QATAR UNIVERSITY

COLLEGE OF BUSINESS AND ECONOMICS

THE IMPACT OF RISK IDENTIFICATION ON IT PROJECT DELIVERY IN

QATAR PUBLIC SECTOR

BY

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A Project Submitted to

the College of Business and Economics

in Partial Fulfillment of the Requirements for the Degree of

Master of Business Administration

June 2021

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ABSTRACT

OSHI, MUTAZ. , Masters : June: 2021, Master of Business Administration

Title: The impact of Risk identification on IT project delivery in Qatar public sector

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Unmanaged project risks can jeopardize the project's success and outcome. To assist project managers in overcoming or reducing the impact of project risk, several risk management models and standards have been established. This study aimed to assess the impact of identified IT project risk factors on project delivery (satisfaction) in Qatar public sector. A questionnaire consist identified risk factors were developed by reviewing related literature. Data were collected from 160 from the target sample. Data were analyzed using SPSS and SmartPLS. The results demonstrated the impact of each of the nine identified risk factors with the dependent variable project delivery (satisfaction).

The hypotheses analysis showed five hypotheses H1, H2, H5, H6, and H8 supporting the literature with a positive impact on project delivery (satisfaction). Those factors namely, the Stakeholders, Business process, Organizational, Technical, and Schedule with significant P- values 0.030, 0.002, 0.028, 0.023, and 0.001, respectively. The other four hypotheses H3, H4, H7, and H9 are inconsistent with the literature, with (insignificant) high P-values resulting in a negative impact on project delivery (satisfaction). Those factors namely, Project Management, Human resources, Budget, and External with P-values 0.164, 0.605, 0.096, 0.225 respectively. The researcher recommends that project management professionals consider the five identified risk factors with a positive impact as the most critical IT risk factors, the research findings serve as a foundation and guideline to help the project management community avoid project pitfalls commonly associated with poor risk management and project failure.

DEDICATION

I dedicate this research to those who always inspire me "Dad, Mom, My wife & my kids" who have always been constant pillars of support throughout my entire life.

Thank you!

ACKNOWLEDGMENTS

First, and foremost, I am extremely grateful to my supervisor, Prof.

Emad A. Abu-Shanab for his invaluable advice, continuous support, and

patience during my MBA graduation research project. His immense

knowledge and plentiful experience have encouraged me during my

academic research and daily life.

My deepest appreciation to my loving, caring, and compassionate wife.

Your words of support during difficult times were greatly appreciated and

acknowledged. Knowing that you were able to handle our family

responsibilities while I was going through my MBA gave me immense

comfort and relaxation.

Finally, I would like to express my gratitude to my parents, without their

tremendous support and encouragement in the past few years, it would be

impossible for me to complete my study.

Thank you from the bottom of my heart...

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CHAPTER 1: INTRODUCTION

1.1 Background Information

In recent decades, the world has undergone a major revolution in information technology. Currently, IT applications allow us to access a variety of information and resources at our fingertips, including the ability to manage bank accounts, pay utility bills, and access government services. In education, for example, IT has changed the way educators and students interact, the availability of a variety of gadgets, including smartphones, tablets, and computers, educational institutions can deliver and collaborate online with their students and their communities. In finance, IT enables secure communications between banks for online purchases, sends, and receives money instantly. In business, IT has radically changed the business world by developing information systems, integrating organization's departments, and reaching other organizations globally with secure and efficient communication channels.

Globalization has increased with the transformation of information technology, and the world is becoming a small village and brought closer as a result, the world economy is becoming a single, interdependent system. Web designers, hardware and software engineers, system analyzers, programmers, among other IT jobs have been growing as a result of information technology transformation. E-government initiatives, according to (Clemente et al. 2018), turn hierarchical relationships into interactive collaborations between government, people, corporations, civil servants, and other governments in general, necessitating flexibility and the ability to respond to changes. There is a relationship between organizational performance and the impact of information technology. Researchers have used a variety of methods to investigate the processes that produce and estimate the business value of information technology. (Kraemer 2019) have shown that IT can contribute to improving organizational performance. The types of IT, management

strategies, and organizational structure, as well as the competitive and macro environments, all these factors influence the dimensions of IT business value.

IT projects implementations in all of these different types of industries are not free from risks; risk sources dimensions are diverse depending on the industry and the enterprise environment. According to (Bannerman,2007) a comprehensive understanding of these possible risk dimensions and their associated factors will enable project managers and practitioners to create strategic project risk plans to contribute to the successful delivery of IT project implementations.

1.2 Purpose of the Research

The purpose of the research is to realize and investigate the impact of the identified risk factors on IT project delivery in Qatar public sector. By focusing on the below research questions:

1- What are the critical risk factors that impact IT project delivery in Qatar public sector?

2- What is the impact of the identified risk factors on project delivery (Satisfaction)

3- Stakeholder's satisfaction with the identified risk factors

According to (George 2018), identifying risk allows one to comprehend its nature and determine how the risk should be managed. Risk identification has an impact on project stakeholders' decisions to create a sustainable project. Identifying the critical risk factors enables project managers and practitioners to have a holistic view of all possible project risk sources, and their factors rather than merely focusing on traditional risk sources (cost and time). Thus, a comprehensive understanding of the risk identification including their associated factors will empower project managers and practitioners to prepare a well-defined risk management plan, which will positively

contribute to project delivery.

1.3 Scope of the research

The research's scope is to investigate the influence of risk identification factors on IT project delivery in Qatar public sector. The targeted sample consists of project management professionals, Functional managers, and project stakeholders involved in IT projects in Qatar public sector.

1.4 The motivation behind the Research

Some reasons motivated the researcher to pursue this research; first, its alignment with Qatar National Vision 2030, "(QNV) 2030 aims that – by 2030 – Qatar becomes an advanced society capable of sustaining its development and providing a high standard of living for its people". According to (Qatar e-Government 2020 Strategy), risk management is one of Qatar public sector's major pillars and initiatives towards successful Information technology project management. Second, Information technology project failure had always been a focus area of research in the past decades. The great rate of project failure is affected by many risk factors such as over-budget completion or behind schedule or not meeting stakeholder's requirements, all of these risk dimensions could threaten the existence of any organization (Pimchangthong and Boonjing 2017). Third, being an IT project manager in one of Qatar's public sector (Qatar University) and experiencing a high rate of project failure motivated the researcher to explore and investigate in his domain of expertise. Therefore, the researcher strongly believes that there is a desperate need to undertake examinations to see the roots of project defects and cover all areas/gaps that enable the public sector's project management professionals to manage IT projects in an improved manner. Forth, lack of available similar research papers conducted in Qatar public sector. Fifth, the foreseen result will shed some light

on the risk management practices specifically in the risk identification area which will enable project management professionals to have a holistic view in managing IT projects within Qatar public sector.

1.5 Benefits of the Research

The researcher identified in the existing literature the research gap in the context of IT project risk identification in Qatar public sector is a causal relationship between risk identification adoption and project delivery (stakeholder's satisfaction). Therefore, this research hypothesizes that project risk identification adoption for the identified dimensions (consisting of nine factors namely, Stakeholders, Business processes, Project management, Human resources, Organizational, Technical, Budget, Schedule, and External) impact project delivery (satisfaction). Understanding the impact of the identified risk factors will enable project managers, practitioners to manage the public sector's projects more efficiently. On the other hand, IT decision-makers can better appreciate the value of risk management practice adoption and its contribution to overall project delivery.

1.6 Structure of the Research

This research developed and examined a conceptual research model with nine hypotheses based on the aforementioned rationales. The following chapter presents the literature review in (Chapter 2) which includes an investigation of the key factors of the research conceptual model and hypotheses, followed by the research methodology undertaken to perform this research in (Chapter 3). The data analysis and results' discussion is reported in (chapter 4), and finally, conclusions, implications, limitations, and future work in (Chapter 5).

CHAPTER 2: LITERATURE REVIEW

IT project management is never easy, particularly when there are multiple stakeholders, new or unproven technologies, changing or ambiguous project requirements, and limited resources. These project challenges are increased in the public sector, which relies on efficient projects to make the required changes to keep up with a rapidly changing environment. According to (Odimabo and Oduoza 2018) assessing risk is an important part of well-managed information technology projects; risk management has become a serious matter due to globalization and continued pursuit for greater returns. Why risk management in IT project specifically in the public sector? According to (Pimchangthong and Boonjing 2017) public projects have the potential to change citizens' lives as well as government effectiveness and productivity. Many in charge of public-sector projects are part of a proud tradition of projects that have produced positive outcomes for society. This research investigates and explores the risk identification impact on IT projects in Qatar's public sector from the project management professionals' and various stakeholders' perspectives.

2.1 Public versus Private sectors

The public sector has its own set of attributes and distinctions from the private sector. An early public-private distinction theory (Rainey et al. 1976), based on public administration, argued that the two sectors have major differences in terms of their goals, priorities, and planning, selection, management, motivation, monitoring, and evaluating outcomes. Public managers in Denmark use more participative leadership, while private managers use more directive leadership (Hansen and Villadsen 2010). In a similar vein, (Andersen 2010) discovered that public and private managers in Sweden have very different leadership styles and motivation profiles. In his research, the public

administrators had a more change-oriented leadership style. Also,(Martinez-Lorente, Dewhurst, and Gallego-Rodriguez 2000) characterize public organizations as being those that are not profit-oriented, whereas (Fryer, Antony, and Douglas 2007) define the public sector as the set of organizations that provide goods, and services to a government at a local or national level. Therefore,(Fryer, Antony, and Douglas 2007) pointed out that the distinction between the public and private sectors has four aspects, the first is the main objective is not profit maximization. The second, lack of clarity about who the actual customers are in line with different customer's needs. The third, a large number of stakeholders. Fourth, the public sector is subject to the controls and oversights of governments.

The fundamental distinction between these two sectors of society, according to (Waldt 2011), boils down to benefit (private sector) and service delivery (public sector) as priorities to be accomplished. "Public" usually refers to the portion of the economy that is under the control and direction of the government, while "financial" usually refers to the portion of the economy that is under the control and direction of non-governmental entities. The private sector is described as businesses that are founded and run for profit, with profits going to owners, partners, or sole traders.

2.2 What is Risk

(Bannerman 2013) defines risk in IT projects as the likelihood of a particular failure or effect on the project's outcome. That is, R = P x I, where R is the risk exposure due to a particular risk factor, P is the risk's likelihood, and I is the impact or magnitude of the unsatisfactory outcome loss. Risk is characterized as an event or an unknown situation that, if it occurs, will have a positive or negative impact on at least one project objective, according to (De Godoi Contessoto et al. 2016). When a risk has the potential to produce a positive outcome, it is referred to as an opportunity; whereas, when the

risk has the potential to produce a negative outcome, it is referred to as a threat.

