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**The Impact of Risk Management Processes on Digital
Transformation Project Management Efficiency: A Project
Manager Perspective**

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أثر عمليات إدارة المخاطر على كفاءة إدارة مشاريع التحول الرقمي من وجهة نظر مديري

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Dedication

This research is dedicated to our families and friends, whose words of encouragement and push for tenacity consistently ring in our ears, and to all of those who supported us throughout the journey.

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Abstract

Title of the study: The Impact of Risk Management Processes on Digital Transformation Project Management Efficiency: A Project Manager Perspective

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This study aimed to identify the impact of risk management processes on the efficiency of digital transformation projects from the project managers' point of view

To achieve its aims, this study followed the descriptive survey approach, using a questionnaire tool to collect data. The study's sample was randomly selected, which is considered of three hundred (300) project managers, and seventy one (71) of them have responded. They specialized in Computer Science, Information Technology, Management, Project Management, and Risk Management working in Riyadh, Saudi Arabia during the academic year (2023).

The results of the study concluded to identify the most important metrics that contribute to the efficiency of digital transformation projects from project managers perspective. The study also identified the impact of risk management processes on the efficiency of digital transformation projects from the project managers' point of view. According to the results of the study, it recommended a number of recommendations, among them: setting applied programs to educate project managers and digital transformation teams on the importance of risk management processes in increasing the efficiency and the success of digital transformation projects.

مستخلص الدراسة

عنوان الدراسة: أثر عمليات إدارة المخاطر على كفاءة إدارة مشاريع التحول الرقمي من وجهة نظر مديري المشاريع

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القسم: إدارة المخاطر

الدرجة العلمية: ماجستير

العام الدراسي: 2023

هدفت الدراسة إلى التعرف على هدفت هذه الدراسة إلى التعرف على أثر عمليات إدارة المخاطر على كفاءة

مشاريع التحول الرقمي من وجهة نظر مديري المشاريع

ولتحقيق أهدافها اتبعت هذه الدراسة المنهج الوصفي المسحي، وذلك باستخدام أداة الاستبيان لجمع البيانات. تم

اختيار عينة الدراسة عشوائياً، حيث بلغ عددها ثلاثمائة (300) مدير مشروع، وقد استجاب واحد وسبعون (71) منهم.

متخصصون في علوم الكمبيوتر، وتقنية المعلومات، والإدارة، وإدارة المشاريع، وإدارة المخاطر، ويعملون في الرياض

بالمملكة العربية السعودية خلال العام الدراسي (2023).

وخلصت نتائج الدراسة إلى التعرف على أهم المقاييس التي تساهم في كفاءة مشاريع التحول الرقمي من وجهة

نظر مديري المشاريع. كما حددت الدراسة تأثير عمليات إدارة المخاطر على كفاءة مشاريع التحول الرقمي من وجهة نظر

مدراء المشاريع. وفي ضوء نتائج الدراسة أوصت بعدد من التوصيات من بينها: وضع برامج تطبيقية لتوعية مديري

المشاريع وفرق التحول الرقمي بأهمية عمليات إدارة المخاطر في زيادة كفاءة ونجاح مشاريع التحول الرقمي.

Chapter One: Identifying the Research Problem

1. Introduction

Digital transformation projects involve significant investments in technology, resources, and time. However, these projects may also entail certain risks that can impact their success. Thus, to ensure the successful implementation of digital transformation projects, it is essential to have risk management processes in place (Lamarre, Chheda, & Wong, 2023).

Risk management involves five main processes: identifying potential risks, analyzing their impact, risk assessment, mitigating the analyzed risks, and monitoring and controlling. Effective risk management processes enable organizations to proactively manage risks and reduce the likelihood and impact of unwanted events. When considering digital transformation projects, risk management is even more critical as these projects often involve complex technologies, processes, and stakeholder involvement.

While the importance of risk management in digital transformation projects seems to be clear, there is a gap in our understanding of how risk management processes impact the efficiency of these projects. Therefore, this research aims to explore the impact of risk management processes on the efficiency of digital transformation projects. Specifically, this research will examine how effective risk management processes can enhance the efficiency of digital transformation projects, reduce delays, and lower costs. By understanding the impact of risk management processes, organizations can make informed decisions regarding risk management strategies and enhance their overall project success.

2. Research Problem

The research problem was: What is the impact of risk management processes on the efficiency of digital transformation projects from the project managers' point of view?

3. The Importance of The Research

The research investigated the impact of risk management on digital transformation projects from the project managers' point of view. It aimed to help them to measure risk management effectiveness and prioritize efforts. Incorporating risk management processes in digital transformation project management strategies benefits project managers by identifying potential risks and developing effective mitigation strategies. The research aimed to help organizations investigate the need for effective risk management strategies. Moreover, it aimed to provide valuable insights on achieving maximum efficiency and success in digital transformation projects.

4. The Objectives of The Research

The primary objective of this research was to investigate the impact of risk management processes on digital transformation project management efficiency from the perspective of project managers. Specifically, the research aimed to achieve the following objectives:

1. To identify the most important metrics that contribute to the efficiency of digital transformation projects from project managers perspective.
2. To identify the impact of effective risk management processes on the efficiency of digital transformation projects from project managers

perspective. The following sub-objectives fall under the second objective:

- 2.1. To identify the impact of effective risk identification on the efficiency of digital transformation projects from project managers perspective.
- 2.2. To identify the impact of the effective risk analysis process on the efficiency of digital transformation projects from project managers perspective.
- 2.3. To identify the impact of effective risk assessment on the efficiency of digital transformation projects from project managers perspective.
- 2.4. To identify the impact of effective risk mitigation on the efficiency of digital transformation projects from project managers perspective.
- 2.5. To identify the impact of effective monitoring and review of risks on the efficiency of digital transformation projects from project managers perspective.

5. Research Questions/Hypotheses

1. What are the most key metrics that increase the efficiency of digital transformation projects from a project manager's perspective?
2. To what extent do effective risk management processes impact project efficiency from a project manager's perspective? The following sub-questions fall under the second objective:

- 2.1. To what extent do effective risk identification impact project efficiency from a project manager's perspective?
- 2.2. To what extent does an effective risk analysis process impact project efficiency from a project manager's perspective?
- 2.3. To what extent does effective risk assessment impact project efficiency from a project manager's perspective?
- 2.4. To what extent does effective risk mitigation impact project efficiency from a project manager's perspective?
- 2.5. To what extent does effective risk monitoring and reviewing impact project efficiency from a project manager's perspective?

6. Theoretical Premises

The research aimed to investigate the relationship between risk management processes and digital transformation project management efficiency, with a specific focus on the perspectives of project managers. The findings contributed to the existing literature on digital transformation project management and provided practical insights for organizations embarking on digital transformation initiatives.

7. Research Limits

7.1 Temporal limits

The study was conducted in the academic year of 2023.

7.2 Spatial limits

City of Riyadh, Kingdom of Saudi Arabia.

7.3 Objective boundaries

The study was limited to:

- Identifying the most important metrics that contribute to the efficiency of digital transformation projects from project managers perspective.
- Identifying the impact of risk management processes on digital transformation projects' efficiency from the point of project managers' view.

Chapter Two: Theoretical Framework and Literature Review

Literature Review

The impact of risk management on digital transformation project management efficiency is a critical aspect for project managers perspective. Research indicates that a robust risk management process contributes significantly to successful project outcomes in the realm of digital transformation. By systematically identifying, assessing, and mitigating risks, project managers can enhance decision-making, minimize potential disruptions, and improve overall project efficiency. Understanding the intricate relationship between risk management and digital transformation is pivotal for prospective project managers aiming to navigate the complexities of modern project management effectively.

