



جامعة الجميع الذكية  
EVERYONE'S SMART UNIVERSITY

## Everyone's Smart University

### Project (Spring 2021)

|              |                      |               |
|--------------|----------------------|---------------|
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Section

Master

Date

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Course Code

(PMG510)

## Project Risk Management

### Instructions:

- اخر موعد للتسليم هو يوم السبت 2021-05-08 في تمام الساعة ٩ مساءً.
- الإجابة متاحة باللغة الإنجليزية أو اللغة العربية مع مراعاة أن تكون المصطلحات العلمية باللغة الانجليزية.
- يتم تسليم المشروع في صيغة ملف pdf مع الالتزام نموذج الجامعة ولن تقبل أي مستندات أخرى.
- يجب مراعاة أقسام البحث الرئيسية (مقدمة Introduction، دراسات علمية سابقة Literature Review، طريقة البحث Methodology، النتائج والمناقشة Results and Discussion، وأخيراً المراجع References. وان كان هناك ملحقات Appendices يتم إضافتها)
- يجب الالتزام بـ Theme موحد كما يلي:
- حجم الخط 12.
- نوع الخط Arial.
- لون الخط أسود.
- المسافة بين الأسطر 1.5 line spacing
- عدد صفحات البحث (لا يقل عن ثلاث صفحات ولا يزيد عن ست صفحات).

Instructor's Name: Eng. Mosaab M. Hamed

## Project:

### **Risk Identification and Analysis (Based on the project you chose in APM)**

The objective of this report is to identify project risks, prepare a risk probability matrix, and carry out an analysis of selected risks. Referring to the project you select in **Advanced projects management APM course**, your task is to prepare a risk management plan that identifies potential risks in **the selected stage of the project** and identify risk management strategies.

From the course content and readings, you know that the overall purpose of risk planning is to anticipate possible risk events and be ready to take appropriate action when risk events occur—to eliminate or reduce negative impacts on the project.

You may wish to begin this exercise with a brainstorming about potential risks to get candidate risks “on the table” for consideration. And then identify and refine that wording for risks that have some realistic chance of occurring in this stage. For example, potential weather problems present a real obstacle to completing field data collection by the planned completion date. It is also an issue that the project manager will ultimately have to plan for, as opposed to other issues such as a major disaster (e.g., your office burning down), is not a high-enough probability event that requires much time in planning. As described below, you will select several of the identified risks and carry out a risk analysis.

You will use the distilled list of risks to make a risk probability/impact matrix. The matrix will have at least three categories (high/medium/low) for probability and impact.

Remember that it is important to name risks effectively—use words that describe the risk event and point to the impact on the project (e.g., “injury of field technician disrupts data installation work”).

After completion of the risk matrix, document a risk analysis for the selected risks. This detailed documentation for that selected risk will include:

- a description of the risk and potential impacts (schedule, quality of work, cost, etc.) on the project.
- indicators or triggers that would be monitored to help identify the risk as early as possible.
- specific risk response strategies to take.

Using probability and impact matrix calculate the **Expected Monetary Value (EMV)** for all risks that have the impact in terms of cost \$\$.

**Best of luck...**

## المشروع:

التعرف على المخاطر وتحليلها (بحث مبني على مشروعك الذي اخترته في مادة ادارة المشاريع المتقدمة)

الغرض من هذا التقرير هو التعرف على المخاطر المحيطة بالمرحلة التي تختارها المرحلة من مراحل مشروعك (نفس المرحلة التي اخترت التطرق لها في مشروعك لمادة إدارة المشاريع المتقدمة Advanced project management) حيث أن مهمتك هي تحضير خطة متكاملة لإدارة المخاطر تشمل التعريف بالمخاطر المحتملة التي تحيط بتلك المرحلة وتحضير مصفوفة احتمالية المخاطر ومن ثم القيام بالتحليل لهذه المخاطر المختارة وتحديد استراتيجيات ادارة المخاطر المناسبة لكل خطر على حدة.

من محتويات المقرر والمصادر الأخرى المتاحة أصبحت تعلم الان أن الغرض العام لمرحلة التخطيط للمخاطر هي توقع أحداث المخاطر المحتملة والتجهز لاتخاذ ردة الفعل المناسبة عند وقوع الخطر – لمنع أو تقليل الاثار السلبية على المشروع.