Furthermore, according to (Bannerman 2013), the risk is usually calculated in terms of dollars or time. The general principle is that all possible project risk factors should be established to minimize the chances of a poor project outcome. The risk exposure for each factor is then determined (using the formula above) and the exposures are prioritized to determine the most critical project risks. The priority is then changed to high-risk factors to minimize the chances of them happening. (and/or the severity of the effects if they do occur) by putting in place control mechanisms such as mitigation techniques and/or contingency plans.

Risk factors are monitored over time to identify them as early as possible. The onset of a predefined risk trigger or the reaching of a predetermined risk threshold signals the materialization of a risk factor, at which point predefined contingency plans can be implemented to mitigate the impact.

2.3 Risk Identification

According to (De Godoi Contessoto et al. 2016) the PMBoK guide proposes risk management as a collection of six processes that interact with one another and with other knowledge areas. Each process occurs at least once during the project's life cycle. Since the inaccurate identification of risks directly impacts the failure of a product or service, the risk identification process is critical for the efficient implementation of risk management in projects. After all, it's difficult to manage something that isn't well-known. As a result, project managers must encourage activities that will result in complete and comprehensive risk identification. Risk identification is central to the risk management practice; the project team should always ensure that specific risks affecting the success of the project are identified.

Risk identification, therefore, is the procedure used by the project team to

document risk attributes and their potential impact on the outcome of the project (Kloppenborg, Contemporary Project Management, Third Edition, 2014). Investment in risk management is not considered expensive since it contributes towards project's success (Bhujang 2017).

2.3.1 The Identified Research Risk Factors

The literature reviews identified the most critical risk factors that affect IT project delivery. In addition, the researcher conducted brainstorming sessions, and interviews with project management professionals to get their views and feedback to validate the established risk factors and construct the research questionnaire accordingly.

2.3.2 Stakeholders Factor

According to (Kishk and Ukaga 2008) stakeholder factor has been divided into five items namely: Organizational management support, Business owner's support, Project team commitment, Government policies/procedures, and Support entities, e.g. Procurement, Finance, etc. The purpose of these items to seek the respondent's feedback on the criticality of the factor and its impact on project delivery (satisfaction).

2.3.3 Business Processes Factor

According to (Caron 2013) Business process has been divided into three items namely: The availability of all relevant business processes, Documentation of all relevant business processes, and the adaptability of IT platforms to the required business processes. The purpose of these items to seek the respondent's feedback on the criticality of the factor and its impact on project delivery (satisfaction).

2.3.4 Project Management Factor

According to (DIDRAGA 2013) Project management factor has an impact on project success. Therefore, the factor has been divided into four items namely: The

accurate estimation of project activities' duration, Proper project planning, and in

place project management controlling process (to compare actual vs. planned), and

Effective project communications. The purpose of these items to seek the

respondent's feedback on the criticality of the factor and its impact on project delivery

(satisfaction).

2.3.5 Human Resources Factor

According to (Kishk and Ukaga 2008) Human resources factor has been divided into four items namely: Project team competence, Proper conflict management, Project managers' skills, and knowledge, and Project team dynamics (teamwork). The purpose of these items to seek the respondent's feedback on the criticality of the factor and its impact on project delivery (satisfaction).

2.3.6 Organizational Factor

According to (Caron 2013) Organizational factor has been divided into four items namely: Project dependencies on other projects, Resource availability, Availability of funding, and Prioritization of organizations' projects. The purpose of these items to seek the respondent's feedback on the criticality of the factor and its impact on project delivery (satisfaction).

2.3.7 Technical Factor

According to (S. T. Namitha Sheen, R. Shanmuga Priyan, and S. Sugumar 2017) the technical factor has been identified as a risk factor and divided into six items namely: Complete requirements (i.e. cover technical, security, quality, scalability, etc.), Accuracy of requirements (i.e. cover technical, security, quality, scalability, etc.). The stability of the IT infrastructure, The complexity of the IT platform, The performance and reliability of the IT platform, and The availability of a quality assurance process. The purpose of these items to seek the respondent's feedback on the criticality of the factor and its impact on project delivery (satisfaction).

2.3.8 Budget Factor

According to (S. T. Namitha Sheen, R. Shanmuga Priyan, and S. Sugumar 2017) budget has been identified as a risk factor and divided into four items namely:

Accuracy of project cost estimation, Availability of project funds, Monitoring and controlling the project spending, and Transferring funds between projects. The purpose of these items to seek the respondent's feedback on the criticality of the factor and its impact on project delivery (satisfaction).

2.3.9 Schedule Factor

According to (S. T. Namitha Sheen, R. Shanmuga Priyan, and S. Sugumar 2017) schedule is an identified risk factor that impacts the project delivery. Therefore, the items related to schedule were divided into five items namely: Completeness and Accuracy of schedule estimation, Validation of the project schedule (i.e. team proposal vs. realistic), Crashing project schedule, Monitoring and controlling the project progress, and Longer project duration. The purpose of these items to seek the respondent's feedback on the criticality of the factor and its impact on project delivery (satisfaction).

2.3.10 External Factor

According to (S. T. Namitha Sheen, R. Shanmuga Priyan, and S. Sugumar 2017) external factor has been identified as a risk factor and divided into three items namely: Vendor competence, Market fluctuation, and Fluctuating customer expectations. The purpose of these items to seek the respondent's feedback on the criticality of the factor and its impact on project delivery (satisfaction).

2.3.11 Delivery Satisfaction Factor

According to (Kishk and Ukaga 2008) Delivery satisfaction factor has been divided into five items namely: Satisfaction with the identified risk factor, Adoption of identified risk factors, Risk factors identified process meet the expectations, Recommendation of the identified risk factors to other project management professionals and the identified risk factors positively contribute to project delivery.

The purpose of these items to seek the respondent's feedback (Satisfaction) on the identified risk factors

3. Related work

According to (DIDRAGA 2013), Risk management is a process that consists of four distinct phases: (identification), (analysis), (response), (monitoring, and control). The rational decision-making approach to risk management is used by management and seeks to recognize project-specific incidents and circumstances that could have an impact on the initial schedule, as well as establish strategies to keep the current project on track. Since it deals with the real risks of the current project, the risk management approach makes a direct contribution to project performance.

According to (Baccarini, Salm, and Love 2004), identifying IT project risks and related factors during project execution can be a difficult task for project managers since there are so many different ways to classify and categorize them. Since risks vary in nature, magnitude, and effect, it is critical to identify, understand, and handle those considered high-level. According to (Tesch, Kloppenborg, and Frolick 2007) IT project risk management Advocates claim that identifying and evaluating risks will lead to actions that minimize the likelihood of failure while increasing the likelihood and effect of positive events

Risk identification is critical to the risk management process; therefore, the project team members should ensure that specific risks affecting project success are identified. As a result, risk identification is the process by which the project team documents risk attributes and their potential impact on project outcome. This process, however, is preceded by effective brainstorming sessions, which are usually led by the project manager (George, 2020).

According to (George, 2020), the identification of risk allows the team to

comprehend the risk nature and formulate a strategy for proper management. Risk identification has an impact on project stakeholder's decisions in the creation of a sustainable project. When assessing risk in IT projects, keep the following in mind: Increase the number of information sources to capture enough risks that could jeopardize the project. Examine all of the readily available risk identification tools and, if necessary, seek out additional tools and methods. Ascertain the effectiveness and efficiency of the risk identification process

3.1 Techniques used to gather risk information

Interview: An interview is a one-on-one meeting between the interviewer and the interviewee that can help identify many of the project's hidden risks. The Delphi method is an estimation method in which a structured group of subject experts is given the chance to answer questions in two or more rounds, each of which is predetermined by a stop criterion. At the end of each round, the coordinator will ask each panelist anonymous questions to help them make a decision. During this process, however, the range of possible responses narrows until the group agrees on a single answer that is considered correct. Other techniques are Expert opinion, SWOT analysis, Diagramming techniques, and Review of previous project documents.

According to (Ewer and Mustafa 2008) both presented another approach to risk identification that is both prescriptive and creative. Checklists of common risks are frequently used. These risks arise in a specific context. Working with checklists is simple and quick, but it only addresses the risks listed. Checklists are active if no issues are left out. Identifying risks typically requires experience and knowledge; however, the project team must ensure that the historical risk information does not obstruct a creative assessment of the future risks. According to the researcher's knowledge, IT project risk identification has not been explored, nor investigated. Hence, this research

will investigate the relationship of the nine identified risk factors with project delivery (satisfaction) including testing the research hypotheses in the context of Qatar public sector.

4. A summary of the literature review

The identified research risk factors were based on literature reviews, brainstorming sessions, and interviews with several project management professionals. The identified risk factors were used to construct the research questionnaire to collect the research data. The risk factors were identified as follows: Stakeholders, Business Processes, Project Management, Human Resources, Organizational, Technical, Budget Schedule, External, and Delivery Satisfaction.

Risk identification is a crucial and important process to project risk management, hence, the project management team should ensure proper risk identification tools have been utilized to effectively identify potential risks; some of the tools and techniques are brainstorming sessions, Expert opinion, SWOT analysis, Diagramming techniques, and Review of previous project documents. Other researches utilized more tools and techniques to identify risks such as Interviews, Delphi method.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Research Model

Project risk management practice consists of four main processes namely: Risk identification, Risk analysis, Risk response plan, and Risk monitoring and control. The below model was built to assess the impact of risk management practice on project delivery and then the project delivery impacts on Stakeholder's satisfaction, this is a comprehensive model
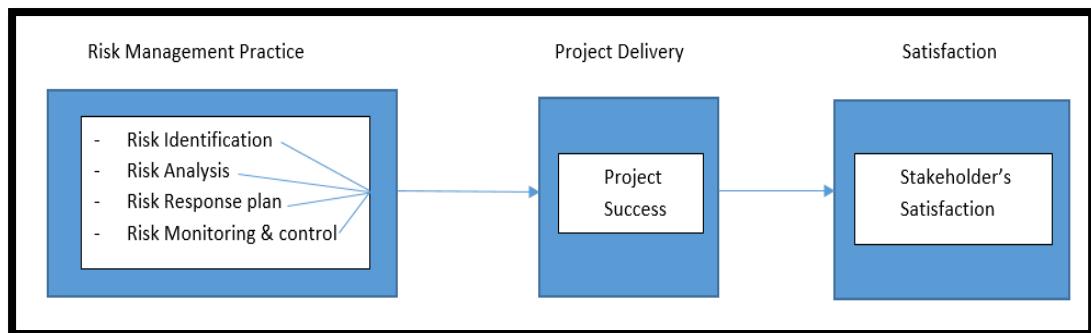
Figure 1. Overall Risk Management Practice Model

