



“Ascertaining Key Risks in the Construction Projects From Stakeholder and Life Cycle Perspectives”

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Introduction

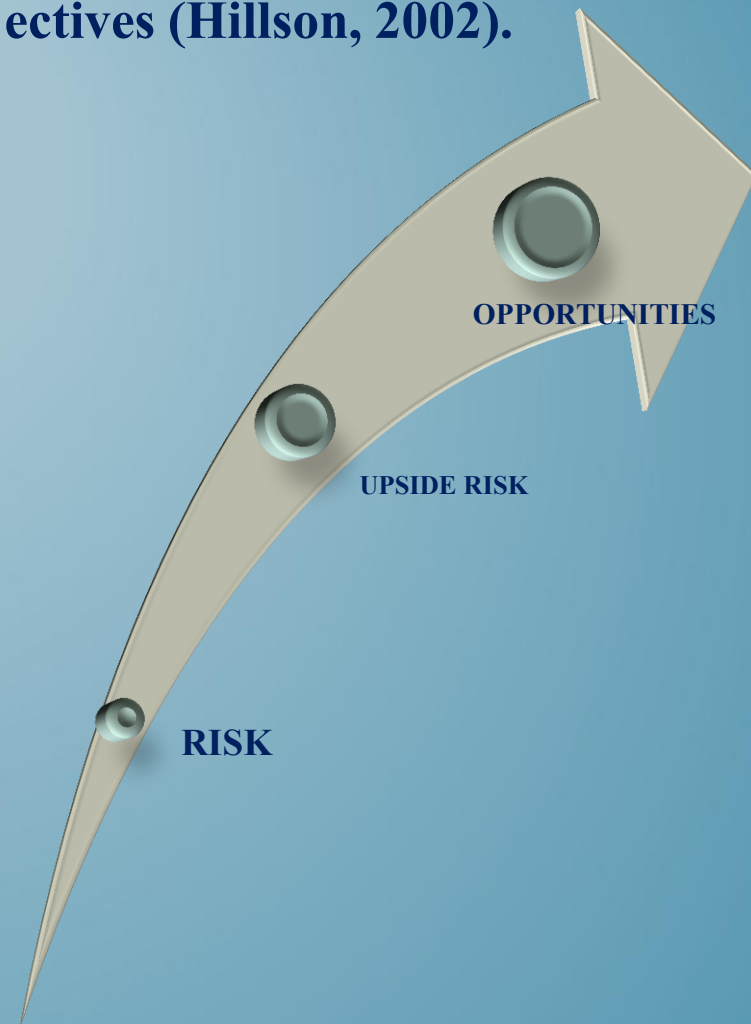


RISK VS OPPORTUNITY

The traditional view of risk is



i.e. Uncertainties that could have a beneficial effect on achieving objectives (Hillson, 2002).



AIM

- *Aim to explain a more systematic and holistic approach to identify and analysis the associated Risk in the construction projects.*
- *Since project participants are having different interests and demands*

