

Risk Identification Barriers in Construction Projects in MENA¹

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Abstract

Construction projects nowadays are facing difficulties and financial losses due to high economic and political instability, especially in North Africa and the Middle East. So they require effective project management. Risk management is one of the most important aspects of project management, as it deals with unknown events which may cause benefits or losses to the project. Risk identification process is essential to the successful implementation of risk management. You can deal with risks effectively if you identify them properly. Risks are divided into opportunities and threats. This paper focuses on risk identification barriers while applying PMI risk standards for the projects. If the organization considers those barriers while risk identification, it will enhance the risk identification process, enhance profits and reduce damages.

Keywords: Risk management, Risk identification, Construction, PMI risk standards, MENA, Risk identification barriers.

1. Introduction

In construction projects uncertainty is everywhere. Each project contains hidden parts which may cause negative or positive events. The construction industry in the MENA region was rapidly growing before the political crisis and the drop in oil prices, which badly affected the sector. Now investors need to spend less, earn more within short durations. This is difficult because of the nature of construction projects. Project management goal is to drive the project to successful completion, to meet the pre-established targets, to avoid losses and gain customer's satisfaction. Project management processes are initiating, planning, execution, monitor, control, and closure. These processes are cyclical and repetitive through

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the project. Risk management is an important part of project management which plays an important role in trying to manage all unknown events which may affect the project. So the team should identify the risk, understand its nature, plan to manage once occur, monitor and control responses effectiveness, and make enhancements and changes to plans if required.

What is the risk? There are multiple answers to this simple question, As per PMI ⁽²⁾, the risk is “an uncertain event that, if it occurs, has a positive or negative effect on one or more project objectives such as scope, schedule, cost, and quality”. If risk is positive, it is known as opportunity, but negative ones are known as threats as per W.D. Rowe ⁽⁷⁾, Mistakenly many people focus only on managing threats and think that those only should be identified, analyzed and managed, while they missed the positive chances and the profit might be gained from those chances.

As per PMI ⁽²⁾, organizations and project managers should also focus on non-event risks which are divided into two main types: (1) Variability: activities are usually performed within a probable range of duration and resources, and By using Monte Carlo simulation a good confidence level can be reached through iteration. (2) Ambiguity: when there is imperfect knowledge in any area of the project, which might affect the project’s success and can be solved by defining this gap and then filling it either internally or externally. To assure the continuous development of the project resources.

Jardine C.G. ⁽⁶⁾ defined risk as the probability of unknown events to cause losses or gain on a specific time frame.

Risk management is defined as the processes of risk management, identification, analysis, planning responses, monitoring and controlling risks of the project ⁽²⁾. Risk management should start as soon as possible once the project starts so that the project team can properly identify and deal with risks.

Project management plan contains a risk management plan which aims to manage the project successfully. Objectives of risk management are to reduce losses and impact of negative risks and to enhance gains and impact of positive risks ⁽²⁾.

There are two levels of risks must be addressed to successfully implement a risk management plan:

- Individual project risk: is an unknown event which, if it occurs, will have a positive or negative effect on the project objectives. Management of individual risks aims to control the individual risk.
- Overall project risk: is the effect of unknown events on the whole project, It is caused due to all uncertainty sources on the project including individual risks.

Management of overall risk aims to control the risk exposure and keep it within the acceptable range defined by stakeholders.

According to PMI⁽²⁾, Project Risk Management processes include:

1. **Risk management planning:** is to determine how the team will perform risk management activities, determine project risk strategy, methodology, roles and responsibilities, funding and time allocated to risk management activities, reporting formats, probability and impact matrix, stakeholders risk appetite and thresholds and help determine risk categories.
2. **Risk identification:** is the process which helps to discover the risky events in the project as well as sources of overall project risks, once identified it becomes easy to plan how to deal with them
3. **Risk qualitative analysis:** is to arrange risks according to their impact and probability of occurrence and any other factors, and it is a subjective evaluation.
4. **Risk quantitative analysis:** is the numerical analysis of the risk event impacts on overall project objectives, based on a numerical and statistical evaluation, and it aids to remove uncertainty from the project.
5. **Risk response planning:** to determine how to deal with risks, select the appropriate strategies, determine the required resources and time to deal with those risks. Selecting the proper plan can minimize threats and maximize benefits.
6. **Risk response implementation:** once a risk trigger happened, the agreed-upon risk response plans should be implemented.
7. **Risk monitoring:** is to monitor the implementation of the risk responses, keep eyes on the effectiveness of the plans, modify or change if required, identify and analyze new risks during project life cycle.