In 2018, three researchers (Alfredo Federico Serpell, Ximena Ferrada and Larissa) submitted a research paper entitled :measuring the performance of project risk management: a preliminary model. This paper investigates risk management in building projects, creating a model based on interviews and expert validation. The model aims to quantify risk management performance and provide a reliable understanding for building companies. Measuring risk management performance in construction projects will help improve procedures and align with project objectives. The research aims to increase performance and conformity with objectives, highlighting the importance of risk management in a sector that often fails to implement it consistently. The study aims to challenge the assumption that risk management is a bureaucratic and pointless procedure.

According to Tabrizi, Lam, Girard, and Irvin (2019), digital transformation is not about technology. They argue that companies fail to realize the value of digital

transformation because they focus too much on the technology rather than the business strategy and management processes.

In 2023, Rachel Longhurst presented research titled "What the next generation of project management will look like." This search indicated that the needs of organizations are changing, and traditional project management techniques like project governance and methodology are insufficient to address these needs. To determine which "next generation" skills—from organizational awareness to financial acumen—have a disproportionately high influence on performance. Gartner recently polled 373 project management leaders. The teacher, the fixer, and the orchestrator are three future-focused project manager roles that they identified. These roles all emphasize the distinctive human aspects of project management that go beyond carrying out distinct, repetitive tasks.

The role of a fixer project manager (Longhurst & Choi, 2023) highlights the importance of risk management processes in projects. The fixer is skilled in identifying and managing risks at both a project and cross-portfolio level, which is essential for delivering projects efficiently and effectively. Risk management processes help organizations to identify potential risks, assess their impact, and develop mitigation strategies to reduce their likelihood of occurring. By leveraging the expertise of a fixer project manager, organizations can improve their ability to identify, mitigate, and manage risks, which will ultimately lead to greater project success. This highlights the critical role of risk management in supporting efficient project delivery and should be considered as a crucial aspect of project management processes.

When viewing the website of the Digital Government Authority of the Kingdom of Saudi Arabia We can summarize their methodology as follows: The Digital Government Authority (DGA) is implementing Risk Management Guidelines for Digital Government to support Vision 2030 objectives of improving continuity and reliability of digital services. The DGA emphasizes the importance of risk management in addressing various variables and risks at all levels, ensuring government entities understand and manage risks associated with digital transformation.

Chapter Three: Research Methodology

1. Research Methodology and Design

The research aimed to examine the effect of risk management processes on project management efficiency in digital transformation, as well as identify the key factors that influence project efficiency in such projects, from the project managers perspective.

This study employs a quantitative research design to gather and analyze data on the impact of risk management processes on project management efficiency in digital transformation projects. The research design is based on a survey questionnaire method, where project managers in different organizations will be asked to respond to a structured questionnaire.

The survey questionnaire will be designed to collect data on project managers' perceptions regarding the research problem. The questions will be closed-ended, aimed at gathering quantitative data.

2. Population

The research population consisted of project managers working on digital transformation projects in various organizations in Riyadh, Saudi Arabia. The sample was selected randomly.

3. Sample

The questionnaire was distributed to a random sample consisting of only project managers in the digital transformation sector in different organizations in Riyadh, Saudi Arabia. The questionnaire was given to three-hundred (300) project managers of which seventy-one (71) have responded. Tables (3.1), (3.2), (3.3), and

(3.4) below show a description of the research sample in terms of: Academic Specialization, Educational level, Years of Experience, and their Work Sector.

Table (3.1)
Distribution of study sample according to Academic Specialization

Academic Specialization	Frequency	Percent
Computer Science	13	18.3
Information Systems	15	21.1
Management	21	29.6
Risk Management	11	15.5
Project Management	11	15.5
Total	71	100.0

Table (3.2)
Distribution of study sample according to Educational level

Educational level	Frequency	Percent
PhD	3	4.2
Master's	22	31.0
Bachelor	46	64.8
Total	71	100.0

Table (3.3)
Distribution of study sample according to Years of experience

Years of experience	Frequency	Percent
Less than 5 years	14	19.7
From 5 to 10 years	25	35.2
More than 10 years	32	45.1
Total	71	100.0

Table (3.4)
Distribution of study sample according to Work sector

Work sector	Frequency	Percent
Government	33	46.5
Private	16	22.5
Semi-government	22	31.0
Total	71	100.0

4. Research Tool

Data was collected through self-administered questionnaires. The questionnaires were distributed electronically and physically to the selected project managers. The data collection process was ongoing for a period of one week, after which the data was analyzed.

4.1. The Validity

4.1.1. Judges Validity

The questionnaire was distributed to a group of thirty experts in the field for evaluation. Out of these, five experts completed the evaluation. Based on their feedback, the questionnaire was modified accordingly. The information about these experts can be found in Appendix A.

4.1.2. Internal Consistency Validity

To ensure the correlation of the statements with the total score of the factor to which they belong, the validity of the internal consistency of the tool was measured through a random sample of twenty-five (25), of the study members' answer data. The

validity was measured by calculating the Pearson correlation coefficient between each item of the factor and the total score of the factor to which it belongs. Tables (3.5) and (3.6) show the correlation coefficients between the items of the two factors with the total score of those factors. The results show that the correlation is significant which means internal consistency between the items of the factor and the factor in which they belong to.

Table (3.5)

*The correlation coefficients between the items of the first factor the most important metrics that contribute to the efficiency of digital transformation projects with the total score of the factor
(The pilot sample: n=25)*

No.	The correlation coefficient	No.	The correlation coefficient
1	0.4435*	6	0.7406**
2	0.5681**	7	0.5901**
3	0.3968*	8	0.7042**
4	0.7107**	9	0.7899**
5	0.7780**	10	0.8913**

* Correlation is significant at the 0.05 level (2-tailed)

** Correlation is significant at the 0.01 level (2-tailed)

Table (3.6)

*The correlation coefficients between the items of the second factor the impact of risk management processes on the efficiency of digital transformation projects with the total score of the factor
(Pilot Sample: n=25)*

No.	The correlation coefficient	No.	The correlation coefficient	No.	The correlation coefficient
1	0.5510**	8	0.7587**	15	0.5734**
3	0.7179**	9	0.7034**	16	0.6022**
4	0.6820**	11	0.6228**	17	0.6779**
5	0.6566**	12	0.8799**	18	0.8129**
6	0.7221**	13	0.6507**	19	0.6223**

7	0.5893**	14	0.8254**	20	0.7662**
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** Correlation is significant at the 0.01 level (2-tailed)

4.2. The Reliability

To measure the reliability, Cronbach's Alpha was calculated for each factor of the questionnaire. Table (3.7) shows the alpha value for each factor.

Table (3.7)
Cronbach's Alpha for the Reliability of the factors of survey
(Pilot Sample: n=25)

Factor	No. of Items	Alpha
The most important metrics that contribute to the efficiency of digital transformation projects	10	0.85
The impact of risk management processes on the efficiency of digital transformation projects	18	0.92

5. Research Procedures

After all modifications, the research tool (shown in Appendix B) was distributed to the research sample of three-hundred (300) project managers in Riyadh, Saudi Arabia. After answers were gathered, data analysis came in place, using Likert scale.

5.1. Likert Scale

For the questionnaire, all items were based on a five-item Likert scale (i.e. Extremely important, Very important, Important, Slightly important, and Not important); the highest grade was given 5 degrees and the lowest grade given 1 degree. The range calculated for the scale was $5-1 = 4$; dividing this by the number of categories (5) gave $4/5 = 0.80$, which was the length of each category of the five scales. Finally, the length of

the category was added to the lowest grade of the scale, which was 1. Thus, the first category was calculated to be 1 to 1.80. And by adding (0.80) for the next category (which starts with the first category ending) to produce the second category, and so on for the rest of the categories, the following criteria in Table (3.8) were defined to analyze the results:

Table (3.8)
***Distribution according to the gradient
of the categories used in the search tool***

Description	Rang of mean
Extremely important	4.21-5.00
Very important	3.41-4.20
Important	2.61-3.40
Slightly important	1.81-2.60
Not important	1.00-1.80

After that, answers were analyzed and explained using statistical analysis of the means, standard deviations, frequencies, and percentages. Researchers then included some recommendations.