Client

- **Focuses on the final quality with in the Budget and time**

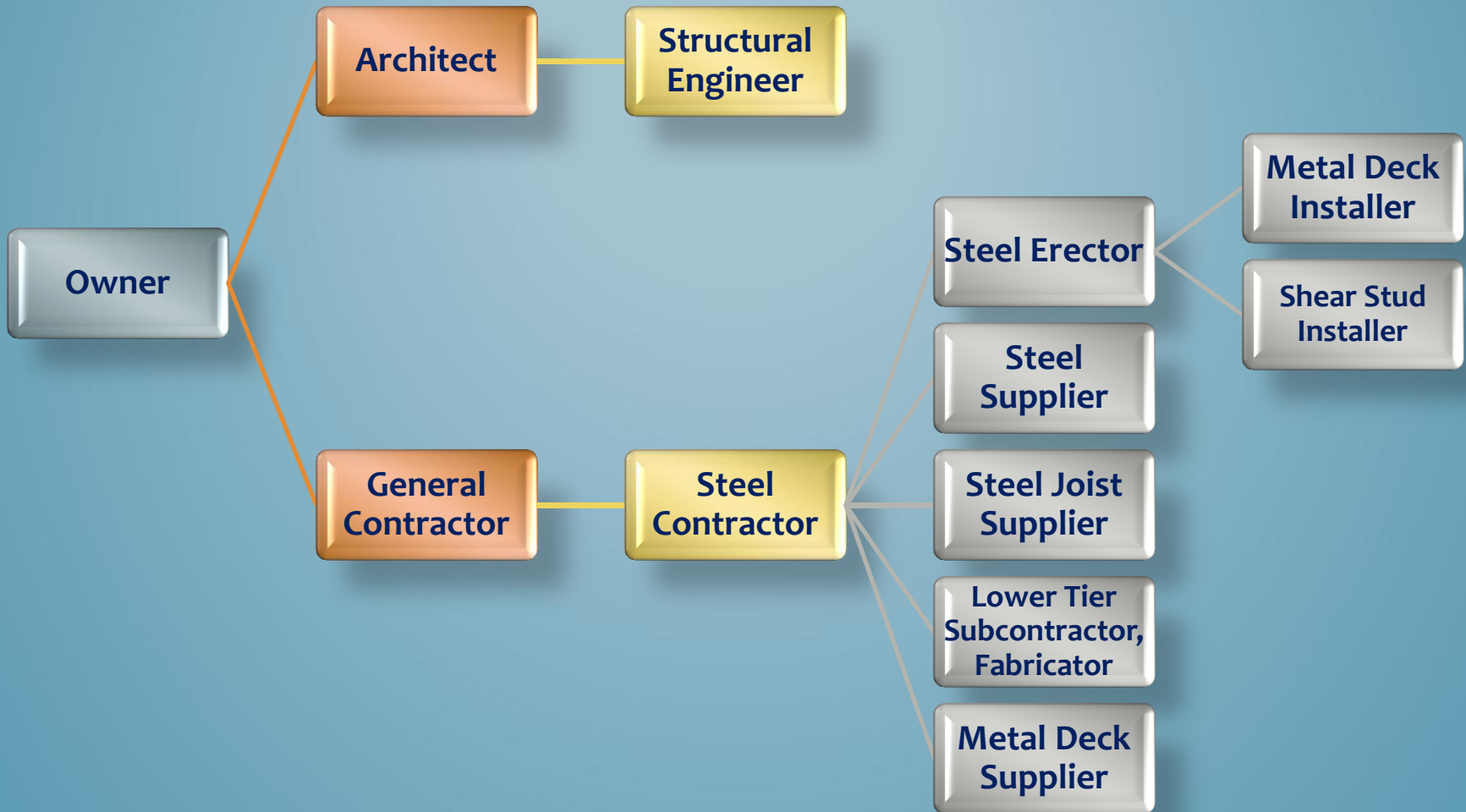
Contractors

- **Financial Result**
- **Future Projects with same Client**
- **Image in the society**

Consultants

- **Quality and Execution monitoring to comply the design intent**
- **Over come the design /construction issues, which has been noticed during the construction stage without impact in the contract.**

PROJECT DELIVERY PARTICIPANTS PARTIES (SAMPLE)



In general that the construction projects involves numerous participants ,which has different perspectives' of the project such as :



Herewith some (7) Practical cases from construction projects to make you to understand the Risk in the projects.

Managing risks in construction projects has been recognized as a very important management process in order to achieve the project objectives in terms of

- **Time, Cost, Quality, Safety and Environmental sustainability.**
- ***RISK CASE:01 ;"Requirement of Coordination in the project to facilitate all the trades activities to attain the Project Goal".***



RISK CASE:02 : “Constructability consideration from the Design”

Precast Structural System as a Roof of Plant Room in basement.

- Which has been erected after erecting the Equipment including the Crane.



RISK CASE:03 : “Difficulties due to Poor Construction Planning/Scheduling to Erect the Long Span Over Head Crane in the Basement.

- Which has been erected after completion of the concrete construction works.
- Due to Crane Erection the other trade works have been adjusted/Held in the route more than 100m in length to bring the Long span Crane Girders in to the Position.
- This activity has been caused potential time impact.



Long Span Over Head Crane has been erected in the Basement after placing the great effort



