Agile Project Management Implications to Organization's Performance and Readiness for Digitalization

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Abstract   This study aims to examine the impact of Agile Project Management as one of the prominent Methodologies of projects management on organizational performance as well as the other implications of Agile on projects success and organizational readiness for digital transformation through a real case study for a manufacturing multinational company operating in Egypt that has utilized the Scrum methodology to manage the capacity extensions projects in a fast, dynamic, and Agile way to achieve project success and on turn capture the return on its investments.

Keywords: agile project management, projects success, readiness for digital transformation, organizational performance, multinational companies in Egypt

1. Introduction

Normally in any country, foreign investment is one of the important leverages to economic growth, however, due to recent statistics, foreign investment represented a weak positive effect on economic growth and employment in Egypt last ten years, especially in the construction and manufacturing sectors [1]. The foreign investment inflows through the past ten years based on the world bank data reveal that the inflows started to increase progressively reaching the most value in 2019 due to the economic reforms then a sudden decrease in 2020 due to the global pandemic situation (COVID-19) which mean that the foreign investment inflows are very sensitive to the political and economic conditions (world bank 2022).

Considering that all foreign investments could be considered as development projects, whether they were for the sake of startups, process improvement, capacity extension, or reshaping the company's business model, Agility, and effectiveness should be the dominant attribute for managing these investments otherwise it will not succeed in light of the volatile nature of operational environments [2]. Therefore, such organizations should rely on effective project management as a mechanism for achieving project success, thereby achieving excellence in organizational performance.

On other hand, the most critical emerged threat was the disruptive waves of digital technology which has become a crucial transformation for each organization to survive and thrive, so, the choice of Agile transformation and digital transformation became a must for every organization to be able to confront these challenging conditions [3].

This research represents a real case study for a multinational company operating in Egypt that has utilized the Agile project management methodology (Scrim Method tools and techniques) to manage the capacity Extension projects aiming to capture quick growth with intensive inflow for foreign investments through the years 2017 to 2022 have been allocated to manufacturing facilities capacity extensions and digital transformation process. This case study is investigating an Agile methodology success story aiming to demonstrate and provide evidence of the reliability of Agile methodology in construction projects (not only software development) as an enabler to the project's success and eventually organizational performance.

There were some phases of the organizational culture shift toward Agile philosophy which are not deeply addressed in this research, keeping the main focus on the implications of Agile implementation. However, the analysis of historical data demonstrates better results for projects that have been managed by Agile versus what has been managed by traditional project management. Even though most researchers advocate the effectiveness of Agile project management methodology but most of these research assumptions have been built based on anecdotal

and case studies in different conditions and considering different organizational variables [4].

The realized outcomes of following the Agile methodology were breakthrough impressive compared to the traditional methodology project's results, furthermore, the project team productivity and engagement were shifted for more Agility and resilience confronting the experienced waves of turbulence, designating more tendency to utilize the digital tools and techniques to perform and communicate project's activities in Agile way. So, it was the motive to make this case study applied research on this multinational industrial company in Egypt to explore the effectiveness of the Agile project management approach as leverage for the organizational performance through the project's success and readiness for digital transformation.

2 Literature Review

2.1. Agile Project Management

It can be argued that Agile and agility have been used as a buzzword in many recent types of research and articles to demonstrate flexibility and the lean way of adaptation. a few of them have defined deeply the authenticated meaning of those two terms and differentiated them from flexibility and adaptability [5]. Project management knowledge and practices have been used by Software developers as a guideline and framework to lead their projects but unfortunately, it was not working well to enhance project success [6]. Therefore, there were many attempts to find an alternative way to manage the software project efficiently and effectively, One of these attempts to develop software project management used an assembly-line process and applied the project management engineering concepts to software development in the early 1960s with Concurrent Engineering which were somewhat successful attempts to move toward a rigorous science known as software engineering but software engineering is an immature science or application that should keep software developers did not capitalize on lessons learned therefore they didn't formalize a concrete guide toward success [6]. The project management, tools, and techniques, and project measurement, documentation, affected the human side of engineering software and they were becoming lost in the mainstream software development technical process [7]. The mid–1980's shaped several new processes of software development methodologies including the spiral model of "Boehm", which evolved from a risk management point of view, then there were many efforts to formulate a suitable approach that could be utilized to enhance the software development project's success [8].

In the early 1990s, software development faced a crisis called "Software Crisis", it was widely referred to as "the application development crisis" or "application delivery lag", in this crisis many major software projects have run over budget and over schedule and many even has caused loss of life and property [9].

These frustrations around seemingly unproductive software development activities led to the famous Snowbird meeting in Utah in early 2001, During this meeting Agile project management ideology was expressed by seventeen software developers as a response to the critical and prevalent problem managing projects in software development by using linear ''waterfall'' strategies [10].

At that meeting, the Agile Term was not the goal but, the terms "light" and "lightweight" were the most common terms, eventually, they formalized the Agile movement with the publication of the Manifesto for Agile Software Development [9].

The original text of Agile software development is as follows:

"We are uncovering better ways of developing software by doing it and helping others do it, through this work we have come to value:

1. *Individuals and interactions over processes and tools,*
2. *Working software over comprehensive documentation,*
3. *Customer collaboration over contract negotiation,*
4. *Responding to change over following a plan, that is, while there is value in the items on the right, we value the items on the left more"* [11].

The declaration of the Agile manifesto was such a commitment from these software developers that they are setting and agreed on certain values (four manifesto Values) and principles (Principles behind the Agile Manifesto) that were also published in the agile agilemanifesto.org website, these principles have been originated in the software industry; However, they have since spread to many other industries as an implication of mindset, values, and principles define what constitutes an Agile approach [2]. Then by the time these values and principles were developed more and more constituting many methods and practices that stick to Agile manifesto values and principles generating several methods within the Agile movement such as Scrum Methodology, Kanban Methodology, Extreme Programming (XP), Crystal Clear and many others including the provision for the custom Agile management methods [9].