However, this research aims only to investigate the impact of the risk identification factors on project delivery (Satisfaction) which is part of the above model, therefore, the above model was modified to test the impact of the risk identification and project delivery only as depicted below.
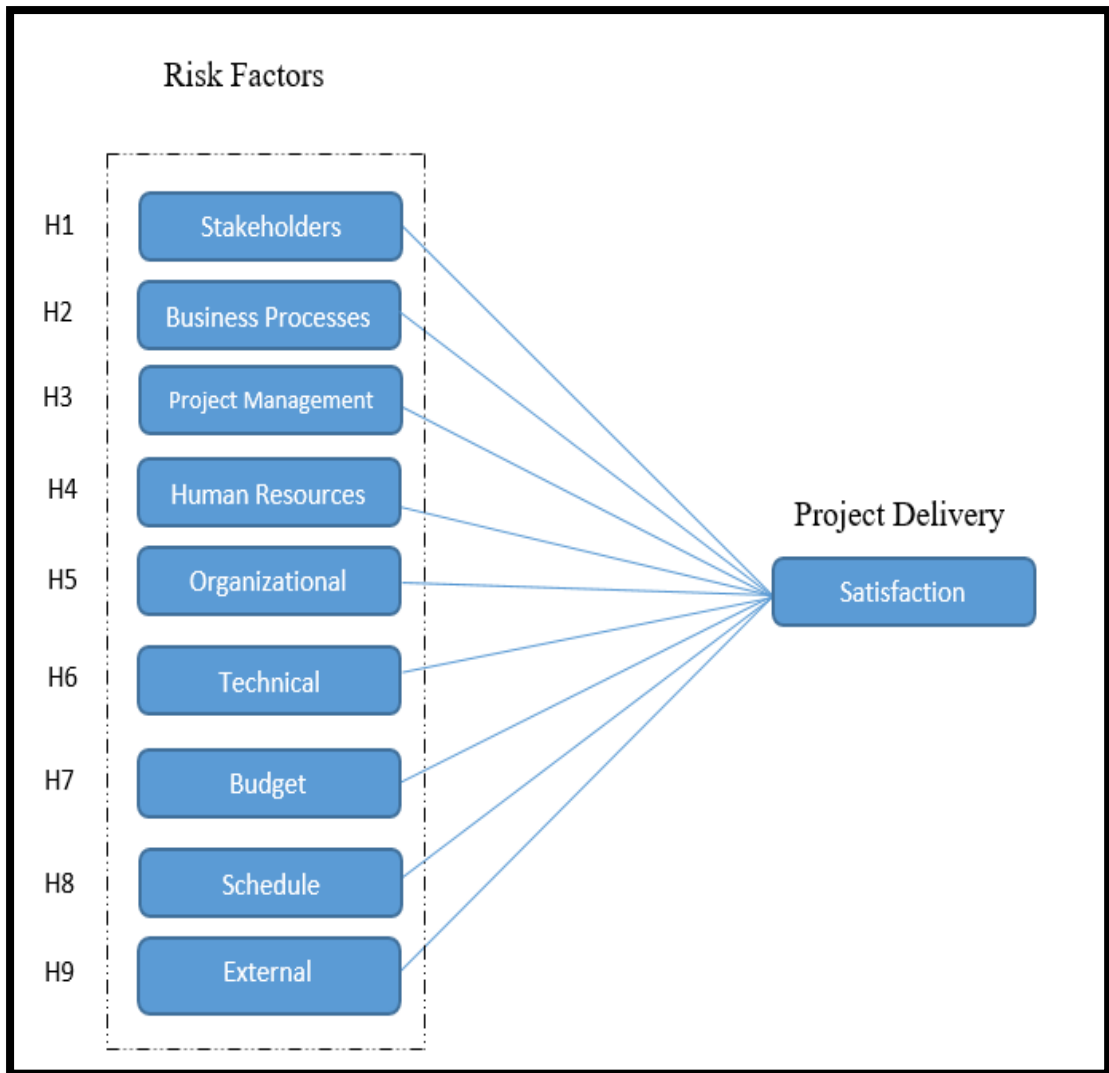
Figure 2. Research Model

3.2 Research Hypotheses:

Based on an extensive literature review and interviews with key project management professionals, the nine research hypotheses developed as follows:

H1: Stakeholders engagement impact project delivery

H2: Comprehensive and accurate business process availability impact project delivery

H3: Adopting well-defined project management methodology impact project delivery

H4: Human resources competence impact project delivery

H5: Organizational strategic objectives impact project delivery

H6: Reliable IT systems and platforms impact project delivery

H7: Accuracy of estimates and availability of budget impact project delivery

H8: Realistic schedule estimates impact project delivery

H9: Competent and reliable vendors and suppliers impact project delivery

3.2 Research Approach and Design

This research is using the experimental research approach where we can manipulate and apply the independent variables (Risk factors) to the dependent variable (Project delivery) to measure the impact on the project delivery (Satisfaction). As shown previously in the research model, this research identified the critical key risk factors in IT projects within Qatar public sector that lead to project delivery satisfaction. The questionnaire captured the respondent's feedback/views on the identified risk factors.

3.3 Research Instrument

An online-based Google form questionnaire was developed to determine the critical risk factors that have an impact on project delivery (satisfaction). The questionnaire was divided into three parts, with the first addressing the sample's demographics and the second concentrating on risk factors and their items. The third focusing on delivery satisfaction. The risk factors that made up the independent variables were carefully chosen after conducting a comprehensive literature review and conducting brainstorming sessions and interviews with few project management professionals working in Qatar public sector. The rating scale used for measuring the critical risk factors is the Likert scale, which is used to assess the subject's view, feelings, or perceptions. Subjects choose from a variety of responses to a particular question or statement; typical responses include (1= strongly disagree, 2= disagree, 3= neutral, 4= agree, and 5= strongly agree).

3.4 Sample and Data Collection

The research sample included the following individuals: project management professionals, functional managers, and project stakeholders involved in IT projects in Qatar public sector. A combination of purposive and snowball sampling provided the target. According to (Baccarini, Salm, and Love 2004), Purposive sampling helps the researcher to choose appropriate respondents who are knowledgeable about the research subject and can contribute the most to the analysis. Snowball sampling starts with a few respondents being asked to suggest others who might be able to contribute to the study, and then they are interviewed (Baccarini, Salm, and Love 2004). This allows the best respondents to be chosen based on their knowledge of the subject, availability, and the researcher's opinion of their suitability for the research.

The parameters used to pick the sample were as follows: Project Managers, functional managers, and the project team (business/technical), with a range of 1 to 3, 4 to 10 years, and over 10 years of experience. Business owner (customer), and Service provider (vendor) involved in IT projects implementation in Qatar public sector. Data were obtained through a structured English questionnaire developed in Google forms. The research used quantitative research methodology. The questionnaire was pre-tested on a group of project managers, functional managers, and project team, who had over 5 years of collective experience in IT projects implementation, minor improvements were made as recommended. The self-administered online survey was available for 5 days, starting on April 11 and ending on April 15, 2021. As the web-based survey allows for real-time response searching, its advantages surpass those of a paper-based survey in terms of data collection speed and cost, as well as data quality. As a result, the web-based survey was chosen. Also, the web-based survey allows for real-time data and response viewing, as well as easy data conversion to analysis applications.

The survey was designed in such a way that it could be completed between 10 to 15 minutes maximum. To reduce the non-response rate, the survey design included anonymity, assurance of confidentiality, and a voluntary arrangement to obtain the research results if respondents desired. The target population included all project management professionals, functional managers, and project team members who manage or are involved in IT projects implementation in the Qatar public sector. All respondent provides his/her consent since the survey stated clearly that participation is voluntary and anonymous, thus reducing bias.

3.5 Data Sources

The research data based on primary data collection through an online questionnaire. Initially, respondents were asked whether they were managing IT projects or part of the project management team in Qatar Public Sector. This question was added to the questionnaire to confirm respondents among the targeted sample. Based on His/her answer, either they may continue to complete the survey or the survey will end for them. Respondents demographically categorized by age, gender, educational level, occupation, experience, His/her Organization role, and nationality.

Following the demographics section, the risk identification was divided into nine factors based on the research model, with at least three items for each factor. The delivery satisfaction is the last section with its items. The questionnaire was distributed to get at least 300 respondents. Appendix A contains the questionnaire that was distributed to collect the primary data for this research.

3.6 Statistical Methods

For demographic variables, the descriptive statistics tool is used to calculate measurements of central trend (mean), dispersion (range, standard deviation, variance,

minimum, and maximum), and frequency. The correlation coefficient and significance levels were calculated to assess the degree to which all factors that made up the research variables were linearly associated.

A Hypotheses Test method was used to predict the P-value of each of the nine independent risk factors to the dependent delivery satisfaction. SmartPLS was used to perform the outer loading analysis, they evaluate an item's absolute contribution to the construct from which it is assigned.

CHAPTER 4: DATA ANALYSIS AND RESULT DISCUSSIONS

The total number of participants who took part in the research was 174. Since the online survey only reported completed responses and ignored any partially filled surveys, all responses were final. 14 respondents were excluded from the total 174 surveys collected; these respondents stated that they do not manage IT projects nor members of the project management team. The remaining 160 responses were taken into account. The questionnaire was generated with Google Forms, and the data were analyzed with SPSS v27, Microsoft Excel 2016, and SmartPLS 3.3.3.

4.1 The Questionnaire's Validity

The questionnaire was approved by the QU-IRB Committee to ensure its validity and integrity. All of the ethical conditions and requirements were met by the questionnaire. QU-1500 E21 is the ethical approval number, and the approval letter can be found in Appendix B.

4.2 Frequencies and Percentages

As shown in Table 1, The frequency of responses for the demographic variables was determined using descriptive statistics. Respondents were included in the research regardless of their age, gender, education level, occupation, experience, organizational role, or nationality. In terms of age, however, only respondents over the age of 18 were considered. The age categories, 26 to 40 years old, and above 40 years old each accounting for 36.9% of the total, followed by 26.3% for the 18 to 25 years old category. In respect to gender, 58.8% of respondents were male compared to 41.3% were female. The bachelor degree constituted the highest 40% compared to 38.1% for Master/Ph.D. and 21.9% high school/diploma. In Occupation, the data shows 53.1% of the respondents were project managers and 18.8% are functional managers, 23.1% are project team (business/technical), and 5% other. For the

experience categories, 1 to 3 years and 4 to 10 years each counted for 33.8%, and over the 10 years category was 32.5%.

According to organizational role 61.3% were from the business owner (customer) side whereas, 38.8% from the service provider (vendor) side. Non-Qataris made up 69.9% whereas the Qataris are 30.1% of the respondents.