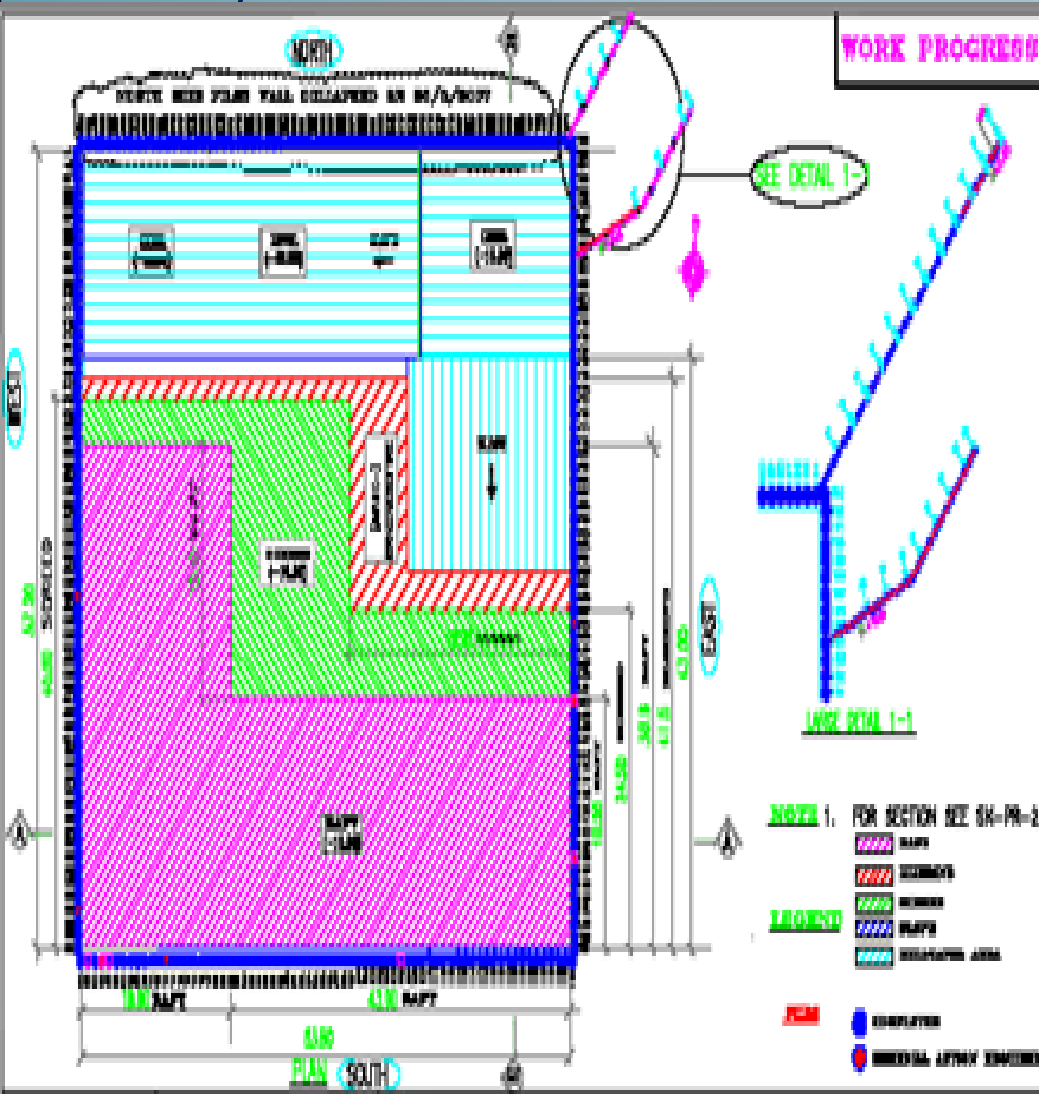
RISK CASE:04: “Construction Facilitation by changing the connection type by the steel subcontractors incompliance with Specs-05120” .

- Which helps the contactors to mitigate the delay as well to complete the project on time.

- For this case the Contractors should assign the experienced structural professionals to generate the structural models, connection calculations and method of erection to facilitate the site, safe work



- **RISK CASE:05** : *Soil Behavior in Kuwait at deep level.*
- *Air Pocket/Cavities in mid layer of the soil*
- *Caused shoring failure ,which potentially effected the project completion..*



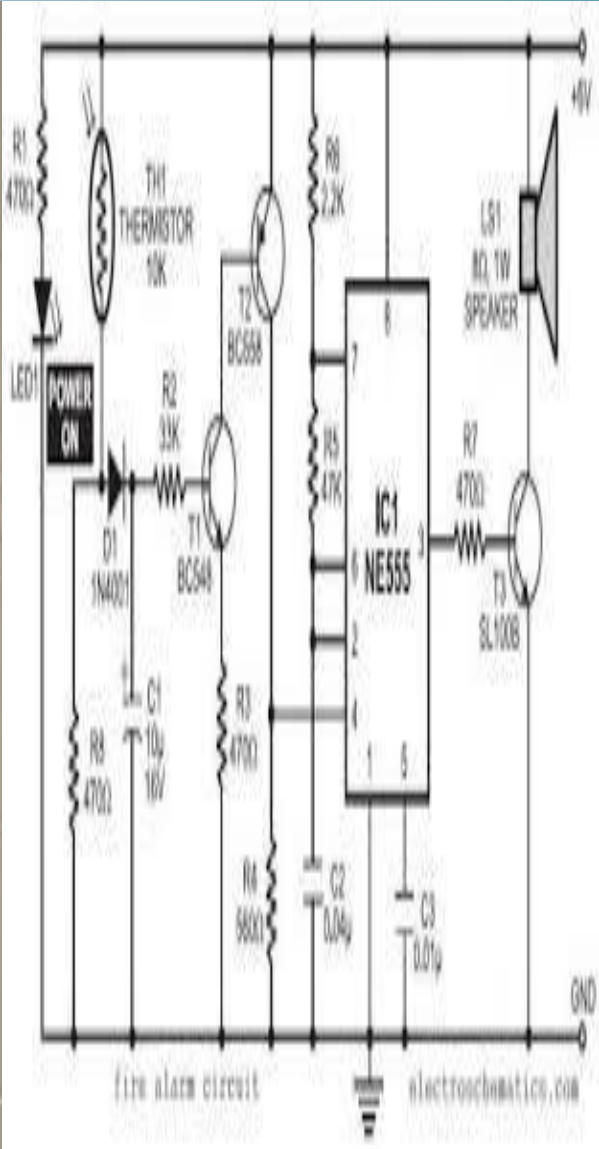
Setback in the project due to Shoring failure.