قد تحبذ بداية هذا البحث بعصف ذهني عن ماهية المخاطر التي قد تحيط بتلك المرحلة من مراحل مشروعك, وذلك للحصول على قائمة بتلك المخاطر. ومن ثم تحديد وتصفية هذه القائمة للوصول إلى قائمة مختصرة بالمخاطر التي لها فرصة واقعية أكبر في الحدوث. على سبيل المثال: المشاكل الجوية المتوقعة والتي تمثل عقبة حقيقية أمام اكتمال جمع البيانات من المواقع في أو قبل الوقت المحدد، هذه تعتبر مشكلة على مدير المشاريع أن يضعها في الحسبان. من ناحية أخرى، فإن المخاطر غير الواقعية مثل الكوارث الطبيعية والأعاصير (تلك التي تسبب حريقاً بمكتبك وفقدان الأوراق المهمة) ليست لها احتمالية وقوع عالية وبالتالي لاتستدعي تضيق الكثير من الوقت في التخطيط لها. كما سيتبين لك، ستقوم باختيار عدة مخاطر من تلك التي قمت بالتعرف عليها لتحليلها.

ستقوم باستخدام هذه القائمة المختصرة لعمل مصفوفة المخاطر (الاحتمالية/الأثر). المصفوفة ستحتوي على الأقل على ثلاث تصنيفات (عالي/متوسط/منخفض) للإحتمالية والأثر.

لاتنس استخدام أسماء تصف طبيعة المخاطر بصورة فعالة – قم باستخدام كلمات تصف الحادثة الخطرة وتشير الى أثرها على المشروع (مثل: إصابة أحد الفنيين في الموقع مما يؤثر على أعمال التركيب).

بعد انتهاءك من مصفوفة المخاطر، قم بتوثيق تحليلك للمخاطر المختارة. هذا التسجيل المفصل للمخاطر يجب أن يتضمن:

- وصف للخطر واثاره المحتملة (الجدولة، جودة العمل، التكلفة، الخ)
- المؤشرات والمحفزات التي يجب مراقبتها للمساعدة في التعرف على هذا الخطر قبل وقوعه
- تفصيل للاستجابة المقترحة للتصدي لهذا الخطر

باستخدام مصفوفة الاحتمالات والتأثير ، احسب **القيمة النقدية المتوقعة (EMV)** لجميع المخاطر التي لها تأثير من حيث التكلفة \$\$.

مع تمنياتي بالتوفيق..

## **Risks of Unclear Project Scope and Objectives**

### **1. Introduction:**

When it comes to project management, beginning well is important and helps the project build momentum. Scope risk, however, may threaten the earliest stages of project work, when scope is defined. Project managers must key in on the triple constraint scope, schedule, and cost throughout the project lifecycle. Of the three, scope risk should be considered first and early on. Scope risk also is most significant, because it could reflect a project that is literally impossible to accomplish. Scope risk analysis helps uncover a feasible project or one beyond the advancement of technology. It reveals loose ends in requirements, and guards against creep. Scope risk analysis also helps in management of software & hardware defects along with system integration setbacks. Early decisions to adjust or abandon a project are critical on projects that have significant scope risk. In a nutshell requirement are what the customer wants and scope is the work to be done. There must be a realistic or suitable match between the requirements and the scope of work. Unrealistic requirements may make the scope of work impossible; requirements must correlate to feasible scope. Scope risks are tasks that endanger project objectives, deliverables, or timeline. This is the most well-known project risk of entrepreneurs. Even though there are various steps to be taken to avoid the odds of this happening. Create consistent concrete goals and task dates for each phase and team member working on a given project. This will ensure your team doesn't try and add additional tasks or take up any extra free time on tasks for any given project.

### **2. Literature Review**

#### **2.1. Risk Management**

The process of minimizing the risk impact on the company's resources, earnings and cash flows is known as risk management. It is a systematic process (Meredith and Mantel, 2010) to manage the company's risk exposure in a manner that will be consistent and acceptable to the law, environment, human safety and the public interest. Risk management is a process that decides on the measures that will have

to be taken to reduce the probability of risks occurring, or to minimize the impact that will occur as a result of the risk.

