Lessons Learned from the PMMM Research Series[1]

Peculiarities of the "Performance versus Maturity" Relationship[2]

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ABSTRACT

This is the second article in the series "Lessons Learned from Maturity Research". It uses the database from our maturity research to analyze the relationship between some performance indicators of completed projects and maturity levels and discusses some interesting conclusions, such as the difficulty in having a 100% successful portfolio. In order to properly understand this text, it is very important that the reader is already familiar with the article published in the previous issue of this journal [1].

1 – INTRODUCTION - PROJECT PERFORMANCE INDICATORS

There are several indicators to measure the performance of completed projects. In our online research, we used four:

- Success
- Delay
- Cost overruns
- Execution of the planned scope

When the user answers each question related to performance indicators, he or she should interpret it as being applied to the entire set of projects completed in the last period (for example, in the last year). It is certainly necessary to collect data before answering such questions. For example, in a certain department, the evaluation of the portfolio of projects completed in the last year could be as follows:

- Success:
  - Total success: 53%

[1] *The Project Management Maturity series of articles by Prof Darci Prado is based on his extensive research on this topic in Brazil and other countries. Darci is the developer of the Prado Project Management Maturity Model which has been successfully implemented by many organizations in Brazil. More about this model and related research can be found at. https://maturityresearch.com/en/home-en/*

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  - Partial success: 34%
  - Failure: 13%
- Average delay: 20%
- Average cost overrun: 12%
- Average execution of the planned scope: 75%

The "Success" indicator is not so easy to understand and deserves an explanation. The definition of success can vary when we consider different categories of projects, scenarios, types of clients, etc. Ideally, the user should have their own definition of success that is appropriate for their department. Since this is not always the case, our website suggests that the user use a generic definition created by us and inspired by that of the Standish Group [2]. It is as follows:

Type of Success	Description
Total Success	A successful project is one that has achieved its goal. This generally means that it was completed and produced the expected deliverables, results and benefits, and that the key stakeholders were fully satisfied. In addition, it is expected that the project was completed within the expected time, cost, scope and quality requirements (small differences may be acceptable depending on the type of project).
Partial Success	The project has been completed, but it has not produced all the expected results and benefits. There is significant dissatisfaction among key stakeholders. In addition, some of the anticipated time, cost, scope, and quality requirements are likely to have been significantly worse than desired.
Failure	There is enormous dissatisfaction among the main stakeholders either because the project was not completed or because it did not meet the expectations of the main stakeholders or because some of the expected requirements for deadline, cost, scope and quality were at absolutely unacceptable levels.

In addition to this definition, on our website we present additional suggestions for specific scenarios, such as Engineering, Construction and Information Technology.

In a way, the "Success" indicator contains the other three indicators (time, cost and scope) shown above. But its concept goes beyond that and, therefore, in the questionnaire we have specific questions for each of them.

2 – OUR LAWS: RELATIONSHIP BETWEEN PERFORMANCE AND MATURITY

The following relationships between maturity and the performance indicators mentioned above are shown below. These relationships have become our laws because they were proven by our research conducted since 2005 and are as follows:

1. There is a positive relationship between maturity and success, that is, the greater the maturity, the greater the overall success of a project portfolio.
2. There is a negative relationship between maturity and failure, that is, the greater the maturity, the less likely a project portfolio will fail.
3. There is a negative relationship between maturity and average delay, that is, the greater the maturity, the smaller the delay of a project portfolio.
4. There is a negative relationship between maturity and average cost overrun, that is, the greater the maturity, the smaller the cost overrun of a project portfolio.
5. There is a positive relationship between maturity and average execution of the planned scope, that is, the greater the maturity, the greater the average execution of the planned scope of a project portfolio.

3 – GRAPHICAL VISUALIZATION OF RELATIONS

An appropriate way to observe the above relationships is through graphs obtained from some of our research, as shown below. Some comments:

- For visual simplicity, we selected only data from 4 research studies: 2012, 2014, 2017 and 2021 [3].

- The 2012 and 2021 graphs do not show values for level 5 because the respective sample sizes are not statistically adequate.

2.a) Project Success versus Maturity

In Figure 1 we see the relationship between maturity and success for the years mentioned: the greater the maturity, the greater the Total Success (blue color) and the lower the Failure (red color).