Benefits of implementing risk management in construction projects:

- Determine real cost and time estimates with a high probability of achieving.
- Save project cost from unknown events which, if occur lead to costly losses.
- Gain benefits if the predefined opportunity occurred and the proper response plan implemented.
- The deep review of the project gives the team deep understanding of the project.
- Higher management can use risk analysis output to support their decisions.
- It minimizes risk exposure level.
- Understanding the constraints of the project.
- Differentiate between risks and issues, try to solve the issue and develop a strategy to deal with risk.
- Use customer risks thresholds and tolerances to keep risk exposure within customer limits.

- Increased customer's satisfaction.
- Awareness of different stakeholder risks attitudes.
- Customer's involvement in project decisions.
- Gain management support and interest through awareness of project risks.

2. Risk Identification

Risks, as explained before, are uncertain events which may or may not happen in future, if they happen, they will affect the project in a positive or a negative manner. Risk identification tries to manage them through proper determination of their characteristics, possibly expected time, impact, probability, preliminary response plan, assign preliminary risk owner.

The risk identification main purpose is to reduce project contingency through identification of unknown events that may cause an impact on the project objectives. But don't forget that it is impossible to identify all the risks of the project. Risk exposure level decreases over project time, Project manager and team members gain more understanding of project objectives and related risks, Risk identification is an iterative process as new risks can arise suddenly at any point in time in the project and need an immediate action.

2.1. Risk identification inputs

As stated in PMBOK below are input document which must be reviewed to obtain as many risks as possible ⁽²⁾.

Risk Management Plan

Is the basic document and serves as the basis of the process, assigned stakeholders, roles and responsibilities, level of authorities, risk categories, allocated time and costs for risk identification activities.

Cost Management Plan

Provides a basis for cost estimation processes (planning, structuring, estimating, budgeting and control project cost), cost management procedures, this help to discover cost-related risks.

Schedule Management Plan

Serves as the basis of time management processes, procedures, methodology, scheduling tools, roles and responsibilities, accuracy level, schedule reports formats and frequency, thus help risk team to discover schedule related risks.

Quality Management Plan

Provides a basis for quality management processes, policy, metrics, a baseline, and thresholds for quality measurements.

Resource Management Plan

Provides a basis for defining, hiring, managing, and releasing project personnel, required training, procedures, policies, and code of conduct.

Requirements Management Plan

Describes how product requirements will be analyzed and managed. Also includes the assigned time and resources for requirement activities.

Scope Baseline

Deep understanding of work break down structure helps to identify related risks, Assumptions and constraints must be reviewed for validity as they can hide risks.

Schedule Baseline

The final approved schedule for the project, which can only be changed through formal change control procedures, and is used as a base reference for monitoring and controlling to determine the variances.

Cost Baseline

The final approved project budget without any management reserves, which can only be changed through formal change control procedures. It is used as a basis for determining variances either cost overrun or saving.

Agreements

Include any related contracts or agreements, as it can include risks.

Project Documents

Any document which can provide important information on identifying risks, and may include assumption log, issue log, lessons learned register, requirements documentation, resource requirements.

Cost Estimates

Provide direct, indirect and overhead costs estimating ranges required to finish the activities, also estimate contingency reserves indicating the level of risk.

Duration Estimates

Provide a range of the likely duration to complete an activity, thus range estimate contains risks and needs to be identified.

Procurement Documents

Include a request for proposals, quotations, bid documents, terms and conditions which can hide risks.

Stakeholder Register

Risk manager should identify stakeholder, their requirements, expectation, influence, attitude, classification to successfully involve the appropriate stakeholders in Identifying risks process.

Enterprise Environmental Factors

Governmental standards and regulations, industry standards, publications, marketplace conditions, and organizational culture help to identify risks.

Organizational Process Assets

Organizational standard processes, policies, and process definitions, and lessons learned knowledge base are supportive documents to identify risks.