6. Data Analysis

The collected data was analyzed using statistical analysis tools including the following:

- The Pearson Correlation Coefficient to measure the validity.
- Cronbach' Alpha to measure the reliability.
- Frequencies and percentages to describe the research sample.

- Means and standard deviations to calculate the variance between the respondents' answers to each statement of the survey.

7. Ethical Considerations

The research adhered to ethical standards and practices in data collection and analysis. Participants were informed about the research objective and the confidentiality of their responses. Participation in the study was voluntary, with participants providing informed consent before filling in the questionnaire. The data was stored securely and used for this study's purposes only.

Chapter Four: Results and Discussion

1. Answering the First Question

What are the most key metrics that increase the efficiency of digital transformation projects from a project manager's perspective?:

To answer this question, frequencies, percentages, means, and standard deviations have been calculated for the study sample's answers about the most key metrics that increase the efficiency of digital transformation projects from a project manager's perspective, as shown in Table (4.1)

Table (4.1)

Frequencies, Percentages, Means, and Standard Deviations of the sample respondents' answers about the most important metrics that contribute to the efficiency of digital transformation projects

Ser No.	Statement		E x t r e m e l y i m p o r t a n t	V e r y i m p o r t a n t	I m p o r t a n t	S l i g h t l y i m p o r t a n t	N o t i m p o r t a n t	M e a n	S t d. D e v i a t i o n	R a n k
1	Timely delivery of the project	Freq.	42	25	4			4.54	0.61	2
		%	59.2	35.2	5.6					
2	Adherence to the defined budget	Freq.	40	25	6			4.48	0.65	5
		%	56.3	35.2	8.5					
3	Stakeholder satisfaction	Freq.	44	18	9			4.49	0.71	4
		%	62.0	25.4	12.7					
4	Team collaboration and communication	Freq.	47	15	9			4.54	0.71	2
		%	66.2	21.1	12.7					
5	Utilization of appropriate technology solutions	Freq.	33	24	14			4.27	0.77	8

Ser No.	Statement		Extremely important	Very important	Important	Slightly important	Not important	Mean	Std. Deviation	Rank
		%	46.5	33.8	19.7					
6	Effective change management	Freq.	33	27	8	3		4.27	0.83	8
		%	46.5	38.0	11.3	4.2				
7	Constant monitoring and evaluation of project progress	Freq.	50	16	4	1		4.62	0.66	1
		%	70.4	22.5	5.6	1.4				
8	Alignment of project goals with overall business objectives	Freq.	40	20	8	2	1	4.35	0.90	6
		%	56.3	28.2	11.3	2.8	1.4			
9	The level of employee engagement and training during digital transformation projects	Freq.	26	30	11	3	1	4.08	0.91	10
		%	36.6	42.3	15.5	4.2	1.4			
10	The alignment of project timelines with the organization's strategic timeline	Freq.	38	22	9	1	1	4.34	0.86	7
		%	53.5	31.0	12.7	1.4	1.4			
*Mean for total								4.40	0.49	

* The mean of 5 degrees

From the table above it is evident that the total mean of the answers on the most key metrics that increase the efficiency of digital transformation projects from a project manager's perspective was (4.40) which indicates the study sample's agreement on those metrics. As for the standard deviation, it can be seen that it was (0.49) which is less than (1); and thus indicates a low variance in the sample

respondents' answers about the most key metrics that increase the efficiency of digital transformation projects from a project manager's perspective.

The “the most key metrics that increase the efficiency of digital transformation projects from a project manager's perspective” factor included ten (10) statements with mean range between (4.08 - 4.62), those mean values fall under the fourth and fifth categories in Likert scale, which indicate (Very Important, Extremely Important) respectively. The ten (10) statements have been arranged in a descending manner starting with the highest mean as shown in Table (4.2), with further explanation for each statement as follows:

- The statement “Constant monitoring and evaluation of project progress” came in first place as extremely important and with a mean of (4.62) and a percentage of (70.4%) of the respondents.
- As for the statements that ranked second in terms of mean value, both “Timely delivery of the project” and “Team collaboration and communication” were listed as extremely important with a mean of (4.54). The statements came in second and third in terms of variance in respondents' answers with standard deviations of (0.61, 0.71) respectively. As forty-seven (47) (66.2%) of the respondents stated that “Team collaboration and communication” are extremely important key metrics in increasing the efficiency of digital transformation projects. Where forty-two of the respondents (42) (59.2%) stated that “Timely delivery of the project” is extremely important in increasing digital transformation projects efficiency.

- Among the survey questions about the first factor, the third statement "Stakeholder satisfaction," ranked fourth with a mean value of (4.49). A total of (44) respondents emphasized the significant role of stakeholder satisfaction in enhancing the effectiveness of digital transformation projects.
- The second statement in the survey "Adherence to the defined budget" ranked fifth with a mean value of (4.48) and standard deviation of (0.65). over Fifty-six percent (56.3%) of the respondents stated that adherence to the defined budget is extremely important in increasing digital transformation projects efficiency.
- The eighth statement in the survey "Alignment of project goals with overall business objectives" ranked sixth with mean of (4.35) and standard deviation of (0.90) as 56.3% of the respondents answers fall under the "extremely important" gradient.
- The last statement in the survey "The alignment of project timelines with the organization's strategic timeline" ranked seventh with mean value of (4.34) and standard deviation of (0.86). Over fifty-three (53.5%) of the respondents agreed that "The alignment of project timelines with the organization's strategic timeline" is an extremely important metric in increasing digital transformation projects efficiency.
- Both fifth and sixth statements in the survey about the first factor, which are "Utilization of appropriate technology solutions" and "Effective change management" ranked eighth with mean of (4.27) and standard deviations of (0.77) and (0.83) respectively.

- Finally, the ninth statement in the survey questions on the first factor “”, was “The level of employee engagement and training during digital transformation projects” and ranked eighth with the least mean of (4.08) and most standard deviation of (0.91). This means that “The level of employee engagement and training during digital transformation projects” had the most variance in respondents’ answers with over forty-two percent (42.3%) falling under the fourth gradient “Very Important”.

Table (4.2)
Means, Standard Deviations, Ranks, and Assessments of the sample respondents' answers about the most important metrics that contribute to the efficiency of digital transformation projects

Ser No.	Statement	Mean	Std. Deviation	Rank	Assessment
7	Constant monitoring and evaluation of project progress	4.62	0.66	1	Extremely important
1	Timely delivery of the project	4.54	0.61	2	Extremely important
4	Team collaboration and communication	4.54	0.71	2	Extremely important
3	Stakeholder satisfaction	4.49	0.71	4	Extremely important
2	Adherence to the defined budget	4.48	0.65	5	Extremely important
8	Alignment of project goals with overall business objectives	4.35	0.90	6	Extremely important
10	The alignment of project timelines with the organization's strategic timeline	4.34	0.86	7	Extremely important
5	Utilization of appropriate technology solutions	4.27	0.77	8	Extremely important
6	Effective change management	4.27	0.83	8	Extremely important
9	The level of employee engagement and training during digital transformation projects	4.08	0.91	10	Very important
	Mean* for total	4.40	0.49		Extremely important

* The mean of 5 degrees

2. Answering the Second Question

To what extent do effective risk management processes impact project efficiency from a project manager's perspective? The following sub-questions fall under the second objective:

2.1. To what extent do effective risk identification impact project efficiency from a project manager's perspective?

To answer this sub-question, frequencies, percentages, means, and standard deviations have been calculated for the study sample's answers about the impact of effective risk identification on the efficiency of projects from a project manager's perspective, as shown in Table (4.3). The first sub-factor of the second main factor consisted of four (4) statements in the survey, of which (the second statement), was a checkbox question about the tools project managers use in identifying risks in their digital transformation projects. The answers for this checkbox are shown in Table (4.4). As for the other three statements, further arrangement according to rank and assessment is shown in Table (4.5).

