

# THE RELATIONSHIP BETWEEN PROJECT MANAGEMENT MATURITY AND PROJECT SUCCESS

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**Abstract:** As businesses become increasingly 'projected,' the relationship between project management maturity and project success will likely grow more significantly. However, there is no unanimity regarding this relationship. This article examines the association between levels of project management maturity and project success. A structured online questionnaire was distributed using purposeful sampling, and it was decided to end the study when 600 replies were collected for economic considerations. Using descriptive statistics and the Kruskal-Wallis test, the hypothesis that higher levels of project management maturity improve the likelihood of project success was examined. The perceived project success of 9,389 projects and the project management maturity of the participating organizations were analyzed, and the results validated the theory. This research contributes to the little literature on the connection between project management maturity and project success.

**Keywords:** Project management maturity, project success, project management maturity model, project management maturity level, the value of project management maturity

## 1. INTRODUCTION

In a globalized, hypercompetitive, and rapidly changing environment, the execution of projects has become routine for many firms (Jugdev & Müller, 2005), and successful project execution has become essential for competitive advantage and success (Alvarenga et al., 2019). This pattern is not anticipated to change in the post-COVID-19 epidemic era as governments seek to revitalize their economies and stimulate jobs (Ika et al., 2022). Despite advancements in the project management industry and the abundance of publications, the effective completion of projects is not as prevalent as may be expected (Anantatmula & Rad, 2018). Significant projects are frequently in the news for the wrong reasons, such as perplexing cost overruns, lengthy project delays, and numerous benefit underperformances (Ika et al., 2022). Project failures are estimated to cost billions of euros annually, regardless of industry or geography (Joslin & Müller, 2016). Approximately 30% of all projects still miss deadlines, incur cost overruns, or do not meet quality standards (Busse, Zafer, & Warner, 2020). More than 12 percent of all investments are lost due to subpar project execution (PMI, 2016). According to Busse et al. (2020), there is universal agreement that projects with higher levels of project management maturity will be more successful. Still, experts debate whether project management maturity positively affects project success (Busse et al., 2020).

This study contributes to the research on the relationship between project management maturity and project success by examining the influence of an organization's

maturity on the success of its projects in emerging nations.

This study also contributes to research on project management in developing nations (or emerging markets). Developing nations, such as those in Africa, are progressively becoming the global growth drivers. For 15 years, long-term investments in emerging countries have outpaced investments in industrialized economies (Bond-Barnard, Fletcher, & Steyn, 2018). As the influence of project management maturity on project success may vary across developed and developing nations, it is crucial to examine its effect in various countries.

## 2. LITERATURE REVIEW

### 2.1 Project Success

Project success is a complex notion, and it is subjective to describe a project as a success or failure (Ika, 2009; Joslin & Müller, 2016; Jugdev & Müller, 2005). One individual may view a project as successful, while another may view it as unsuccessful (Müller & Turner, 2007). A person's unique values may cause them to evaluate a project differently from another stakeholder (Ika, 2009). According to De Wit (1988), the success of a project is time-dependent; stakeholders rarely view a project as a success or failure across its entire life cycle. Therefore, different individuals may view the same project as a success one day and a failure a few days later (Dvir, Segev, & Shenhar, 1993; Jugdev & Müller, 2005; King, 2021; Shrnur, Levy, & Dvir, 1997). It is nearly impossible to accurately evaluate the success of a project (De Wit, 1988; Ika, 2009). This study analyzes the relationship between

project management maturity and project management success - (as perceived by the respondents).

### 2.1.1 Critical Success Factors and Project Success Criteria

Jugdev and Thomas (2002) and Müller and Turner (2007) highlight two elements of project success: project success criteria and crucial success factors.

Project success criteria are the measurements to evaluate a project's successful outcome. Critical success factors are components of a project that raise the likelihood of project success and are independent variables. These parameters, arguably including project maturity, have a strong correlation with project success, and when they are managed well, the likelihood of project success increases.