2.2. Tools and techniques

The researcher listed below the recommended tools and techniques to use while risk identification by Practice standard for project risk management ⁽³⁾:

- 1- Assumptions and Constraints Analysis.
- 2- Documentation Reviews.
- 3- Checklists.
- 4- Information Gathering Techniques.
 - 2.1. Brainstorming.
 - 2.2. Delphi Technique.
 - 2.3. Interviews.
 - 2.4. Root-Cause Analysis.
- 5- SWOT Analysis.
- 6- WBS Review.
- 7- Questionnaire.
- 8- Risk Breakdown Structure (RBS).
- 9- Prompt Lists.
- 10- Nominal Group Technique.
- 11- Diagramming Techniques.
 - 9.1. Cause and Effect (Ishikawa) Diagrams.
 - 9.2. System Dynamics (process flowchart).

9.3. Influence diagrams.

12- Failure Modes and Effects Analysis (FMEA) or Fault Tree Analysis.

13- Force Field Analysis.

3. Construction projects in MENA

Any item of construction: a house, an airport, a dam is a basic requirement for national development ⁽⁹⁾. Construction is a driving sector in the economic growth of all nations. The governments usually show high interest in construction as this is how they will translate their development plans to benefits or services. And it is related to our everyday activity, that is why construction has a high impact on the national economy.

Construction projects in MENA are facing difficult times due to dropping in oil prices, as the economy in those countries mainly depends on oil, so the importance to reduce costs and save loosed money has increased. Successful implementation of risk management helps to achieve this goal through avoiding negative events which may cause time and money losses, and exploiting probable chances which may save time and money ⁽⁸⁾, construction projects are suffering great losses due to some factors hindering the successful implementation, which needs to be identified as early as possible in the projects and to be managed in a proper way. Here the importance of risk management arises, as it tries to manage uncertainty through identification, assessment, implementation, and control.

4. Research Survey

As stated by Kotb and Ghattas ⁽¹⁾, 2017 in their paper, they found twenty-two risk identification barriers in construction projects in MENA that badly affect the successful identification of risks. Those barriers are categorized into three categories. This paper target is to check the validity of those barriers which, if they are overcome, the project team will be able to discover as many risks as possible, analyze and manage them. Thus finally leads to cost and time-saving. A survey was performed using a questionnaire answered by risk managers, project managers, and construction managers who are working on construction projects in MENA.

This study is concerned with the projects with below specification:

- Duration range from twelve to twenty-four months,
- Budget range from ten million dollars to one-hundred million dollars,
- PMI risk standard as a reference for risk management processes.

Those barriers^{(1), (4), (5)} are:

1- Human Barriers:

- 1- Imagination.
- 2- Short-Term Focus.
- 3- Silos.
- 4- Lack of Knowledge.
- 5- Bias.
- 6- Risk management culture among stakeholders.
- 7- The idea of being a firefighter.
- 8- Risk Attitude.
- 9- Risks vs. Issues.
- 10- Team Issues.

2- Project Management Barriers:

- 11- Identification Quality.
- 12- Inadequate Planning.
- 13- Improper stakeholders' identification.
- 14- Level of Detail.
- 15- Incomplete scope.
- 16- Too Many Assumptions.
- 17- Depending on a single tool and technique while identification.
- 18- Poor Communication.

3- Higher Management and Organization Barriers:

- 19- Lack of Management Support.
- 20- Afraid of management.
- 21- Improper Risk Systems and Processes.
- 22- Risk management practices among organization projects.

4.1. Survey methodology

The survey was designed to check the validity of the barriers defined by Kotb and Ghattas⁽¹⁾, 2017, and contains two parts:

1. The questionnaire includes twenty-two barriers to successful identification of risks. The respondents are required to check their validity, and if these barriers are considered while risk identification they will be able to identify project risks properly. A sample of risk managers, project managers, and construction managers who are working on construction projects in MENA are required to answer the questionnaire depending on

their related experience. Only those barriers which got 70% consensus or over are explained here in detail, while others were eliminated.

2. Other data such as (project budget, duration of the projects, years of experience implementing PMI risk management standard in his projects, implementation of risk management in the project and applied risk standards in the project) is used to determine the minimum and maximum budgets and duration of the projects, also used to determine the accuracy of results and the correlation between the answers.

4.2. Survey Results

The survey results show that 68% of the respondents are working in projects with minimum and maximum duration range from 12 months and 24 months, and this is the range assumed in the study as shown in figure (3). Also, the results show that common minimum and maximum budget for projects were (\$10,000,000 and \$100,000,000) as shown in figure (4), and this is the required range.