- ***RISK CASE:06”Poor Quality Control and Execution methodology by the Cladding Contractors, Which has lead to remove and re – execute the claddings eventually these kind of activity could causes significant time and quality impact on the project”.***



RISK CASE:07: “Temporary Fire Fighting compliance “



- **RISK CASE:07: “Ineffective Temporary Fire Fighting systems in the projects“**
- Which unable to use to stop the fire effectively eventually caused uncountable loss in the project and lead to
- Removal , Reconstruction and repair works .
- Insurance claim .
- Finally these kind of incidents could
- lead time , quality impact in the project.



Setback in the Project.



Detailed Evaluations.



CODE

5.6.5.4 — Concrete in an area represented by core tests shall be considered structurally adequate if the average of three cores is equal to at least 85 percent of f'_c and if no single core is less than 75 percent of f'_c . Additional testing of cores extracted from locations represented by erratic core strength results shall be permitted.

5.6.5.5 — If criteria of 5.6.5.4 are not met and if the structural adequacy remains in doubt, the responsible authority shall be permitted to order a strength evaluation in accordance with Chapter 20 for the questionable portion of the structure, or take other appropriate action.

Requirements of ACI 318



This model is focusing

- **systematic and**
- **holistic approach**

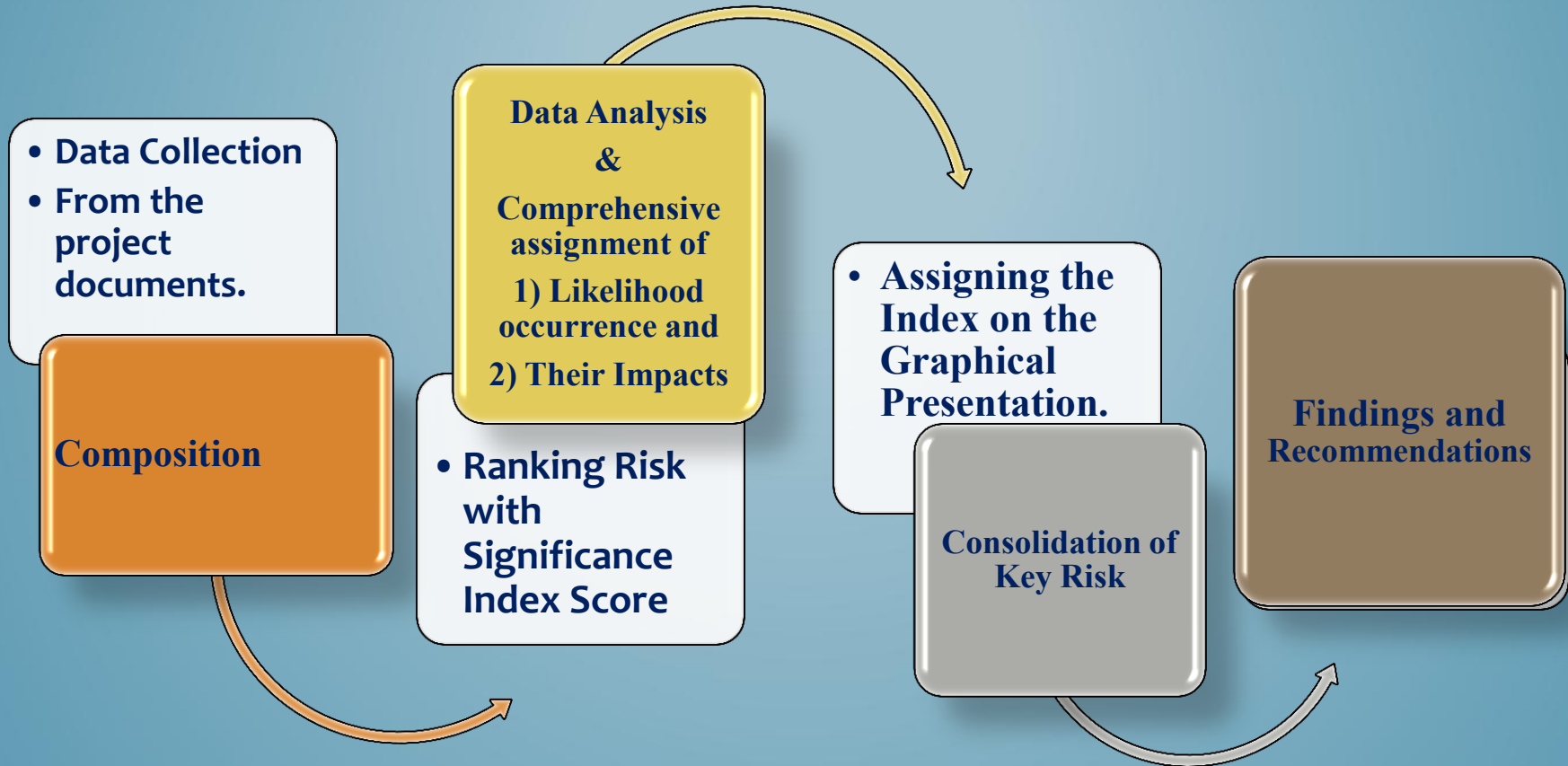
To identify risks and analyze the likelihood of occurrence and impacts of the risks