Table 1. Response percentages based on demographic

Variable	Frequency	Percentage
Age		
• 18-25 years	42	26.3
• 26-40 years	59	36.9
• Above 40 years	59	36.9
Gender		
• Male	94	58.8
• Female	66	41.3
Education		
• High School/Diploma	35	21.9
• Bachelor Degree	64	40.0
• Master/Ph.D.	61	38.1
Occupation		
• Project Manager	85	53.1
• Functional Manager	30	18.8
• Project team (business/technical)	37	23.1
• Other	8	5.0
Experience		
• 1 to 3 years	54	33.8
• 4 to 10 years	54	33.8
• Over 10 years	52	32.5
Organizational Role		
• Business owner (Customer)	98	61.3
• Service Provider (Vendor)	62	38.8
Nationality		
• Qatari	56	35.0
• Non-Qatari	104	65.0

4.3 Descriptive Analysis

The items in the questionnaire reflect the factors that contribute to the nine major dimensions that characterize the research's current state. This research aimed to address the research questions by using a collection of statements that described how subjects feel about the identified IT project risk factors. As a result, the means and standard deviations of the nine dimensions' set of items were measured. The social sciences study followed the classification shown in Table 2 using a 5-point Likert scale in discussing the status of a scale meaning.

Table 2. Mean scale and criteria

Mean	Criteria
1.00 – 2.33	Low agreement with the statement
2.33 – 3.66	Moderate agreement with the statement
3.66 – 5.00	High agreement with the statement

The item descriptive statistics were calculated individually for each set of items constituting the nine factors. The data in Table 3 indicates that the mean for each of the items under Stakeholder is perceived to be within the range of high agreement with the statement including the total mean average of 4.3. The standard deviations for each item are considered in a low range, which indicates that the points are distributed close to the mean that is including the total stakeholder average SD of 0.705.

Table 3. Item descriptive statistics for Stakeholder factor

	Item description	Mean	SD
Q3.1.1	Organizational management support impacts the project delivery satisfaction	4.36	.542
Q3.1.2	Business owner's support impacts the project delivery satisfaction	4.29	.723
Q3.1.3	Project team commitment impacts the project delivery satisfaction	4.29	.764
Q3.1.4	Government policies/procedures impact the project delivery satisfaction	4.20	.783
Q3.1.5	Supporting Entities, e.g. Procurement, Finance, etc. policies and procedures impact the project delivery satisfaction	4.36	.714
StakeAve		4.3	0.705

The second factor analyzed is the Business process factor in table 4. All the mean items are perceived to be within the range of high agreement with the statement, including the item's mean average of 4.28. Each item Standard Deviation within the low range, which indicates that the points are distributed close to the mean, that is including the total stakeholder average Standard Deviation of 0.748.

Table 4. Item descriptive statistics for Business processes factors influence

	Item description	Mean	SD
Q3.2.1	Availability of all relevant business processes impacts the project delivery satisfaction	4.28	.770
Q3.2.2	Documentation of all relevant business processes impacts the project delivery satisfaction	4.26	.763
Q3.2.3	The adaptability of the IT platform to the required business processes impacts the project delivery satisfaction	4.29	.713
BPAve		4.28	0.748

The third factor analyzed is the Project Management factor in table 5. All item's mean is perceived to be within the range of high agreement with the statement including the mean average with the value of 4.23 with an average standard deviation of 0.863, which indicates that the points are distributed close to the mean.

Table 5. Item descriptive statistics for Project management factors influence

	Items description	**Mean**	**SD**
Q3.3.1	The accurate estimation of project activities' durations impacts the project delivery satisfaction	4.03	.948
Q3.3.2	Proper project planning impacts the project delivery satisfaction	4.24	.901
Q3.3.3	An in place project management controlling process (to compare actual vs. planned) impacts project delivery satisfaction	4.18	.924
Q3.3.4	Effective project communications impact the project delivery satisfaction	4.47	.682
PMAve		4.23	0.863

The fourth factor analyzed is the Human Resources factor in table 6. All the mean items are perceived to be within the range of high agreement with the statement including the mean average with the value of 4.40. However, the Standard Deviation for all items including the average is 0.665 within the low range indicating that the points are distributed close to the mean.

Table 6. Item descriptive statistics for Human resources factors influence

	Items description	Mean	SD
Q3.4.1	Project team competence impacts the project delivery satisfaction	4.39	.701
Q3.4.2	Proper conflict management impacts the project delivery satisfaction	4.33	.661
Q3.4.3	Project Manager's skills and knowledge impact the project delivery satisfaction	4.45	.642
Q3.4.4	Project team dynamics (teamwork) impact the project delivery satisfaction	4.43	.659
HRAve		4.40	0.665

The fifth factor analyzed is The Organizational factor in table 7. All the mean items under the Organizational factor are perceived to be within the range of high agreement with the statement, including the total mean average of 4.17. The standard deviation for each item is considered to be in a low range including the average value of 0.865, which means that the points are distributed close to the mean.

Table 7. Item descriptive statistics for Organizational factors influence

	Items description	Mean	SD
Q3.5.1	Project dependencies on other projects/resources impact the project delivery satisfaction	4.11	.958
Q3.5.2	Resources availability impacts the project delivery satisfaction	4.17	.953
Q3.5.3	Availability of funding impacts the project delivery satisfaction	4.15	.826
Q3.5.4	Prioritization of organizations' projects impact the project delivery satisfaction	4.24	.725
ORAve		4.17	0.865

The sixth factor analyzed is the Technical factor in table 8. All the mean items are perceived to be within the range of high agreement with the statement, including the average mean with the value of 4.16. The Standard Deviation of each item is considered in the low range including the average value of 0.938 which means all points are distributed close to the mean.

Table 8. Item descriptive statistics for Technical factors influence

	Items description	**Mean**	**SD**
Q3.6.1	Complete requirements (i.e. cover technical, security, quality, scalability, etc.) impacts the project delivery satisfaction	4.41	.772
Q3.6.2	Accuracy of requirements (i.e. cover technical, security, quality, scalability, etc.) impacts the project delivery satisfaction	4.11	1.028
Q3.6.3	The stability of the IT infrastructure impacts the project delivery satisfaction	4.01	1.037
Q3.6.4	The complexity of the IT platform impact the project delivery satisfaction	4.00	1.022
Q3.6.5	The performances and reliability of the IT platform impact the project delivery satisfaction	4.15	.919
Q3.6.6	The availability of a quality assurance process impacts the project delivery satisfaction	4.30	.853
TCAve		4.16	.938

The seventh factor analyzed is the Budget factor in table 9. All the mean items are perceived to be within the range of high agreement with the statement including the average value of 4.13. The Standard Deviation for each item including the average is 0.901 that is considered to be in a low range which means all points are distributed close to the mean.

Table 9. Item descriptive statistics for Budget factors influence

	Item description	Mean	SD
Q3.7.1	Accuracy of project cost estimation impacts the project delivery satisfaction	4.28	.672
Q3.7.2	The availability of project funds throughout the project lifecycle impact the project delivery satisfaction	4.16	.924
Q3.7.3	Monitoring and controlling the project spending impact the project delivery satisfaction	4.13	.946
Q3.7.4	Transferring funds between projects impacts the project delivery satisfaction	3.94	1.062
BDAve		4.13	.901

The eighth factor analyzed is the Schedule factor in table 10. All the mean items are perceived to be within the range of high agreement with the statement including the average mean with the value of 4.19. The Standard Deviation for each item is considered in a low range including the average value of 0.919, which means all points are distributed close to the mean.

Table 10. Item descriptive statistics for schedule factors influence

	Items description	Mean	SD
Q3.8.1	Completeness and accuracy of schedule estimation impact project delivery satisfaction	4.42	.639
Q3.8.2	Validation of the project schedule, (i.e. team proposals vs. realistic) impact project delivery satisfaction	4.35	.826
Q3.8.3	Crashing project schedule will influence project delivery satisfaction	4.16	1.031
Q3.8.4	Monitoring and controlling the project progress impact the project delivery satisfaction	4.00	1.040
Q3.8.5	Longer project duration impacts the project delivery satisfaction	4.01	1.061
SCAve		4.19	.919

The ninth factor analyzed is the External factor in table 11. All the mean items are perceived to be within the range of high agreement with the statement including the mean average value of 4.29. The Standard Deviation for all items is considered within the low range including the average with the value of 0.787, which means all points are distributed close to the mean.

Table 11. Item descriptive statistics for External factors influence

	Items description	Mean	SD
Q3.9.1	Vendor competence impacts the project delivery satisfaction	4.31	.754
Q3.9.2	Market fluctuation impacts the project delivery satisfaction	4.23	.892
Q3.9.3	Fluctuating customer expectations impacts project delivery satisfaction	4.34	.717
EXAve		4.29	.787

The Delivery Satisfaction dependent variable is analyzed in table 12. All the mean items are perceived to be within the range of high agreement with the statement including the mean average value of 4.19. The Standard Deviation for each item is considered to be in a low range including the average of 0.965, which means all points are distributed close to the mean.

Table 12. Item descriptive statistics for Delivery satisfaction factors influence

	Items description	Mean	SD
Q4.1	I am satisfied with the risk factors that have been identified	4.19	.955
Q4.2	I would adopt the identified risk factors in my project management strategy	4.25	.984
Q4.3	Risk factors identification process meet my expectations	3.93	1.155
Q4.4	I would recommend the identified risk factors to other project management professionals and practitioners	4.25	.925
Q4.5	The identified risk factors contribute positively to project delivery	4.34	.808
SFAve		4.19	.965

4.4 Reliability Test

The survey reliability test was performed using SmartPLS Cronbach's Alpha measurement, the result is showing in table 13, Cronbach Alpha and Average Variance Extracted (AVE) for each factor is higher than 0.5 indicating that the measurement questions can better reflect the characteristics of each research variable in the model, which indicates that the research factors are reliable and consistent. (Gu et al. 2019).

Table 13. Survey Reliability Test

Factors	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Stakeholders	0.791	0.845	0.877	0.706
Business Process	0.779	0.795	0.871	0.694
Project Management	0.641	1.146	0.820	0.701
Human Resources	0.809	0.827	0.873	0.634
Organizational	0.745	0.842	0.841	0.639
Technical	0.776	0.785	0.870	0.690
Budget	0.796	0.806	0.880	0.710
Schedule	0.712	0.716	0.823	0.537
External	0.732	0.748	0.846	0.647
Satisfaction	0.825	0.848	0.885	0.661

4.5 Correlation Analysis

The correlation analysis was conducted to understand the relationship between the independent variables of the research based on the model that includes stakeholders, business processes, project management, human resources, organizational, technical, budget, schedules, and external, and its dependent variable satisfaction. The correlation analysis helps in highlighting the relationship between each independent variable and the dependent variable. In addition, it helps to show the independent variables related to each other. If the correlation values are greater than 0.50 that indicates there is a high correlation among the variables, a positive value indicates a direct relationship, and a negative value indicates an indirect relationship.