## **2.2. Objectives of risk management**

The objectives of risk management are to:

- Identify all risk factors that affect the project's objectives for scope, quality, time, and cost.
- Quantify the impact for each risk factor.
- Mitigate the impact by influencing the project controllable

## **2.3. Integrating Risk Management into Project Management**

The poor performance of a project as a result of scope definition, quality of the end results, schedules or costs can be attributed to unforeseen risk events which might or might not have been anticipated by project management and the project team, or by foreseen risk events that were not accommodated for, or optimistically ignored.

The associated risk events associated with the project management functions are:

### **2.3.1 Scope**

Risks that arise as a result of changes in the scope of a project to meet project objectives, unclear scope definition, new technology or unfamiliar methods and tools.

### **2.3.2 Quality**

Risks may affect quality by influencing the value of performance, environmental impact, inaccurate metrics or extreme quality requirements.

### **2.3.3 Time**

Delays to the project due to labour, material unavailability, weather, over optimism, omitted tasks or incorrect logic for dependencies become a risk to the time factor for a project.

### **2.3.4 Cost**

The impact on cost due to an accident, fire, theft, price changes, supply shortages pose a risk to inflate the project's original budget

### **2.3.5 Risk**

Insufficient risk management or risks associated with overlooking risks become a risk to the project

### 2.3.6 Contracts and Procurement

There may be risks associated with contractor insolvency, claims settlement.

### 2.3.7 Human Resources

Strikes, termination of resources resulting in under staffing, incompetent resources resulting in resources mismatched to the task, unique skill requirement, and new resources are risks to a project

### 2.3.8 Communication

There are risks associated with incorrect communication which result in incorrect actions.

### 2.3.9 Project Management Integration

An incorrect start relative to the project life cycle can also be a risk to the project.

The poor performance of a project can also be based on the attitude towards risk. This can be due to lack of understanding towards the project concept and techniques, or technology. Since the project life cycle is very dynamic and characterized by rapid change, the project risks vary significantly during the different stages of the project. For a typical project consisting of a concept (development) phase and an implementation (termination) phase, the greatest degree of opportunity and uncertainty is encountered during the concept phase. In this phase, since investment is low, the stakes are low. As the project progresses towards the implementation phase, opportunities and risks reduce because unknowns become known. At this stage, since investments and resources are required, the stakes become high. Risk management uses a systematic process which focuses at influencing project planning in the earlier concept phase. This reduces uncertainty and capital which will impact the implementation phase, which is most vulnerable.

## 3. Methodology

### Identify Risks

The risk management process begins with identifying risks in advance once you have set the goal. Identifying risks should be done early in a project and shouldn't be done in the middle of or during a project, as it may be too late.

Identifying risks can be done in 2 ways

- By identifying root causes and the impact they may have
- By identifying the essential functions, the company must perform to reach a goal and identifying how they can fail

### **Analyze the Identified Risk**

Once you have identified the risks, the next step is to assess the risks to see what kind of an impact they have on your business and current projects. By correctly analyzing the risks, you will be able to prioritize as to which risk has the highest impact on your business.

Analyzing risks can be done in two ways:

- Qualitative risk analysis – here the risks are analyzed based on the likelihood of them occurring and the impact they may have on projects.
- Quantitative risk analysis – quantifies the possible outcomes and evaluate the probability of achieving objects

### **Risk Probability and Impact Matrix**

This is a tool that can be used to do a qualitative risk assessment. It helps to evaluate the relative impact (high or low) of a risk and the probability of its occurrence (high or low).

According to the risk probability and impact matrix, there are two dimensions to risks

- Probability - The probability of a risk occurring can range from 0% to below 100%, therefore it is an event that may occur.
- Impact – A risk always has a negative impact

In the risk probability and impact matrix, you can rate potential risks based on these two dimensions. While the risks on the bottom left corner can often be disregarded, the risks placed on the top right corner should be given top priority.

| Objective      | Relative / Numerical Scale            |                                      |                                             |                                |                                      |
|----------------|---------------------------------------|--------------------------------------|---------------------------------------------|--------------------------------|--------------------------------------|
|                | Very Low / 0.05                       | Low / 0.1                            | Moderate / 0.2                              | High / 0.4                     | Very High / 0.8                      |
| <b>Cost</b>    | Insignificant change in cost          | < 10% increase                       | 10 - 20% increase                           | 20 - 40% increase              | > 40% increase                       |
| <b>Time</b>    | Insignificant change in schedule      | < 5% increase                        | 5 - 10% increase                            | 10 - 20% increase              | > 20% increase                       |
| <b>Scope</b>   | Barely noticeable scope decrease      | Minor areas affected                 | Major areas affected                        | Unacceptable reduction         | Project end item effectively useless |
| <b>Quality</b> | Barely noticeable quality degradation | Only demanding applications effected | Quality reduction requires sponsor approval | Unacceptable quality reduction | Project end item effectively useless |