Throughout history, numerous authors have proposed methods for measuring project performance. Schultz and Slevin (1975) suggested that any measurement of project success should include an evaluation of budget and schedule adherence, project performance capabilities, technical and organizational validity, and organizational efficacy. It is proposed that the project "must work" and provide a technically sound solution to the issue that prompted it first (Khoma & Vdovychyn, 2021; Schultz & Slevin, 1975). Baccarini (1999) cites three project success criteria that directly impact project success: meeting the organization's (i.e., the project owner's) strategic objectives, satisfying the users' needs, and meeting the stakeholders' expectations. Project success criteria should be defined at the outset and identified, changed, and incorporated effectively throughout the project phases (Joslin & Müller, 2016). Jitpaiboon, Smith, and Gu (2019) hypothesize that the system, and not the individual, is typically responsible for project failure. Therefore, project managers should use project management tools (Jitpaiboon et al., 2019) and the organization's project management maturity to execute a project successfully (Keshavarzian & Silvius, 2022; Khamzin, Buribayev, & Sartayeva, 2022; Toledo Gandarias & Otegi Olaso, 2019).

Over the past two decades, the essential success factor method has been acknowledged and pushed (Chan, Scott, & Chan, 2004). Critical success elements are highly correlated with project success, and when these components are managed successfully, the probability of project success increases (Frefer et al., 2018). Nevertheless, several studies find several essential success elements, and writers vary on the

parameters for assessing project success and the factors that influence project success (Alias et al., 2014). Several empirical studies were undertaken in the 1980s to determine project success determinants (Karamaşa et al., 2021; Murphy & Fisher, 1983; Pinto & Slevin, 1988; Thamhain & Wilemon, 1986). In a qualitative content analysis based on the replies of 150 Australian Institute of Project Management members, Baccarini and Collins (2003) identified 15 crucial success elements for projects, the most important of which were project comprehension and a competent project team. Fortune and White (2006) examined 63 publications and determined that the crucial success variables are clear objectives, senior management backing, and sufficient resources. Besteiro, de Souza Pinto, and Novaski (2015), on the other hand, state that knowledge management, leadership, and experience contribute to successful project outcomes. Even if there is some unity between some elements, there is no consensus in the research regarding a definitive list of crucial success factors. As a result, project success was measured as perceived by respondents, and supplementary measurements included those linked to the well-documented fundamental project limitations of time, cost, and quality (John & Dani, 2021; Kan & Khalid, 2021; Zid, Kasim, & Soomro, 2020).

### 2.2 Project Management Maturity

Nicholas and Steyn (2021) define maturity as an organization's project management capacity and proficiency (i.e., developing a project management methodology and putting the organization in a position to benchmark its project management capabilities against other similar leading industries). Maturity in project management denotes the application of acknowledged, tested, and innovative processes and procedures that result in repeated project execution success (Anantatmula & Rad, 2013). Increasing maturity levels entail acquiring more sophisticated organizational competency, predictability, and process control (Derenskaya, 2017).

For organizations to obtain a competitive advantage in a dynamic and competitive environment, their projects must be successful (Farrokh & Mansur, 2013; Görög, 2013). Project management must therefore be considered at the organizational level (Görög, 2016). This necessity prompted the development of project management maturity in the 1990s (Cooke-Davies, 2004). According to Crawford (2021), project management maturity is a "progressive process in which organizations see significant improvements at

distinct phases of development" that comprehensively depicts an organization's project management capabilities and effectiveness.

The project management techniques of industries of origin (such as building and engineering) tend to be more developed than those of industries that adopted the discipline more subsequently (Cooke-Davies & Arzymanow, 2003; Jayaraman, 2021; Pretorius, Steyn, & Jordaan, 2012).

Toledo Gandarias and Otegi Olaso (2019) debate if "optimal" maturity levels exist. They hypothesize that efforts to reach specific levels of maturity within an organization are closely correlated with the investment made to achieve it and that a compromise between the "optimal" level of maturity and what investors expect should be established.

