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Scorecard Methodology for Quantitative Management of Digital Transformation Project Portfolios

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Abstract

This article introduces a Scorecard-like methodology for ranking digital transformation projects within large-scale project portfolios. The methodology can be used for prioritizing project monitoring, auditing, and implementation processes in the scope of Project Portfolio Management (PPM) frameworks. It is not limited to general guidelines for building a scorecard but rather presents concrete quantitative criteria for scoring and ranking different projects within a portfolio. The methodology is empowered by configurable formulas that can be flexibly customized to the needs of different portfolios. This flexibility is illustrated in the paper along with limitations of the proposed methodologies that stem from the accuracy and quality of the data used for scoring the projects.

Keywords: Project Portfolio Management, Digital Transformation, Scorecard, Key Performance Indicator, Transformation Portfolio

1. Introduction

In today's dynamic and ever-evolving business landscape, organizations face numerous challenges when it comes to managing their project portfolios effectively. Specifically, organizations often operate in a highly complex and competitive environment, where resources are scarce, technology advancements are rapid, and market dynamics change frequently. In such a landscape, organizations need a systematic approach to prioritize and execute projects that align with their strategic priorities and deliver the highest value. To this end, modern organizations are increasingly employing tools and techniques for Project Portfolio Management (PPM) [Cooper01]. PPM is a discipline that involves the strategic selection and management of a collection of projects in a way that maximizes an organization's return on investment while aligning with its overarching goals. Unlike traditional project management, which focuses on managing individual projects, PPM takes a holistic view of all projects within an organization, considering their interdependencies and impact on broader business objectives.

In most cases, PPM is carried out based on proper frameworks, which comprise structured steps and mechanisms for projects' prioritization, selection, and execution in alignment with an organization's strategic objectives. In practice, a PPM framework provides a set of guidelines, tools, and processes

that help organizations make informed decisions about project selection, resource allocation, and risk management. In this way PPM frameworks help organizations can optimize their resource allocation, mitigate risks, and increase their overall project success rates. At the same time, it allows them to enhance their ability to deliver projects on time and within budget.

PPM frameworks typically consist of several key components that work together to ensure effective project portfolio management. These components include:

- **Strategic Alignment**: The framework emphasizes aligning project selection and execution with an organization's strategic objectives. Projects that positively contribute to the organization's long-term goals are prioritized.
- **Project Prioritization**: The framework provides a structured approach to prioritize projects based on their potential value, feasibility, and alignment with the organization's strategic priorities. This allows organizations to invest resources in projects that provide the highest return on investment.
- **Resource Optimization**: PPM frameworks emphasize the efficient allocation and utilization of resources across all projects. By carefully managing resources, organizations can avoid overburdening individuals or teams and ensure optimal allocation based on project needs.
- **Risk Management**: Effective risk management is a crucial aspect of PPM frameworks. They incorporate risk analysis and mitigation strategies to identify potential risks and develop appropriate contingency plans. This allows organizations to proactively address risks and minimize their impact on project outcomes.

Over the years, many PPM frameworks have emerged, including lean, agile, data-driven and hybrid PPM frameworks. These frameworks are presented and discussed in more detail in Section 2 of this article. They are evolving leveraging advances in technology (e.g., data analytics and artificial intelligence), while at the same time harnessing the very large amounts of digital data that are currently being generated about the projects of the various organizations. Nevertheless, most of these frameworks prescribe high level mechanisms for the different PPM components (e.g., project prioritization, resource optimization) rather than specifying PPM practices down to implementation detail. This is for example the case with project prioritization functions, where PPM frameworks provide general guidelines about the prioritization criteria, without delving into the details of the ranking criteria that materialize the prioritization process.

Motivating by the general lack of mechanisms for the prioritization of the projects of a portfolio, the present article introduces a scorecard methodology for quantitative ranking of projects. The proposed scorecard methodology is conveniently called “Portfolio Scoring Mechanism” or “Portfolio Scorecard” (PS) as it can be related to the well-known balanced scorecard family of mechanisms [Kaplan96].

The PS scorecard methodology is destined to support the classification of projects within large portfolios into two broad categories i.e., a transformational portfolio and a production portfolio. In this classification, the transformation portfolio is destined to signify the most important projects of the portfolio that drive the implementation of the strategic objectives of the portfolio. Hence, the specification of transformation portfolio enables organizations to focus their project monitoring and management efforts on a smaller subset of projects of a very large portfolio. This can essentially reduce the complexity of progress monitoring and impact assessment processes in large project portfolios without essential deviations in the outcome of the assessment. The rationale of this approach stems from the famous Pareto principle, which states that it is very common for 80% of

the outcomes of some process to be driven by 20% of the inputs or triggers to the process [Dunford14]. Following this principle, the transformation portfolio signifies that a smaller percentage of the projects of the portfolio is likely to have an outsized effect on the accomplishment of the strategic goals of the portfolio.