Table (4.3)
Frequencies, Percentages, Means, and Standard Deviations
of the sample respondents' answers about the impact of effective
identification of risks on the efficiency of digital transformation projects

Identification of risks on the efficiency of digital transformation projects										
Ser No.	Statement		St ro n g l y a g r e e	A g r e e	N e u t r a l	D i s a g r e e	St ro n g l y d i s a g r e e	M e a n	St d. D e v i a t i o n	R a n k
1	The importance of risk identification in project management	Freq .	48	17	5	1		4.58	0.69	1
		%	67.6	23.9	7.0	1.4				
3	Effective risk identification consistently improves project efficiency	Freq .	42	25	4			4.54	0.61	2
		%	59.2	35.2	5.6					
4	I had a project failure that could have been prevented with better risk identification	Freq .	34	21	12	4		4.20	0.92	3
		%	47.9	29.6	16.9	5.6				
Mean* for total								4.44	0.57	

* The mean of 5 degrees

Table (4.4)
Distribution of the sample members' answers about the tools
they used for risk identification in project management process

The tools	Frequency	Percent*
Brainstorming sessions	46	64.8
Risk checklists	49	69.0
Risk assessment templates	48	67.6
Expert judgment	36	50.7
SWOT analysis	44	62.0
Other	3	4.2
No. of participants	71	

* Percent of No. of participants

Table (4.5)
Means, Standard Deviations, Ranks, and Assessments of the sample respondents' answers about the impact of effective identification of risks on the efficiency of digital transformation projects

Ser No.	Statement	Mean	Std. Deviation	Rank	Assessment
1	The importance of risk identification in project management	4.58	0.69	1	Extremely important
3	Effective risk identification consistently improves project efficiency	4.54	0.61	2	Strongly Agree
4	I had a project failure that could have been prevented with better risk identification	4.20	0.92	3	Agree
	Mean* for total	4.44	0.57		Strongly Agree

* The mean of 5 degrees

From the three tables above on the first sub-factor, it can be seen that for the statements on the impact of effective risk identification on digital transformation projects, had the following results after the analysis:

- The respondents' answers had a total mean of (4.44) with standard deviation of (0.57) for the statements "The importance of risk identification in project management", "Effective risk identification consistently improves project efficiency", and "I had a project failure that could have been prevented with better risk identification".
- The first statement "The importance of risk identification in project management", ranked first with a total mean of (4.58)

with standard deviation of (0.69). Over sixty-seven percent of the respondents (67.6%) stated that this statement is extremely important in project management.

- The third statement on this part of the survey, “Effective risk identification consistently improves project efficiency”, ranked second with a total mean of (4.54) and standard deviation of (0.61). The highest respondents’ percentage was (59.2%) and fell under the fourth gradient “strongly agree”.
- The fourth statement on the survey, “I had a project failure that could have been prevented with better risk identification”, ranked third with a total mean of (4.20) and standard deviation of (0.92). The average assessment of the respondents' answers was “agree”, with (47.9%) of them strongly agreed.
- The second statement on the survey was about the tools they used for risk identification in the project management process (shown in Table (4.4) above). Creating a “Risk checklist” had the highest frequency of (49), which means that sixty-nine percent (69%) of the respondents use it when identifying risks in their projects.

2.2. To what extent does an effective risk analysis process impact project efficiency from a project manager's perspective?

Table (4.6)

***Frequencies, Percentages, Means, and Standard Deviations
of the sample respondents' answers about the impact of the effective
risk analysis process on the efficiency of digital transformation projects***

Risk analysis process on the efficiency of digital transformation projects										
Ser No .	Statement		St ro ng ly ag re e	A gr ee	N eu tr al	Di sa gr ee	St ro ng ly di sa gr ee	M ea n	St d. D ev iat io n	R a n k
5	Effective risk analysis process impacts project efficiency positively	Freq .	38	30	3			4.49	0.58	2
		%	53.5	42.3	4.2					
6	Risk analysis processes are included in my project management approach	Freq .	43	21	6	1		4.49	0.71	2
		%	60.6	29.6	8.5	1.4				
7	Effective risk analysis process reduces the likelihood of project delay or failure	Freq .	47	16	8			4.55	0.69	1
		%	66.2	22.5	11.3					
Mean for total								4.51	0.53	

* The mean of 5 degrees

Table (4.7)

Means, and Standard Deviations of the sample respondents' answers about the impact of the effective risk analysis process on the efficiency of digital transformation projects

Ser No.	Statement	Mean	Std. Deviation	Rank	Assessment
7	Effective risk analysis process reduces the likelihood of project delay or failure	4.55	0.69	1	Strongly Agree
5	Effective risk analysis process impacts project efficiency positively	4.49	0.58	2	Strongly Agree
6	Risk analysis processes are included in my project management approach	4.49	0.71	2	Strongly Agree
	Mean* for total	4.51	0.53		Strongly Agree

* The mean of 5 degrees

From Tables (4.6) and (4.7) above, it is evident that the total mean of the respondents' answers was (4.51) with standard deviation of (0.53). Thus, a low variance in the respondents' answers.

2.3. To what extent does effective risk assessment impact project efficiency from a project manager's perspective?

Tables (4.8), (4.9), and (4.10) below, show that the total mean of the respondents' answers was (4.45) with a standard deviation of (0.58) which is less than (1). This means that the majority of respondents' answers fell under the fifth gradient "strongly agree".

Table (4.8)
Frequencies, Percentages, Means, and Standard Deviations of the sample respondents' answers about the impact of effective risk assessment on the efficiency of digital transformation projects

Ser No.	Statement		St ro ng ly ag re e	A gr ee	N eu tr al	Di sa gr ee	St ro ng ly di sa gr ee	M ea n	St d. D ev ia tio n	R a n k
8	Importance of effective risk assessment in ensuring project efficiency	Freq.	39	22	9		1	4.38	0.82	3
		%	54.9	31.0	12.7		1.4			
9	The frequency of conducting risk assessments during the project life-cycle	Freq.	39	17	13	1	1	4.30	0.92	4
		%	54.9	23.9	18.3	1.4	1.4			
11	There is improvement in project efficiency as a result of implementing effective risk assessment measures	Freq.	41	24	6			4.49	0.65	2
		%	57.7	33.8	8.5					
12	Effective risk assessment helps in identifying potential risks proactively and mitigating them before they impact project efficiency	Freq.	46	23	2			4.62	0.54	1
		%	64.8	32.4	2.8					

Ser No.	Statement	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Mean	Std. Deviation	Rank
Mean for total							4.45	0.58	

* The mean of 5 degrees

Table (4.9)
Distribution of the sample members' answers about the tools they employ for risk assessment in their projects

The tools	Frequency	Percent*
Brainstorming sessions	40	56.3
SWOT analysis	40	56.3
Probability & impact assessment	51	71.8
Risk matrix	45	63.4
Expert opinions	37	52.1
Historical data analysis	36	50.7
Experiment and evaluate	1	1.4
No. of participants	71	

* Percent of No. of participants

Table (4.10)
Means, and Standard Deviations of the sample respondents' answers about the impact of effective risk assessment on the efficiency of digital transformation projects

Ser No.	Statement	Mean	Std. Deviation	Rank	Assessment
12	Effective risk assessment helps in identifying potential risks proactively and mitigating them before they impact project efficiency	4.62	0.54	1	Strongly Agree
11	There is improvement in project efficiency as a result of implementing effective risk assessment measures	4.49	0.65	2	Strongly Agree

Ser No.	Statement	Mean	Std. Deviation	Rank	Assessment
8	Importance of effective risk assessment in ensuring project efficiency	4.38	0.82	3	Extremely important
9	The frequency of conducting risk assessments during the project life-cycle	4.30	0.92	4	Always
	Mean* for total	4.45	0.58		Strongly Agree

* The mean of 5 degrees

2.4. To what extent does effective risk mitigation impact project efficiency from a project manager's perspective?

Tables (4.11) and (4.12) below, display the respondents' answers about the impact of risk mitigation on the efficiency of digital transformation projects. The total means was (4.50) with a standard deviation of (0.55) which is less than (1) and thus a low variance in the respondents' answers.