The Agile model is a collection of best practices used to develop a system in smaller increments continuously [12]. Agile project management is described as an incremental, iterative, and adaptable management approach [13]. Agile project management is a project management practice emphasizing the integration of cross-functional teams put together around the customer, with scaled-down structural hierarchy and communication [14]. Agile is a management strategy aiming to achieve sustainable development through adaptation to all kinds of unexpected changes [15].

It is a group of flexible approaches to project management that are specifically effective in a context of high product complexity and uncertainty designated as iterative product development, rapid customer feedback, and constant change [16]. It is the ability to change quickly the project plan as a response to customer or stakeholders' needs, market, or technology demands to achieve better project performance in a dynamic and innovative environment [17].

Agile is the ability to guide the team and continuously influence their behavior toward providing value to customers by having many skills with flexibility enhancing the realization of organizations' strategic objectives and confronting challenges [18]. It is an

approach for managing high-risk and time-sensitive projects as it has proven to provide better productivity, higher quality, and more efficient decision making as well as overall project lower costs and faster time to market, due to its framework that is promoting frequent customer interaction and frequent and quick delivery cycles [19].

Agile is not a methodology, it is an approach that can utilize a variety of methodologies, using organizational models based on people, collaboration, and shared value constituted by the Agile Manifesto which outlines the primary tenets of the agile philosophy along with rolling wave planning, iterative and incremental delivery, rapid and flexible response to change, and open communication between teams, stakeholders, and customers (Project management institute 2017).

Agile development is an evolutionary approach that emerged independently, but consistent with, the directed progress of a theoretical framework for project management and the implication of much better results than traditional project management due to the sociological aspects and human dynamics that have been factored into a dynamic, high flow of feedback set of values which in role exponentially reduce the Cost of change [6]. Agile project management has come up as a highly iterative and incremental process in which project teams and stakeholders actively collaborate to figure out the domain, identify what needs to be built, and prioritize functionality [19].

2.2. Project Success

The main objective of any project is to capture a certain value which is simply the target of the project and the reason for its existence and dedicating the resources to attain that target, also, the most common challenge in project management is to determine whether a project is successful or not, therefore, Project success and project failure are NOT absolutes. "It may not be possible to be a little bit pregnant, but you can be a little bit successful" [20]. Traditionally, the project management metrics of time, cost, scope, and quality have been considered the most important factors in defining the success of a project [2]. It is also referring to the measurement related to project implementation effectiveness, such as cost, duration, specification, and process efficiency as well as user satisfaction as a quality measure [21]. Project success may include additional criteria linked to the organizational strategy and to the delivery of business results that could be inferred through financial figures achievement represented in some measures such as Net present value (NPV), Return on investment (ROI), Internal rate of return (IRR), Payback period (PBP), and Benefit-cost ratio (BCR) [2].

Project success is difficult to measure and requires opinions from different stakeholders such as clients and end-users which make in some cases makes project perception successful even though it doesn't meet budget, time, and user-predetermined specifications [22]. and on the counter side, It is possible for a project to be successful from a scope/schedule/budget viewpoint, and to be unsuccessful from a business viewpoint which can occur when there is a change in the business needs or the market environment before the project is completed [2].

So, each project has its success criteria related to its objective business result, some success criteria are absolute, and some are relative, Project success is determined by how many of your success criteria are satisfied, and how well [20]. It could be having different viewpoints on project success however, success criteria generally include project completion in terms of time, performance, budget, and quality [23].

The link between Success Factors and success criteria has been depicted in The Project Excellence Model [24]. This model is adapted from the EFQM (the European Foundation for Quality Management) Model, this model consists of some result areas covering project success criteria such as time, cost, and quality and other organizational areas covering critical success factors such as human management, process, and organization, to engage both success criteria and factors in the aim to improve the performance of a project [24].

2.3. Readiness for Digital Transformation

"The digital revolution is creating radically new approaches that revolutionize how individuals and institutions engage and collaborate" [25]. Therefore, the digital transformation or digitalization process is going to dominate the radical disruption of all physical and biological transactions engaging digital technology as an enfolding enabler.

The study of the digital transformation process will not be targeted in this research but, the target is the understanding and verification of the enablers of the digital transformation process and the main drivers and motives of that radical shift in the form of readiness for digital transformation or pre-digitalization mode and analyzing the implications of that readiness mode on the organization performance.

Some previous research primarily focused on digital maturity assessment; some of them studied the subject of the digital readiness of organizations and provided methods and tools to evaluate states of digital maturity and the readiness for digital transformations, models that enable companies to assess their digital capabilities and maturity model was also carried out as well as figuring out the factors enabling the successful digital transformation [26].

It is also important to differentiate between readiness and maturity models of digital transformation; readiness models clarify whether an organization is ready to start changing the process or not; however, maturity models target to determine which maturity level the organization has realized and accordingly decide when and why they need to take an action to proceed [27]. it is also crucial to examine readiness for digital transformation as the organization can define and decide its transformation strategy based on the readiness scores [28].

Readiness to digital transformation is an assessment tool that helps organizations assess their readiness for that paradigm change, as it is not merely limited to implementing advanced digital technologies but also depends on the manufacturers' capability to seamlessly integrate the new digital solutions also, digitalization readiness is better fit to effectively prioritize their digital manufacturing investment, perform digitalization risk management and define their weakness and strength [29].

2.4. Organizational Performance

The word performance refers to the measure of change in a particular outcome whether it was good or bad [30]. The performance of any organization is an indicator of its sustainability and growth whether it was a profit or a nonprofit organization and basically could be translated into financial figures which are the most objective and accurate measures of the organization's financial position. therefore, to define the firm's performance, it is important to mention that "financial indicators reflect the fulfillment of economic goals in financial terms" [31].

Furthermore, other economic measures demonstrate the organization's capability to create value for its stakeholders. In addition, corporate social performance measures such as the organization's reputation, the organization's attractiveness as an employer, and the generation of good-will from the society in which it operates are also important, this contrasts with companies run under Shareholder Theory which usually focuses on short term financial result [32].