Table.1 Impact Scale

| Likelihood |           | Description                |
|------------|-----------|----------------------------|
| Relative   | Numerical |                            |
| Very Low   | 0.1       | Highly unlikely to occur.  |
| Low        | 0.3       | Will most likely not occur |
| Moderate   | 0.5       | Possible to occur          |
| High       | 0.7       | Likely to occur            |
| Very High  | 0.9       | Highly likely to occur     |

Table.2 Probability Scale

| Probability     | Threats             |           |                                                                                                                    |            |                 |
|-----------------|---------------------|-----------|--------------------------------------------------------------------------------------------------------------------|------------|-----------------|
| Very High / 0.9 | 0.05                | 0.09      | 0.18                                                                                                               | 0.36       | 0.72            |
| High / 0.7      | 0.04                | 0.07      | 0.14                                                                                                               | 0.28       | 0.56            |
| Moderate / 0.5  | 0.03                | 0.05      | 0.10                                                                                                               | 0.20       | 0.40            |
| Low / 0.3       | 0.02                | 0.03      | 0.06                                                                                                               | 0.12       | 0.24            |
| Very Low / 0.1  | 0.01                | 0.01      | 0.02                                                                                                               | 0.04       | 0.08            |
| Impact          | Very Low / 0.05     | Low / 0.1 | Moderate / 0.2                                                                                                     | High / 0.4 | Very High / 0.8 |
|                 |                     |           |                                                                                                                    |            |                 |
| High risk       | Score > 0.14        |           | An organization defines its risk thresholds, low, moderate and high. These thresholds can differ between projects. |            |                 |
| Moderate risk   | 0.05 < Score < 0.14 |           |                                                                                                                    |            |                 |
| Low risk        | Score < 0.05        |           |                                                                                                                    |            |                 |

Table 3: Impact vs Probability Matrix

## Risk Classification, description, and responses

| ID | Risk description                              | Likelihood of the risk occurring | Impact if the risk occurs | Mitigating action<br><i>Actions to mitigate the risk e.g. reduce the likelihood.</i>                            | Contingent action<br><i>Action to be taken if the risk happens.</i>                                 |
|----|-----------------------------------------------|----------------------------------|---------------------------|-----------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| 1  | Project purpose and need is not well-defined. | Medium                           | High                      | Complete a business case if not already provided and ensure purpose is well defined on Project Charter and PID. | Escalate to the Project Board with an assessment of the risk of runaway costs/never-ending project. |

|   |                                                                                                                                                        |        |        |                                                                                                                                                                                                                                                                |                                                                                                                                                                                          |
|---|--------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2 | Project design and deliverable definition is incomplete.                                                                                               | Low    | High   | Define the scope in detail via design workshops with input from subject matter experts.                                                                                                                                                                        | Document assumptions made and associated risks. Request high risk items that are ill-defined are removed from scope.                                                                     |
| 3 | Project schedule is not clearly defined or understood                                                                                                  | Low    | Medium | Hold scheduling workshops with the project team so they understand the plan and likelihood of missed tasks is reduced.                                                                                                                                         | Share the plan and go through upcoming tasks at each weekly project progress meeting.                                                                                                    |
| 4 | Unplanned work that must be accommodated                                                                                                               | Low    | High   | Attend project scheduling workshops.<br>Check previous projects, for actual work and costs.<br>Check all plans and quantity surveys.<br>Document all assumptions made in planning and communicate to the project manager before project kick off.              | Escalate to the Project Manager with plan of action, including impact on time, cost and quality.                                                                                         |
| 5 | Scope creep                                                                                                                                            | Medium | High   | Document the project scope in a Project Initiation Document or Project Charter and get it authorised by the Project Board. Refer to it throughout the project and assess all changes against it also ensuring alignment of any changes with the Business Case. | Document each and every example of scope creep NO MATTER HOW SMALL in a change order and get authorisation from the project board BEFORE STARTING WORK. This includes ZERO COST changes. |
| 6 | Business Case becomes obsolete or is undermined by external or internal changes.                                                                       | Low    | High   | No ability to reduce likelihood, but make sure early warning is given by reviewing business case on regular basis with the Project Board.                                                                                                                      | Initiate escalation and project close down procedure.                                                                                                                                    |
| 7 | Delay in earlier project phases jeopardizes ability to meet fixed date. For example delivery of just in time materials, for conference or launch date. | Medium | High   | Ensure the project plan is as accurate as possible using scheduling workshops and work breakdown structure. Use Tracking Gantt and Baseline to identify schedule slippage early.                                                                               | Consider insurance to cover costs and alternative supplier as a back up.                                                                                                                 |
| 8 | Added workload or time requirements because of new direction, policy, or statute                                                                       | Low    | Medium | No ability to reduce likelihood.                                                                                                                                                                                                                               | Consider insurance and use Project Board to get advance notice if possible.                                                                                                              |
| 9 | Customer refuses to approve deliverables/milestones or delays approval, putting pressure on project manager to 'work at risk'.                         | Medium | Medium | Ensure customer decision maker with budgetary authority is identified before project start and is part of the project board. Communicate dates for sign-off points up front.                                                                                   | Escalate to project Board and recommend action e.g. to stop the project.                                                                                                                 |

