



جامعة الجميع الذكية
EVERYONE'S SMART UNIVERSITY

Everyone's Smart University

Project (Spring 2021)

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Section

Master

Date

Thursday

18 / 03 / 2021.

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 line spacing 1.5
- 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 الآثار 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.

سنقوم 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..

Project Risk Management

1. Introduction

Risk management is the process of identifying, evaluating, preventing and mitigating risks that are likely to impact the project's outcome. The study considers the case of Freehills Construction Company, an international company known for handling colossal building and construction projects. A project manager in the given project oversees the risk management process. One way to ensure effective management of risks is to clearly understand the objectives to know possible barriers that could impact the project results (Haghshenas *et al.*, 2016). Risk management is about looking at the goals of a project and determining potential threats, and identifying what is needed to address each of them. There are various ways to overcome these risks, but the decision is made after evaluating its factors.

Some project risks occur due to human activities such as neglect where the manager does not control the movements. In the dam construction project, the manager may fail to account for some costs, such as transporting materials to the construction site and the time it takes. Such risks may impact the total cost and completion time for the project. Some of the common risks include cost, schedule, and performance (Haghshenas *et al.*, 2016). Cost risks arise from estimation errors; scheduling issues result from scope creep, and project specification determines the performance.

2. Literature Review

Water supply, drinking water supplies for agriculture, industry, flood control, energy supply, and the possible energy supply for the construction of power stations worldwide are carried out with dam projects. The high cost of building dams in such projects requires proper and efficient management (Firmenich, 2017). Therefore, in particular risk management, inadequate and weak leadership is one of the main reasons for delaying

and increasing the costs of dam projects. The critical area of risk management is risk ranking and assessment.

Because the classification identifies the superiority of risk over other risks and the main project factors can therefore ensure an adequate plan to allocate the existing resources for any threat. Proper knowledge of project risks leads to appropriate management of risk (Haghshenas *et al.*, 2016). Chances are significant and influence based on the probability of occurrences and their impact on the projects. During the risk management process, many risks produced should be classified to be appropriately evaluated and employed as a principle in powerful and effective project management.

Given many and inaccurate criteria, risk evaluation is a problem of several decision-making criteria, with a flickered nature due to linguistic uncertainty. Therefore, the importance of each measure is achieved by combining the effect of criteria such as recurrence, occurrence possibility, and level of impressibility on the existing risks to efficiently analyze and classify the general impact of risk (Haghshenas *et al.*, 2016). This approach is very efficient and helpful for risk analysis projects under uncertain conditions with complex planning.

3. Methodology

Information about construction projects was collected using questionnaires which are provided to the people who oversee the project. The project managers also gave an interview. The project's risk information is also gathered from secondary sources, including previous reports of similar projects (Haghshenas *et al.*, 2016). The information collected from the questionnaires and interviews is evaluated and analyzed to lead to information that can help complete the project with the set scope.

4. Results and Discussion

4.1 Risk Analysis of the Project

First, cost overruns are familiar with the construction projects such as the dam project in this study. Some cost approximations made during the tendering process tend

to change due to changes in the pricing of materials and transportation costs. In some cases, the workers may work for a longer time to complete a specific part of the project, which means they are paid extra for the day. The project manager's responsibility is to determine ways to bridge these cost gaps without compromising the project. These costs are not provided in the initial budget for the project, which means if they are not sorted in other ways, the project may stall.

The other risk is time overruns which occur due to delays in the project, which means it is not completed within the schedule. In the dam project, we estimate to complete it by mid-July, as shown in the Gantt chart for the project. When delays occur, the project may continue for a longer time than anticipated. Those estimating to benefit from the dam expect that it will be ready by that time, which means any delays will frustrate them. Thus, the project manager should set a strict schedule to ensure a particular phase is completed within the set deadline.