There are many subjective measures representing the organization's performance such as market position, human resources management metrics, social and political metrics, innovation capacity, and other metrics related to organization competencies, growth, and effectiveness however, still the accounting standards are the most accurate figures which "aren't just another financial rudder to be pulled when the economic ship drifts in the wrong direction. Instead, they are the rivets in the hull, and you risk the integrity of the entire economy by removing them" [33]. The management of projects is probably among the most important economic and industrial activities in modern society which are used to create, shape, and change the structure of society and the activities of many organizations [34].

2.5. Previous Work

In previous research, there was some focus on investigating the effectiveness of Agile through different models some of which have addressed its impact on project success under certain conditions. Following the Agile approach does not necessarily guarantee the project's success unless it was considering two important success factors; process factor, and people factor [35]. The effect of Agile on project success does not only require robust implementation and team competency and Authenticity, but also it is requiring clear and defined organizational goals, and vision to enable the team's right response [36].

And some others demonstrated the implications of Agile on the Organization's Performance through the mediator role of the project's success. Agile project management practices not only boost the project success probability but also it has other implications on organizational performance such as the project team's psychological empowerment and increasing motivation which in turn leads to boosting their innovative behavior during project implementation [37]. Organizational Agility means that the organization has reached Agile maturity which is matching the Authentic implementation of Agile at a large scale matching the size of the organization and harvesting the benefits of that Agility in

terms of organizational performance and employee satisfaction [38]. following Agile project management, requires re-editing the whole organizational performance indicators and integrating them into a new performance measurement framework [39].

On the other hand, the link between Agile and readiness for digital transformation has been addressed in other research highlighting their implications as well boosting the organization's performance. The increasing diffusion of digital technologies, especially in manufacturing systems, is leading to a new industrial paradigm, named Industry 4.0 (I4.0), which involves disruptive changes in the way corporations establish production and create value through development projects, while organizations willing to get the benefit of I4.0 they must innovate their processes and business models through digital transformation models and roadmaps [26]. The fourth industrial revolution has led to a new period in project management development, which could be defined as Project Management 4.0 [40]. The digital transformation process is a crucial step for any organization to be able to confront the continuous waves of disruptive innovation threats, the critical structure in achieving successful digital transformation is the digital project team and their ability to be agile [41].

As the success in digital transformation become significantly dependent on the project team's agility, a new approach has emerged which is linking both Agile and Digital Transformation in one model known as Agile Digital Transformation (ADT) which is representing the assessment of both Agile maturity and Digital transformation readiness/maturity, therefore, support the organization to make the right decision and perceive the transformation gap [3]. Digital transformation became crucial to the organization's sustainability, survival, and thriving positively impacting the Companie's performance and adapting its business model to cope with these disruptive technological waves in an adaptive way which in turn enhances sustainable business performance [42,43,44,45].

3. Research Method

In this research the Exploratory research methodology has been followed due to the scattered fragmented relationships between the variables which have been experienced from the literature review, this is why the research targeted through this work to understand the previous context, to study the models proposed by other researchers and to exploit them in an integrated model that aims to enable an adequate project Success model, pairing with the digital transformation readiness and demonstrates their contributions toward the organizational performance. The study employed multiscale measures of the constructed structure model and the different correlations between its variables, these scales have been derived from previous studies and reconceptualized and aggregated in one survey.

So, the first step is to verify whether that Agile has an impact on the project success compared to traditional project management or not by analyzing the project success factor for the previous projects that have followed both traditional and Agile methodologies from the historical database of the company through the last five

years. Then, the next step is to measure to what extent following the Agile project management can impact the degree of project success, readiness for digital transformation, and organizational performance using the reconceptualized aggregated survey data analysis. Therefore, both Time horizon-based and multiple cross-sectional (from different correspondents) were utilized to realize the implications of Agile project management on project success and eventually the inferential statistical analysis of Agile project management implications toward readiness for digital transformation and boosting the organizational performance.

The research is representing a Single case study which is a common design for doing business case studies applied research, which may be criticized as a single-case study due to the uniqueness or artifactual conditions surrounding the case, however, the pilot case study can support the refinement of the data collection plans concerning both the content of the data and the procedures to be followed [46]. The advantage of the case study as a strategy for doing research that involves an empirical investigation of a particular phenomenon within its real-life context, a single case is often used where it represents a critical case or unique or because it provides an opportunity to observe and analyze a phenomenon that few have considered before [47].

The research proposed model is illustrated in the following chart:
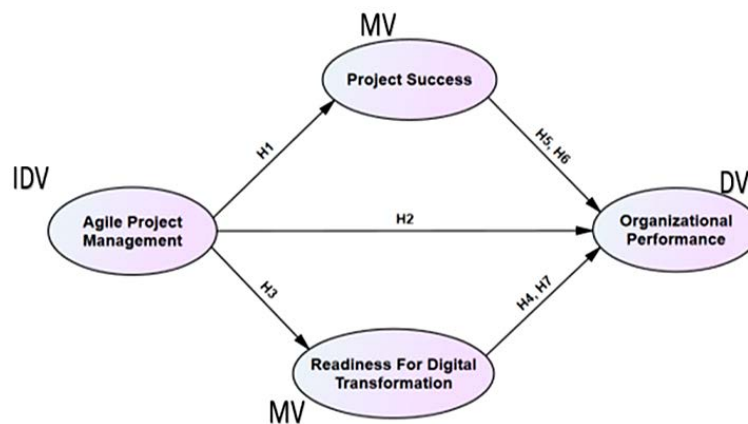
Figure 1. Research conceptual Model and Theoretical Framework. Source: The Author

Research hypothesis

H1: Agile project management has a significant direct effect on project success.

H2: Agile project management has a significant direct effect on organizational performance.

H3: Agile project management has a significant direct effect on readiness for digital transformation.

H4: Readiness for digital transformation has a significant direct effect on organizational performance.

H5: project success has a significant direct effect on organizational performance.

H6: Agile project management has a positive indirect effect on organizational performance when it is mediated by project success.

H7: Agile project management has a positive indirect effect on organizational performance when it is mediated by Readiness for digital transformation.