### 2.3 The Measurement of Project Management Maturity

The concept of maturity suggests a possible progression from one degree of competence to a higher level (Andersen & Jessen, 2003). The idea of a ladder can be used to demonstrate that maturity increases over time. It can be measured through a fixed number of stages (i.e., KPIs/KPAs) – from an initial level (relative simplicity/"naïveté") to a final level (the "level of perfection" and intricacy and thoroughness) (Andersen & Jessen, 2003; Farrokh & Mansur, 2013; Langston & Ghanbaripour, 2016). The degree of standardization and formalization is proportional to the level of project management maturity (Backlund, Chronéer, & Sundqvist, 2015). Consequently, businesses with a low level of maturity practice project management informally. In these businesses, processes (even when documented) are frequently handled haphazardly; managers (sometimes referred to as "firefighters") are more reactive than proactive in terms of problem-solving; and deadlines and budgets are frequently surpassed (Christoph & Konrad, 2014; Reis, Mathias, & de Oliveira, 2017). Higher maturity level organizations have more formal structures and processes (Christoph & Konrad, 2014; Indrayani & Madjid, 2021; Reis et al., 2017). According to Backlund, Chronéer, and Sundqvist (2014), businesses with a higher level of maturity are predicted to have a competitive advantage because they are more proficient in project management, which leads to more efficacy and more significant project success.

They use project management maturity models to measure project management maturity (PMMMs). Kerzner (2002) defines a PMMM as a tool for assessing

an organization's existing status to recommend enhancements. These models compile and ensure the repeatability of best practices. Maturity models are frameworks that connect organizational strategy with project success (Langston & Ghanbaripour, 2016). The frameworks provide competitive benefits through benchmarking with similar and unrelated firms (Backlund et al., 2015; Hussain, 2021; Nenni et al., 2014; Pennypacker & Grant, 2003). A maturity assessment can be viewed as a recurrent process, a technique that might also be incorporated into an organization's improvement cycle. Crosby (1979) produced the first conceptual model for maturity models by proposing a five-level framework for measuring the quality of organizational processes.

Currently, most PMMMs utilize the Software Engineering Institute's Capability Maturity Models as a starting point for measuring processes against predetermined criteria (Jugdev & Thomas, 2002). Level 1 represents the lowest level of maturity (i.e., immature practices), whereas Level 5 represents the highest level of maturity (i.e., solid practices) (Jugdev & Thomas, 2002). According to (Crawford, 2021; Jugdev & Thomas, 2002; Pazderka & Grechenig, 2007), there are five levels:

- Level 1:* Initial (Ad Hoc, informal, no established practices or standards)
- Level 2:* Managed (intentional documentation exists on basic processes)
- Level 3:* Defined (structured, all project management processes are in place)
- Level 4:* Quantitatively managed (integrated project management processes, standards, and supporting systems are cohesive with other corporate processes and systems)
- Level 5:* Optimizing (flexible, continuous improvement projects are utilized to make organizational decisions for the future)

Most firms (regardless of industry size) are at Maturity Level 1 or 2. (Crawford, 2021; Nicholas & Steyn, 2021). However, larger firms recognize that a Level 3 maturity rating will afford them more strategic advantages (Crawford, 2021).

PMMMs are typically connected with worldwide organizations of project management expertise (Grant & Pennypacker, 2006). According to Mullaly (2006), there are about thirty PMMMs; however, Iqbal (2013) mentions approximately sixty distinct models. However, no single maturity model facilitates the success of projects across all industries and project kinds.

### 2.3.1 The Advantages of Project Management Maturity Models

PMMMs offer a formal evaluation of project management maturity that provides guidance, aligns activities, and initiates cultural change (Crawford, 2021). These models are specific and measurable means of determining an organization's project management maturity by enabling a comparison of explicit, unambiguous capabilities at the project and program level vs. a benchmark (Jugdev & Thomas, 2002). Their primary objective is to create a framework for furthering an organization's business objectives by examining its project management strengths and limitations (Khoshgoftar & Osman, 2009). PMMMs can assist organizations in achieving their goals and objectives by offering a practical and workable starting point for implementing improvements, hence bringing substantial value to contemporary organizations (Khoshgoftar & Osman, 2009; Kwak & Ibbs, 2002; Mullaly, 2006).