In this research, most of the variables are showing that the values are greater than 0.50 which shows that there is a high level of correlation among the variables, and it is appropriate to conduct further tests to highlight the effect of all these independent variables on the dependent variable (Satisfaction). If the values lower than 0.50 then it would have indicated that there is no relationship or a weak relationship. The significance values are below 0.05 indicate that the relationship is significant among all

these variables. Stakeholder correlation with Satisfaction is 0.417** indicates that the correlation is significant at 1%. Business process correlation with Satisfaction is 0.506** indicates that the correlation is significant at 1%, however, project management correlation with Satisfaction is 0.083 shows weak correlation, Human resources correlation with Satisfaction is 0.527** indicates that the correlation is significant at 1%,

Organizational correlation with Satisfaction is 0.315** indicates that the correlation is significant at 1%. The technical factor correlation with Satisfaction is 0.468** indicates that the correlation is significant at 1%. The budget correlation with Satisfaction is 0.585** indicates that the correlation is significant at 1%. The schedule correlation with Satisfaction is 0.614** indicates that the correlation is significant at 1%. The External correlation with Satisfaction is 0.399** indicates that the correlation is significant at 1%.

Table 14. Pearson's Correlations Matrix

		Stakeholder	Business Processes	Project Management	Human Resources	Organizational	Technical	Budget	Schedule	External	Satisfaction
Stake	Pearson Correlation	1									
	Sig. (2-tailed)										
	N	160									
Business Processes	Pearson Correlation	.710**	1								
	Sig. (2-tailed)	.000									
	N	160	160								
Project Management	Pearson Correlation	.461**	.494**	1							
	Sig. (2-tailed)	.000	.000								
	N	160	160	160							
Human Resources	Pearson Correlation	.710**	.770**	.458**	1						
	Sig. (2-tailed)	.000	.000	.000							
	N	160	160	160	160						
Organizational	Pearson Correlation	.332**	.540**	.707**	.567**	1					
	Sig. (2-tailed)	.000	.000	.000	.000						
	N	160	160	160	160	160					
Technical	Pearson Correlation	.503**	.601**	.542**	.642**	.719**	1				
	Sig. (2-tailed)	.000	.000	.000	.000	.000					
	N	160	160	160	160	160	160				
Budget	Pearson Correlation	.425**	.440**	.265**	.662**	.471**	.633**	1			
	Sig. (2-tailed)	.000	.000	.001	.000	.000	.000				
	N	160	160	160	160	160	160	160			
Schedule	Pearson Correlation	.494**	.445**	.150	.590**	.387**	.723**	.699**	1		
	Sig. (2-tailed)	.000	.000	.058	.000	.000	.000	.000			
	N	160	160	160	160	160	160	160	160		
External	Pearson Correlation	.389**	.501**	.158*	.612**	.427**	.496**	.524**	.606**	1	
	Sig. (2-tailed)	.000	.000	.047	.000	.000	.000	.000	.000		
	N	160	160	160	160	160	160	160	160	160	
Satisfaction	Pearson Correlation	.417**	.506**	.083	.527**	.315**	.468**	.585**	.614**	.399**	1
	Sig. (2-tailed)	.000	.000	.298	.000	.000	.000	.000	.000	.000	
	N	160	160	160	160	160	160	160	160	160	160

**. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed)

4.6 Outer Loading Analysis

SmartPLS was used to perform the outer loading analysis, in reflective measurement models, outer loadings are the approximate relationships. They evaluate an item's absolute contribution to the construct from which it is assigned. During the analysis, some items were removed for example 3.1.2 was removed since its value was less than 0.05. Also, Q3.3.1 and 3.3.1 both were removed as well since their values

were negative. It was possible to highlight and identify the important questions that were going to support each of the independent variables. All the nine independent variables and the dependent variable were developed using composite variables and the below matrix helped in making sure that the factor loadings were done properly analyzed.

Table 15. Outer Loading

Items	Stake	BP	PM	HR	OR	TC	BD	SC	EX	SF
@3.1.3 Project team commitment impact project delivery satisfaction	0.69									
@3.1.4 Government policies procedures impact project delivery satisfaction	0.90									
@3.1.5 Supporting Entities e.g. Procurement Finance etc. policies and procurement impact project delivery satisfaction	0.90									
@3.2.1 Availability of all relevant business processes impact project delivery satisfaction		0.78								
@3.2.2 Documentation of all relevant business processes impact project delivery satisfaction		0.84								
@3.2.3Adaptability of IT platform to the required business impact project delivery satisfaction		0.88								
@3.3.3 An in place project management controlling process to compare actual vs planned impact project delivery satisfaction			0.68							
@3.3.4 Effective project communications impact project delivery satisfaction			0.96							
@3.4.1 Project team competence impact project delivery satisfaction				0.77						
@3.4.2 Proper conflict management impact project delivery satisfaction				0.83						

Items	Stake	BP	PM	HR	OR	TC	BD	SC	EX	SF
@3.4.30 skills and knowledge impact project delivery satisfaction				0.75						
@3.4.4 Project team dynamics team work impact project delivery satisfaction				0.84						
@3.5.1 Project dependencies on projects resources impact project delivery satisfaction					0.75					
@3.5.3 Availability of funding impact project delivery satisfaction					0.75					
@3.5.4 Prioritization of organizations' projects impact project delivery satisfaction					0.87					
@3.6.4 The complexity of the IT platform impact project delivery satisfaction						0.81				
@3.6.5 The performances and reliability of the IT platform impact project delivery satisfaction						0.86				
@3.6.6 The availability of a quality assurance process impact project delivery satisfaction						0.81				
@3.7.1 Accuracy of project cost estimation impact project delivery satisfaction							0.82			
@3.7.2 The availability of project funds throughout the project lifecycle impact project delivery satisfaction							0.87			
@3.7.3 Monitoring and controlling the project spending impact project delivery satisfaction							0.82			

Items	Stake	BP	PM	HR	OR	TC	BD	SC	EX	SF
@3.8.1 Completeness and accuracy of schedule estimation impact project delivery satisfaction								0.69		
@3.8.2 Validation of the project schedule i.e.team proposals vs. realistic impact project delivery satisfaction								0.73		
@3.8.3 Crashing project schedule will impact project delivery satisfaction								0.78		
@3.8.4 Monitoring and controlling the project progresss impact project delivery satisfaction								0.73		
@3.9.1 Vendor competence impact project delivery satisfaction									0.80	
@3.9.2 Market fluctuation impact project delivery satisfaction									0.83	
@3.9.3 Fluctuating customer expectations impact project delivery satisfaction									0.79	
@4.1 Iam satisfied with the risk factors that have been identified										0.90
@4.2 I would adopt the identified risk factors in my project management stragegy										0.87
@4.3 Risk factors identification process meet my expectations										0.79
@4.5 The identified risk factors contribute positively to project delivery satisfaction										0.68

4.7 Hypotheses Test Analysis

The final analysis is to test the assumed hypotheses; therefore, hypotheses test techniques were used to test the research model. Using SmartPLS the P-value inspects each factor's relationship with the dependent variable. Table 15 shows that the Stakeholders, Business process, Organizational, Technical, and Schedule with their significant P-values 0.030, 0.002, 0.028, 0.023, and 0.001 respectively, which indicates that there is a positive relationship with Satisfaction, accordingly the result supports the research hypotheses as follows: The null hypothesis is rejected and the hypothesis (H1) Stakeholders engagement impact project delivery is supported, and the null hypothesis is rejected and the hypothesis (H2) Comprehensive and accurate business process availability impact project delivery is supported, the null hypothesis is rejected and the hypothesis (H5) Organizational strategic objectives impact project delivery is supported, the null hypothesis is rejected and the hypothesis (H6) Reliable IT systems and platforms impact project delivery is supported, the null hypothesis is rejected and the hypothesis (H8) Realistic schedule estimates impact project delivery is supported,

In contrast, the Project Management, Human resources, Budget, and External factors P-values are insignificant 0.164, 0.605, 0.096, 0.225 respectively shows that there is a negative relationship with Satisfaction, which indicates inconsistency with the research hypotheses as follows: The null hypothesis is accepted and the hypothesis (H3) Adopting well-defined project management methodology impact project delivery is inconsistent. The null hypothesis is accepted and the hypothesis (H4) Human resources competence impact project delivery is inconsistent. The null hypothesis is accepted and the hypothesis (H7) Accuracy of estimates and availability of budget impact project delivery is inconsistent. The null hypothesis is accepted and the

hypothesis (H9) Competent and reliable vendors and suppliers impact project delivery

is inconsistent.

Table 16. Hypotheses Test Result

Hypotheses	Factors Relationship	T Value	P Values
H1	Stakeholders -> Satisfaction	2.172	0.030
H2	Business Process -> Satisfaction	3.086	0.002
H3	Project Management -> Satisfaction	1.395	0.164
H4	Human Resources -> Satisfaction	0.517	0.605
H5	Organizational -> Satisfaction	2.205	0.028
H6	Technical -> Satisfaction	2.278	0.023
H7	Budget -> Satisfaction	1.668	0.096
H8	Schedule -> Satisfaction	3.414	0.001
H9	External -> Satisfaction	1.216	0.225