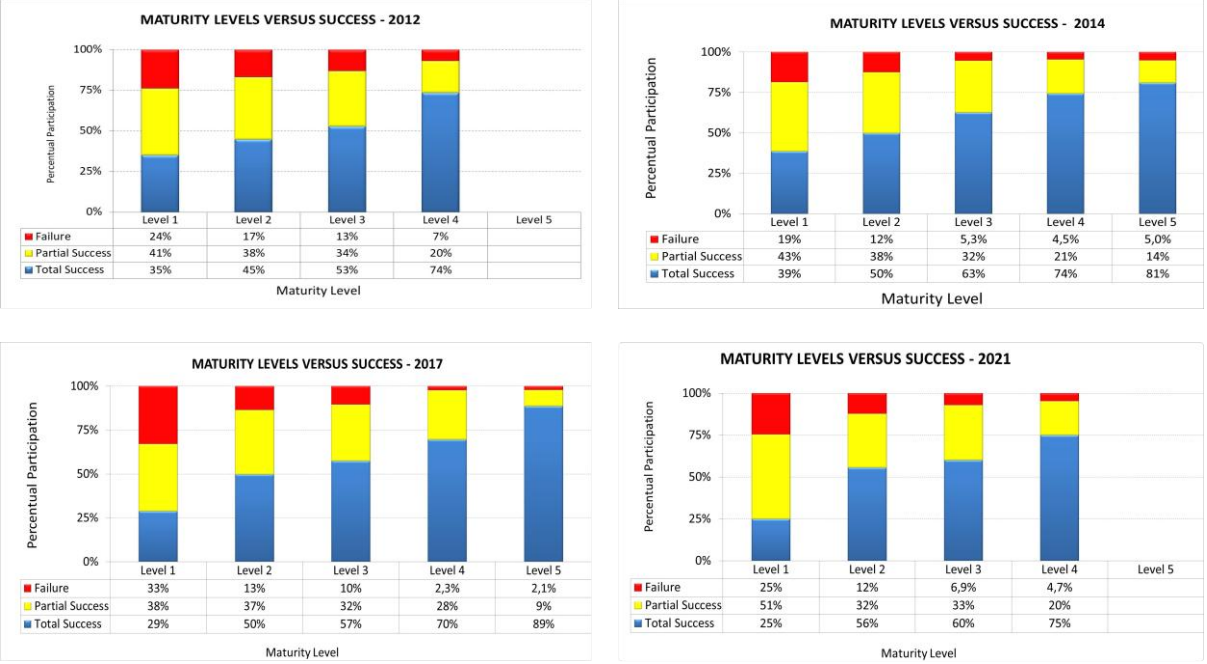

Figure 1: Project Success versus Maturity Relationship [3].

Number of Participating Organizations				
	2012	**2014**	**2017**	**2021**
Level 1	49	72	65	18
Level 2	186	164	104	54
Level 3	156	114	90	68
Level 4	41	57	31	37
Level 5	2	8	11	4
TOTAL	**434**	**415**	**301**	**181**

To better understand the graphs, we provide a brief explanation here. Consider the 2012 graph and see the vertical bar for level 3, where we have the following values for the success performance indicator:

- Total Success = 53%
- Partial Success = 34%
- Failure = 13%.

The interpretation should be as follows: for the organizations participating in the 2012 survey and whose maturity is at level 3, it was observed that the average values of the "Success" indicator of their project portfolios are as mentioned above and shown in the figure. It remains to be added that 156 organizations participating in that survey have maturity that falls within level 3, as seen in the table following the figure.

We can see in Figure 1 that the graphs for the different years do not have exactly the same values. Why? For now, let's just say that the sizes of the annual surveys shown above are different and, therefore, they are not exactly the same participants. What if the sample sizes were large enough? We believe that, in this case, there would be greater similarity in the formats, but they would still not be identical. But we will not go into this topic in this article since it will be addressed in our next article in this series entitled "Heterogeneity Matters".

2.b) Project Delay versus Maturity

In Figure 2 we see the relationship between maturity and average delay: the higher the maturity, the lower the average delay. The interpretation of the graphs here is very simple: the value of each bar represents the average delay observed in the portfolios of the organizations that make up that maturity level.

