

دور الدجتللة في إدارة المشاريع خاصة بالمناطق النائية في المملكة العربية السعودية

The Role of Digitalion on Project Management especially at remote areas in Saudi Arabia

Graduation Research

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A virtual team, sometimes referred to as a Geographically Dispersed Team (GDT), is a group of individuals working on a project who use electronic communication technology to meet from various work base locations more likely used in remote areas in the construction industry.

For project management, a virtual team will strategize and accomplish their projects from different work bases. The virtual team shares a common goal but works from different locations, such as continents or different building areas. They may never meet face to face but can do so to prevent feelings of isolation.

Managers are challenged to develop strategically flexible organizations in response to increasingly competitive marketplaces. Fortunately, a new generation of information and telecommunications technology provides the foundation for resilient new organizational forms that would not have been feasible only a decade ago. One of the most exciting new forms, the virtual team, will enable organizations to become more flexible by providing the impressive productivity of team-based designs in environments where teamwork would have once been impossible.

Virtual teams, linked primarily through advanced computer and telecommunications technologies, respond to the challenges associated with today's downsized and lean organizations and to the resulting geographical dispersion of essential employees. Virtual teams also address new workforce demographics, where the best employees may be located anywhere in the world and where workers demand increasing technological sophistication and personal flexibility. With virtual teams, organizations can build teams with optimum membership while retaining the advantages of a flat organizational structure. Additionally, firms benefit from virtual teams through access to previously unavailable expertise, enhanced cross-functional interaction, and systems that improve the virtual team's work quality.

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1-1 Introduction

Communication plays an essential function in the dissemination of information and the day-to-day operation of any organization. Advancements in information and communication technologies, specifically the use of Internet-based systems, have allowed people to work and learn remotely and virtually while retaining or superseding the performance of traditional teams.

The merger and acquisition trends, alliance, hyper-competition, downsizing, and globalization have pressured firms to locate the best talents around the world and group them to serve the firms' best interests.

As per Lipnack & Stamps, 1997 The virtual team is still becoming the basic work unit in the Information Age. Research on virtual teams is still in its nascent stages. Because of the relative newness of virtual teams, many areas of research have not been examined, especially Saudi Arabia concludes that setting up an infrastructure for a virtual team still requires a large engineering effort, which represents a major obstacle to the implantation of this new paradigm.

Effective and efficient cooperation across disciplines and distributed teams become essential for the success of engineering projects.

Therefore, the experiments suggest that more research is needed to explore ways to enhance the performance of virtual teams. Virtual teams differ from face-to-face teams.

Virtual teams are significantly different from traditional teams. In the proverbial traditional team, the members work next to one another, while in virtual teams, they work in different locations.

In traditional teams, the coordination of tasks is straightforward and performed by the team members together; in virtual teams, in contrast, tasks must be much more highly structured.

Also, virtual teams rely on electronic communication instead of face-to-face communication in traditional teams.

In particular, reliance on computer-mediated communication makes virtual teams unique from traditional ones. Previous studies have investigated the fragmented construction industry due to the many stakeholders and phases involved in a construction project. This fragmentation has led to well-documented problems with communication and information processing and has contributed to the proliferation of adversarial relationships between the parties to a project. This fragmentation is also often seen as one of the major contributors to low productivity in construction.

Information Technology (IT) is now routinely used in the construction industry to reduce some of the fragmentation-related problems. It improves coordination and collaboration between firms participating in a construction project, leading to better communication practices. Its benefits include an increase in the quality of documents and the speed of the work, better financial control and communications, simpler and faster access to common data, and a decrease in documentation errors. IT spending in Architecture/Engineering/Construction (A/E/C) firms has increased significantly during the past few years, indicating that A/E/C firms are increasing their interest in IT applications to facilitate construction projects.