Over time, maturation improves an organization's grasp of its management, governance, and structure. This helps project-based businesses become more adaptable and agile (Jerbrant, 2014). PMMMs are well-known in various sectors and managerial domains (Nesensohn et al., 2014). Companies often use PMMMs for proactive strategic planning to increase their level of competence (Toledo Gandarias & Otegi Olaso, 2019). Thus, PMMMs have become popular for enhancing strategic competence and market competitiveness (Chang & Wei, 2014).

### 2.3.2 The Disadvantages of Project Management Maturity Models (PMMM)

PMMMs do not represent project management holistically and tend to emphasize explicit (physical) aspects to exclude intangible resources (Jugdev & Thomas, 2002). According to Jugdev (2004), the models are inflexible, very punitive, and unrealistic, and they emphasize work procedures while ignoring human resource and organizational aspects. Current PMMMs do not incorporate a contingent view of project management tools. Therefore, when developing new PMMMs, it is essential to reflect on both the intrinsic project characteristics (e.g., degree of uncertainty and degree of interdependence/complexity) and the organizational characteristics (culture, method of supervision) (Görög, 2016).

Most PMMMs are based on best practices and success factors drawn from successful projects in an organization or industry, but they lack a comprehensive

theoretical foundation and methodology (García-Mireles, Moraga, & García, 2012; Nicholas & Steyn, 2021). According to Reis et al. (2017), most maturity models are overly stringent and fail to account for the organization's principal objective when it cultivates new management practices to enhance overall corporate performance. Langston and Ghanbaripour (2016) argue that the "one size fits all" approach to assessing maturity is faulty.

Even if there are many pros and cons of PMMs, it is still preferable to start with a PMMM rather than nothing when attempting to increase an organization's project management capability. This research analyzes the role of PMMMs in an African environment.

### 2.4 Project Management Maturity and Project Success

Nicholas and Steyn (2021) note that few research publications could establish a correlation between project management maturity and success and that the writers who did so were primarily industry consultants. Several publications concluded that there is no correlation between project management maturity and project management success (Backlund et al., 2015; de Carvalho, Patah, & de Souza Bido, 2015; Mullaly, 2014; Pasian, 2014; Pretorius et al., 2012). Some experts concur that project management maturity and success are related (Anantatmula & Rad, 2018; Kerzner, 2015; Toledo Gandarias & Otegi Olaso, 2019; Torres, 2014).

The 'Error School' and the 'Bias School' are two primary schools of thought offering opposing viewpoints on why undertakings fail (Ika et al., 2022; Love, Ika, & Sing, 2019).

- *The Error School includes the following:*

Failures result from faulty management methods, honest errors, inexperience, lack of understanding, and insufficient data. This may result in cost overruns, scope revisions, increased complexity, and project risk (Ika et al., 2022; Love et al., 2019).

- *The Bias School includes the following:*

Nonconformity or "systemic distortion of logical thought" leads to erroneous judgments and incorrect decision-making. Due to optimism bias (i.e., "delusion") and strategic misrepresentation (i.e., "deception"), this Bias School posits that projects tend to over-promise and under-deliver during their planning and initiation phases (Flyvbjerg, Holm, & Buhl, 2002). The combination of

the preceding infractions could lead to cost overruns and/or benefit deficits (Ika et al., 2022).

The 'best practice' approach of PMMMs addresses error and biased schools of thought. A higher level of organizational project management maturity could reduce the possibility of error and bias occurring in projects, reducing the likelihood of project failure and increasing the probability of project success. Multiple scholars concur that an organization's level of project management maturity benefits project success.

- As a company's degree of project management maturity rises, its project performance improves at a lower cost (Ibbs & Reginato, 2002).
- According to Evrard and Partner (2004), a higher level of organizational maturity from a consulting firm improves project success.
- A greater level of project management maturity within an organization is the most notable distinction between high- and low-performing organizations (Besner & Hobbs, 2008).
- Papke-Shields, Beise, and Quan (2010) discovered a significant positive correlation between formal, documented project management processes (therefore, more mature processes) and project success.
- According to Dyett (2011), project management maturity is one of four organizational factors that contribute to successful project completion. Other factors include organizational structure, size, and culture.
- Developing project management techniques (i.e., project management maturity) is crucial to the practical completion of projects and, consequently, to businesses' competitive advantage (Farrokh & Mansur, 2013).
- Project management maturity is a growing component in determining success (Bushuyev & Wagner, 2014).
- Torres (2014) discovered a correlation between project management maturity and achievement.
- There is a strong correlation between project management maturity and each facet of the iron triangle (time, cost, and quality) (Berssaneti & Carvalho, 2015).
- Formalizing processes and procedures increase the likelihood of a project's success (Kerzner, 2015).
- Anantatmula and Rad (2018) discovered that a higher level of project management maturity affects project success and increases project performance factors.