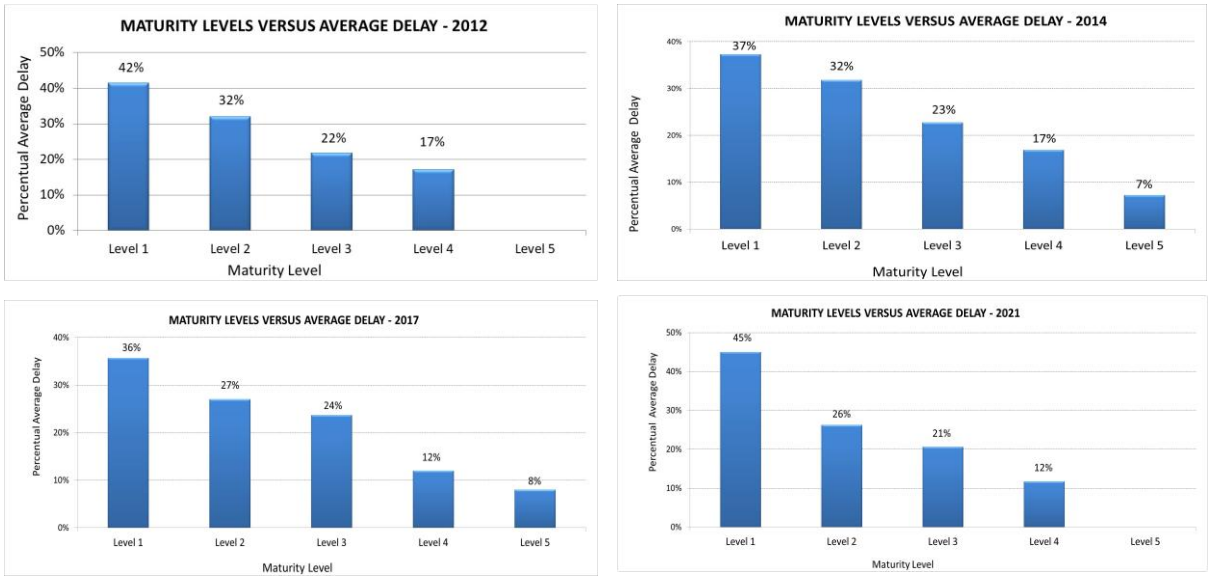

Figure 2: Project Delay versus Maturity Relationship [3].

2.c) Project Cost Overrun versus Maturity

In Figure 3 we see the relationship between maturity and average cost overrun: the higher the maturity, the lower the average cost overrun. The interpretation of the graphs here is similar to the previous one.