Among all IT applications, the Internet is the technology that best facilitates a collaborative working environment in a construction project. Walker and Betts [2] postulated that the Internet, specifically the World Wide Web (WWW), will be the key to a change in the global construction business in the near future and will impact professions, collaboration, and the construction business structure. Its use as a communication medium can help information transfer occur faster and more effectively. It also enables new opportunities for developing distributed systems that can cross organization boundaries and provide a unique teamwork and workflow automation opportunity. The Web can also overcome the incompatibilities of data formats through smart browsers and servers. Therefore, independent project participants using different hardware platforms can share the same system over the Web. As described, the advantages of Web technologies in construction can be broadly categorized into three areas: the support of relevant information services, communication between project participants, and engineering and management computing.

Recently, the concept of how the Web and its associated technologies can be used to manage construction projects has been widely acknowledged by practitioners. This concept is often called a Web-based Project Management System (WPMS)¹. It promises to enhance construction project documentation and control and to revolutionize how a construction project team conducts business. WPMS is an electronic project-management system conducted through the Extranet, a private network that uses Internet protocols to transmit information. The system is only accessible by a project team, but team members can be in different organizations. It provides a centralized, commonly accessible, reliable means of transmitting and storing project information. Project information is stored on the server, and a standard Web browser is used as a gateway to exchange this information, eliminating geographic and boundary hardware platform differences. illustrates the basic functional scheme of WPMS.

As pointed out, there are four general categories of construction project information normally carried out through WPMS: project, design, management, and financial information. Project information includes details about the project, such as project participants, project e-mail directory, project description, and a photo archive of the project's progress. Design

Information includes any information the design team generates, such as CAD drawings, specifications, clarifications and changes, and punch lists. The project manager develops management information and includes meeting minutes, submittals and shop drawings, change order status logs, as-built drawings, requests for information (RFIs), requests for quotations (RFQs), contract status logs, safety information, daily logs, and project schedules. Financial information is developed by the accounting staff responsible for the project and includes cash flow, projections, requisition status, general ledger, and contract status reports.

As project information changes, the database on the server can be easily updated with new data. Project team members can then access the updated information via a digital user ID and password from remote locations, eliminating the problems in linear communication schemes. Since a closed network is used where no one is allowed to access the system without permission and everyone is identified (through an individual user ID and password), the system can automatically track who has seen what and what comments or changes, if any, they made. It is also possible to introduce a project hierarchy into the system, which allows documents or areas of the project to be restricted to only people at certain levels of responsibility, etc. Hence, the mistakes caused by poor communication and the delays due to the time it takes to move documents and people around for approvals and meetings would be minimized. WPMS is predicted to significantly improve the speed and quality of communication among project participants and promotes collaboration and coordination in construction projects.

Engineering News-Record (ENR) reports that the number of A/E/C firms using WPMS has risen by 16% within the past two years. It is also estimated that the number of A/E/C firms prepared to set up "virtual" project teams using the WPMS concept doubles every six months. Currently, there are three options in regard to WPMS implementation. The first option is to develop a customized WPMS in-house by hiring either a consulting company or programmers to create a system. The second is to develop a WPMS by purchasing commercial web-enabled packaged software and installing it on a company's internal server. Examples of this software include Microsoft Project 2002® from Microsoft®, P3e/c™ and SureTrak™ from Primavera®, Prolog™ Project Pack from Meridian Project Systems™, WebProject™ from Novient®, and Teamflow®7 from CFM. The third is to rent/lease a completely developed WPMS from an Application Service Provider (ASP) for a usage fee, normally charged per project, per the amount of computer storage space required, and/or per user. Examples of WPMS developed by ASPs include Buzzsaw™ by Autodesk®, Citadon™, Constructw@re®, ProjectTalk™ by Meridian Project

Systems® (MPS), PrimeContract® by Primavera®, Viecon™ by Bentley®, VISTA 2020® by Market Street Technologies®, Projectmates™ by Systemates®, IronSpire®, Unifier™ by Skire®, ProjectGrid.com™, BuildOnline.com®, e-Builder™, BIW Information Channel™, ProjectVillage™, etc.