4. Data Analysis

The first step was to test the hypothesis of the Agile project management methodology for boosting the project success against the following traditional project management method. Then the second step was to measure the level of utilization of the Agile project management method by the project team and its implications for the project's success, Readiness for digital transformation, and organizational performance. This study uses path analysis to test the predicted causal relationships among the variables and determine whether the model provides an acceptable fit to the data.

The measure of historical data was a descriptive analysis of the Agile project management frequencies versus the traditional method as a nominal variable with the association of the project success which is considered a latent variable that could be measured through the main four dimensions (Budget compliance, Time Compliance, Quality Compliance Scope Compliance). The objective of that analysis is to test the following hypothesis and model through statistical data processing of the historical data of 153 implemented projects over the last five years (2017-2021), some of them were following traditional project management methodology and others were following Agile project management.

4.1. Historical Data Analysis

The analysis of historical data demonstrated the advanced performance of Agile project management versus the traditional method in the terms of budget most of the projects meet or less than the allocated budget at a very good or on-time schedule adherence achieving mostly 100% of the targeted Scope at a very good quality specification accomplishment, on the other hand, it is mostly over budget and moderate quality accomplishment exceeding time and insufficient meeting of targeted scope in case of following the traditional project management methodology.

The following chart represents the stable and controlled sustainable performance of project management in case of following the Agile method versus the random uncontrolled performance in case of following the traditional project management methodology with an average success score of **93.78%** for Agile projects, versus **87.37%** average success score for traditional projects.
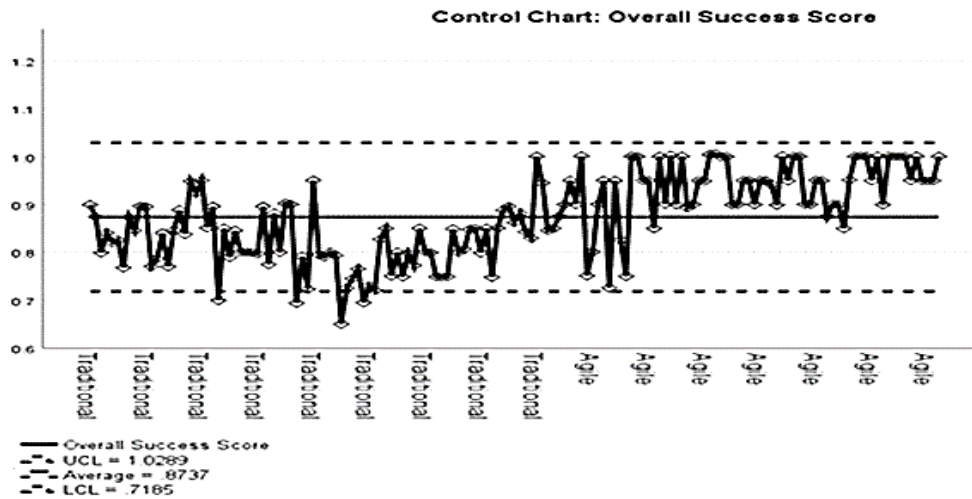
Figure 2. Overall project success score. Source: The Author

4.2. Surveyed Data Analysis

The survey included different questions that are targeted to measure the four variables of the study (Agile project management, Project Success, Readiness for digital transformation, and organizational performance) as well as an introductory question gathering the demographic attributes of the surveyed sample. A refreshment training session have been conducted for all participants before sending them the questionnaire to be sure that all participants share the same knowledge of the scientific and technical terms such as Agile, Hybrid, digital transformation, and the project success criteria, furthermore, it was important to support some participant who is not able to perform the survey without any bias but with some clarifications of the questions objectives and by translation in some cases.

The survey participants were the project management engaged persons of the organization, including employees, project team, Suppliers, Top managers, and stakeholders of the companies who were believed to have sufficient knowledge of both company strategy, project management process, organization performance, and the digital strategy of the company. Of the 220 distributed questionnaires, 157 valid responses were obtained, representing a response rate of 71.36 %. This study analyzed the overall model fit and causal relationship using confirmatory factor analysis and structural equation modeling.

4.3. Reliability Test for Research Variables

Table 1. reliability analysis for the research survey variables. Source: The Author

Variable	No. of items	No. of Cases	Cronbach's Alpha	Conclusion
Agile Project management	42	157	0.895	Good reliability
Project Success	9	157	0.835	Good reliability
Readiness for Digital Transformation	30	157	0.939	Good reliability
Organizational Performance	6	157	0.881	Good reliability
Total Survey	87	157	0.949	Good reliability

The reliability test has been conducted for each variable through the SPSS, all variables passed the reliability test with Cronbach's Alpha values greater than 0.8 which indicates very good reliability.

4.4. Demographic Description

Table 2. Demographic profiles of the sample (n=157). Source: The Author

Question	Demographic component	Frequency	Percent	Cumulative Percent
What Is your role in the Organization?	Employee	90	57.3	57.3
	Project Team	29	18.5	75.8
	Top Management	8	5.1	80.9
	Supplier	17	10.8	91.7
	Stakeholder	13	8.3	100.0
How long have you been working for/have a relationship with the Company?	1-3 Years	56	35.7	35.7
	4-6 Years	41	26.1	61.8
	7-9 Years	33	21.0	82.8
	10-12 Years	15	9.6	92.4
	More than 12 Years	12	7.6	100.0
What was the purpose and goal of the project/projects you have been involved in	Process development	31	19.7	19.7
	Capacity Extension	71	45.2	65.0
	New Constructions	44	28.0	93.0
	Team Development	5	3.2	96.2
	Others	6	3.8	100.0

4.5. Correlation Matrix

Table 3. Correlation between the research variables. Source: The Author

Variable	Statistics	Agile Project Management	Project Success	Readiness for Digital transformation	Organizational Performance
Agile Project Management (APM)	Pearson Correlation	1	0.609**	0.423**	0.540**
	Sig. (2-tailed)		<0.001	<.001	<0.001
	Covariance	0.159	0.122	0.079	0.114
Project Success (PS)	Pearson Correlation	0.609**	1	0.390**	0.424**
	Sig. (2-tailed)	<0.001		<0.001	<0.001
	Covariance	0.122	0.253	0.091	0.113
Readiness for Digital transformation (RFDT)	Pearson Correlation	0.423**	0.390**	1	0.493**
	Sig. (2-tailed)	<0.001	<0.001		<0.001
	Covariance	0.079	0.091	0.217	0.122
Organizational Performance (OP)	Pearson Correlation	0.540**	0.424**	0.493**	1
	Sig. (2-tailed)	<0.001	<0.001	<0.001	
	Covariance	0.114	0.113	0.122	0.280
**. Correlation is significant at the 0.01 level (2-tailed).					