In the study, project performance factors included project policies and procedures, communication, a clearly stated project mission, modifications to project objectives, and project planning tools and methodologies (Anantatmula & Rad, 2018).

- According to Toledo Gandarias and Otegi Olaso (2019), the higher an organization's project management maturity level, the greater the possibility that a project will be finished successfully.
- Organizations with high degrees of project management maturity are more likely to finish projects on schedule and under budget, as well as to fulfill client expectations and foster team cohesion (Busse et al., 2020)

Based on the preceding, we disagree with Nicholas and Steyn (2021) and García-Mireles et al. (2012), who contend that maturity models lack a solid theoretical foundation and that the benefits of higher maturity levels are primarily promoted by consultants rather than supported by scientific research. Based on the literature mentioned above, we consequently suggest the following hypothesis:

**Hypothesis:** *The higher an organization's average level of project management maturity, the higher its likelihood of executing more successful projects will be.*

### 3. RESEARCH METHODOLOGY

Sonnekus and Marnevic's (2003) online, structured, and self-administered survey questionnaire was applied to evaluate the hypothesis mentioned above. The questionnaire was selected because it had been verified in a prior study and was suitable for large-scale surveys. Purposive sampling was adopted since it is a well-established technique in the social sciences and an appropriate and effective instrument when employed appropriately (Tongco, 2007). The questionnaire was distributed to project/program/portfolio managers, project team members, project sponsors/clients, and project stakeholders operating in an African project setting (e.g., regulatory authority, subcontractor, and external party). This demographic was chosen to guarantee that respondents understood projects comprehensively and held significant jobs within the project environment. Utilizing the Qualtrics XM Platform™, the survey was sent to the respondents. In the questionnaire, respondents were asked to base their comments on the outcomes of projects in their workplace and to assess the perceived project success of these projects. The questionnaire comprised mostly of Linkert scale questions. To test the hypothesis, the rank-based, nonparametric Kruskal-Wallis test

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was employed to compare the independent samples. Moreover, the Box-and-Whisker plot demonstrates the need to raise project management maturity values.

4. RESULTS

4.1 Descriptive Statistics

As time was of the essence, we chose a 30-day distribution timeframe for the questionnaire. Following this period, and also for economic considerations, the survey was terminated when 600 replies were collected. Respondents disclosed the results of 9389 projects. Although the questionnaire was distributed to practitioners working on South African initiatives, they could also report on programs in other regions of Africa. The majority of projects were carried out in South Africa (52,4%), followed by Botswana (4.1%), Mozambique (3.8%), and Namibia (3.8%). The "other" group included African nations (such as Ethiopia and the Ivory Coast), where less than 2% of projects were completed. Table 1 displays the countries where the projects were carried out. It should be emphasized that not every response was comprehensive.

The majority of respondents were employed in engineering (15.8%), construction (15.4%), and information and communications technology (ICT) (12.0%). 23.6% of respondents indicated that they worked in an industry that was not listed on the survey. The initiatives in which projects have been undertaken are listed in Table 2.