Among these three options, the third, referred to hereafter as a "Project Management System-Application Service Provider (PM-ASP)", is becoming popular because it requires minimal technical, financial, and human resources to develop and operate [8]. Since PM-ASP is outsourced to an ASP, it requires no effort to develop and maintain the system in-house, involves comparatively low initial investment and overhead cost, and is convenient for keeping up with cutting-edge technology. Therefore, it is a viable solution for a small or mid-sized A/E/C firm that needs more resources to maintain an in-house IT department and/or a sophisticated networking infrastructure. In addition, PM-ASP is also capable of performing electronic commerce, such as online bidding and procurement, which are difficult to develop and conduct through an in-house WPMS. The number of A/E/C firms who are turning to PM-ASPs is growing rapidly. The total spending of A/E/C firms on PM-ASPs is anticipated to reach 6 billion Sar by 2004 [10].

Although PM-ASP is a topic of increasing importance to practitioners as well as researchers in construction, it is still relatively new, and its optimal styles and extensions of use still need to be thoroughly investigated. there is still a debate among A/E/C firms on whether or not to move permanently to PM-ASPs. Most companies have used PM-ASPs either because their competitors are influencing them or they are being forced to adopt them by their clients]. Although several ASPs have claimed that their products are the only right solutions to the problems currently facing construction project management, these claims usually need to be more accurate and realistic, aiming only at marketing purposes.

The apparent utility of PM-ASPs in construction still needs to be more attractive than was initially widely expected, and factors such as sociological and people issues require more attention as they greatly impact the system's performance. Industry practitioners must consider not only the technology but also give equal prominence to processes and people involved in the system to embrace PM-ASPs and achieve business benefits successfully. It is evidenced that 80–90% of IT projects generally do not meet their performance objectives, with the main reasons not related to technical issues. Nevertheless, technically related factors have often gained sole attention, while nontechnical factors are considered separately, overlooked, or even ignored completely. Research studies conducted to date still either aim to solve the existing technical problems of PM-ASPs or to introduce some new advanced techniques to improve the current systems, ignoring the fact that technology push is not the only critical success factor for the effective implementation of a new technology such as PM-ASP. Unlike other technologies, PM-ASPs are very much concerned with the exchange of information across

the project life cycle. Their successful implementation, therefore, will require not only a state of readiness within one organization but also within all organizations involved in the construction processes. This makes the successful implementation of PM-ASPs difficult to be planned and managed.

In order for a construction organization to successfully embrace PM-ASPs, factors such as technology, process, people, procurement, legal issues, and knowledge management must be considered equally. Although some studies have been conducted to identify factors that can foster the successful development and usage of PM-ASP in a construction project, all of them are still based solely on individual case studies using interview techniques or anecdotal evidence provided by success stories reported in the trade press. There has yet to be empirical research on a large scale conducted on this topic, and it is obvious that a gap still exists in our understanding of what technical and nontechnical factors significantly affect the performance of implementing PM-ASPs in construction projects.

As the importance of the PM-ASP concept increases, empirical research is needed to identify common factors across the systems and organizations that can lead to the successful implementation of PM-ASPs. The research agenda presented here can help identify these success/failure factors and their levels of impact, leading to productive ways of implementing PM-ASP in a construction project and thereby promoting the possibility of successful widespread adoption of PM-ASPs in the construction industry.

In order to implement PM-ASP successfully in a construction project, careful planning and strategies are needed. Several opinions exist regarding PM-ASP implementation, e.g.

1. There are several attributes or measures that might be used to assess the performance of PM-ASP implementation in a construction project.
2. Various factors can contribute to the performance of PM-ASP implementation in a construction project. However, a single factor cannot govern this performance by itself. The interaction of these factors together drives the performance.
3. The success or failure of PM-ASP implementation may or may not directly affect the success of a construction project.