The previous table shows a positive significant correlation among the variables; however, it is not a perfect correlation that ensures the absence of multicollinearity between variables. to test the accuracy of the conceptual model, the measurement model measures/dimensions have to be examined to see how well the hidden variables are represented by the observed variables It is mainly confirmatory factor analysis (CFA) and indicates the construct validity of scales [48].

4.6. Model Fit

4.6.1. Covariance and Measurement Model Confirmatory Factor Analysis (CFA).

The covariance between the four variables of the research has been tested as well as the model fit test for verifying that the dimensions of variables are representing and explaining well their latent variables, the test has been conducted using IBM AMOS V29 Software Scalar Estimates (Default model)Maximum Likelihood Estimates and Standardized Regression Weights the results were as shown in the below figure.

Results were as shown in the below figures.

The model Chi-square ratio to the degree of freedom (CMIN/DF) = 2.797(less than 3) which indicates a good fit of the model; however, the other model fit indicators were not conforming to the good fit as shown in the below table.

Therefore, the model should be re-adjusted to obtain a better measurement instrument.

Figure 3. Covariance standardized estimates main model. Source: The Author

Table 4. goodness of fit indicators for the confirmatory factor analysis. Source: The Author

Good Fit Indicator	CMIN/DF	PCLOSE ≥ 0.05	RMSEA ≤ 0.10	NFI ≥ 0.90	CFI ≥ 0.90	TLI ≥ 0.90	IFI ≥ 0.90	RFI ≥ 0.90	RMR ≤ 0.05	GFI ≥ 0.90	AGFI ≥ 0.90
Result	3.133	0	0.117	0.737	0.801	0.764	0.805	0.688	0.032	0.791	0.723
Interpretation	Poor fit	Poor fit	Poor fit	Poor fit	Poor fit	Poor fit	Poor fit	Poor fit	Poor fit	Poor fit	Poor fit

All P values for the correlations and covariance relations were less than 0.05 and all C.R. values were greater than 1.964 however, the loading (standardized regression weight estimates) for some dimensions are so low factor loading (less than 0.50) that show lower representation for the measured variables such as AP7, AP1, PS4, and RFDT4 as shown in the below table:

Table 5. Regression weight for the research default model. Source: The Author

Regression path			Unstandardized Est.	Standardized Est.	S.E.	C.R.	P	Factor Loading level
AP8	←	APM	1.134	0.710	0.160	7.080	***	High Factor loading
AP7	←	APM	0.735	0.495	0.138	5.317	***	Low factor loading
AP6	←	APM	1.000	0.615				Moderate Factor loading
AP5	←	APM	1.493	0.677	0.209	7.143	***	Moderate Factor loading
AP4	←	APM	1.180	0.736	0.161	7.346	***	High Factor loading
AP3	←	APM	1.177	0.802	0.170	7.860	***	High Factor loading
AP2	←	APM	1.114	0. .769	0.147	7.562	***	High Factor loading
AP1	←	APM	0.622	0.367	0.151	4.125	***	Low factor loading
PS4	←	PS	0.562	0.386	0.139	4.053	***	Low factor loading
PS3	←	PS	1.166	0.808	0.195	5.981	***	High Factor loading
PS2	←	PS	1.018	0.585	0.161	6.310	***	Moderate Factor loading
PS1	←	PS	1.000	0. .620				Moderate Factor loading
RFDT4	←	RFDT	1.000	0. .374	0.146	4.563	***	Low factor loading
RFDT3	←	RFDT	1.353	0.793	0.084	10.698	***	High Factor loading
RFDT2	←	RFDT	1.539	0.918	0.087	11.778	***	High Factor loading
RFDT1	←	RFDT	1.000	0.794				High Factor loading
OP2	←	OP	1.006	0.786	0.093	8.733	***	High Factor loading
OP1	←	OP	1.000	0.900				High Factor loading

The first step to fine-tuning model fit initially was through the removal of the dimensions that have low factor loading then running the model calculating estimates and examining the model fit, furthermore, it was necessary to follow the modification indices suggestion to place covariance between some errors estimates to the decrease in the Chi-square value of the model and improve the other good fit indicators. these model's fit indices will improve the model fit. however, these covariances between errors estimates are not to be considered as unrelated concepts in the literature that should be taken into account when setting because each modification changes the conceptual model which is primarily introduced, it should be noted that the changes made by this reason do not contradict the purpose of the research and the relations in the literature [48].

The following confirmatory factor construct represents the adjusted model after removing the low factor loading dimensions and placing covariance between some error estimates. estimates.

Figure 4. Modified covariance construct for standardized model estimates. Source: The Author

The following table shows the good fit indicators for the adjusted model

Table 6. modified CFA Goodness of fit indicators table. Source: The Author

Good Fit Indicator	CMIN/DF	PCLOSE ≥ 0.05	RMSEA ≤ 0.10	NFI ≥ 0.90	CFI ≥ 0.90	TLI ≥ 0.90	IFI ≥ 0.90	RFI ≥ 0.850	RMR ≤ 0.05	GFI ≥ 0.90	AGFI ≥ 0.90
Result	1.836	0.034	0.073	0.901	0.951	0.935	0.952	0.868	0.02	0.902	0.848
Interpretation	Good fit	Poor fit	Good fit	Good fit	Good fit	Good fit	Good fit	Good fit	Good fit	Good fit	Good fit

Based on the adjusted confirmatory factor analysis (CFA) a good fit has been indicated, Acceptable Fit Values Fit Indices Goodness of Fit Values CMIN/DF = 1.836 < 3, NFI, TLI, and CFI > 0,9, 0,05 < RMSEA < 0,08, which indicate a good fit results that proof the conjunction between the model, and the measured variable data considering that the values of RFI are less than 0.9 but so close to 0.9 and greater than 0.8 that could be accepted as good fit indications [48].