Table (4.11)
Frequencies, Percentages, Means, and Standard Deviations of the sample respondents' answers about the impact of effective risk mitigation on the efficiency of digital transformation projects

Ser No.	Statement		St ro ng ly ag re e	A gr ee	N eu tra l	Di sa gr ee	St ro ng ly di sa gr ee	M ea n	St d. D ev iat io n	R a n k
13	Risk mitigation is extremely important in ensuring project efficiency	Freq.	39	27	5			4.48	0.63	2
		%	54.9	38.0	7.0					
14	There are positive outcomes in terms of project efficiency when project managers actively incorporate risk mitigation practices in their project planning and execution process	Freq.	41	26	4			4.52	0.61	1
		%	57.7	36.6	5.6					

Ser No.	Statement	St ro ng ly ag ree	A gr ee	N eu tra l	Di sa gr ee	St ro ng ly di sa gr ee	M ea n	St d. D ev ia tio n	R a n k
Mean for total							4.50	0.55	

* The mean of 5 degrees

Table (4.12)
Means, and Standard Deviations of the sample respondents' answers about the impact of effective risk mitigation on the efficiency of digital transformation projects

Ser No.	Statement	Mean	Std. Deviation	Rank	Assessment
14	There are positive outcomes in terms of project efficiency when project managers actively incorporate risk mitigation practices in their project planning and execution process	4.52	0.61	1	Strongly Agree
13	Risk mitigation is extremely important in ensuring project efficiency	4.48	0.63	2	Strongly Agree
	Mean* for total	4.50	0.55		Strongly Agree

* The mean of 5 degrees

2.5. To what extent does effective risk monitoring and reviewing impact project efficiency from a project manager's perspective?

Tables (4.13) and (4.14) below, show that the total mean of the respondents' answers was (4.44) with a standard deviation of (0.68) which is less than (1). This means that the majority of respondents' answers fell under the fifth gradient "strongly agree"

Table (4.13)
Frequencies, Percentages, Means, and Standard Deviations of the sample respondents' answers about the impact of effective monitoring and review of risks on the efficiency of digital transformation projects

Ser No.	Statement		St ro ng ly ag ree	A gr ee	N eu tr al	Di sa gr ee	St ro ng ly di sa gr ee	M ea n	St d. D ev iat ion	R a n k
15	Effective risk monitoring and reviewing significantly improve project efficiency	Freq.	45	23	2	1		4.58	0.62	1
		%	63.4	32.4	2.8	1.4				
16	The frequency of conducting risk monitoring and reviews during a project's life-cycle	Freq.	38	21	8	3	1	4.30	0.93	2
		%	53.5	29.6	11.3	4.2	1.4			
Mean for total								4.44	0.68	

* The mean of 5 degrees

Table (4.14)
Means, and Standard Deviations of the sample respondents' answers about the impact of effective monitoring and review of risks on the efficiency of digital transformation projects

Ser No.	Statement	Mean	Std. Deviation	Rank	Assessment
15	Effective risk monitoring and reviewing significantly improve project efficiency	4.58	0.62	1	Strongly Agree
16	The frequency of conducting risk monitoring and reviews during a project's life-cycle	4.30	0.93	2	Always
	Mean* for total	4.44	0.68		Strongly Agree

* The mean of 5 degrees

Going back to the main second question which was “**To what extent do effective risk management processes impact project efficiency from a project manager's perspective?**” further general statements were distributed to the research sample to further identify the overall impact of risk management processes on digital

transformation project management. Tables (4.15) and (4.16) show the respondents' answers in detail.

Table (4.15)
*Frequencies, Percentages, Means, and Standard Deviations
of the sample respondents' answers about the impact of risk
management processes on the efficiency of digital transformation projects*

management processes on the efficiency of digital transformation projects										
Ser No.	Statement		St ro ng ly ag ree	A gr ee	N eu tr al	Di sa gr ee	St ro ng ly di sa gr ee	M ea n	St d. D ev ia tio n	R a n k
17	Risk management processes are implemented in my digital transformation projects	Freq.	34	22	10	4	1	4.18	0.98	3
		%	47.9	31.0	14.1	5.6	1.4			
18	Risk management processes are extremely effective in ensuring the success of digital transformation projects	Freq.	42	22	7			4.49	0.67	2
		%	59.2	31.0	9.9					
19	Project managers are satisfied with the current risk management processes implemented in digital transformation projects	Freq.	28	18	20	4	1	3.96	1.02	4
		%	39.4	25.4	28.2	5.6	1.4			
20	Risk management processes are crucial for the success of digital transformation projects	Freq.	46	18	7			4.55	0.67	1
		%	64.8	25.4	9.9					
Mean for total								4.30	0.68	

* The mean of 5 degrees

Table (4.16)
*Means, and Standard Deviations of the sample respondents'
answers about the impact of risk management processes
on the efficiency of digital transformation projects*

Ser No.	Statement	Mean	Std. Deviation	Rank	Assessment
20	Risk management processes are crucial for the success of digital transformation projects	4.55	0.67	1	Strongly Agree
18	Risk management processes are extremely effective in ensuring the success of digital transformation projects	4.49	0.67	2	Strongly Agree
17	Risk management processes are implemented in my digital transformation projects	4.18	0.98	3	Agree
19	Project managers are satisfied with the current risk management processes implemented in digital transformation projects	3.96	1.02	4	Agree
	Mean* for total	4.30	0.68		Strongly Agree

* The mean of 5 degrees

From the tables above, it is evident that the total mean of the respondents answers was (4.30) of (5) degrees, with a standard deviation of (0.68).

In a final observation to the answers of the second factor, all statements of the factor about “the impact of risk management processes on the efficiency of digital transformation projects”, were displayed in Table (4.17), and further in Table (4.18) according to their rank.

Table (4.17)
Frequencies, Percentages, Means, and Standard Deviations
of the sample respondents' answers about the impact of risk
management processes on the efficiency of digital transformation projects

Ser No.	Statement		St ro ng ly ag ree	A gr ee	N eu tr al	Di sa gr ee	S t r o n g l y d i sa gr ee	M ea n	St d. D ev ia tio n	R a n k
1	The importance of risk identification in project management	Freq.	48	17	5	1		4.58	0.69	2
		%	67.6	23.9	7.0	1.4				
3	Effective risk identification consistently improves project efficiency	Freq.	42	25	4			4.54	0.61	6
		%	59.2	35.2	5.6					
4	I had a project failure that could have been prevented with better risk identification	Freq.	34	21	12	4		4.20	0.92	16
		%	47.9	29.6	16.9	5.6				
5	Effective risk analysis process impacts project efficiency positively	Freq.	38	30	3			4.49	0.58	8
		%	53.5	42.3	4.2					
6	Risk analysis processes are included in my project management approach	Freq.	43	21	6	1		4.49	0.71	8
		%	60.6	29.6	8.5	1.4				
7	Effective risk analysis process reduces the likelihood of project delay or failure	Freq.	47	16	8			4.55	0.69	4
		%	66.2	22.5	11.3					
8	Importance of effective risk assessment in ensuring project efficiency	Freq.	39	22	9		1	4.38	0.82	13
		%	54.9	31.0	12.7		1.4			
9	The frequency of conducting risk assessments during the project life-cycle	Freq.	39	17	13	1	1	4.30	0.92	14
		%	54.9	23.9	18.3	1.4	1.4			
11	There is improvement in project efficiency as a result of implementing effective risk assessment measures	Freq.	41	24	6			4.49	0.65	8
		%	57.7	33.8	8.5					