OBJECTIVES

- *Development of a Ranked Risk.*
- *Development of more consistence approach for analysis and aggregation by Significant index score.*
- *Assigning the significant index score on the Graphical Presentation on the key Risk.*
- *Consolidation of key Risk, Stakeholder and the Project Life cycle.*

Methodology



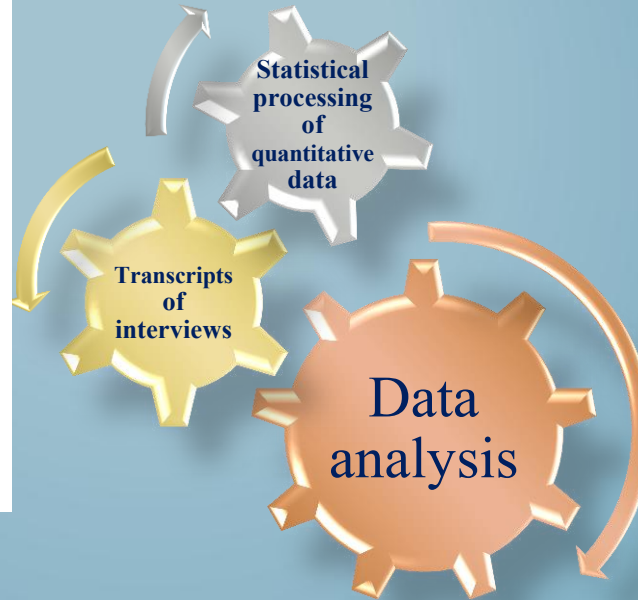
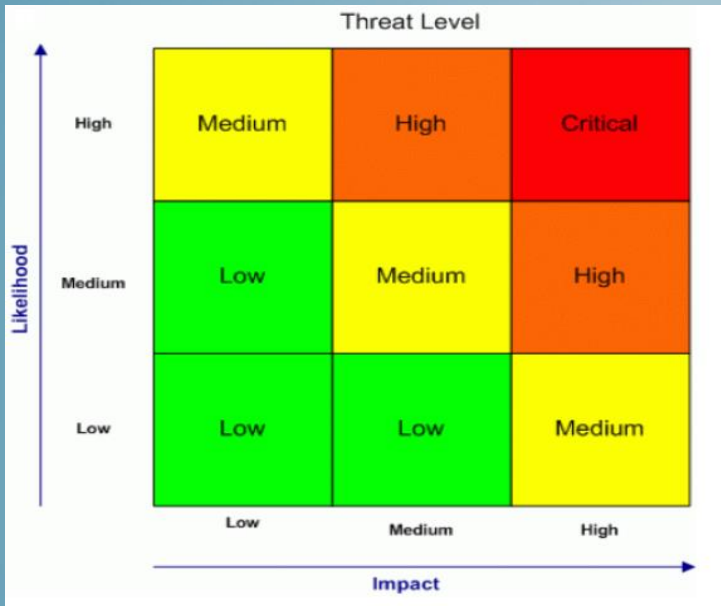
Risk Register/Documentation:

QNo	Key Risk Which could Influence the Project Objectives	Like hood hood Occurrence			Level of impact		
		Highly Likely(1)	Likely (0.5)	Less Likely (0.1)	High Level(1)	Medium (0.5)	Low Level (0.1)
Q1	Tight Project Schedule						
Q2	Design Variations						
Q3	Excessive Approval Procedures in a dministrative government departments						
Q4	High Performance/Quality Expectations						
Q5	Ina dequate Program Scheduling						
Q6	Unsuitable Constructions Program Planning						
Q7	Variations of Construction Programs						
Q8	Low management Competency of Subcontractors						
Q9	Variations by the Client						
Q10	Incomplete Approval and other Documents						
Q11	Incomplete or Inaccurate Cost Estimate						
Q12	Lack of Coordination between Project participants						
Q13	Unavailability of sufficient professionals and Managers						
Q14	Unavailability of sufficient amount of Skilled Labor						
Q15	Bureaucracy of Government						
Q16	General Sa fety Accident Occurrence						
Q17	Ina dequate or Insufficient site information (Soil, Wind, Seismic & Survey report)						
Q18	Occurrence of Dispute						
Q19	Price Inflation of Construction Materials						
Q20	Serious noise, dust Pollution Caused by Construction						

The above analysis and documentation has to performed for the bellow 5 clause:

- 1) Cost Related Risk
- 2) Time Related Risk
- 3) Quality Related Risk
- 4) Environmental related Risk
- 5) Safety related Risk