The aforementioned opinions would lead one to raise the following questions regarding PM-ASP implementation in a construction project:

- 1.What attributes or measures should be used to evaluate the performance of PM-ASP implementation in a construction project?
- 2.What are the success/failure factors leading to the performance of PM-ASP, and how do they affect its performance?
- 3.Can these factors, if controlled, ensure the success of PM-ASP implementation in a construction project?
- 4.What are the relationships, if any, between the success or failure of PM-ASP implementation and construction project success?

This paper is based on research intended to provide answers to all of the aforementioned questions. An attempt to answer these questions leads to the following objectives:

- 1.To define a set of measures that can be used to assess the performance of PM-ASP implementation in a construction project.
- 2.To identify factors leading to the performance of PM-ASP implementation in a construction project.
- 3.To examine the cause—effect relationships between the identified factors and the performance measures.
- 4.To use the identified factors and their associated relationships with performance measures for inference, deviation-cause detection, and improvement of PM-ASP implementation in a construction project.
- 5.To determine if the success or failure of PM-ASP implementation has any effect on the success of a construction project.

The results of this research can be beneficial to A/E/C firms that are using or planning to implement PM-ASPs, and they may shed some light on unexplained deviations in the performance of PM-ASPs. The users of such systems can better understand the important factors that need to be considered to ensure the success of PM-ASP implementation, and the benefits behind changes or improvements in areas of implementation related to critical success factors may increase the chances of successful PM-ASP applications. In addition, the relationship between the success or failure of PM-ASP implementation and the success of a construction project can be better comprehended. Altogether, the results of this

research can lead to an improvement in PM-ASP utilization, management, and more widespread acceptance of such systems in the construction industry

2-2 Background

Around the world, numerous remote construction projects are taking place in places like the Sahara Desert, the Antarctic region, the Arabian Peninsula Desert, the Australian Desert, the Empty Quarter, etc.

According to Deng et al., managing remote projects presents a challenge. He emphasized that one of the main contributors to management issues is distance, which leads to loose control. He offered potential factors, including a lack of need for more structure, human resources, and project management expertise for these remote initiatives.

Remote construction sites in the Kingdom of Saudi Arabia face particular challenges, and it has been noted that some of the project management and communication issues are brought on by the use of ineffective tools and systems for coordination, management, and communication. For instance, Due to their flaws and inability to carry out project duties and objectives, traditional communications and information management systems cannot satisfy the project team's acute demand for project information and efficient communication.

One of these drawbacks is that traditional systems only offer restricted information access, which is regarded as one of the main obstacles to effective project management techniques.

many of these project failures result from poor construction process organization and management (e.g., poor process coordination and ambiguity surrounding the information that is now available).

The utilization of ACMS, such as mobile, web-based Project Management Systems (WPMS), augmented reality, and BIM, can solve these management issues.

To a certain extent, these systems use wireless, satellite, Internet-based, or mobile tools and networks to help construction industry firms manage the rising complexity of typical building projects.

Additionally, they have assisted in achieving project goals regarding quality, scope, money, and time.

Maintaining project quality, eliminating waste, and cost containment are further benefits of sustainable practices and methods.

However, the adoption, spread, and several obstacles, including hamper complete use of the technology.

Large organizations in the KSA with several remote building projects include Aramco and the Royal Commission of Jubail (RCJ). These projects come in various sizes, from modest to very enormous.

They operate in isolated areas, some undeveloped and have delicate environmental conditions.

They are far from the contractor's office, the office of the monitoring team, and significant urban centres.

All project participants face several challenges and challenging management issues during construction.

These potential issues harm the project's quality, result in significant delays, and raise expenses.

The potential for significant enterprises in the Eastern province to utilize ACMS for managing remote projects is examined in this article, as well as any obstacles to such prospective use and how ACMS could assist these businesses in solving project-related issues and enhancing their management techniques.

3-3 Study Objectives

This research aims to address the role of Digitalization and Remote teams in Project Management. It will be a comparative study of both types of teams that assesses their advantages, disadvantages, and importance, especially in remote areas and the construction industry .