Table 4. Risk Events VS Probability & Impact

## 4. Results and Discussion

### Expected Monetary Value (EMV)

| Risk ID | Likelihood % | Impact % | Impact Cost (\$) | EMV (P*IC) |
|---------|--------------|----------|------------------|------------|
| 1       | 0.5          | 0.8      | 20000            | 10000      |
| 2       | 0.3          | 0.6      | 17000            | 5100       |
| 3       | 0.2          | 0.2      | 7500             | 1500       |
| 4       | 0.2          | 0.5      | 10000            | 2000       |
| 5       | 0.5          | 0.6      | 12500            | 6250       |
| 6       | 0.1          | 0.4      | 15000            | 1500       |
| 7       | 0.6          | 0.5      | 22500            | 13500      |
| 8       | 0.4          | 0.2      | 5000             | 2000       |
| 9       | 0.3          | 0.3      | 2500             | 750        |
| Total   |              |          | 112000           | 42600      |

Based on the identification of these nine risks, the potential impact to the project is 112000. However, we cannot ask for that level of risk contingency budget. The only reason you would need that much money is if every risk occurred. But the objective of risk management is to minimize the impact of risks to your project. Therefore, we would expect that we will be able to successfully manage most, if not all of these risks. The risk contingency budget should reflect the potential impact of the risk as well as the likelihood that the risk will occur. This is reflected in the last column.

Notice the total contingency request for this project is 42600, which could be added to the budget as risk contingency. If risk 3, 6, and 9 occurred, we would be able to tap the contingency budget for relief. However, we see that if risk 7 and 1 occurred, the risk contingency budget still might not be enough to protect you from the impact. However, Risk 7 and 1 only have a 60% and 50% chance of occurring, so the project team must really focus on this risk to make sure that it is managed successfully. Even if it cannot be totally managed, hopefully its impact on the project will be lessened through proactive risk management. The risk contingency budget works well when there are a number of risks involved. The more risks the team identifies, the more the overall budget risk is spread out between the risks. In the case above, the fact that there are 9 risks helps pool enough risk contingency to accumulate a protective budget. If we have only identified one or two risks, we may not be able to spread the risk out enough to be as effective as we like.

The EMV calculations above only reflect the risks that are known at the beginning of the project when the initial risk assessment is performed. If we are managing a large project, we need to continue to monitor risks on an ongoing basis. Therefore, we can also ask for additional risk contingency budget to cover risk that will probably surface later that we do not know about now. For example, we could request an additional 5% of total budget for risk contingency to cover the unknown risks that we will encounter later. This is in addition to the risk contingency of the known risks that have already been identified.

## References

[Jack R. Meredith](#), [Samuel J. Mantel](#) , Project Management: A Managerial Approach, Wiley, 2010

[Paul Hopkin](#), [Institute of Risk Management](#) , Fundamentals of Risk Management: Understanding, Evaluating and Implementing Effective Risk Management , Kogan Page Publishers, 2012