The below figure shows the T values which should be above or equal to 1.96 to be significant
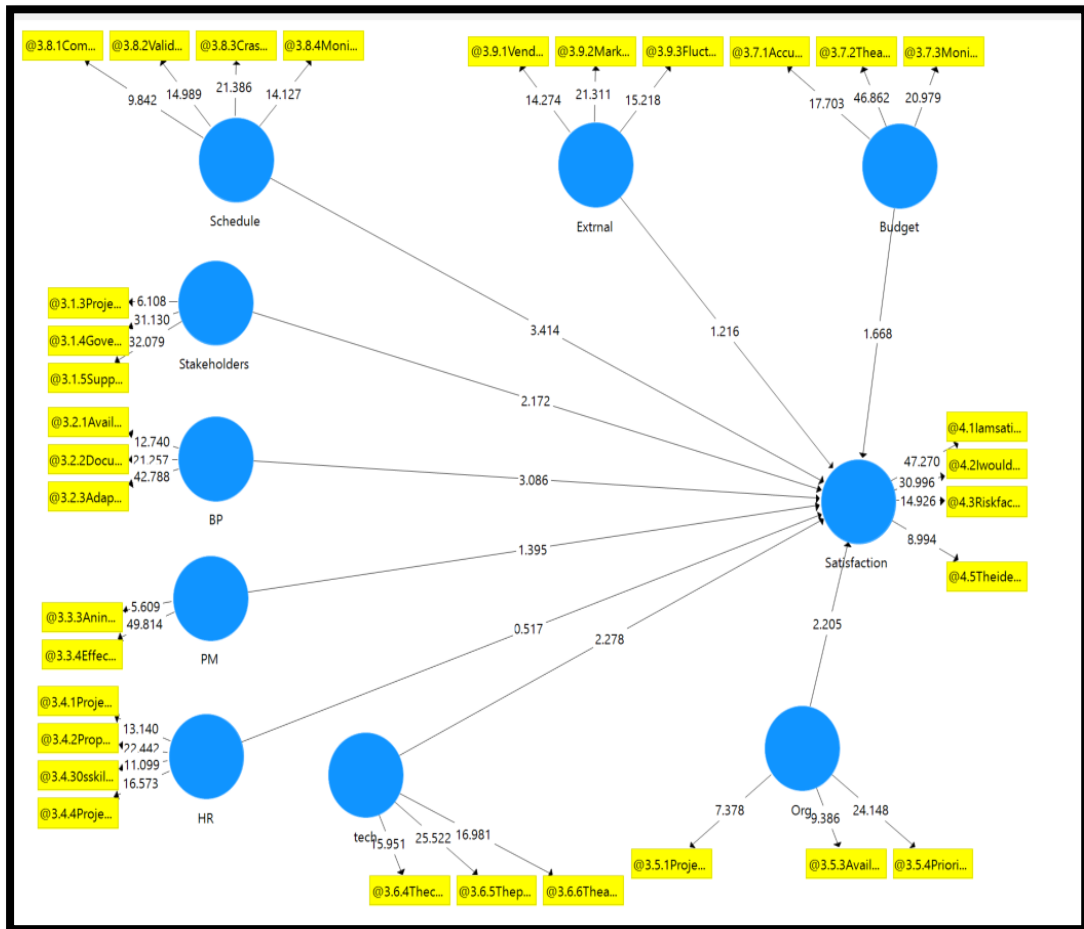
Figure 3. T values

The coefficient of determination (R Square)

In PLS, the coefficient of determination is a key metric for assessing the structural model (Hair et al., 2016). It shows how well the independent variables that are related to the dependent variable describe the variance of the dependent variable (Hair et al., 2016). Falk and Miller (1992) recommended that R2 be accepted at a minimum of 0.1. In the meantime, Chin (1998) classified R2 values in PLS path models as small, moderate, and strong, respectively, at 0.19, 0.33, and 0.67. The R-Square value

for the dependent variable (Satisfaction) in this analysis is 0.589, indicating that the model accounts for 58.9% of the variance in the sample.

Figure 4. The coefficient of determination

4.8 Discussion of findings

The statistical data analysis and results revealed a lot about the research. The age categories, 26 to 40 years old, and above 40 ye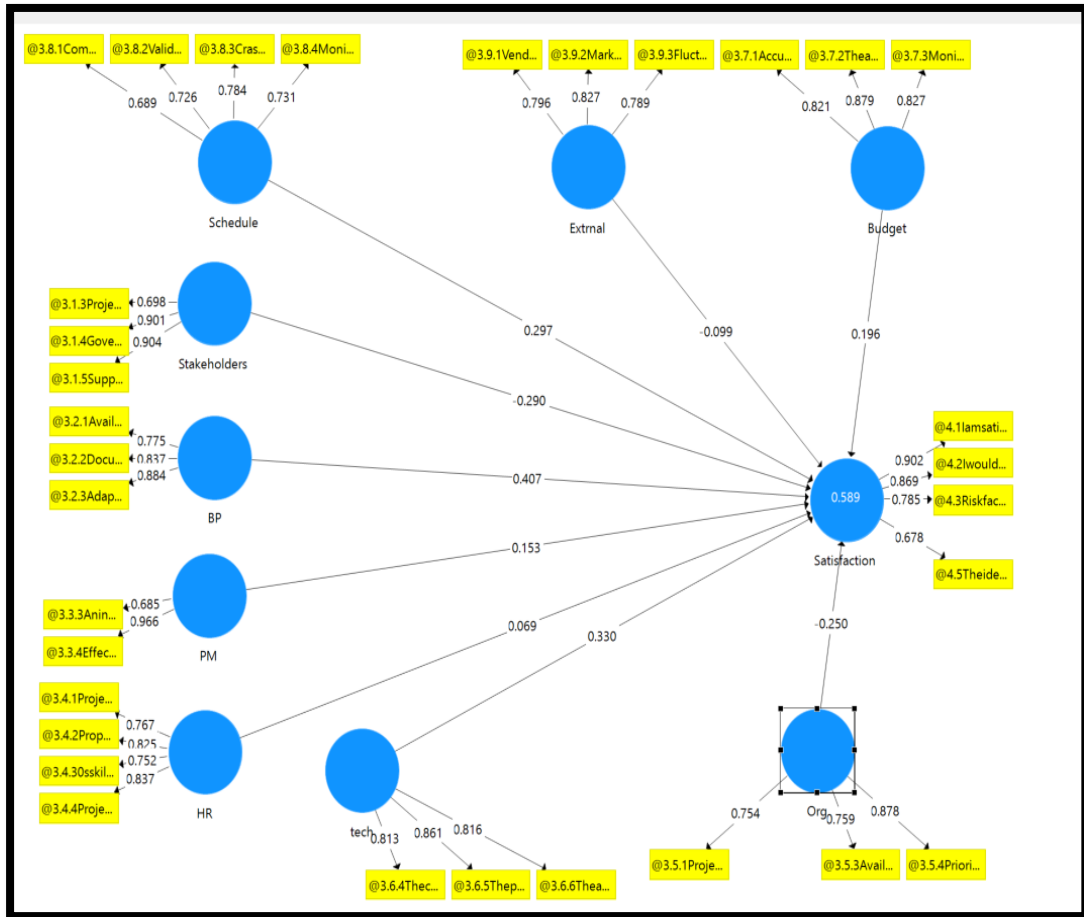ars old each accounting for 36.9% of the total, followed by 26.3% for the 18 to 25 years old category. In respect to gender, 58.8% of respondents were male compared to 41.3% were female. The bachelor degree constituted the highest 40% compared to 38.1% for Master/Ph.D. and 21.9% high school/diploma. In Occupation, the data shows 53.1% of the respondents were project managers and 18.8% are functional managers, 23.1% are project team (business/technical), and 5% other. For the experience categories, 1 to 3 years and 4 to 10 years each counted for 33.8%, and over the 10 years category was 32.5%. According to organizational role 61.3% were from the business owner (customer) side whereas, 38.8% from the service provider (vendor) side. Non-Qataris made up 69.9% whereas the Qataris are 30.1% of the respondents.

The result showed a high level of agreement with most of the 43 identified risk items that assumed potentially to impact project delivery (satisfaction) according to the literature and the proposed research model, those factors namely, Stakeholders, Business process, Project Management, Human resources, Organizational, Technical, Budget, Schedule and External.

Each factor has a Cronbach Alpha and an Average Variance Extracted (AVE) greater than 0.5, indicating that the measurement questions will better represent the characteristics of each research variable in the model, which indicates that the research factors are reliable and consistent. Most of the independent factors have a 1% significant correlation with the dependent variable (Satisfaction).

However, based on the Hypotheses Test analysis, the result showed only five of

hypotheses are supported and have a positive relationship with the dependent variable (Satisfaction), namely, H1, H2, H5, H6, and H8 with their significant P- values 0.030, 0.002, 0.028, 0.023 and .001 respectively. These hypotheses are consistent with related literature (S. T. Namitha Sheen, R. Shanmuga Priyan, and S. Sugumar 2017), (Stankova 2015) (Benaroch, Lichtenstein, and Robinson 2006), (Tesch, Kloppenborg, and Frolick 2007). The other four hypotheses showed an insignificant relationship with the dependent variable (Satisfaction) namely, H3, H4, H7, and H9 which represent the factors namely, the Project Management, Human resources, Budget, and External factors with their P-values 0.164, 0.605, 0.096, 0.225 respectively, which shows inconsistency with the related literature.

The researcher concludes that a larger sample size of at least 500 respondents is required to obtain further analysis to be able to further test the literature hypotheses.

CHAPTER 5: CONCLUSION

In every setting, private or public, IT projects are complex multi-dimensional endeavors. This research aimed to investigate the impact of identified project risk factors on Qatar public sector's IT projects. The nine research hypotheses assumed a positive relationship between the independent (risk factors) and the dependent variable project delivery (satisfaction). The research sample was 160 respondents consisted of project management professionals, including functional managers and project teams (business/technical) working in Qatar public sector, besides, the same categories from the service provider's side. Based on the literature review, the researcher identified a list of nine risk factors that were validated by key Qatar public project stakeholders. Data were collected through a structured English questionnaire developed in Google forms and quantitative research methodology was used.

The research objective was tested and accordingly, the nine research hypotheses were analyzed and using SmartPLS, the result showed that the factors namely, Stakeholder, Business process, Organizational, Technical, and Schedule showed a positive relationship with the dependent variable (Satisfaction) which supporting the related literature with their significant P- values as follows: 0.030, 0.002, 0.028, 0.023 and .001 respectively. However, the other risk factors namely, Project management, Human resources, Budget, and External showed a negative relationship with the dependent variable (Satisfaction); which is inconsistent with the related literature with their P-values as follows: 0.164, 0.605, 0.096, 0.225.

The researcher believes that with a bigger size of sample these findings might change and more factors will have a positive relationship with the dependant variable

This research contributed insights into the key potential IT risk factors within

Qatar public sector, project managers can consider the identified risk factors as a foundation and guideline to build a comprehensive risk management strategy to overcome project issues and pitfalls by reducing the impact of those risks. Focusing on the risk factors that have a positive relationship with the dependent variable (satisfaction) will enable project managers to further analyze these factors and set the required response plan and control.

5.2 Research implication and recommendation

The research has important implications for the project management community in Qatar. The findings supporting five hypotheses and the other four hypotheses are inconsistent based on hypotheses analysis; however, the researcher recommends that project management professionals consider the five identified risk factors as the most critical IT risk factors that have a positive impact on the dependent variable (satisfaction), which will serve as a foundation and guideline to help the project management community avoid project pitfalls commonly associated with project failure. As mentioned in previous sections identifying project risk factors is the most important process of project risk management, which will eventually lead to a comprehensive and mature practice. This research contributes a set of key project risk factors that is different from most current lists, while some of the factors mentioned are inconsistent with the literature, the research provides insights in shaping a foundation and guideline to IT project management professionals specifically in Qatar public sector.

5.3 Research limitation and future work

The results of this study must be viewed in light of certain limitations that hampered the research's quality. One constraint was the amount of time available to

obtain the research data and conduct the necessary study. Since the (IRB) ethical approval board took longer than expected, that has caused a relatively small sample size to be collected for better statistical measurement. The initial targeted sample size was around 300, due to time constrain only 160 responses were collected, more sample size would have added value to the research findings.