Ser No.	Statement		St ro ng ly ag re e	A gr ee	N eu tr al	Di sa gr ee	S t r o n g l y di sa gr ee	M ea n	St d. D ev ia tio n	R a n k
12	Effective risk assessment helps in identifying potential risks proactively and mitigating them before they impact project efficiency	Freq.	46	23	2			4.62	0.54	1
		%	64.8	32.4	2.8					
13	Risk mitigation is extremely important in ensuring project efficiency	Freq.	39	27	5			4.48	0.63	12
		%	54.9	38.0	7.0					
14	There are positive outcomes in terms of project efficiency when project managers actively incorporate risk mitigation practices in their project planning and execution process	Freq.	41	26	4			4.52	0.61	7
		%	57.7	36.6	5.6					
15	Effective risk monitoring and reviewing significantly improve project efficiency	Freq.	45	23	2	1		4.58	0.62	2
		%	63.4	32.4	2.8	1.4				
16	The frequency of conducting risk monitoring and reviews during a project's life-cycle	Freq.	38	21	8	3	1	4.30	0.93	14
		%	53.5	29.6	11.3	4.2	1.4			
17	Risk management processes are implemented in my digital transformation projects	Freq.	34	22	10	4	1	4.18	0.98	17
		%	47.9	31.0	14.1	5.6	1.4			
18	Risk management processes are extremely effective in ensuring the success of digital transformation projects	Freq.	42	22	7			4.49	0.67	8
		%	59.2	31.0	9.9					

Ser No.	Statement		St ro ng ly ag ree	A gr ee	N eu tr al	Di sa gr ee	S t r o n g l y di sa gr ee	M ea n	St d. D ev ia tio n	R a n k
19	Project managers are satisfied with the current risk management processes implemented in digital transformation projects	Freq.	28	18	20	4	1	3.96	1.02	18
		%	39.4	25.4	28.2	5.6	1.4			
20	Risk management processes are crucial for the success of digital transformation projects	Freq.	46	18	7			4.55	0.67	4
		%	64.8	25.4	9.9					
Mean for total								4.43	0.51	

* The mean of 5 degrees

Table (4.18)
Means, and Standard Deviations of the sample respondents' answers about the impact of risk management processes on the efficiency of digital transformation projects

Ser No.	Statement	Mean	Std. Deviation	Rank	Assessment
12	Effective risk assessment helps in identifying potential risks proactively and mitigating them before they impact project efficiency	4.62	0.54	1	Strongly Agree
15	Effective risk monitoring and reviewing significantly improve project efficiency	4.58	0.62	2	Strongly Agree
1	The importance of risk identification in project management	4.58	0.69	2	Extremely important
20	Risk management processes are crucial for the success of digital transformation projects	4.55	0.67	4	Strongly Agree

Ser No.	Statement	Mean	Std. Deviation	Rank	Assessment
7	Effective risk analysis process reduces the likelihood of project delay or failure	4.55	0.69	4	Strongly Agree
3	Effective risk identification consistently improves project efficiency	4.54	0.61	6	Strongly Agree
14	There are positive outcomes in terms of project efficiency when project managers actively incorporate risk mitigation practices in their project planning and execution process	4.52	0.61	7	Strongly Agree
5	Effective risk analysis process impacts project efficiency positively	4.49	0.58	8	Strongly Agree
11	There is improvement in project efficiency as a result of implementing effective risk assessment measures	4.49	0.65	8	Strongly Agree
18	Risk management processes are extremely effective in ensuring the success of digital transformation projects	4.49	0.67	8	Strongly Agree
6	Risk analysis processes are included in my project management approach	4.49	0.71	8	Strongly Agree
13	Risk mitigation is extremely important in ensuring project efficiency	4.48	0.63	12	Strongly Agree
8	Importance of effective risk assessment in ensuring project efficiency	4.38	0.82	13	Extremely important
9	The frequency of conducting risk assessments during the project life-cycle	4.30	0.92	14	Always
16	The frequency of conducting risk monitoring and reviews during a project's life-cycle	4.30	0.93	14	Always
4	I had a project failure that could have been prevented with better risk identification	4.20	0.92	16	Agree
17	Risk management processes are implemented in my digital transformation projects	4.18	0.98	17	Agree
19	Project managers are satisfied with the current risk management processes implemented in digital transformation projects	3.96	1.02	18	Agree

Ser No.	Statement	Mean	Std. Deviation	Rank	Assessment
	Mean* for total	4.43	0.51		Strongly Agree

* The mean of 5 degrees

After all answers on the five sub-factors of the second questions have been compared, respondents' answers were detailed in Table (4.19) to show which risk management process step had the highest importance from project managers perspective.

Table (4.19)
Means and Std. Deviation for total of second factor the impact of risk management processes on the efficiency of digital transformation projects

Factor	Mean	Std. Deviation	Rank	Assessment
The impact of the effective risk analysis process on the efficiency of digital transformation projects	4.51	0.53	1	Strongly Agree
The impact of effective risk mitigation on the efficiency of digital transformation projects	4.50	0.55	2	Strongly Agree
The impact of effective risk assessment on the efficiency of digital transformation projects	4.45	0.58	3	Strongly Agree
The impact of effective identification of risks on the efficiency of digital transformation projects	4.44	0.57	4	Strongly Agree
The impact of effective monitoring and review of risks on the efficiency of digital transformation projects	4.44	0.68	4	Strongly Agree
The impact of risk management processes on the efficiency of digital transformation projects	4.30	0.68	6	Strongly Agree
The total of the impact of risk management processes on the efficiency of digital transformation projects	4.43	0.51		Strongly Agree

* The mean of 5 degrees

From the table above, it is evident that according to the project managers perspective, all five risk management processes fall in the fifth gradient “strongly agree” when it comes to their impact on the digital transformation projects efficiency. The effective risk analysis process has the most impact on the efficiency of digital transformation projects. The second process in ranking was the effective risk mitigation, and the third process in ranking was the effective risk assessment. While both effective risk identification, and risk monitoring and reviewing, ranked fourth.

Chapter Five: Research Summary and Recommendations

Summary

Incorporating risk management processes in digital transformation project management strategies benefits project managers by identifying potential risks and developing effective mitigation strategies. The research investigated the impact of risk management on digital transformation projects from the project managers' point of view. It aimed to help them to measure risk management effectiveness and prioritize efforts. Specifically the research aimed to answer the following questions:

3. What are the most key metrics that increase the efficiency of digital transformation projects from a project manager's perspective?
4. To what extent do effective risk management processes impact project efficiency from a project manager's perspective? The following sub-questions fall under the second objective:
 - 4.1. To what extent do effective risk identification impact project efficiency from a project manager's perspective?
 - 4.2. To what extent does an effective risk analysis process impact project efficiency from a project manager's perspective?
 - 4.3. To what extent does effective risk assessment impact project efficiency from a project manager's perspective?
 - 4.4. To what extent does effective risk mitigation impact project efficiency from a project manager's perspective?
 - 4.5. To what extent does effective risk monitoring and reviewing impact project efficiency from a project manager's perspective?

The research aimed to help organizations investigate the need for effective risk management strategies. Moreover, it aimed to provide valuable insights on achieving maximum efficiency and success in digital transformation projects.

The research was limited to the following temporal, spatial, and objective limits and boundaries: The study was conducted in the academic year of 2023, in the city of Riyadh, Kingdom of Saudi Arabia, with the limitations of “Identifying the most important metrics that contribute to the efficiency of digital transformation projects from project managers perspective,” and “Identifying the impact of risk management processes on digital transformation projects’ efficiency from the point of project managers’ view.”