4-4 Research Questions

- 1- How has the adoption of digital and remote teams impacted project management practices in Saudi Arabia?**
- 2- What are the key benefits and challenges of using digital and remote teams in project management in Saudi Arabia?**
- 3- Are there any cultural or societal factors in Saudi Arabia that influence the effectiveness of digital and remote teams in project management?**
- 4- What skills and competencies are required for project managers to effectively lead and manage digital and remote teams in Saudi Arabia?**
- 5- What key factors have led to the increased use of digital and remote teams in project management in Saudi Arabia?**
- 6- What challenges or barriers do organizations face when implementing digital and remote teams for project management in Saudi Arabia?**

- 7- What are the best practices or strategies for effectively managing digital and remote teams in project management in Saudi Arabia?
- 8- What are the future trends or developments in the use of digital and remote teams in project management in Saudi Arabia?

5-5 Importance of the Research

A project management virtual team will accomplish projects for a specific amount of scope, time, and cost. Members of the project management team have complementary goals and skills. They usually have the budget for quality, reliable communication technology tools so they can discuss their project plans and accomplishments. The technology tools can include email, groupware, videoconferencing, intranet, fax, chat, or telephone conversations. The virtual team represents different departments and locations of the project management team working on their projects.

6-6 Literature review

6-1 Remote construction sites problems

Deng et al. (2001) highlight the dilemma of managing remote projects, mentioning that the extensive physical distance between project participants, sometimes extending over national boundaries, is the primary cause of delays in decision-making. The project team has to not only tackle traditional management problems but those that specifically occur as a result of the remote locations of these often environmentally sensitive sites.

These sites are often far from logistic support and need more materials and specialized labour. Investigating the management problems of remote projects and reports a need for project pre-planning, certainty, and/or clarity concerning project process integration.

There were also misinterpretations and miscommunications of project results and needs issues.

A centralized decision-making process and lack of delegated authority to field personnel often hindered progress and communications at critical emergency response and recovery stages.

There is a suggestion for a framework for the design management of remote sites. **The framework emphasizes the following management functions:** serving, controlling, organizing, and economizing.

The conducted survey of construction contractors with experience in remote construction projects.

They may find that contractors experience difficulty attracting and **retaining skilled workers**; working in remote locations hurts an employee's family life.

It is difficult to procure and access materials and equipment in remote areas, and severe climatic factors in remote areas hurt productivity. There needs to be more infrastructure and communications. The researchers suggest several possible solutions, such as the need for appropriate material management systems and design cost information specifically for remote construction works.

They recommended that unique types of costing issues should be included in the project's cost estimation at the pre-construction stages of the project; these include mobilization/demobilization, accommodation, inclement weather downtime, site allowances, delivery, and productivity.

For example, the case of Saudi Electric Company (SEC).

SEC has several remote projects, and it experiences difficulties in running these projects. **These problems can be summarized as the following:**

A. Procurement and Risk Management: There needs to be more materials. The delivery of materials and equipment is constrained by road/highway regulations and bad conditions of some remote roads. Projects have much higher risk margins than ordinary projects. The ad hoc approach causes this, and both sides, i.e., the owner and the contractor, do not accurately plan projects.

B. Cost, time, scope, and quality management: There is a serious delay in decision-making, loose control, and infrequent visits to the remote site result in wasted time, excessive costs, unfocused scope, and poor construction quality.

C. Human Resources: SEC has a staff shortage, so employees are incapable of doing all required site visits. There needs to be more security and a shortage of skilled workers. The impact of harsh working conditions hurts the productivity of SEC's supervisors.

D. Infrastructure and communications: Land ownership in some remote areas is not definite or known; legal disputes are likely to occur. There needs to be more infrastructure. Contractors and SEC supervisors still use traditional communications and management tools. Decisions are made autocratically, and SEC's project managers are not able to control and coordinate integration of a project's aspects, and the typical management style needs to be revised, cohesive, and loose.

