



جامعة الجميع الذكية
EVERYONE'S SMART UNIVERSITY

Everyone's Smart University

Project (Spring 2021)

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Section

Master

Date

Thursday

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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 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.

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..

Regeneration of Risk Profile Matrix and its Effect on a Mega Project The Hoover Dam of Black Canyon Case Study

Introduction

Project risk management is a process to identify, analyze, and minimize potential problems that could negatively affect the progress of a project. The main objective of risk management in project management is to take care of anything that might deflect the project from reaching its ultimate goal. If project risks aren't identified, avoided or rectified, your project may end up over budget, delayed, or even brought to a complete standstill.

The ability to foresee risks which may sneak up any time within the future may be a crucial skill of an efficient project manager. A definite risk management plan helps you to be prepared to affect uncertainties and minimize extra costs by saving valuable resources like time, income, assets, and other people.

Throughout the history of development, operation and maintenance of dams and their reservoirs have provided significant benefits to mankind. Storage of water behind dams provides effective means to manage natural streamflow but at an equivalent time creates a replacement hazard downstream if the dam fails.

In this research, a famous civil engineering landmark in the world last century will be the study case. The Hoover Dam. Through studying the effect of regenerating the risk profile matrix hypothetically and its effect on the project.

Literature Review

In the context of dam safety practice, risk is generally and simply defined as follows:

Risk = Probability of dam failure per year x consequences of realized failure

The risk may be total risk from all causes, or specific risks from individual random events such as floods, earthquakes, or other events such as piping of embankment dams or mis-operation of spillway gates. Human error pervades many aspects of risk, contributing to the probability of failure in some cases and magnifying the consequences in others. (Raymond A. Stewart, 2000).

The project and construction of a dam present special problems demanding high knowledge of several sciences and techniques: Geology, foundations, Hydraulics, properties and treatment of materials, etc. Perhaps, that is the reason why it requires, more than any other construction project, the collaboration of several specialists and team work. As a conclusion, the plan and the project have special importance in dam construction, for the corresponding works and for the river diversion system. (Russel Effandy, 2019).

Throughout the construction of the Hoover Dam innovative techniques were developed to overcome emergent issues. The standard approached utilized in constructing a dam could not deal with the complexity of the Hoover Dam project. The schedule, with a number of penalty clauses, presented a number of challenges. As issues emerged, e.g. how to construct the diversion tunnels within the specified time, innovative techniques enabled the actors to address the issues and reduce uncertainty in the project. Experiential knowledge from earlier projects was used to develop techniques to reduce uncertainty. (Owen, J. & Linger, H. 2008).

Methodology

Preface

The Hoover Dam is a concrete dam in the Black Canyon of the Colorado River. The Boulder Canyon Project act was approved in June 1929, in the Great Depression. In the early 1930s thousands of people travelled to the region in the hope of obtaining employment. Construction began in 1931 and was completed in 1935 two years ahead of schedule.

Tools

In this research, the risk profile matrix will be the tool used to study out the Hoover Dam's risks probability and consequences.

ID	RISK TYPE	RISK DESCRIPTION	SEVERITY	LIKELIHOOD	IMPACT	TRIGGER	RESPONSIBLE	RESPONSE-BEFORE	RESPONSE-CONTINGENCY
	Uncertainty		ACCEPTABLE	IMPROBABLE	LOW				
	Opportunity		TOLERABLE	POSSIBLE	MEDIUM				
	Compliance		UNDESIRABLE	PROBABLE	HIGH				
	Hazard		INTOLERABLE	PROBABLE	EXTREME				

Table 1: Risk profile matrix in project management

ID	RISK TYPE	RISK DESCRIPTION	RISK SEVERITY	RISK LIKELIHOOD	IMPACT LEVEL	TRIGGER	RESPONSIBLE	RESPONSE – BEFORE –	RESPONSE – CONTINGENCY –
1	Uncertainty (Schedule Constraint)	Time spent in constructing tunnels	ACCEPTABLE	IMPROBABLE	LOW	Schedule overrun	Structural core team	Modification of some trucks	Shrinking the schedule by increasing overtime
2	Uncertainty (Schedule Constraint)	Diversion of Colorado River	TOLERABLE	POSSIBLE	MEDIUM	Schedule overrun	Civil core team	Regular reviewing of the design in comparison with the site	Shrinking the schedule by increasing overtime
3	Opportunity	Project champion is extremely supportive	TOLERABLE	POSSIBLE	MEDIUM	Change requests by USRD	Project Management team	Special team allocation	Developing additional supportive teams
4	Uncertainty (Quality Issues)	Rework and delay during construction	UNDESIRABLE	PROBABLE	HIGH	Internal quality inspections	QC/QA quality core team	Regular and continuous controlling of deliverables	Reviewing of the construction standards while starting of the rework
5	Compliance	Dividing water and power to seven basin states	UNDESIRABLE	PROBABLE	HIGH	Electricity and water flow rates deviation	Commissioning core team	Regular and continuous monitoring and controlling of the parameters	Restarting the electricity and water productions from the lowest possible operating point
6	Uncertainty (Schedule Constraint)	Continuous concrete pouring	UNDESIRABLE	PROBABLE	HIGH	Schedule overrun	Structural core team	Concrete pouring in sections	Monetary penalty reserve
7	Hazard	Risk of serious injury caused by falling rocks	INTOLERABLE	PROBABLE	EXTREME	Safety personnel observations	Safety core team	Design of special 'hard hat'	Special medical dispensaries
8	Contractual	Labors Striking	INTOLERABLE	PROBABLE	EXTREME	Delayed and inaccurate of work deliverables	Project Management team	Reaching into a settlement stance	Continuous interviewing prospective labors

Table 2: Hoover Dam risk profile matrix

Results and Discussion

It is noted that the lowest risk in the matrix is related with heavy machine/equipment, which can be tolerated as there is no significance workmanship. On the other hand, the diversion of Colorado River has been considered as medium since it is in the beginning of the project although there is a penalty of daily delaying. However, the USRD (United States Reclamation Department), which was the project champion, was very supportive either financial or conflict resolution during the project. The project manager has to be ready to seize this opportunity any time within the project. Although the USRD was supportive, a risk of inequal distribution of the water and generated power would have a higher impact as it is belonging to several states (i.e. governmental compliance). Mortality, which is one of the most extreme impact risks, would be reduced/eliminated have a fast and sharp safety personnel as a trigger in addition to special safety programs. Labor striking is considered as the most dangerous contractual risk, as the Hoover Dam was in point of nowhere which means that it would be pretty difficult to find/hire labors replacing the striking ones as project progresses. Further studies and risks will give more comprehension for such similar project in the future.

References:

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4. Paul Hopkin (2009). Fundamentals of Risk Management. Understanding, evaluating and implementing effective risk management.
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