Methods of analyses



$$r_{ij}^k = \alpha_{ij} \beta_{ij}^k \quad (1)$$

$$R_i^k = \frac{\sum_{j=1}^n r_{ij}^k}{n} = \frac{1}{n} \sum_{j=1}^n \alpha_{ij} \beta_{ij}^k \quad (2)$$

Table 1 Matrix for the calculation of the risk significance index

		High level of impact	Medium level of impact	Low level of impact
		(1.0)	(0.5)	(0.1)
a	Highly likely (1.0)	1.00	0.50	0.10
	Likely (0.5)	0.50	0.25	0.05
	Less likely (0.1)	0.10	0.05	0.01

“ Risk Ranks that could Influence Project Objectives and their abbreviations-Which obtain from the detailed Study and Secondary dates”

20 Key Risk Rank	Abbreviations	Significant Index
• 01 Tight Project Schedule	TPS	??
• 02 Design Variations	DV	??
• 03 Excessive Approval Procedures in administrative government departments	EAP	??
• 04 High Performance/Quality Expectations	HPQE	??
• 05 Inadequate Program Scheduling	IPS	??
• 06 Unsuitable Constructions Program Planning	UCPP	??
• 07 Variations of Construction Programs	VCP	??
• 08 Low management Competency of Subcontractors	LMCS	??
• 09 Variations by the Client	VC	??
• 10 Incomplete Approval and other Documents	IAD	??
• 11 Incomplete or Inaccurate Cost Estimate	ICE	??
• 12 Lack of Coordination between Project participants	LCP	??
• 13 Unavailability of sufficient professionals and Managers	UPM	??
• 14 Unavailability of sufficient amount of Skilled Labor	USL	??
• 15 Bureaucracy of Government	BG	??
• 16 General Safety Accident Occurrence	GSAO	??
• 17 Inadequate or Insufficient site information (Soil, Wind, Seismic&Survey report)	ISI	??
• 18 Occurrence of Dispute	OD	??
• 19 Price Inflation of Construction Materials	PICM	??
• 20 Serious noise, dust Pollution Caused by Construction	SNP	??

Consolidated graphical representation.