Table 1. African countries in which projects were executed

Country	Responses	
	N	Percentage
South Africa	541	52.40%
Botswana	42	4.10%
Mozambique	39	3.80%
Namibia	39	3.80%
Zambia	35	3.40%
Kenya	27	2.60%
Zimbabwe	27	2.60%
Ghana	26	2.50%
Nigeria	21	2.00%
Other	236	22.8%
Total	1033	100.00%

Table 2. Industries in which projects were executed

Industry	Responses	
	N	Percentage
Engineering	165	15.8%
Construction	159	15.4%
Information and Communications Technology	129	12.0%
Finance and Banking	79	7.4%
Manufacturing	76	7.1%
Utilities	71	6.6%
Services	67	6.3%
Mining	65	6.1%
Telecommunication	52	4.9%
Petro-Chemical	44	4.1%
Transport	36	3.4%
Other	128	23.6%
Total	1071	100.0%

The description of the three categories of project outcomes in the questionnaire was:

- **Failed:** A project that is never finished or does not meet the client's needs. It delivers little value or no value at all.
- **Challenged:** A project that is finalized but is late, over budget, or does not meet the client's needs. It delivers moderate value, less than was anticipated.
- **Successful:** A project that is delivered on time, within budget, within scope, and meets all the needs of the client. It provides the anticipated value." (Sonnekus & Labuschagne, 2003)."

70% of respondents indicated that they perceived

their projects as successful, 22% as challenged, and 8% as failures.

4.2 Results of Statistical Hypothesis Testing

**Hypothesis:** The higher an organization's average level of project management maturity, the higher its likelihood of executing more successful projects will be.

The results of the independent Kruskal-Wallis Test performed to test the hypothesis are presented in Table 3. The test size of 11,439 was modified to account for ties. The p-value is less than 0.05, indicating that the null hypothesis can be rejected. Thus, the mean percentages of successful initiatives vary considerably among the five degrees of perceived maturity. The idea is therefore

supported.

Table 3. Independent kruskal-wallis test summary

Total N	365
Test Statistic	11.439a
Degree of Freedom	4
Asymptotic Sig. (2-sided test) (p-value)	0.022b
The test statistic is adjusted for ties	
a. The significance level is 0.05	

4.3 Further Insights

The influence of organizational project management maturity on the probability of project management success is illustrated in Figure 1. Level 1 has a much lower median value than the other levels. Level 1 statistics also have the narrowest range, indicating that we can anticipate with a high degree of certainty that the project performance of businesses at this level will be relatively bad. The median and range values for this level suggest that Level 1 has the lowest probability of project success; hence, Level 1 is not optimal for most firms.

As depicted by the line between the median values,

there is a significant improvement in project success between Level 1 and Level 2, showing that firms at Level 2 have a significantly better probability of project success than organizations at Level 1.

The data for Level 2 shows the most variation of all levels and is skewed to the left (i.e., to the bottom). This suggests a high probability of project failure. Level 2 is, therefore, dangerous, yet the median values imply that most firms should be on Level 2 instead of Level 1.

When moving from Level 2 to Level 3, the risk of failed projects (as represented by the data distribution) decreases. In addition, there are only minimal gains in range and median values at levels above Level 3. This might be viewed as evidence that Level 3 is 'as good as it gets' and provides some support for Crawford's (2021) assertion that a Level 3 maturity grade affords firms sufficiently high strategic benefits. Nonetheless, the skewed data distribution for firms at Level 5 suggests that functioning at the maximum maturity level is advantageous.

