *Charge the subcontractors*

It is not a wise decision, rather than admitting your errors, to start involving and blaming the subcontractors or suppliers for that. This strategy is convenient, because you pass the buck to someone else; you allege that it “is not your fault”. At least this is the concept. This is a dangerous strategy because dealing with subcontractors is part of the job for every Project Manager. It is rational to claim that any subcontractor can result in project delays, but in any case we cannot allege that this situation can lead to disaster. Furthermore, it is the Project Manager's responsibilities to identify problems and try to take actions to mitigate them, otherwise something is very wrong.

- *Blame the client*

This strategy is similar to charging the subcontractor for the disaster. The disaster is the outcome of the falling client to meet the objectives, he behaved irrationally, and he delayed to pay and so on. It is a very risky strategy, which if it works then the disaster is not problem of the Project Manager. It appears everything was done professionally, and the disaster was something inevitable. In this case, the morale of project team remains untouched; they believe that they have done excellent work, as well as the reputation of the organization remains intact. But as we mentioned before, it's a dangerous strategy because there is a doctrine “the customer is always right, even when wrong”. As with the subcontractor charging, it can be said that client management is also part of the role of the Project Manager. So, if the project team couldn't control changes or has failed to monitor or control change, then this is not a client's problem

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