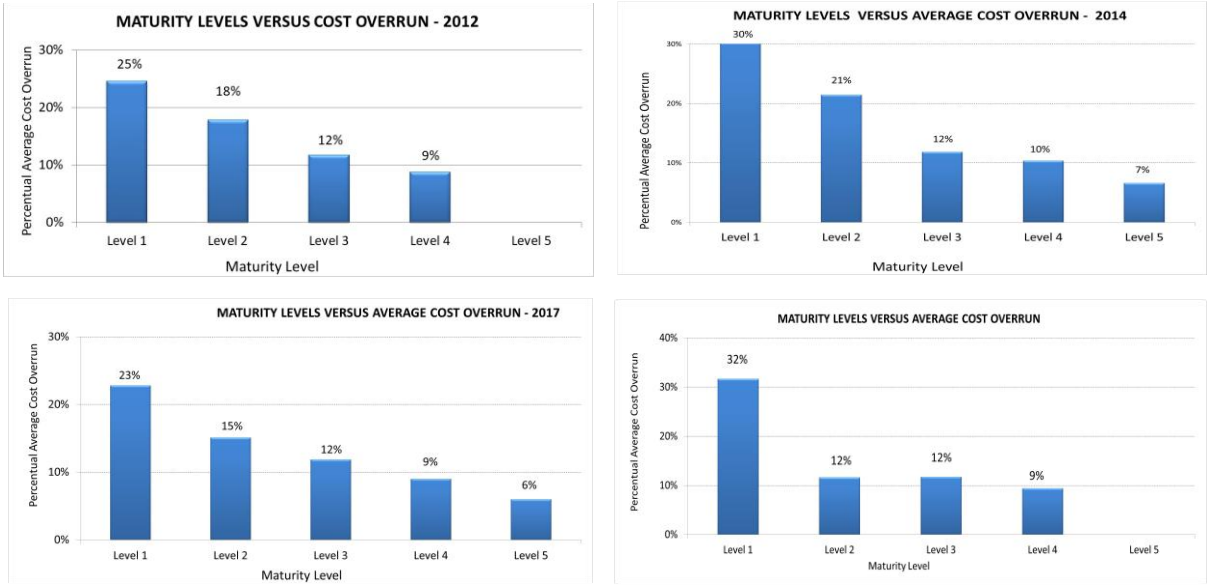

Figure 3: Project Cost Overrun versus Maturity Relationship [3].

2.d) Project Planned Scope Execution versus Maturity

In Figure 4 we see the relationship between maturity and average execution of the planned scope: the higher the maturity, the higher the execution of the planned scope. The interpretation of the graphs here is similar to the previous one.

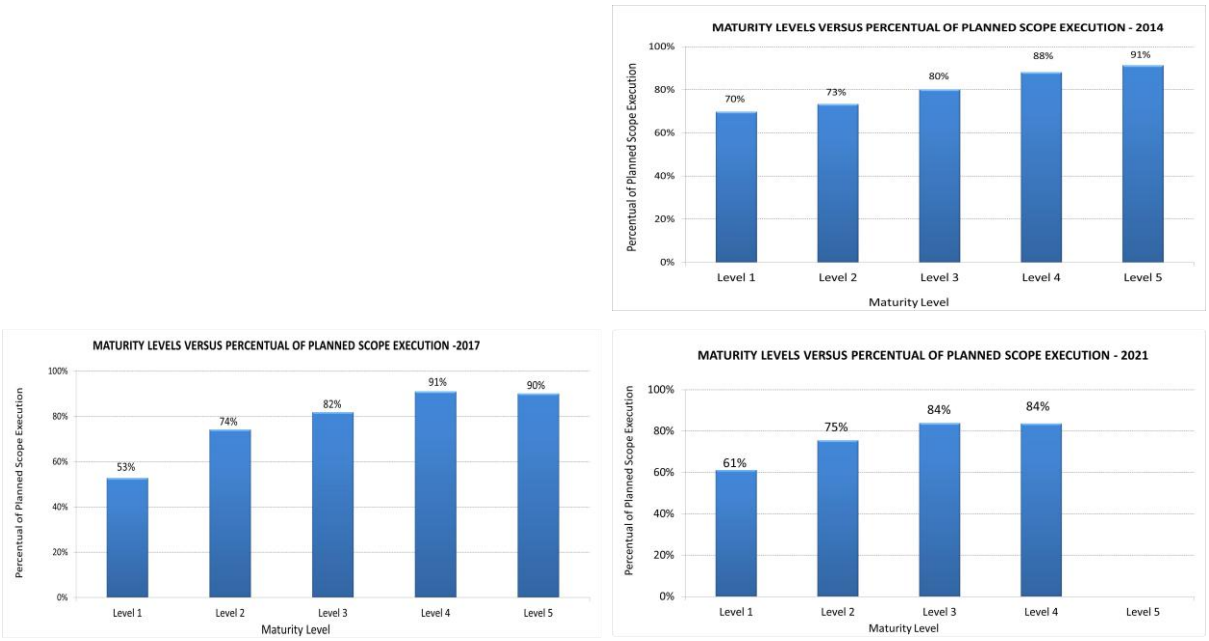

Figure 4: Project Planned Scope Execution versus Maturity Relationship [3].

3 – A NOTE: MATURITY LEVEL SHOWING "TOTAL SUCCESS" EQUAL TO 100% HAS NEVER OCCURRED IN OUR RESEARCH

An interesting aspect seen in the graphs in Figure 1 is that at no level do we have Total Success equal to 100%. This occurred in all the surveys shown on our website. Always, at each level, we have a little bit of Partial Success and Failure, even at levels 4 and 5. Looking at Figure 1 carefully, this fact becomes more important when we remember how many respondents participated in the respective surveys:

- The majority of respondents in all surveys conducted since 2005 are at levels 1, 2 and 3 (generally over 85%). Note the high values for "Partial Success" and "Failure" at these levels.
- Respondents at levels 4 and 5 represent a minority (generally totaling under 15%). Note that, even though they are participants at the excellence level, the average value for "Total Success" at each of these levels does not reach 100%.