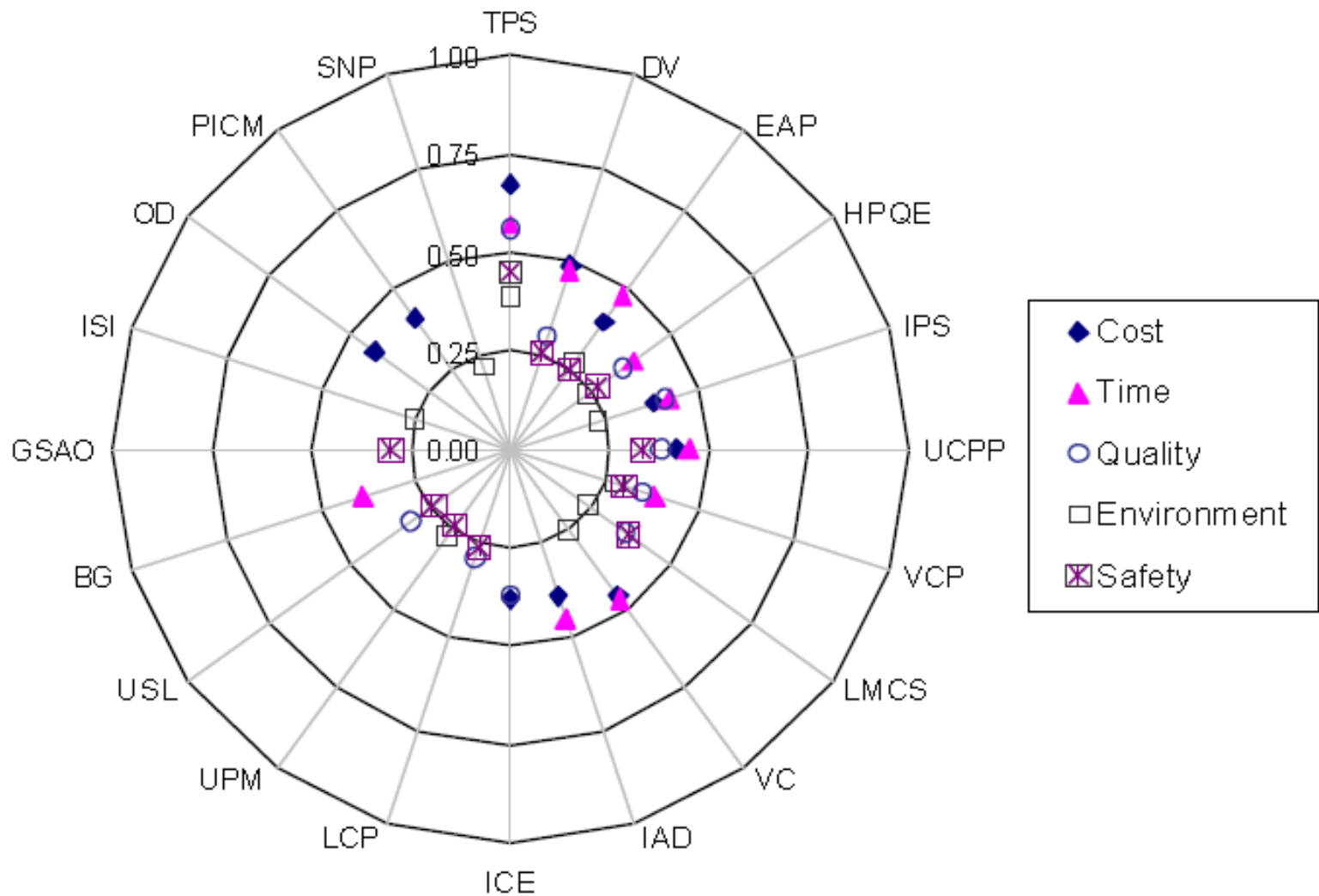


Figure 2 Key risks versus significances of influence on project objectives

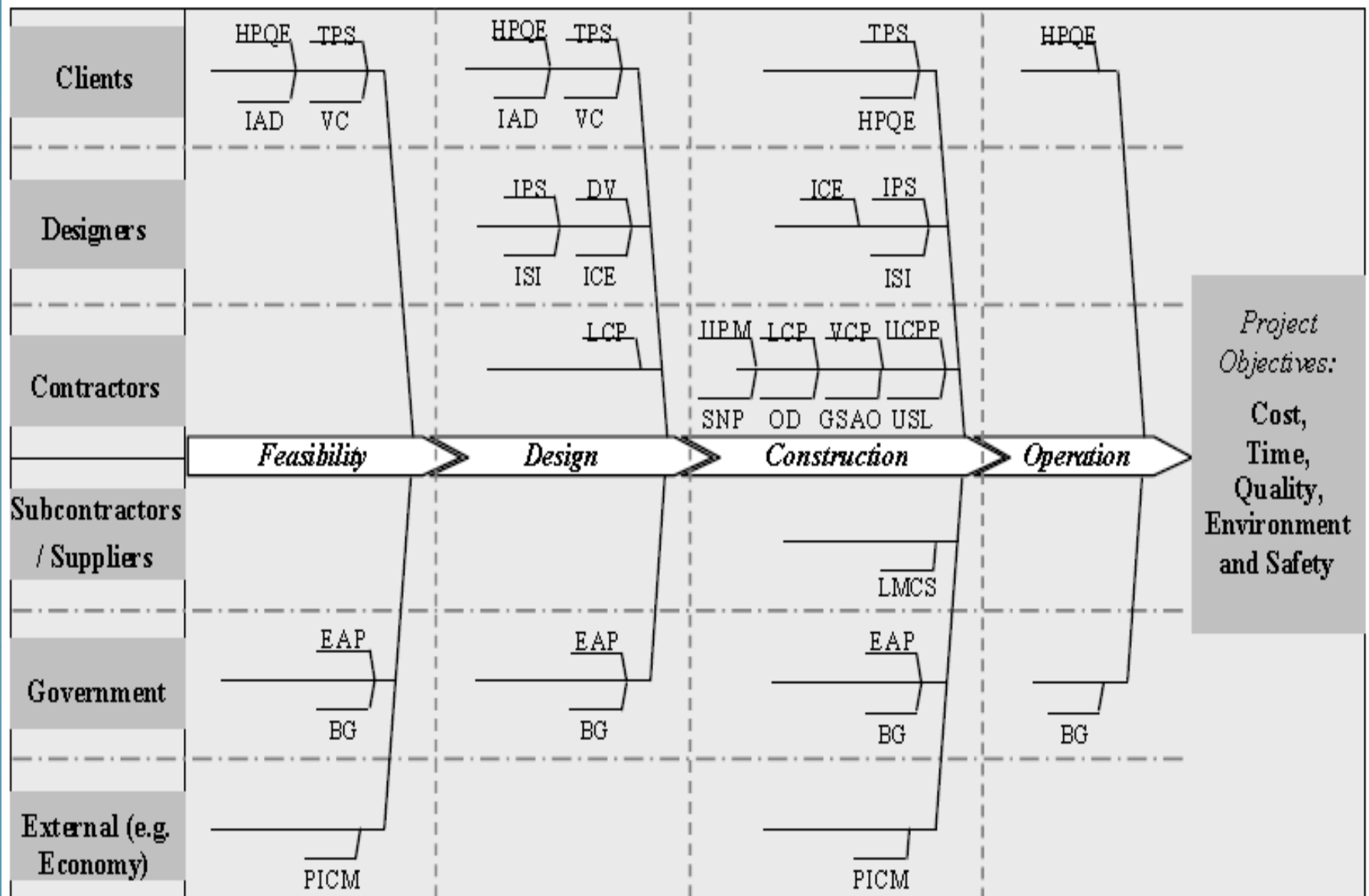


Figure 3 Consolidation of key risks, stakeholders and the project life cycle

Managing Risk.