The researcher believes this research study will serve as a base for future researches focusing on the impact of risk factors on IT project delivery in Qatar public sector due to the fact that it is the first of its kind. While Future research can be done with much larger sample sizes (500 or more) to confirm or refute the findings of this report. Other data collection approaches, such as interviews and focus groups, provide qualitative information that can be used to better understand the subject. Other methods of study may be used to determine whether project management professionals' findings vary based on demographic variables.

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APPENDICES

Appendix A: Online Questionnaire

The Impact of Risk Identification on IT Project Delivery in Qatar public sector

* Required

Survey Consent

Dear respondent,

We would like to invite you to participate in this research study titled "The impact of risk identification on IT project delivery in Qatar public sector". This is a Master of Business Administration (MBA) project conducted by Mutaz Oshi, a student at Qatar University. The study is approved by Qatar University Institutional Review Board - QU-IRB board under the reference number 1500-E21
If you have any questions related to the ethical compliance of the study you may contact the board at QU-IRB@qu.edu.qa.
The study aims to investigate and realize the risk factors affecting IT projects delivery in Qatar public sector, identifying the critical risk factors will enable project managers, practitioners, and researchers to have a holistic view of all project risks sources, rather than merely focusing on traditional risks sources (cost and time). Thus, a comprehensive understanding of possible risk sources and their associated factors will enable public sector project managers, practitioners, and researchers to have a well-defined risk management strategy. This study only targets males and females who are of 18 years of age and above, project management professionals, project stakeholders involved in IT projects in Qatar public sector. Any other respondents will be excluded. The survey consists of multiple-choice questions only, answering the survey questions should not take more than 10 minutes of your time. The sample size targeted is 100 responds. The data will be used for the purpose of this study only. Your participation is completely voluntary and anonymous. There are no personal benefits you will get from participating in this research. Completing the survey involves no risks to you. Confidentiality will be strictly maintained, and the given information will not be shared with a third party. You have the right to withdraw from the process at any time. Your completion of this survey indicates your consent to participate in this research study. If you have any questions, feel free to contact me and/or my supervisor at the addresses below.

Prof: Emad Ahmed Mohammed Abushanab,
College of Business & Economics
Qatar University
Office Phone No: +974 4403 5077
Email: eabushanab@qu.edu.qa

Mutaz Oshi
Qatar University, MBA student
Phone No.: +974 50100301
Email: mo1305365@qu.edu.qa

If you would like to obtain the results of this study, please contact the emails above.
You may withdraw from this study at any time. If you have read, understood, and agree to participate, please click Agree, otherwise click I Disagree

Thank you for your time

*

○ Agree

○ Disagree

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The Impact of Risk Identification on IT Project Delivery in Qatar public sector

* Required

Managing IT projects in Qatar public sector

Do you manage IT projects or part of project management team in Qatar public sector ? *

◯ Yes

◯ No (Since you are not managing IT projects in Qatar public sector the survey will end for you - Thank you for your participation)

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Google Forms

The Impact of Risk Identification on IT Project Delivery in Qatar public sector

Part 1: Demographic Information

Age group *

Choose ▼

Gender *

Choose ▼

Educational Level *

Choose ▼

Occupation *

Choose ▼

Experience with IT project Management in Qatar public sector *

Choose ▼

Your Organization Role *

Choose ▼

Nationality *

Choose ▼

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The Impact of Risk Identification on IT Project Delivery in Qatar public sector

* Required

Part 3: Factors affecting project success

We would like you to identify the different risk factors that influence IT project success from your perspective and experience. For this purpose, we constructed a scale from 1 to 5 where 1 means that you: Strongly disagree with this statement, 2: Disagree 3: Neutral 4: Agree and 5: Strongly agree.

3.1 Stakeholders Influence Factors

3.1.1 Organizational management support impacts the project delivery satisfaction *

○ Strongly disagree

○ Disagree

○ Neutral

○ Agree

○ Strongly agree

3.1.2 Business owner's support impacts the project delivery satisfaction *

○ Strongly disagree

○ Disagree

○ Neutral

○ Agree

○ Strongly agree

3.1.3 Project team commitment impacts the project delivery satisfaction *

○ Strongly disagree

○ Disagree

○ Neutral

○ Agree

○ Strongly agree

3.1.4 Government policies/procedures impact the project delivery satisfaction *

○ Strongly disagree

○ Disagree

○ Neutral

○ Agree

○ Strongly agree

3.1.5 Supporting Entities, e.g. Procurement, Finance, etc. policies and procedures impact the project delivery satisfaction *

○ Strongly disagree

○ Disagree

○ Neutral

○ Agree

○ Strongly agree

3.2 Business Processes Factors

3.2.1 Availability of all relevant business processes impacts the project delivery satisfaction *

○ Strongly disagree

○ Disagree

○ Neutral

○ Agree

○ Strongly agree

3.2.2 Documentation of all relevant business processes impacts the project delivery satisfaction *

○ Strongly disagree

○ Disagree

○ Neutral

○ Agree

○ Strongly agree

3.2.3 Adaptability of IT platform to the required business processes impacts the project delivery satisfaction *

○ Strongly disagree

○ Disagree

○ Neutral

○ Agree

○ Strongly agree

3.3 Project Management Factors

3.3.1 The accurate estimation of project activities' durations impacts the project delivery satisfaction *

- ○ Strongly disagree
- ○ Disagree
- ○ Neutral
- ○ Agree
- ○ Strongly Agree

3.3.2 Proper project planning impacts the project delivery satisfaction *

- ○ Strongly disagree
- ○ Disagree
- ○ Neutral
- ○ Agree
- ○ Strongly Agree

3.3.3 An in place project management controlling process (to compare actual vs. planned) impacts project delivery satisfaction *

- ○ Strongly disagree
- ○ Disagree
- ○ Neutral
- ○ Agree
- ○ Strongly Agree

3.3.4 Effective project communications impact the project delivery satisfaction *

○ Strongly disagree

○ Disagree

○ Neutral

○ Agree

○ Strongly Agree

3.4 Human Resources (Project team) Factors

3.4.1 Project team competence impacts the project delivery satisfaction *

○ Strongly disagree

○ Disagree

○ Neutral

○ Agree

○ Strongly Agree

3.4.2 Proper conflict management impacts the project delivery satisfaction *

○ Strongly disagree

○ Disagree

○ Neutral

○ Agree

○ Strongly Agree

3.4.3 Project Manager's skills and knowledge impact the project delivery satisfaction *

○ Strongly disagree

○ Disagree

○ Neutral

○ Agree

○ Strongly Agree

3.4.4 Project team dynamics (team work) impact the project delivery satisfaction *

○ Strongly disagree

○ Disagree

○ Neutral

○ Agree

○ Strongly Agree

3.5 Organizational Factors

3.5.1 Project dependencies on other projects/resources impact the project delivery satisfaction *

○ Strongly disagree

○ Disagree

○ Neutral

○ Agree

○ Strongly Agree

3.5.2 Resources availability impacts the project delivery satisfaction *

○ Strongly disagree

○ Disagree

○ Neutral

○ Agree

○ Strongly Agree

3.5.3 Availability of funding impacts the project delivery satisfaction *

○ Strongly disagree

○ Disagree

○ Neutral

○ Agree

○ Strongly Agree

3.5.4 Prioritization of organizations' projects impact the project delivery satisfaction *

○ Strongly disagree

○ Disagree

○ Neutral

○ Agree

○ Strongly Agree

3.6 Technical Factors

3.6.1 Complete requirements (i.e. cover technical, security, quality, scalability, etc.) impacts the project delivery satisfaction *

○ Strongly disagree

○ Disagree

○ Neutral

○ Agree

○ Strongly Agree

3.6.2 Accuracy of requirements (i.e. cover technical, security, quality, scalability, etc.) impacts the project delivery satisfaction *

○ Strongly disagree

○ Disagree

○ Neutral

○ Agree

○ Strongly Agree

3.6.3 The stability of the IT infrastructure impacts the project delivery satisfaction *

○ Strongly disagree

○ Disagree

○ Neutral

○ Agree

○ Strongly Agree

3.6.4 The complexity of the IT platform impact the project delivery satisfaction *

○ Strongly disagree

○ Disagree

○ Neutral

○ Agree

○ Strongly Agree

3.6.5 The performances and reliability of the IT platform impact the project delivery satisfaction *

○ Strongly disagree

○ Disagree

○ Neutral

○ Agree

○ Strongly Agree

3.6.6 The availability of a quality assurance process impacts the project delivery satisfaction *

○ Strongly disagree

○ Disagree

○ Neutral

○ Agree

○ Strongly Agree

3.7 Budget factors

3.7.1 Accuracy of project cost estimation impacts the project delivery satisfaction *

- ○ Strongly disagree
- ○ Disagree
- ○ Neutral
- ○ Agree
- ○ Strongly Agree

3.7.2 The availability of project funds throughout the project lifecycle impact the project delivery satisfaction *

- ○ Strongly disagree
- ○ Disagree
- ○ Neutral
- ○ Agree
- ○ Strongly Agree

3.7.3 Monitoring and controlling the project spending impacts the project delivery satisfaction *

- ○ Strongly disagree
- ○ Disagree
- ○ Neutral
- ○ Agree
- ○ Strongly Agree

3.7.4 Transferring funds between projects impacts the project delivery satisfaction *

○ Strongly disagree

○ Disagree

○ Neutral

○ Agree

○ Strongly Agree

3.8 Schedule Factors

3.8.1 Completeness and accuracy of schedule estimation impact project delivery satisfaction *

○ Strongly disagree

○ Disagree

○ Neutral

○ Agree

○ Strongly Agree

3.8.2 Validation of the project schedule, (i.e. team proposals vs. realistic) impact project delivery satisfaction *

○ Strongly disagree

○ Disagree

○ Neutral

○ Agree

○ Strongly Agree

3.8.3 Crashing project schedule will influence project delivery satisfaction *

○ Strongly disagree

○ Disagree

○ Neutral

○ Agree

○ Strongly Agree

3.8.4 Monitoring and controlling the project progress impact the project delivery satisfaction *

○ Strongly disagree

○ Disagree

○ Neutral

○ Agree

○ Strongly Agree

3.8.5 Longer project duration impacts the project delivery satisfaction *

○ Strongly disagree

○ Disagree

○ Neutral

○ Agree

○ Strongly Agree

3.9 External Factors

3.9.1 Vendor competence impacts the project delivery satisfaction *

○ Strongly disagree

○ Disagree

○ Neutral

○ Agree

○ Strongly Agree

3.9.2 Market fluctuation impacts the project delivery satisfaction *

○ Strongly disagree

○ Disagree

○ Neutral

○ Agree

○ Strongly Agree

3.9.3 Fluctuating customer expectations impacts project delivery satisfaction *

○ Strongly disagree

○ Disagree

○ Neutral

○ Agree

○ Strongly Agree

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Part 4: Delivery Satisfaction