Lastly, the project faces performance risk since the successful completion of the dam is to hold water for the supply to the people. The threat causes the outcome to become inconsistent. In our case, any flaws in the construction will mean the structure cannot meet its expectation. It is the project manager's duty and those involved to ensure that all dam sections are constructed according to the stipulations. It is worth noting that the three risks related to this project such that time and cost overruns may impact the performance.

4.2 Risk Mitigation Strategy

The project manager in construction projects is the one who notes the risks and comes up with ways to deal with them. In the project, there are various indicators of the dangers. One way to ensure that changes occurring are identified is to enhance the flow of information from the managers to the workers; for instance, project managers should share the project schedule with the workers to ensure that they know what is expected of them given time. That way, time overruns are avoided since there are no delays in project completion. When there is a communication breakdown, people tend to delay their work, which increases the time required to complete the project.

The other indication of the risk is disparities between the actual cost and the one used to complete the project. It may be higher or lower than the actual cost. Either way, the credibility of the project results becomes questionable since higher prices may be construed as embezzlement, while lower costs may mean neglect of some of the tasks.

Table 1: Risk probability and EMV Calculations

Risk	Probability	Impact (\$)	EMV(impact x probability)
Cost overruns	56	-6000	\$3360
Time overruns	62	-7600	\$4712
Performance risk	36	-3240	\$1166.4

4.3 Risk Mitigation Strategies

After the project manager has determined all the risks involved, the next step is to develop ways to mitigate the impact. The first strategy is to develop ways to ensure that the risk is avoided (Perrenoud *et al.*, 2017). In the construction project, the manager should ensure that all the costs and time included in the schedule coincide with the outcomes. Secondly, when the risk has occurred, the best way is to accept it. Acceptance helps plan the projects and offers the best way to proceed (Perrenoud *et al.*, 2017). For instance, when the manager notes that the project is running outside the scheduled time or cost, they need to rectify the other areas to ensure it does not delay for long.

Thirdly, the project manager may come up with a way to mitigate the impact of the risk on the project. The way to do that is to reduce the likelihood of its occurrence and reduce its effects once it occurs (Firmenich, 2017). The risk in this project is that the dam may take a longer time or cost to complete and may not perform as stipulated when it is completed. We can mitigate such risks by maintaining a proper schedule and financial approximations.

Lastly, the project manager may opt to transfer the risk to a third party. It involves a third party such as an insurance company. When commencing the project, there is a schedule of expected costs and time to complete it. Thus, in any case, that this does not

happen, other areas are affected. However, when the risk is transferred, the insurer pays for the losses arising from that risk.

Expected Monetary Value (EMV) is used to determine the general outcome in the future when a given situation occurs or does not occur. It helps in mapping different options and scenarios. EMV is calculated by calculating the probability of outcome with the products and probability occurrences. The EMV shows how the effects of the risk can become costly when they occur to a given project. In this case, the chances are apparent losses since the customers are the basis of the business.

4.4 Conclusion

Risk management in a project involves determining the impact and probability of the risk and identifying, assess, prevent or mitigate the outcomes. In the dam construction project, various chances are likely to occur, which results in delays in completing the project. As a project manager, one should supervise the risks involved in the project and come up with remedies. Project managers need to clearly understand the objectives of the project for them to manage the risks effectively. Therefore, we have to identify potential barriers that could affect the team's capacity to deliver results.

5. References

- Firmenich, J. (2017). Customizable framework for project risk management. *Construction Innovation*.
- Haghshenas, S. S., Neshaei, M. A. L., Pourkazem, P., & Haghshenas, S. S. (2016). The risk assessment of dam construction projects using fuzzy TOPSIS case study: Alavian Earth Dam). *Civil Engineering Journal*, 2(4), 158-167.
- Perrenoud, A., Lines, B. C., Savicky, J., & Sullivan, K. T. (2017). Using best-value procurement to measure the impact of initial risk-management capability on qualitative construction performance. *Journal of Management in Engineering*, 33(5), 04017019.