6-2 The potentials and barriers to the use of ACMS

6-2-1 The potentials of ACMS

Some of remote project management's problems can be avoided if ACMS were used.

It is important to know how far these systems would be capable of sorting remote construction problems.

These systems include Web-based Project Management Systems WPMS and mobile systems that feature mobile tools, personal digital assistants (PDA), wearable computers, wireless tools, four-dimensional augmented reality (4D), virtual reality, and other technologies.

These systems possess the capability to improve communications between project team members and enable teams to share information and quickly solve problems .

They improve team members' ability to manage time and costs (ibid). construction costs can be reduced by 25% through the efficient transfer of information between the construction teams; that transfer can be achieved through ACMS.

Several suggest that adopting Information Communication Technology (ICT) enables effective communication between dispersed project team members but argues that strategic adoption of ICT. This enables them to grasp effectively the IT benefits also it has been

identified **the following benefits of using WPMS**: productivity enhancement of communication between project participants, reduction in project delays, heightened awareness of project issues among all parties, and ease of access to and retrieval of project information.

Other advantages include: avoiding delays due to the arrival of updated drawings and documents, reducing visits to sites and travelling time to meetings, avoiding drawing mistakes, reducing time and money spent on disputes, sharing and exchanging project information, automating repetitive routine processes, and eliminating paper reports.

There is discussion on how WPMS - from the point of view of selecting contractors - helps project managers boost contractor performance and confidence by minimizing subjectivity and eliminating the potential for corrupt practices.

This improves competitiveness through increased awareness of competitors' strengths and weaknesses and nurtures mutual trust in the exchange of sensitive information such as performance data.

Also that the benefits of using WPMS can be categorized into four main areas. These categories include cost reduction and time-saving, enhancement of communications and collaboration, improvement of productivity and partnership, and support of e-commerce and the customer.

Several researchers anticipate that WPMS will replace traditional project management methods, and these methods are drivers of WPMS adoption. Several aspects support this claim, including increased competitive pressures, expectations of revenue growth, the ability to compete globally, and the desire to re-engineer the business to respond to market challenges. It is difficult to assess which mobile systems would benefit the construction industry directly.

The most important intangible benefits include improving customer service, gaining a competitive advantage, acquiring more timely management information, supporting core business functions, avoiding competitive disadvantages, improving management information, improving product quality, improving internal communication, implementing changes through innovation, improving external communication, and enhancing the jobs of employees.

In recent years, the development of laser scanning and video and image-based 3D reconstruction system is enabling remote and virtual walkthroughs on actual construction sites. These systems can minimize the travel times of supervisors and may increase the frequency of progress, quality, and safety inspections by providing project supervisors with systems that are easily applicable.

The utilization of Building Information Modeling (BIM) by the project team would provide a more streamlined business process and associated project and site management methodologies, including complete facilitation of construction knowledge during the full lifecycle of a building project.

This led to argued that BIM implementation serves as a useful alternative to addressing key construction sector issues and offers solutions to these to increase productivity, efficiency, and quality; reduce costs, lead times, and duplications, via effective collaboration and communication of stakeholders in remote construction projects.

These key findings, in terms of challenges, also lend support to the classification of the key challenges for construction project management in remote construction projects, such as human resources, cost, time, scope, and quality management; procurement and risk management; infrastructure and communication.

there is a study on the potentiality of Communications and Project Management Systems (CPMS) and whether they would help SEC avoid some construction problems, sort out efficient site queries and improve the management of these projects.

They pointed out that the CPMS would support SEC's management activities, particularly during the construction stages that witness long delays in providing feedback to the construction inquiries. CPMS can be used to provide fast feedback to the site personnel regarding the most problematic construction problems, such as those related to the monitoring of the construction process, quality of work, procurement of materials, and productivity levels.

The section above highlighted the problems and capabilities of ACMS regarding each project management aspect.