These results indicated that 70% of the respondents are implementing risk management in their projects as shown in figure (1). Figure (2) illustrated that those respondents who are implementing risk management are using PMI risk standards. Thus creates reliability to their answers as 60% of them are holding a PMI-RMP certificate that confirms demonstrates their awareness of PMI risk standards and methodologies.



Figure 1 Risk management implementation

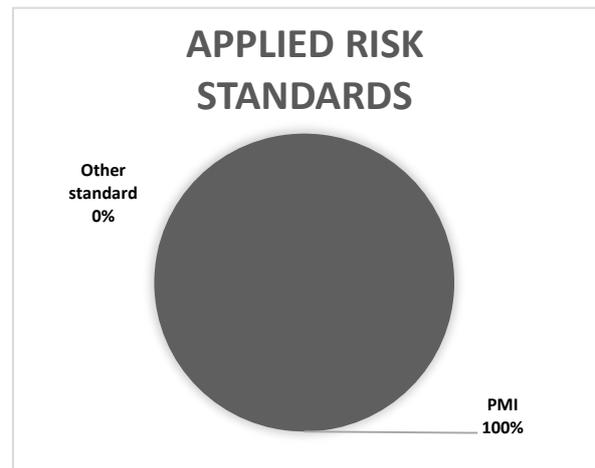


Figure 2 Applied risk standards

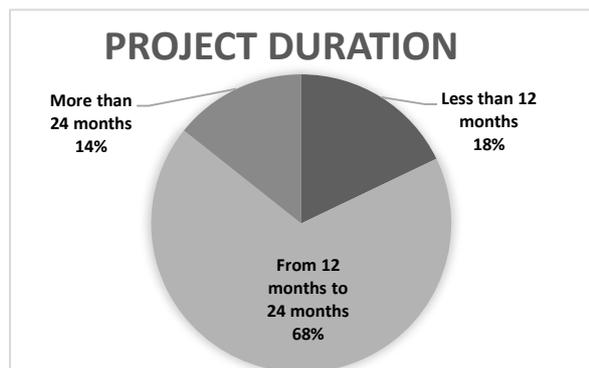


Figure 3 Project Durations

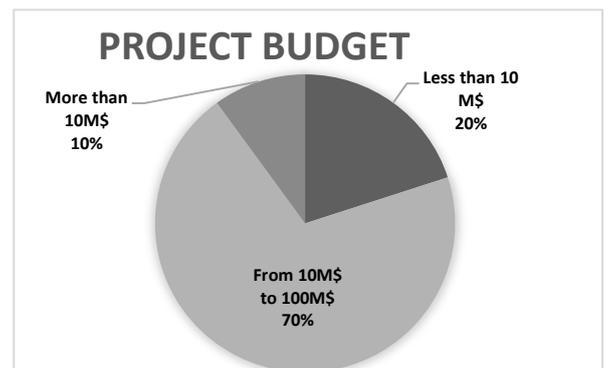


Figure 4 Project Budgets

Using Pareto technique to sort the barriers according to the percentage of respondents' acceptance, figure (5) shows that the two barriers that got consensus across all participants are "Inadequate Planning" and "Improper stakeholders' identification". The next three barriers got 90% consensus are "Lack of Knowledge", "Incomplete scope" and "Risk management practices among organization projects". Then these four barriers "Lack of Management Support", "Afraid of management", "Identification Quality", "Afraid of management" and "Bias" got 80% consensus. And the next four barriers got 70% and they are "The idea of being a firefighter", "Imagination", "Level of Detail" and "Depending on a single tool and technique while identification".

The barriers which got 70% or over consensus among participants indicate their importance and that the organizations and personnel should consider them. On the other side the barriers which got near to 70% are "Risk culture among stakeholders" and "Stakeholder's attitude" and the researcher thought they also may be considered as important barriers which need to be considered while risk identification of construction projects.

Those barriers that got less than this are not a priority to the organizations to focus on and they are "Project Assumptions" "Difference between issues and risks" "Short-Term Focus" "Silos" "Team Issues" "Poor Communication" "Improper Risk Systems and Processes".