Please note that we are focusing the comments above on the research shown in Figure 1, in which the value shown for each maturity level represents an average of the values of the organizations participating in that level. Of course, looking at a single organization in isolation, it is possible that it has a portfolio of projects completed with 100% Total Success. Reinforcing our observation, to make it very clear, what we are saying is that, when we analyze a group of companies at levels 4 or 5 (level of excellence), the average value of the "Total Success" indicator never reached 100%. If this is the case, it is because we have many organizations at these levels that present "Partial Success" and "Failure".

However, the presence of "Partial Success" and "Failure" at these levels is an apparent paradox, given the definitions used in the Prado-PMMM maturity model [4]:

Level	Name	Characteristics
4	**Managed** (anomaly mitigation)	Elimination (or mitigation) of the causes of manageable anomalies that hinder the success of projects.
5	**Optimized**	This level represents the situation in which the PM platform not only works and delivers results but has also been optimized through the practice of continuous improvement and technological and process innovation.

So, how can we explain the presence of Failure and Partial Success at these levels of excellence (levels 4 and 5)?

We found the answer to this question in our experience as a consultant at Falconi Consultants, where we had the opportunity to monitor hundreds of companies in Brazil, some of which

were at the level of excellence. The explanation we found is the presence of unforeseen and unmanageable factors that can influence the success (or failure) of projects. Some examples:

- Unforeseen changes in the team
- Unforeseen shortage of resources
- Climate phenomena with negative impacts on a scale never imagined
- Bankruptcy of a supplier critical to the success of the project
- Unachievable goal arising from strong challenges from the board of directors or the council
- Unexpected change in the market scenario, altering the characteristics of the business
- Changes in government regulations

These factors are all the more present the more uncertain the economic scenario in which the projects are executed. And uncertainty is something that has been very present in Brazil in recent years.

4 – THE PROTAGONISM OF "FAILURE" AND "PARTIAL SUCCESS"

Certainly, having projects terminated as "Failure" or "Partial Success" does not please any executive. We have seen that they can occur at any level, impacting strategic expectations, and this is even worse the less mature the organization is. Observing their presence at all levels in all surveys (see Figure 1), we conclude that these categories ("Partial Success" and "Failure") have a leading role that cannot be ignored. Not that we should accept them, but rather that we should be prepared for them. This aspect is important for all those organizations that have significant dependence on the success of their projects for survival and growth, and this is particularly critical for project-oriented organizations (Construction Companies, Software-houses, etc.) and Government. In all these cases, improving performance is crucial.

Below we list some measures to mitigate this problem.

A first suggestion involves a PMO initiative that should clarify the impact of this phenomenon through the following actions:

- Create a definition of success appropriate to the department, which should include which performance indicators will be measured.
- Use this definition to evaluate the performance of projects in the last fiscal or annual period.
- Calculate, in partnership with the financial management team, the loss caused by Partially Successful and Failed projects.
- Identify the causes of anomalies (Partially Successful and Failed).
- Assess Maturity, prepare and execute a Growth Plan.

The above topics are covered in detail in the Brazilian-Portuguese language book "Maturity in Project Management" [4]. In a future article in this series, we will show some lessons learned on the subject.

We also have some additional recommendations:

1 - For senior management (C-Level)

- Remember that achieving strategic goals depends on good strategic planning and good project management. Our experience shows that without the support and engagement of senior management in these matters, the chance of failure increases significantly.

2 - For those involved in strategic planning (or doing business with clients):

- Monitoring the portfolio of ongoing projects and analyzing risks (internal and external scenarios) are of fundamental importance to detect serious unforeseen events early, so that correct decisions can be made at the right times to mitigate the effects.

3 - For those involved in financial management in project-oriented organizations:

- Use the loss data calculated in partnership with the PMO for financial performance reports for the past fiscal year.

- Use this experience when preparing the budget for the next fiscal period (or year). It may be necessary to include an item such as "unforeseen losses" in the budget forecast for the next fiscal period.