The study used self-administered questionnaires, and used Pearson Correlation Coefficient, and Chronbach’ Alpha to measure its validity and reliability. The results then were analyzed and explained, and recommendations were given according to the results.

الملخص

إن دمج عمليات إدارة المخاطر في استراتيجيات إدارة مشاريع التحول الرقمي يفيد مديري المشاريع من خلال تحديد المخاطر المحتملة وتطوير استراتيجيات التخفيف الفعالة. تناول البحث أثر إدارة المخاطر على مشاريع التحول الرقمي من وجهة نظر مدراء المشاريع. وهدف إلى مساعدتهم في قياس فعالية إدارة المخاطر وتحديد أولويات الجهود.

وعليه سعت الدراسة على الإجابة عن الأسئلة التالية:

1. ما هي أهم المقاييس الرئيسية التي تزيد من كفاءة مشاريع التحول الرقمي من وجهة نظر مدير المشروع؟

2. إلى أي مدى تؤثر عمليات إدارة المخاطر الفعالة على كفاءة المشروع من وجهة نظر مدير المشروع؟ ومنه تفرعت الأسئلة التالية:

2.1. إلى أي مدى يؤثر التحديد الفعال للمخاطر على كفاءة المشروع من وجهة نظر مدير المشروع؟

2.2. إلى أي مدى تؤثر عملية تحليل المخاطر الفعالة على كفاءة المشروع من وجهة نظر مدير المشروع؟

2.3. إلى أي مدى يؤثر التقييم الفعال للمخاطر على كفاءة المشروع من وجهة نظر مدير المشروع؟

2.4. إلى أي مدى يؤثر التخفيف الفعال للمخاطر على كفاءة المشروع من وجهة نظر مدير المشروع؟

2.5. إلى أي مدى تؤثر المراقبة الفعالة للمخاطر ومراجعتها على كفاءة المشروع من وجهة نظر مدير المشروع؟

هدفت الدراسة إلى مساعدة المنظمات على دراسة الحاجة إلى استراتيجيات فعالة لإدارة المخاطر. علاوة على ذلك، هدفت إلى تقديم رؤى قيمة حول تحقيق أقصى قدر من الكفاءة والنجاح في مشاريع التحول الرقمي. واقتصر البحث على الحدود الزمانية والمكانية التالية: أجريت الدراسة في العام الدراسي 2023م، في مدينة الرياض بالمملكة العربية السعودية، كما اقتصرَت الحدود الموضوعية للدراسة على "التعرف على أهم المقاييس

التي المساهمة في كفاءة مشاريع التحول الرقمي من وجهة نظر مديري المشاريع"، و"التعرف على تأثير عمليات إدارة المخاطر على كفاءة مشاريع التحول الرقمي من وجهة نظر مديري المشاريع".

اتبعت الدراسة المنهج الوصفي ذو الأسلوب المسحي، لتحقيق أهداف الدراسة، وطبقت عليه عينة عشوائية بلغ عددها واحد وسبعون 71 مدير مشروع في جهات مختلفة في الرياض.

واستخدمت هذه الدراسة الاستبانة أداة لجمع البيانات، وذلك بعد التحقق من خصائصها السيكمترية من خلال صدق المحكمين، و صدق الاتساق الداخلي بحساب معامل ارتباط بيرسون، و حساب ثبات الاستبانة من خلال معامل ألفا كرونباخ. ومن ثم تم عرض وتحليل النتائج وشرحها، وتقديم التوصيات في ضوء النتائج.

Recommendations

Given the dynamic nature of digital transformation, it is recommended to monitor the impact of risk management processes on digital transformation projects and find appropriate framework to implement risk management strategies to increase the project efficiency and success. Researches further recommend the following:

- measuring the impact of risk management processes on digital transformation in the government sectors of Saudi Arabia, and suggesting appropriate framework to apply risk management processes.
- setting applied programs to educate project managers and digital transformation teams on the importance of risk management processes in increasing the efficiency and the success of digital transformation projects.

References

References

- Association for Project Management. (2018). APM body of knowledge (7th ed.). APM Publishing Limited.
- Boehm, B. W., & Turner, R. (2004). *Balancing Agility and Discipline: A Guide for the Perplexed*. Pearson.
- Chapman, C., & Ward, S. (2002). *Managing project risk and uncertainty: A constructively simple approach to decision making*. John Wiley & Sons.
- CIO.com: "Why digital transformation success hinges on effective risk management"
- Clement, R. T., & Reilly, T. (2013). *Making hard decisions with decision tools* (3rd ed.). Cengage Learning.
- Cooper, D., Grey, S., Raymond, G., & Walker, P. (2005). *Project risk management guidelines: Managing risk in large projects and complex procurements*. John Wiley & Sons.
- Cooper, D. (2016). Complex project landscape: Towards a combined model of the complex project landscape measures and practices for improved performance. *International Journal of Project Management*, 34(5), 839-853.
- Deloitte: "The Importance of Risk Management in Digital Transformation"
- El-Sayegh, S. M. (2016). Risk management in construction projects. *International Journal of Engineering and Advanced Technology*, 5(4), 68-77.

Forbes: "Digital Transformation Success Requires a Strong Focus on Risk Management"

Gartner: "The CIO's Guide to Digital Transformation"

Gray, C., & Larson, E. W. (2014). Project management: The managerial process (6th ed.). McGraw-Hill Education.

Harvard Business Review: "Digital Transformation is Not About Technology"

Harvard Business Review: "How to Manage Digital Transformation Risks"

Hillson, D., & Murray-Webster, R. (2017). Understanding and managing risk attitude (2nd ed.). Gower Publishing, Ltd.

Hillson, D., & Simon, P. (2012). Practical risk management: The ATOM methodology (2nd ed.). Management Concepts.

Hillson, D. (2002). Success in project management: Learning from the experiences of project managers. Ashgate Publishing.

Hillson, D. (2004). Managing risk in projects: Second edition. Gower Publishing, Ltd.

Huemann, M., Keegan, A., & Turner, R. (2018). Human resource management in the project-oriented organization: Towards a viable system for project personnel. Routledge.

Husdal, J. (2011). The psychology of risk in project management. Farnham, Surrey: Gower.

International Association of Project Managers: "Risk Management in Digital Transformation Projects"

Journal of Information Technology Management: "Risk Management in Digital Transformation Projects: A Review and Future Research Directions"

Kerzner, H. (2017). Project management: a systems approach to planning, scheduling, and controlling (12th ed.). Wiley.

Kutsch, E., & Haller, M. (2015). Addressing risk attitude in project portfolio management—a review and conceptualization. *International Journal of Project Management*, 33(2), 318-332.

Lakshmi, S., & Sankaran, S. (2017). A review on risk management practices in construction industries. *International Journal of Engineering Technology Science and Research*, 4(7), 285-290.

McKinsey & Company: "The case for digital reinvention"

Meredith, J. R., & Mantel Jr, S. J. (2018). Project management: A managerial approach (10th ed.). Wiley.

Olander, S., & Landin, A. (2004). Managing project risks using co-ordinated risk management. *International Journal of Project Management*, 22(2), 115-123.

Paez, M. J., & Rosacker, K. M. (2013). Assessing project risk management maturity: A multi-method approach. *International Journal of Project Management*, 31(5), 709-724.

PMI Risk Management Professional (PMI-RMP)® Handbook. (2018). Project Management Institute.

Project Management Institute. (2017). Agile practice guide. Project Management Institute.

Project Management Institute. (2017). A guide to the project management body of knowledge (PMBOK® Guide) (6th ed.). Project Management Institute.

Project Management Institute. (2017). Organizational project management maturity model (OPM3®) (3rd ed.). Project Management Institute.

Project Management Institute: "The Critical Role of Risk Management in Digital Transformation"

Project Management Institute: "The Critical Role of Risk Management in Digital Transformation"

Project Management Institute. (2017). A guide to the project management body of knowledge (PMBOK® Guide) (6th ed.). Project Management Institute.