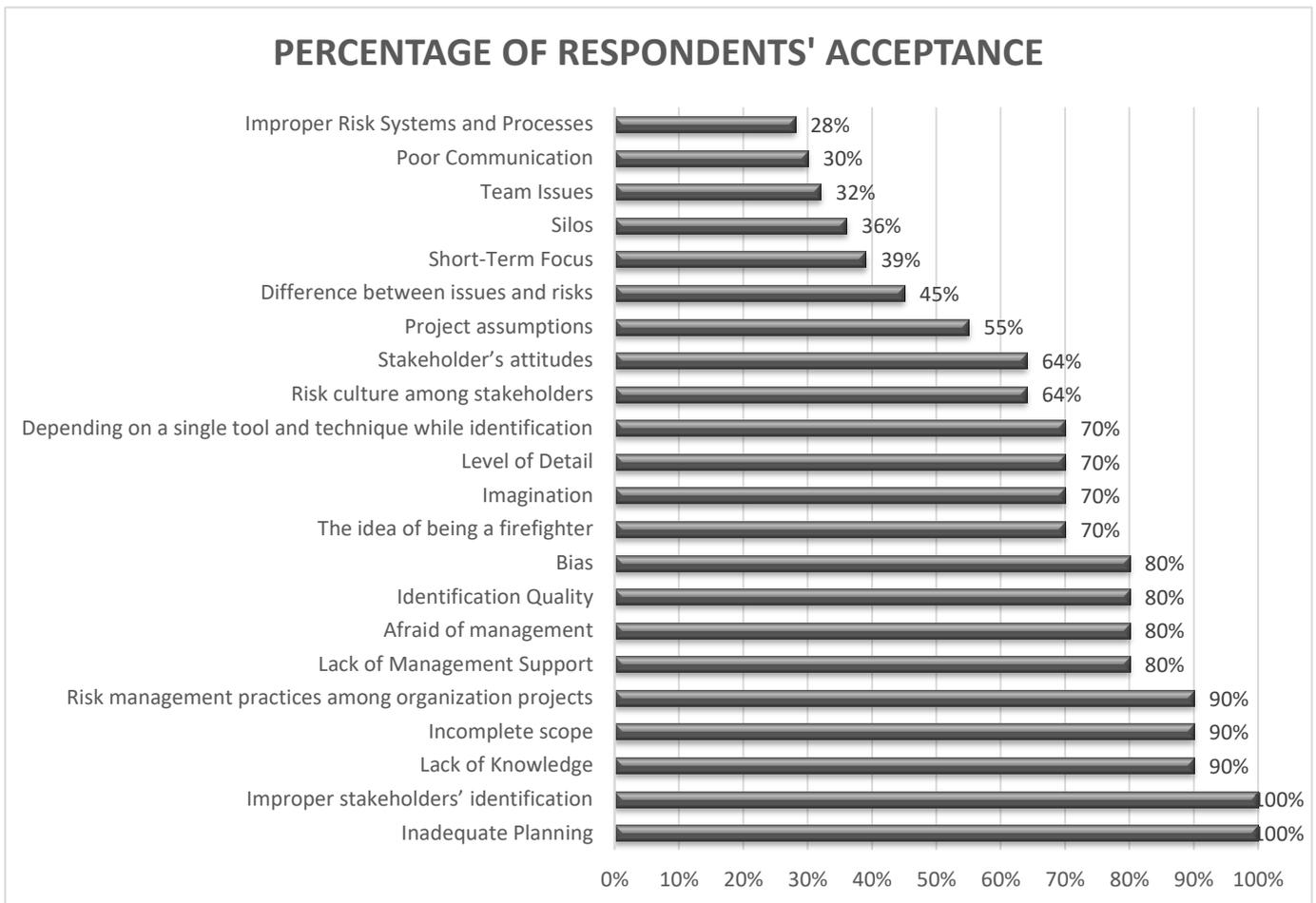


Figure 5 Percentage of respondents' acceptance

Table (1) illustrates the barriers which got consensus 70% or over, and further explanation of each of them.

Risk identification barriers	Category	Respondents answer	
		Yes	No
Inadequate Planning: Risk identification framework should be provided by project management plans, also identification activities should be given enough time to allow the team to discover risks, and the level of effort should be estimated to calculate the appropriate budget for these activities.	Project Management Barriers	100%	0%
Improper stakeholders' identification: Those who will participate in risk identification should be defined properly as missing participants will lead to missing risks, future problems and losses to project, also their roles and responsibilities regarding identification should be clear.	Project Management Barriers	100%	0%