Effective Approach.

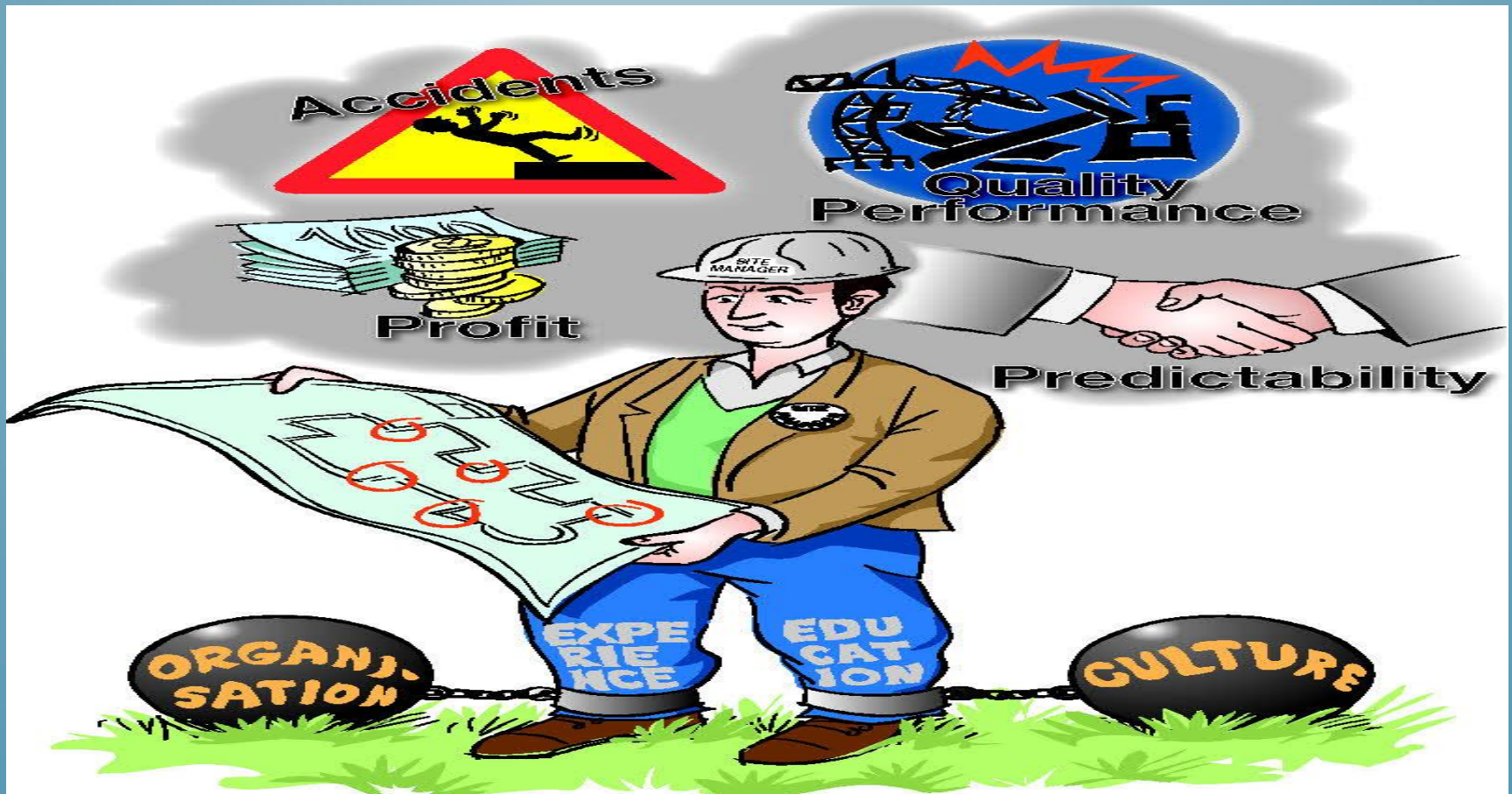


Recommendations:

- The clients should know what kind of project features they want and clearly define it in brief to avoid a changes during the execution.
- The early effective involvements of the parties on the projects should help the clients to produce an appropriate project schedule, financial report by considering the price inflation.
- Designers (including consulting engineers) should carry out in-depth investigation of site conditions prior to the design works and effective mechanism to be adopted to articulate the clients' needs.
- Bureaucracy Authorities Could create a swift environment to support the project development while the project team should always maintain close relationship with the government officers to shorten the time for approvals.
- To keep the construction work on track, experienced professionals need to be assigned in the project as early as possible to make sound preparations for developing valid construction programs.

Conclusion

- This systematic explained approach would assist the stockholders /managers' to manage and resolve the potential risk at various stage and degree of the project and take decision to drive that the project team to goal and complete the construction projects on time with profit.





Thanks for your kind attention.