The previous research indicated that remote construction sites have unique problems that need unique and customized IT solutions. It also indicated that remote construction sites have some common problems, such as those related to time, potential risk, pre-planning, cost, and logistic support, despite that they are in different geographical locations.

6-2-2 Barriers to the use of ACMS

Despite fast developments in IT and the creation of many IT applications for the construction industry, some issues still need to be improved for the applicability of these systems to construction project management.

There needs to be a solution with the diffusion of IT in the construction industry and the absorption of IT into work practices. This includes the level of strategic IT investment by construction industry firms.

Other barriers include IT technical shortages, deployment of the system on an ad hoc basis, isolated project management practices, and costly systems .

To minimize such barriers and enable ICT adoption, the following issues should be investigated (Margherita and Petti, 2010):

- **Strategy:** the action plan deriving from an integrated view of the organization's goals and priorities, **people's expectations, and potential benefits;**
- **People:** the single individuals' attitude and the overall organizational context that impact the level of willingness and readiness to change;
- **Process:** the real unit of analysis and trigger of change in terms of alternative redesign scenarios and associated impact; and

- **Enablers:** the potential facilitators of implementation at the technological and organizational levels investigated the impact of project success/ failure factors on the performance of WPMS. This is regarding the following aspects: project characteristics, project team characteristics, service provider characteristics, and system characteristics.

Concerning the project and project team characteristics, they found that strategic, time, cost, quality, Risk, and communication improvement are significantly linked: owner type, project type, project cost, project duration, and starting stage of PM-ASP development. In regards to project team characteristics, the above project factors are significantly linked with the project Parties deciding on the use of PM-ASP.

the following structural and social impediments to **the integration of ICT systems**: commitment from top management, continuing support for users, highly reliable systems, involvement of users, we-use systems, effective project management, clear cost justification, well-proven systems, full training, precisely defined objectives, facilities to meet specific needs, use of pilots or prototypes and organizational change .

7-7 Research design and methods

research exhibits the characteristics the research generated deals with solving practical problems. Regarding the Role of Digitalion in Project Management, especially in remote areas, this has shown to be the case as much of the past research has addressed project success or project failure. The evidence supports digitalization in project management works better than physical project management in achieving project success is largely anecdotal. This study focused solely on agile and traditional methodologies, including moderators industry and experience, as to the influence of project management methodology on reported project success. The study was limited to the Role of Digitalis in Project Management, especially in remote areas as these categories encompass most specific approaches. Project management methodology was the independent variable in this research. Reported project success is the dependent variable in this study. Industry and experience are moderating variables.

8-8 Methodology

The methodology has an influence on reported project success. The present study extends their work by attempting to repeat their findings as well as introducing experience and industry as moderating variables. The participants were recruited through an intermediary using a simple, random sample obtained from a double opt-in access panel in attempt to reduce same source bias.

➤ Population and Sample

The target population for this study was Saudi Arabia's, remote areas, project managers. The research looked at project management methodology, Reported Process Success, industry, and experience. The sampling frame consisted of individuals who chose to opt-in for the online survey.

The population met the inclusion criteria of 25 years of age or older, five years of experience, and experience with multiple PMMs. The following criteria eliminated participants from the study: the respondent did not have experience with multiple PMM or did not agree to the informed consent. The research utilized an intermediary to deliver the surveys. The intermediary selected participants using a simple, random sample obtained from the sample frame. The use of simple random selection allows researchers to determine the appropriate sample size of participants, which can then be generalized to a larger population. The intermediary conducted Communication with respondents with no direct contact with the researcher. The researcher will provide the intermediary survey as well as the informed consent form for the research, including the objectives of the study along with associated risks.

Using SAP programs to calculate recommended sample size, a target of 176 completed surveys, all participants self-identified as holding a PMP® certification.

➤ Instrument

This research utilized Google Surveys , an Internet survey website, to deliver the questionnaire.