4.6.2. Structural Equation Modeling Analysis

Based on the confirmatory factor analysis, the following model shows the structural equation modeling construct as an examination for the research model fit and hypothesis testing support

Figure 5. Structural equation modeling for hypothesized model standardized regression. Source: The Author.

The following table shows the regression table for research variables based on the theoretical structure model construct:

Table 7. Regression estimates for research theoretical model. Source: The Author

Regression			Estimate	Estimate	S.E.	C.R.	P
PS	←	APM	1.209	0.939	0.129	9.375	***
RFDT	←	APM	0.601	0.616	0.095	6.346	***
OP	←	APM	0.44	0.415	0.53	0.83	0.407
OP	←	RFDT	0.219	0.202	0.11	1.99	0.047
OP	←	PS	0.114	0.139	0.405	0.282	0.778
OP ←PS, RFDT	←	APM	0.265	0.256	1.145	0.231	0.481
OP←PS	←	APM	0.138	0.131	1.148	0.120	0.693
OP ←RFDT	←	APM	0.132	0.124	0.081	1.629	0.098
PS3	←	PS	1	0.829			
PS2	←	PS	0.677	0.465	0.124	5.472	***
PS1	←	PS	0.702	0.521	0.114	6.167	***
RFDT3	←	RFDT	1	0.784			
RFDT2	←	RFDT	1.171	0.931	0.099	11.865	***
RFDT1	←	RFDT	1.11	0.784	0.106	10.44	***
AP8	←	APM	1	0.746			
AP6	←	APM	0.761	0.558	0.114	6.651	***
AP5	←	APM	1.225	0.663	0.153	7.99	***
AP4	←	APM	0.856	0.636	0.112	7.614	***
AP3	←	APM	1.042	0.747	0.115	9.05	***
AP2	←	APM	0.928	0.764	0.1	9.275	***
OP2	←	OP	1	0.783			
OP1	←	OP	1.242	0.903	0.139	8.906	***

The following table shows the good fit indicators for the theoretical research model

Table 8. Goodness of Fit for the Research theoretical model SEM. Source: The Author

Good Fit Indicator	CMIN/DF	PCLOSE ≥ 0.05	RMSEA ≤ 0.10	NFI ≥ 0.90	CFI ≥ 0.90	TLI ≥ 0.90	IFI ≥ 0.90	RFI ≥ 0.850	RMR ≤ 0.05	GFI ≥ 0.90	AGFI ≥ 0.90
Result	1.826	0.035	0.073	0.9	0.951	0.936	0.952	0.868	0.021	0.9	0.848
Interpretation	Good fit	Poor fit	Good fit	Good fit	Good fit	Good fit	Good fit	Good fit	Good fit	Good fit	Good fit

From the previous table the significance level of the following relations was not verified:

- Agile project management direct impact on organizational performance.
- Readiness for digital transformation's direct impact on organizational performance.
- Project success direct impact on organizational performance.
- Total effect of Agile project management on organizational performance through the two mediation roles of project success and readiness for digital transformation.
- The indirect effect of Agile project management on organization performance through the mediator role of project success.
- The indirect effect of Agile project management on organization performance through the mediator role of readiness for digital transformation.

While two relations were significantly verified:

- Agile project management direct impact on project success
- Agile project management direct impact on readiness for digital transformation.

The goodness of fit indicators for the model construct were indicating a good fit. however, the non-significance effects of some variables mean that some indirect relations are disturbing the significance of others, therefore it was necessary to make an independent investigation for each relation in the terms of regression and goodness of fit for each model to segregate the disturbance path reaching the modified research model.

The following Table shows the unstandardized and standardized regression estimates for the model:

Regression estimates for the proposed model:

Table 9. Model hypothesis testing for independent regression paths. Source: The Author

Regression						Un-St. Estimate	St. Estimate	S.E.	C.R.	P	Hypothesis
PS	←	APM				1.217	0.903	0.136	8.958	***	**H1: Is Accepted**
OP	←	APM				0.786	0.658	0.134	5.870	***	**H2: Is Accepted**
RFDT	←	APM				0.638	0.595	0.112	5.683	***	**H3: Is Accepted**
OP	←	RFDT				0.570	0.547	0.110	5.157	***	**H4: Is Accepted**
OP	←	PS				0.559	0.663	0.131	4.259	***	**H5: Is Accepted**
OP	←	PS	←	APM		0.228	0.212	1.059	0.215	**0.562**	**H6: Is Rejected**
OP	←	RFDT	←	APM		0.164	0.141	0.081	2.012	**0.019**	**H7: Is Rejected**

From the regression estimates and significance levels, the direct effect of Agile project management on project success, readiness for digital transformation, and organization performance were verified at a significance level of less than 0.01 and high regression estimates. also, the direct effect of project success on organization performance and the direct effect of readiness for digital transformation on organization performance were significant as well at a significance level of less than 0.01 and high regression estimates.

The indirect effect of Agile project management on organization performance through the mediator role of project success was not verified (P-Value = 0.562, C.R =0.215) which lead to the rejection of that hypothesis. The indirect effect of Agile project management on organization performance through the mediator role of readiness for digital transformation was verified but at a significance level =0.019 (P-Value > 0.01) which is not conforming the research significance methodology that decided to follow the significance level of less than 0.01 due to the small sample size also to reduce the risk of committing a type I error which means that there is a 1% chance of committing a Type I error and accepting risking a type II error).

So, as a summary of Hypothesis testing results that all hypotheses have been accepted except the two hypotheses of mediator roles could not be proven also from the confirmatory factor analysis and the structural modeling equation analysis these relations have been confirmed once again through the default model estimates and the goodness of fit indicators. These regression estimates have been generated through IBM AMOS software for the structural equation modeling (SEM) of the adjusted model

that has been adjusted during confirmatory factor analysis (eliminating the low factor loading dimensions and covariance between some errors recommended by modification indices) and also unadjusted computed variable regression analysis were supporting the same estimates for hypothesis testing. So, H1, H2, H3, H4, H5, are Accepted, and H6, H7, are Rejected.