Raftery, J., & Donohue, T. (2006). Risk in construction contracts: Perspectives from the architect's profession. *International Journal of Project Management*, 24(5), 434-442.

Smith, N. J., Merna, T., & Jobling, P. (2006). *Managing risk in construction projects* (2nd ed.). Wiley-Blackwell.

Tesfamariam, S., & Sadiq, R. (2006). Risk-based bridge management systems. *Journal of Infrastructure Systems*, 12(2), 68-79.

Turner, J. R. (2014). The handbook of project-based management (4th ed). McGraw-Hill Education.

Williams, T. (2002). Modelling complex projects. Wiley.

Kliem, R. L., & Ludin, I. S. (2018). The risk management process: Business strategy and tactics. Routledge.

Appendices

Appendix A: List of Experts

No.	Expert Name	Specialization and Educational Level	Job Title and Employer
1	Abdullah Rozah	Computer Science, Master's degree	Director of Digital Transformation, National e-Learning Centre
2	Nasser Alsallum	Computer Science, Bachelor degree	Head of Applications and Systems, National e-Learning Centre
3	Abdulaziz Alharbi	Computer Science, Master's degree	Director of Digital Transformation, General Commission of the Guardianship of Trust Funds for Minors and their Counterpart
4	Mohammad Abdulaziz Alrassi	Information Systems, Master's degree	Director of Project Management Office, General Commission of the Guardianship of Trust Funds for Minors and their Counterpart
5	Abdulelah Alsallum	Computer Engineering, Bachelor degree	Director of Cyber Security, General Commission of the Guardianship of Trust Funds for Minors and their Counterpart

Appendix B: Research Tool (The Distributed Questionnaire)

المحور الأول: التعرف على أهم المقاييس التي تساهم في تعزيز كفاءة مشاريع التحول الرقمي من وجهة نظر مديري المشاريع

درجة الأهمية					الفقرة	
☐	☐	☐	☐	☐	timely delivery of the project التسليم في الوقت المحدد للمشروع	1
☐	☐	☐	☐	☐	adherence to the defined budget الالتزام بالميزانية المحددة	2
☐	☐	☐	☐	☐	stakeholder satisfaction رضا أصحاب المصلحة	3
☐	☐	☐	☐	☐	team collaboration and communication التعاون والتواصل بين الفريق	4
☐	☐	☐	☐	☐	utilization of appropriate technology solutions استخدام حلول التكنولوجيا المناسبة	5
☐	☐	☐	☐	☐	effective change management إدارة التغيير الفعالة	6
☐	☐	☐	☐	☐	constant monitoring and evaluation of project progress المراقبة والتقييم المستمر لتقدم المشروع	7
☐	☐	☐	☐	☐	alignment of project goals with overall business objectives مطابقة أهداف المشروع مع أهداف الأعمال العامة	8
☐	☐	☐	☐	☐	the level of employee engagement and training during digital transformation projects مستوى تفاعل الموظفين وتدريبهم خلال مشاريع التحول الرقمي	9
☐	☐	☐	☐	☐	the alignment of project timelines with the organization's strategic timeline مواءمة الجداول الزمنية للمشاريع مع الجدول الزمني الإستراتيجي للمؤسسة	10

المحور الثاني: التعرف على أثر خطوات عملية إدارة المخاطر (تحديد المخاطر، تحليل المخاطر، تقييم المخاطر، الاستجابة للمخاطر، مراقبة ومراجعة المخاطر) على كفاءة إدارة مشاريع التحول الرقمي من وجهة نظر مديري المشاريع

درجة الموافقة					الفقرة	
☐	☐	☐	☐	☐	Importance of risk identification in project management مدى أهمية تحديد المخاطر في إدارة المشروع	1
☐	☐	☐	☐	☐	tools used for risk identification in project management process الأساليب أو الأدوات المستخدمة لتحديد المخاطر في عملية إدارة المشروع	2
☐	☐	☐	☐	☐	effective risk identification consistently improves project efficiency التحديد الفعال للمخاطر يعمل باستمرار على تحسين كفاءة المشروع	3
☐	☐	☐	☐	☐	I had a project failure that could have been prevented with better risk identification سبق وأن تعرضت لفشل مشروع كان من الممكن منعه من خلال تحديد المخاطر بشكل أفضل	4
☐	☐	☐	☐	☐	effective risk analysis process impacts project efficiency تؤثر عملية تحليل المخاطر الفعالة على كفاءة المشروع	5
☐	☐	☐	☐	☐	risk analysis processes are included in my project management approach يتم تضمين عمليات تحليل المخاطر في النهج الخاص بي لإدارة المشروع	6
☐	☐	☐	☐	☐	effective risk analysis process reduces the likelihood of project delay or failure عملية تحليل المخاطر الفعالة تقلل من احتمالية تأخير المشروع أو فشله	7
☐	☐	☐	☐	☐	Importance of effective risk assessment in ensuring project efficiency مدى أهمية التقييم الفعال للمخاطر في ضمان كفاءة المشروع	8
☐	☐	☐	☐	☐	The frequency of conducting risk assessments during the project lifecycle عدد مرات إجراء تقييم للمخاطر خلال دورة حياة المشروع	9
☐	☐	☐	☐	☐	methods or tools I employ for risk assessment in my projects الأساليب أو الأدوات المستخدمة لتقييم المخاطر في مشاريعي	10

☐	☐	☐	☐	☐	There is improvement in project efficiency as a result of implementing effective risk assessment measures يوجد تحسن في كفاءة المشروع نتيجة لتنفيذ تدابير فعالة لتقييم المخاطر	1 1
☐	☐	☐	☐	☐	effective risk assessment helps in identifying potential risks proactively and mitigating them before they impact project efficiency يساعد التقييم الفعال للمخاطر في تحديد المخاطر المحتملة بشكل استباقي والتخفيف منها قبل أن تؤثر على كفاءة المشروع	1 2
☐	☐	☐	☐	☐	risk mitigation is extremely important in ensuring project efficiency التخفيف الفعال للمخاطر هي خطوة فائقة الأهمية في ضمان كفاءة المشروع	1 3
☐	☐	☐	☐	☐	There are positive outcomes in terms of project efficiency when project managers actively incorporate risk mitigation practices in their project planning and execution process هناك نتائج إيجابية من حيث كفاءة المشروع عندما يقوم مديرو المشاريع بدمج ممارسات تخفيف المخاطر (الاستجابة للمخاطر) بشكل فعال في عملية تخطيط المشروع وتنفيذه	1 4
☐	☐	☐	☐	☐	effective risk monitoring and reviewing significantly improve project efficiency تؤدي المراقبة والمراجعة الفعالة للمخاطر إلى تحسين كفاءة المشروع بشكل كبير	1 5
☐	☐	☐	☐	☐	The frequency of conducting risk monitoring and reviews during a project's life-cycle عدد المرات التي أقوم فيها بإجراء مراقبة ومراجعة للمخاطر خلال دورة حياة المشروع	1 6
☐	☐	☐	☐	☐	risk management processes are implemented in my digital transformation projects يتم تنفيذ خطوات عملية إدارة المخاطر في مشاريع التحول الرقمي التي أديرها	1 7
☐	☐	☐	☐	☐	risk management processes are extremely effective in ensuring the success of digital transformation projects تعتبر عمليات إدارة المخاطر فعالة للغاية في ضمان نجاح مشاريع التحول الرقمي	1 8
☐	☐	☐	☐	☐	project managers are satisfied with the current risk management processes implemented in digital transformation projects مديرو المشاريع راضون عن خطوات عملية إدارة المخاطر الحالية المطبقة في مشاريع التحول الرقمي	1 9
☐	☐	☐	☐	☐	risk management processes are crucial for the success of digital transformation projects خطوات عملية إدارة المخاطر ضرورية لنجاح مشاريع التحول الرقمي	2 0