➤ Data Collection

A single electronic survey instrument served as the primary measure for this study. A simple random sampling technique has the mode of data collection. Potential respondents review the informed consent form for the study at the onset of the online survey. Participants will require to accept all terms of the informed consent before proceeding to the survey.

Participants who do not accept the terms of consent will not be allowed to continue with the survey and instead will present with a statement of gratitude and exit the questionnaire. Participants who met the inclusion criteria and who accepted the terms of consent proceeded to the survey. A copy of the consent form will be available to all participants. Data

collection occurred using Google Surveys, as facilitated through an intermediary. Such usage of an Internet survey is a popular data collection method due to its speed, efficiency, and cost .

However, such surveys also carry validity risks regarding the accuracy and reliability of responses.

➤ Data Analysis

Analysis of the collected survey responses utilized Statistical Package for the Social Sciences (SPSS). The data will confirm to have all the data, which would prevent accurate analysis. Performance and analysis of summary statistics and normality of data will use to establish the quality of the data. The first and second sets of hypotheses use descriptive statistics as well as Pearson's correlation coefficient to identify and measure differences in reported success between the PMM .

The third hypothesis will be tested using multiple linear regression. Multiple linear regression is useful in identifying the strength of relationships between multiple predictor variables to a single outcome variable, especially when moderated by another set of variables.

➤ Validity and Reliability

instrument utilized 25 questions to measure methodology, including the percentage of planning effort in either the initiation or the initiation and execution phases, as well as report project success. The instrument will be published and establish validity and reliability as measured.

➤ Results

The results will show only a correlation between project management methodology and reported project success. Industry played both digitalized and physical management methodology in remote areas a moderating role in this correlation, and project manager experience will help to have accurate results.

9-9 Conclusion

This paper aims to identify the application and impact of using the virtual team in Saudi Arabia. The literature and various studies concluded that virtual teams are still in their nascent stages. Because of virtual teams' relative newness, many research areas have not been examined, especially in Saudi Arabia.

Studies like these are rare or do not exist in our region. This paper is an endeavour to facilitate using virtual teams in Saudi Arabia, the types of virtual teams, the challenges of virtual teams, and the benefits of virtual teams.

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11-11 Research schedule

Research phase	Objectives	Deadline
Scientific Research	The concept of scientific research <u>- Formation and approval of graduation project team</u>	Jun 3 rd , 2023
Research Proposal	Research Proposal components: 1. Research Title 2. Introduction 3. Research problem 4. The importance of the research <u>-Choose and update the project title and variables</u>	Jun 10 th , 2023
	5. Research Hypotheses 6. Literature Review 7. Research Methodology 8. Research Structure 9. Research limits 10. Initial reference list <u>-Evaluate the project title and variables</u>	Jun 17 th , 2023
Research Methods	- Research method concept - Types of research methods <u>- Project plans Discussion.</u>	July 1 st , 2023
Population and Sampling	- An Introduction - The concept of population and research sample	July 8 th , 2023

	- Reasons for using the sampling method - Sample types - <u>Receiving and Approval of all project plans</u>	
Population and Sampling	- Sample selection steps - Specify the sample size - <u>follow up theoretical content writing tasks with research groups.</u>	July 15 th , 2023
Data Collection	- Data Collection Introduction - Primary data and secondary data - Methods for collecting primary data - <u>Follow up on the practical application of research</u>	July 22 nd , 2023
Validity and Reliability	- Validity and Reliability Introduction - <u>Follow up on the practical application of research</u>	July 29 th , 2023
Data Types (Quantitative & Qualitative)	- The first stage: Presentation and analysis of data using the SPSS program - The second stage: Describing the data using statistical measures. - The third stage: Data analysis using SPSS software - <u>Follow up on the practical application of research</u>	August 5 th , 2023
Research Conclusion	- Research Findings - Research Recommendations - Research Reference	August 12 th , 2023
Final submission	<u>Graduation research final submission</u>	August 19 th , 2023