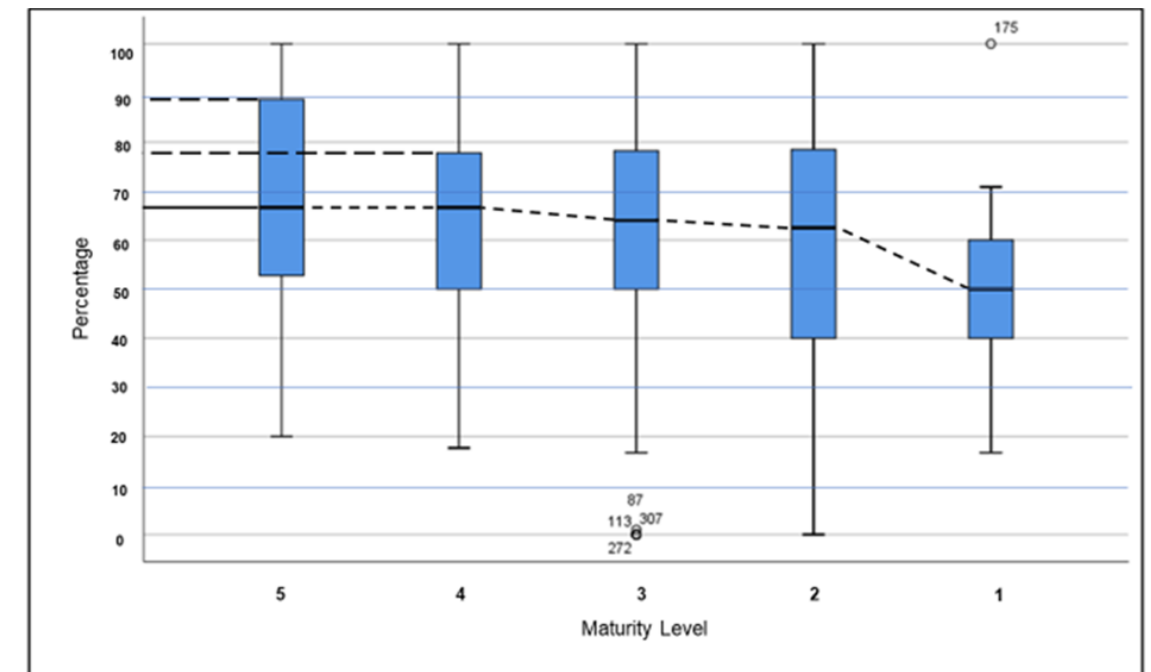


Figure 1. Box and whisker plot of probability of project management success against project management maturity level

At Level 5, there is a 25% possibility of achieving a success rate of at least 90%, while at Level 4, there is a 25% chance of achieving a success rate of at most 78%.

Data dispersion suggests that Level 4's distribution is skewed to the left. The nearly equal median values

for levels 4 and 5 indicate that organizations at these levels can expect a 50% probability that their projects will have a success rate of less than 67% and a 50% chance that their projects will have a success rate of greater than 67%. Concerning our hypothesis, Figure

1 demonstrates that the difference between Level 1 and the median for the other four levels is sufficient for the statistical test to detect a signal indicating the essential differences to reject  $H_0$ .

## 5. CONCLUSIONS

The study indicates that organizations with greater project management maturity execute projects more successfully than those with lower maturity levels. It supports the theory that the higher the average level of project management maturity in an organization, the more likely it is to execute successful projects. This result is consistent with the findings of Anantatmula and Rad (2018), Toledo Gandarias and Otegi Olaso (2019), and Busse et al. (2020), who discovered that higher degrees of project management maturity results in a greater likelihood of project success. Figure 1 indicates that businesses with a maturity level of 1 are most likely to undertake unsuccessful projects, whereas the probability of project success improves significantly as the maturity level rises. This supports the results of numerous research (see section 2.4).

Every organization is not required to operate at the "highest" level of maturity. Christoph and Konrad (2014) and Nicholas and Steyn (2021) reject the notion that there exists an industry-specific "ideal" level of maturity. The maturity level of an organization is determined by averaging the maturity levels of each project management knowledge area inside that organization. Organizations should determine which competency areas are essential and avoid "wasting" resources to reach high maturity in the regions that are not vital to the industry or unrelated to it (Nicholas & Steyn, 2021). It may be said that maturity is not a destination everyone will attain; instead, it is a continually shifting goal (Nesensohn et al., 2014). The importance of project management maturity to project success is unmistakable, and practitioners should not take project management maturity for granted.

## 6. LIMITATIONS AND RECOMMENDATIONS

Projects vary greatly in scale, complexity, and the technological innovation required to complete them. In addition, industry differences are likely to impact project approaches and procedures. The study does not account for differences in project size, technology, or complexity, nor considers the industries in which projects are done.

In addition, the study was restricted to developing nations in Africa. Not necessarily applicable to project contexts in wealthy economies. In addition, only

the average values of maturity across many project management knowledge areas were addressed; the study did not address the individual maturity levels associated with particular knowledge areas. Project management maturity is typically judged based on various knowledge domains. Some knowledge management domains may correlate more strongly with project performance than others. The factors mentioned above should be included in future research on project management maturity.

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