4.1 I am satisfied with the risk factors that have been identified *

○ Strongly disagree

○ Disagree

○ Neutral

○ Agree

○ Strongly Agree

4.2 I would adopt the identified risk factors in my project management strategy *

○ Strongly disagree

○ Disagree

○ Neutral

○ Agree

○ Strongly Agree

4.3 Risk factors identification process meet my expectations *

○ Strongly disagree

○ Disagree

○ Neutral

○ Agree

○ Strongly Agree

4.4 I would recommend the identified risk factors to other project management professionals and practitioners *

◯ Strongly disagree

◯ Disagree

◯ Neutral

◯ Agree

◯ Strongly Agree

4.5 The identified risk factors contribute positively to project delivery *

◯ Strongly disagree

◯ Disagree

◯ Neutral

◯ Agree

◯ Strongly Agree

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Appendix B: QU-IRB Approval

Qatar University Institutional Review Board QU-IRB
QU-IRB Registration: IRB-QU-2020-006, QU-IRB, Assurance: IRB-A-QU-2019-0009

DATE:	April 11, 2021
TO:	Emad Abushanab, PhD in Business Administration, MIS
FROM:	Qatar University Institutional Review Board (QU-IRB)
PROJECT TITLE:	1715238-2 The Reality of Risk Management Practices, and how they influence IT projects success in Qatar Public Sector
QU-IRB REFERENCE #:	QU-IRB 1500-E/21
SUBMISSION TYPE:	Amendment/Modification
ACTION:	APPROVED
REVIEW TYPE:	Exempt Review
DECISION DATE:	April 8, 2021

Approved Modifications:

- Change of the Project title.
- Amendment of the survey questions to match the changes by adding the delivery satisfaction part.
- Amendment of the consent to match the objectives.

Thank you for your submission of Amendment/Modification materials for this project. The Qatar University Institutional Review Board (QU-IRB) has APPROVED your submission. This approval is based on an appropriate risk/benefit ratio and a project design wherein the risks have been minimized. All research must be conducted in accordance with this approved submission.

This submission has received Exempt Review according to Qatar Ministry of Public Health (MoPH) regulations.

Please remember that informed consent is a process beginning with a description of the project and insurance of participant understanding followed by a signed consent form. Informed consent must continue throughout the project via a dialogue between the researcher and research participant. Qatar MoPH regulations require that each participant receives a copy of the consent document.

Please note that Exempt Review approvals are valid for a period of one year and renewal should be sought prior to   to ensure timely processing and continuity. Moreover, any changes/modifications to the original submitted protocol should be reported to the committee to seek approval prior to continuation.

All UNANTICIPATED PROBLEMS involving risks to subjects or others (UPIRSOs) and SERIOUS and UNEXPECTED adverse events must be reported promptly to this office. Please use the appropriate reporting forms for this procedure.

All NON-COMPLIANCE issues or COMPLAINTS regarding this project must be reported promptly to this office.

Please note that all research records must be retained for a minimum of three years after the completion of the project.

Documents Reviewed:

- Amendment/Modification - QU-IRB Renewal-Modf. Request_V2_Feb2019.pdf (UPLOADED: 03/14/2021)

- 1 -

Generated on IRBNet

- Consent Form - Consent v5.0.docx (UPLOADED: 03/14/2021)
- Proposal - Research Proposal Model and Hypothese v4.0.docx (UPLOADED: 03/14/2021)
- Questionnaire/Survey - Questionnaire v7.0.docx (UPLOADED: 03/14/2021)

If you have any questions, please contact QU-IRB at 4403 5307 or qu-irb@qu.edu.qa. Please include your project title and reference number in all correspondence with this committee.

Best wishes,

Dr. Ahmed Awaisu
Chairperson, QU-IRB

Institutional Review Board
(IRB)
Office Of Academic Research

This letter has been issued in accordance with all applicable regulations, and a copy is retained within Qatar University's records.

Consent

Dear respondent,

We would like to invite you to participate in this research study titled "**The impact of risk identification on IT project delivery in Qatar public sector**". This is a Master of Business Administration (MBA) project conducted by Mutaz Oshi, a student at Qatar University. The study is approved by Qatar University Institutional Review Board - QU-IRB board under the reference number ------------.

If you have any questions related to ethical compliance of the study you may contact the board at QU-IRB@qu.edu.qa.

The study aims to investigate and realize the risk factors affecting IT projects delivery in Qatar public sector, identifying the critical risk factors will enable project managers, practitioners and researchers to have a holistic view of all project risks sources, rather than merely focusing on traditional risks sources (cost and time). Thus, a comprehensive understanding of possible risks sources and their associated factors will enable public sector project managers, practitioners and researchers to have a well-defined risk management strategy. This study only targets males and females who are of 18 years of age and above, project management professionals, project teams and managers working in IT industry in Qatar public sector. Any other respondents will be excluded. The survey consists of multiple-choice questions only, answering the survey questions should not take more than 10 to 15 minutes of your time. The sample size targeted is 100 responds. The data will be used for the purpose of this study only. Your participation is completely voluntary and anonymous. There are no personal benefits you will get from participating in this research. Completing the survey involves no risks to you. Confidentiality will be strictly maintained, and the given information will not be shared with a third party. You have the right to withdraw from the process at any time. Your completion of this survey indicates your consent to participate in this research study. If you have any questions, feel free to contact me and/or my supervisor at the address below.
Prof: Emad Ahmed Mohammed Abushanab,

College of Business & Economics

Qatar University

Office Phone: 4403 5077

Email: eabushanab@qu.edu.qa

Mutaz Oshi
Qatar University, MBA student

Phone No.: +974 50100301
Email: mo1305365@qu.edu.qa
If you would like to obtain the results of this study, please contact the emails above.
You may skip any question or withdraw from this study at any time. If you have read,
understood, and agree to participate, please click on the link below.

(Link to be provide later)

Thank you for your time.

Questionnaire

If you have read, understood, and agree to participate, please click on the link below.

(Survey Link)

Part 1: Working with IT project in Qatar public sector

Do you manage IT projects or part of the project management team in Qatar public sector?

___ Yes   ___ No

If yes, please proceed. If no, the questionnaire has ended for you. Thank you for your time and participation.

Part 2: Demographic Information

Please indicate the following:

1. **Age:** ___ 18–25   ___ 26–40   ___ Above 40

2. **Gender:** ___ Male ___ Female

3. **Educational Level:** ___ High School/diploma ___ Bachelor's Degree

   ___ Master or PhD

4. **Occupation:** ___ Project Manager   ___ Functional Manager

   ___ Project team (Business/Technical)

   ___ Other

5. **Experience with IT management in public Qatar sector:**

   ___ 1 to 3 years' ___ 4 to 10 years

   ___ Over 10 years

6. **Nationality:**

   ___ Qatari ___ Non- Qatari

Part 3: Variables affecting project delivery satisfaction

Please tick the box that best describes your opinion.

1. We would like you to identify the different factors that influence IT project success from your perspective and experience. For this purpose, we constructed a scale from 1 to 5 where 1 means that you: Strongly disagree with this statement, 2: Disagree 3: Neither agree nor disagree 4: Agree and 5: Strongly agree.

No.	Stakeholders Influence factors	1	2	3	4	5
1.	Organizational management support impacts the project delivery satisfaction					
2.	Business owner's support impacts the project delivery satisfaction					
3.	Project team commitment impacts the project delivery satisfaction					
4.	Government policies/procedures impact the project delivery satisfaction					
5.	Supporting Entities, e.g. Procurement, Finance, etc. policies and procedures impact the project delivery satisfaction					
No.	Business Processes factors	1	2	3	4	5
1.	Availability of all relevant business processes impacts the project delivery satisfaction					
2.	Documentation of all relevant business processes impacts the project delivery satisfaction					
3.	Adaptability of IT platform to the required business processes impacts the project delivery satisfaction					
No.	Project Management factors	1	2	3	4	5
1.	The accurate estimation of project activities' durations impacts the project delivery satisfaction					
2.	Proper project planning impacts the project delivery satisfaction					
3.	An in place project management controlling process (to compare actual vs. planned) impacts project delivery satisfaction					
4.	Effective project communications impact the project delivery satisfaction					

No.	Human Resources (Project team) Factors	1	2	3	4	5
1.	Project team competence impacts the project delivery satisfaction					
2.	Proper conflict management impacts the project delivery satisfaction					
3.	Project Manager's skills and knowledge impact the project delivery satisfaction					
4.	Project team dynamics (team work) impact the project delivery satisfaction					
No.	Organizational Factors	1	2	3	4	5
1.	Project dependencies on other projects/resources impact the project delivery satisfaction					
2.	Resources availability impacts the project delivery satisfaction					
3.	Availability of funding impacts the project delivery satisfaction					
4.	Prioritization of organizations' projects impact the project delivery satisfaction					
No.	Technical Factors	1	2	3	4	5
1.	Complete requirements (i.e. cover technical, security, quality, scalability, etc.) impacts the project delivery satisfaction					
2.	Accuracy of requirements (i.e. cover technical, security, quality, scalability, etc.) impacts the project delivery satisfaction					
3.	The stability of the IT infrastructure impacts the project delivery satisfaction					
4.	The complexity of the IT platform impact the project delivery satisfaction					
5.	The performances and reliability of the IT platform impact the project delivery satisfaction					
6.	The availability of a quality assurance process impacts the project delivery satisfaction					
No.	Budget Factors	1	2	3	4	5
1.	Accuracy of project cost estimation impacts the project delivery satisfaction					
2.	The availability of project funds throughout the project lifecycle impact the project delivery satisfaction					
3.	Monitoring and controlling the project spending impacts the project delivery satisfaction					

No.		1	2	3	4	5
4.	Transferring funds between projects impacts the project delivery satisfaction					

No.	Schedule Factors	1	2	3	4	5
1.	Completeness and accuracy of schedule estimation impact project delivery satisfaction					
2.	Validation of the project schedule, (i.e. team proposals vs. realistic) impact project delivery satisfaction					
3.	Crashing project schedule will influence project delivery satisfaction					
4.	Monitoring and controlling the project progress impact the project delivery satisfaction					
5.	Longer project duration impacts the project delivery satisfaction					

No.	External Factors	1	2	3	4	5
1.	Vendor competence impacts the project delivery satisfaction					
2.	Market fluctuation impacts the project delivery satisfaction					
3.	Fluctuating customer expectations impacts project delivery satisfaction					

No.	Part 4: Delivery Satisfaction	1	2	3	4	5
1.	I am satisfied with the risk factors that have been identified					
2.	I would adopt the identified risk factors in my project management strategy					
3.	Risk factors identification process meet my expectations					
4.	I would recommend the identified risk factors to other project management professionals and practitioners					
5.	The identified risk factors contribute positively to project delivery					