4.6.3. Modified SEM

The regression models are representing hypothesis testing as well for the research hypothesis but in fact, these segregated independent regression models do not fully represent a validation for the proposed model construct. Therefore, it is necessary to repeat the structural equation modeling analysis after adaptation and modification based on the hypothesis testing results.

As the mediator roles of project success and readiness for digital transformation have been rejected based on the regression analysis that has been conducted on the structural model construct. So, the mediation relationship is not proven therefore the following model structure has been constructed and the following table shows the regression estimates between variables that show a significance level <0.01 and high regression estimates confirming the validity of the modified model which is also supported through the model goodness of fit indicators. The highest regression estimate was for the direct impact of Agile project management on project success at a standardized regression estimate of 0.944 then the direct impact of Agile project management on organization performance (0.691) then the impact of Agile project management on readiness for digital transformation (0.635).
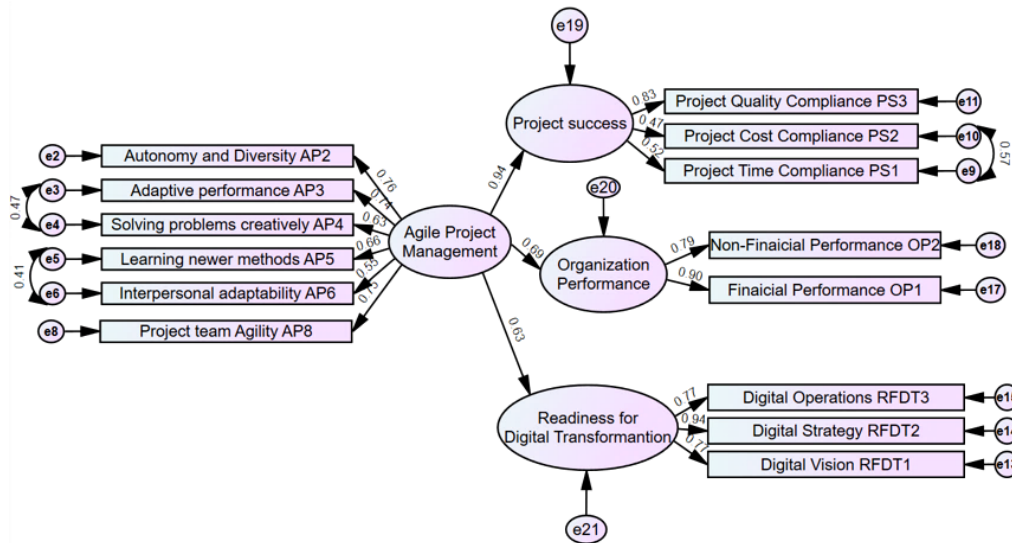
Figure 6. Standardized estimates for the Modified structural model construct. Source: The Author.

The previous figures show the modified structural model construct and the factor loading, the model fit has been tested and the goodness of fit indicators is shown in the following table

Table 10. regression weights for the adjusted structural model construct. Source: The Author

Regression			Un-St. Estimate	St. Estimate	S.E.	C.R.	P
PS	←	APM	1.211	0.944	0.128	9.486	***
RFDT	←	APM	0.612	0.635	0.094	6.507	***
OP	←	APM	0.738	0.691	0.113	6.531	***

Table 11. Goodness of fit indicators for adjusted structural equation modeling. Source: The Author

Good Fit Indicator	CMIN/DF	PCLOSE ≥ 0.05	RMSEA ≤ 0.10	NFI ≥ 0.90	CFI ≥ 0.90	TLI ≥ 0.90	IFI ≥ 0.90	RFI ≥ 0.85	RMR ≤ 0.05	GFI ≥ 0.90	AGFI ≥ 0.90
Result	1.828	0.033	0.073	0.897	0.95	0.936	0.951	0.868	0.022	0.896	0.847
Interpretation	Good fit	Poor fit	Good fit	Good fit	Good fit	Good fit	Good fit	Good fit	Good fit	Good fit	Good fit
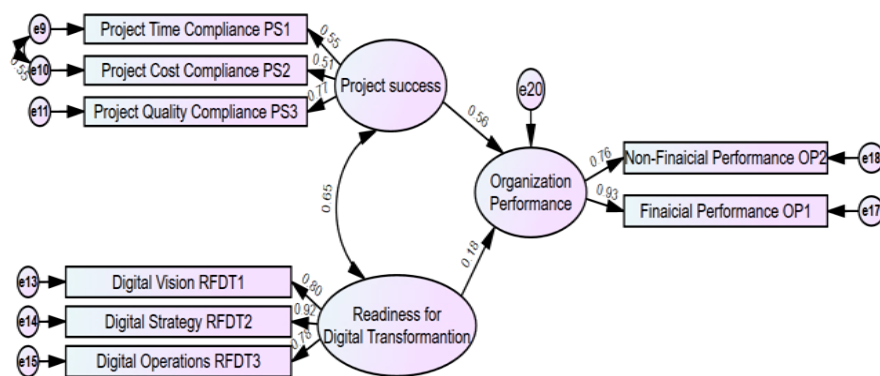
Figure 7. Structural model for a direct effect of the mediator variables standardized Estimates. Source: The Author

The previous table summarizes the goodness of fit values, the value of the AGFI, RFI, NFI, and GFI is less than 0.9 but still very close to 0.9. but they still meet the requirement suggested by Baumgartner and Homburg [49]: "the value is acceptable if above 0.8". [50] that could be accepted as a good fit considering that all the other indicators are confirming the good fit thresholds limits except the PCLOSE value (0.026), For convergent validity, The correlations between the constructs were strong and highly significant for all construct pairs, which is consistent with prior researches and the research theoretical model.