4 - For those involved in project planning/execution (project managers and PMO):

- The computerized system should have an easy-to-use cockpit suitable for the C-Level, in which the current status of each project is presented, including irregularities and risk situations. Lighthouses should highlight projects with anomalies. A monitoring trail for the execution is also appropriate. This function allows everyone involved to be easily aligned with what is happening with the projects and for governance meetings to be productive.

- Special attention should be given to each project for which there is a perception of some anomaly or irregularity that could compromise the achievement of its goals. Such situations should be documented in the cockpit and also presented at committee meetings.

- Always have everything recorded in a document such as the Project Logbook. It can help you remember situations where anomalies are analyzed (for example, projects concluded with partial success or failure). Always be aligned with senior management at the appropriate governance moments.

5 – SAMPLE SIZES

When working with statistical data analysis, sample size is of fundamental importance. This is even more critical when many stratifications need to be performed, as is the case in our research. In our experience, the minimum size for the total number of participating organizations in a given year should be greater than 300 (ideally, over 700). To produce a specific report to analyze a certain stratification (for example, "Construction Projects" or "Innovation Projects"), the minimum size is 60 (ideally, over 200). In addition, the number of participants in a given data (for example, total participants who were classified as "Total Success" at level 3) has the following requirements:

- Over 30 participants: full trust
- Over 15 participants: medium trust
- Below 15 participants: low trust
- Below 5 participants: avoid use and disclosure

Obtaining adequate sample sizes is not easy. As we know, there is a close relationship between a country's economic situation and the strategies (and projects) of organizations, whether private or public. In the case of Brazil, the size of its economy naturally limits the number of companies that execute projects, in addition to the fact that we have been experiencing very low economic growth since 2015. In addition, changes in the economic scenario each year can have a more severe impact on some business segments (construction, for example). Innovations in management methods also have an impact, such as the use of the AGILE approach for software development, especially after 2015. Many IT departments have stopped using the traditional project management approach.

All of this impacts the number of areas that handle projects in organizations and the size and value of their respective project portfolios.

On the other hand, it is not easy to operationally conduct a survey, especially the stage of asking companies to participate in it.

Finally, we cannot ignore the fact that interest in the topic of maturity has decreased since 2015, as David Pells rightly pointed out in the editorial of the October 2020 issue of this journal [5]. But we would like to point out here that the same editorial praised our work and highlighted it positively on the world stage.

All of this makes it difficult to obtain statistically adequate sample sizes that allow us to reliably perform the stratifications that will be shown in the reports that participants would like to see. This makes our work an imprecise science. Fortunately, what gives us confidence that our data deserves respect, even when we use inadequate sample sizes, is that the graphical curves they produce have similar shapes for different years and validate our laws (see item 2 "Our Laws"). In other words, the values of the points on the curves may not correctly represent the overall situation of that population, but the shape of the curve is reliable. As we have shown in the previous figures for four years and on our website *https://maturityresearch.com/en/home-en/* since 2005.

And this is very important to our website users: they need to believe that by creating and executing a Maturity Growth Plan, following our model and instructions, there will be an improvement in the results of their performance indicators. We believe that the information contained on the website has given them this confidence, since dozens of companies in Brazil have been using our model since 2005 to establish and execute growth plans. This has also pleased academics, where students have used our model for their MBA, Master's and Doctorate work.

6 – HETEROGENEITY MATTERS

Perhaps, after finishing reading this article, the reader will ask: are the comments and graphs shown here valid for any category of projects (construction, innovation, software development, etc.)? The reader can find this information on our website www.maturityresearch.com and also in the next article in this series.

REFERENCES

1. Prado, D. (2025). Contextualization, Lessons Learned from the PMMM Research, Series article 1, PM World Journal, Vol. XIV, Issue IV, April.
2. The Chaos Report 2004. http://www.standishgroup.com/
3. *https://maturityresearch.com/en/home-en/*
4. Prado, D., *Maturidade em Gerenciamento de Projetos*, Falconi Editing Co. 2025, 4th Edition, 256p.
5. Pells, D., PM World Journal, Vol. IX, Issue X – October 2020, *Whatever Happened to Organizational Project Management Maturity?* . *https://pmworldjournal.com/article/whatever-happened-to-organizational-pm-maturity*

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