<p>Lack of Knowledge: Risk identification depends upon the knowledge and experience of stakeholders, lack of knowledge can lead to missing risks or wrong information. The right persons with the adequate level of experience must be selected.</p>	<p>Human Barriers</p>	<p>90%</p>	<p>10%</p>
<p>Incomplete scope: Many projects started with an uncompleted scope which leads to missing risks while identification. Those parts of the scope which will be completed later may affect the project objectives badly unless their risks are identified properly.</p>	<p>Project Management Barriers</p>	<p>90%</p>	<p>10%</p>
<p>Risk management practices among organization projects: Companies which have recently applied risk management in their projects will face difficulties in identification also stakeholders will face difficulty to discover risks. On the other hand, a company with a history of risk management implementation will find it easy to identify risks.</p>	<p>Higher Management and Organization Barriers</p>	<p>90%</p>	<p>10%</p>
<p>Lack of Management Support: Management should support, cooperate with project manager and his team, provide clarifications, any required documents, solve a problem which they face, standardize processes, share knowledge and lessons learned among all organization members. The project manager has to gain their support, cooperation and establish roles and responsibilities for them.</p>	<p>Higher Management and Organization Barriers</p>	<p>80%</p>	<p>20%</p>
<p>Afraid of management: Management, as explained before, should be cooperative and encourage teams to report bad news as well as good ones, Unlikely, some senior managers do not like to hear bad news at project start, so project managers will hide those risks from his reports. This leads to unpredictable consequences and maybe great losses to project time and money.</p>	<p>Higher Management and Organization Barriers</p>	<p>80%</p>	<p>20%</p>
<p>Identification Quality: Risk management plan should contain the required level of accuracy and precision of identified risks. Some plans require very high accuracy and precise information. Thus the team consumes more time to reach the required level and may overcome some risks due to limited time and budget. So the level should be adequate to the project importance and allocated time and budget for identification activity.</p>	<p>Project Management Barriers</p>	<p>80%</p>	<p>20%</p>
<p>Bias: Two types of bias affect risk identification process: motivational and cognitive. Cognitive bias, when the</p>	<p>Human Barriers</p>	<p>80%</p>	<p>20%</p>

<p>stakeholder is pushing for his opinions, depends on his past experience; while motivational bias when stakeholder uses his power to force his points of view for personal purposes, bias causes ineffective risk identification process and inaccurate output.</p>			
<p>The idea of being a firefighter: Some organizations provide benefits when the project manager or team member solve many issues. It is a behavior encouraged by corporates and this leads those participants for risk identification either to hide risks so they can fight against them in future and gain benefits or not to spend the adequate effort to identify risks and misidentify many risks which may lead to time and money losses in future. In all cases this is not ethical and not good for project success, Project managers should fight this behavior and act in the right way.</p>	Human Barriers	70%	30%
<p>Imagination: Risk identification mainly depends on predicting future events before they occur. So we should depend on the imagination of the participant's stakeholders. Those who cannot imagine will badly affect the process and misidentify many risks.</p>	Human Barriers	70%	30%
<p>Level of Detail: The project or risk manager should determine the appropriate level of details –not too much and not too little- to get reliable and manageable data. And should state this level on the risk management plan.</p>	Project Management Barriers	70%	30%
<p>Depending on a single tool and technique while identification: PMI-RMP ⁽³⁾, 2009, standard explains in appendix D the weakness of each used tool and technique to identify risks. Attention should be paid while selecting the used tool and technique. Project manager and the team should not use one tool only. They should depend on a couple of mixed tools to properly help stakeholders to identify risks and reach the required level of reliability and data accuracy.</p>	Project Management Barriers	70%	30%

Table 1-Questionnaire response summary

5. Conclusion

Construction projects in the Middle East and North Africa (MENA) are suffering due to the economic and political crisis. Risk management implementation in such environments is necessary to avoid losses and maximize benefits. PMI risk standards are the most commonly used in this region. Risk identification process is essential to successful risk management implementation. Many risk management plans failed due to the improper identification of risks. The researcher recommends to focus on those barriers during risk identification process: “Inadequate Planning”, “Improper stakeholders’ identification”, “Lack of Knowledge”, “Incomplete scope”, “Risk management practices among organization projects”, “Lack of Management Support”, “Afraid of management”, “Identification Quality”, “Afraid of management”, “Bias”, “The idea of being a firefighter”, “Imagination”, “Level of Detail” and “Depending on a single tool and technique while identification”.

Trying to overcome those barriers will reduce project uncertainty, increase benefits, and reduce losses.

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