The direct impact of readiness for digital transformation on project success has been examined & it was found a significant impact but also it was at the same amount from the opposite direction (from project success toward readiness for digital transformation) which indicates that both of them are impacting each other, on other words; the more the company has digital technical excellence the more it has leverage to boost successful projects outcomes. at the same time when the company has a project's success competency and leverage this will augment the company's readiness for implementing the digital transformation projects successfully. Therefore, it is a

covariance mutual impact/relation between readiness for digital transformation and the project's success level.

As shown in the previous table that there is a significant covariance between the project success and readiness for digital transformation with a mutual impact even though the un-standardized regression estimate of projects success on readiness for digital transformation is higher than the regression estimates in the opposite direction (from a readiness for digital transformation to project success), The direct impact of both project success and readiness for digital transformation that has been tested to supplement the model and to test the other hypothesis through structural model construct (Figure 7).

As inferred from both previous models' Agile project management has a direct positive impact on project success, readiness for digital transformation, and organizational performance, while the direct impact of Agile project management on organizational performance is not statistically supported. Also, both Project Success and Readiness for digital transformation are showing a direct impact on organizational performance only in the absence of the effect of Agile project management which has a dominant impact over the three variables of the research (Project success, readiness for digital transformation, and Organizational performance).

5. Results and Discussion

As a recap for the previous statistical analysis the following evidence has been inferred from the various statistical analysis indicators and statistical analysis that have been conducted for both subjective and objective research data:

5.1. Consolidating the Results

From the historical data analysis, it was inferred that the selection of Agile project management as a project management methodology is augmenting the Projects success versus the traditional methodology for Achieving the project scope at the shortest lead time, and high-quality project deliverables. but, for the project's budget efficiency it was not that significant which can be related to the Agile approach of welcoming changes to enlarge the scope for better outcomes.

Agile project management adherence level was perceived through six dimensions out of the 8 proposed in the survey (Autonomy and Diversity, Adaptive Performance, Solving problems creatively, Learning new Methodologies, Interpersonal adaptability, and Project team Agility) at a high factor loading while the other two dimensions have been terminated due to their low factor loading (Agile Adherence level (0.36) and handling work stress (0.495). Readiness for Digital Transformation has been interpreted through three dimensions out of four (Digital Vision, Digital Strategy, and Digital Operations) while the fourth dimension (Digital Challenge) has been eliminated due to its low factor loading (0.37).

The mediation roles of both Project success and Readiness for Digital transformation have not been proven therefore the research model was separated into two models (the main Model and the supplementary models),

the main research model depicts the direct impact of Agile project management on Project Success, Readiness for digital transformation, and Organizational performance, then the supplementary model depicts the Direct impact of both Project success and Readiness for Digital transformation on Organizational performance.

The common direct impact of Agile project management on project success, Readiness for digital transformation, and organization performance at the same time depicted in the research model is augmented and proofing that the implications of Agile project management towards boosting the organization performance, enhancing the readiness for the digital transformation process, and highly impacting the potential success of all projects.

5.2. Conclusion & Recommendations

5.2.1. Conclusions

The research set out to answer the research question, to gain a better understanding of Agile project management and its implications for the organization's performance.

Research findings have shown how Agile project management practices are the key enabler to a project's success, readiness for digital transformation, and excellence in organizational performance which matches to a high extent the literature review conclusion and the initial research conceptual model and hypothesis. The link between project success and the readiness for digital transformation was not examined nor addressed in the previous research therefore it was not detailed enough in the research literature review. however, it has been hypothesized and statistically examined and detected a mutual correlation which also conforms to the logical inference that both of them are enhancing a privilege to the project team for agile performance and competency.

A comparative analysis has been done between "Traditional" and "Agile", project management methodologies using the company's project's historical data these results were supporting the conceptual model and research hypothesis however, the results are deeper than expected as it has inferred a weak impact of Agile project management on Budget compliance and cost reduction.

Team autonomy and diversity, and adaptive team performance are crucial factors when implementing Agile methodology which has a strong correlation with the organizational digital strategy for confronting the digital challenges and rapid evolution of technological aspects that have been inferred through the significant correlation between these two dimensions and the four dimensions of readiness for digital transformation variable.

5.2.2. Limitations

The distribution of the questionnaire limited the pool of respondents to only project team members, and stakeholders who can provide a subjective judgment for the project management, success, readiness for digital transformation, and organizational performance furthermore, some refreshment sessions have been conducted to be sure that all respondent is well understanding the different terminologies of project management and digital transformation. however, there was not a clear contrast in terms of project success perception despite the difference

in interests and professional backgrounds that might be referred to as the common focus and general perception of common groups.

These results are promising in that they suggest interesting possibilities and tools for further study. However, the results from this single case study, within a single company, through the analysis of the surveyed data received from only 157 respondents, cannot be considered generalizable. Furthermore, those 157 participants who chose to respond were not a random sample. The fact that they all have a relative junction to projects whether they were a part of a project team or employees, suppliers, or stakeholders, and that they chose to respond to the survey because they have a background in projects management and digital transformation necessarily characterizes them as those who have something to say - and in some way were motivated by this study on Agile approach. This must also be considered when reviewing the results and Recommendations for Future Research.

5.2.3. Recommendations and Future Work

It is highly recommended to replicate that case study on a larger scale to re-examine the model validity in different organizations and to extract more implications and consequences of implementing Agile strategies as a management tool as well as a project management methodology. The key behavioral indicators (KBIs) as one of the organizational performance measures and other organizational behavioral aspects have not been tested in this research. However, many other types of research have confirmed the profound impact of Agile methodology to achieve organizational agility and its contribution to employee satisfaction and engagement.

The real financial indicators of the organization where that case study has been conducted have not been shared in that research for some reasons related to confidentiality and on other hand to avoid any bias claiming that these figures have been realized only through the implementation of Agile methodology especially that the Agile methodology has been implemented only in the investment project sector and it has not been generalized as a management tool on the whole organization yet. However, the financial figures showed very good financial performance indicators, especially those that are correlated to investment projects such as return on investment and free cash flow from operating activities. Therefore, it is highly recommended in future research to study the association between the implementation of Agile methodology the real organizational financial figures.

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