The scorecard mechanism that is introduced in this article can therefore help organizations to establish and support an effective PPM process [Enoch15]. The latter involve the following typical steps (Figure 1):

- **Objectives specification**. The first step of a PPM process involves the specification of main objectives that must be achieved through the project's portfolio.
- **Inventory and prioritize projects**. This step focuses on the development of the portfolio of projects that will realize the objectives. The various projects are usually structured in a catalogue or inventory of projects with appropriate descriptions and metadata for each project. As part of this step, organizations are sometimes performing a prioritization of the projects to be implemented. The scorecard introduced in this article can be used to prioritize projects at this stage.
- **Feasibility studies and projects initiation**. This is the step that commences the implementation of the specified projects. In several cases, there is also a need for feasibility and maturity studies about the projects, which are usually carried out as prerequisite steps to the project's initiation.
- **Managing and monitor the portfolio of projects**. In this step, the organization undertakes the monitoring of the projects and their continuous alignment to the specified goals and objectives. The above-mentioned transformation portfolio is destined to boost the effectiveness of the monitoring process by shifting the focus of attention to the projects that matter the most.

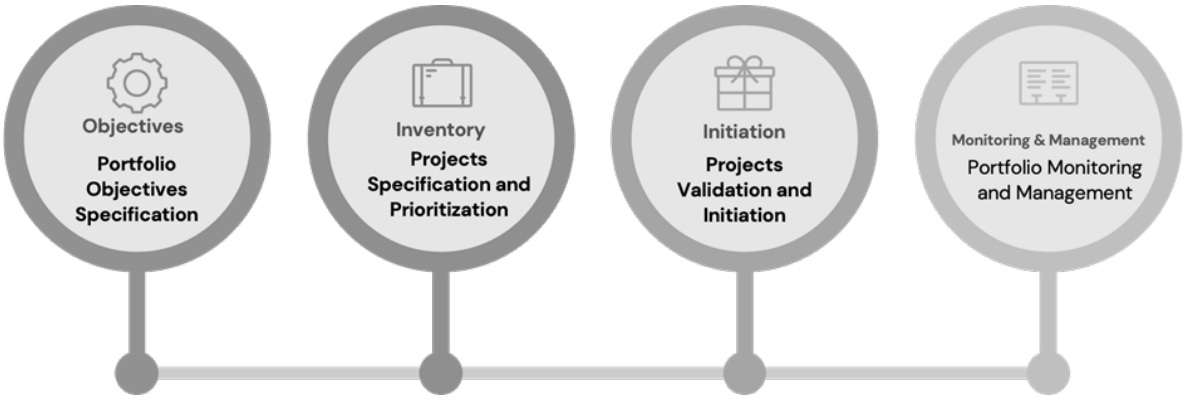


Figure 1: Typical Steps of a Project Portfolio Management process

Overall, the specification of the "transformation portfolio" delivers the following tangible benefits:

- More effective portfolio monitoring and management through an objective way for prioritizing monitoring actions.
- Lower effort for monitoring the implementation progress of the portfolio and for assessing its impact.
- Focused interventions and remedial actions concerning strategic projects i.e., actions targeting the projects with the highest potential impact.

The remainder of the article is structured as follows:

- Section 2 discussed related work and the state of the art in PPM towards positioning the PS methodology in the broader landscape of PPM methods and frameworks.
- Section 3 introduces and presents in detailed the scoring criteria of the scorecard methodology.
- Section 4 illustrates mechanisms for ranking different projects in terms of their importance, leveraging the scoring criteria of the presented scorecard.
- Section 5 is the financial and concluding section of the article.

2. PPM and Scorecards: State of the Art and Future Outlook

Most of the state-of-the-art PPM frameworks that are currently supporting and shaping PPM processes in the industry can be classified in the following categories:

- **Agile PPM Frameworks**: Agile PPM has gained significant traction in recent years, particularly in industries where flexibility and adaptability are of paramount importance. This approach enables organizations to embrace iterative project management practices, accommodating evolving customer requirements and shifting market dynamics [Schwabe19]. Agile PPM frameworks, such as Scrum and Kanban, prioritize incremental delivery of value and foster collaboration, empowering teams to respond swiftly to changing priorities. With Agile PPM, organizations are better equipped to achieve project success in dynamic environments.
- **Lean PPM Frameworks**: Lean PPM frameworks have their roots in lean manufacturing methodologies. They emphasize the elimination of waste, optimization of value delivery, and continuous improvement. Lean PPM streamlines project processes, identifies bottlenecks, and promotes efficient resource utilization. By employing lean tools like value stream mapping and process optimization techniques, organizations can improve project quality, reduce project cycle times, and enhance overall productivity. Lean PPM frameworks can be particularly beneficial in industries with tight budgets and strict time constraints.
- **Data-Driven PPM Frameworks**: Data-driven PPM frameworks leverage analytics and project management software to enable organizations to make informed decisions. These frameworks rely on data-driven insights to optimize project selection, resource allocation, and risk management. By adopting data-driven PPM frameworks, organizations can effectively prioritize projects based on their potential return on investment, accurately allocate resources, and proactively identify and mitigate project risks. Real-time visibility into the project portfolio's performance enables organizations to make data-backed, evidence-based decisions that enhance project outcomes.
- **Hybrid PPM Frameworks**: Hybrid PPM frameworks integrate principles from multiple project management methodologies (e.g., Waterfall methodologies, Agile methodologies), to tailor the approach to the specific needs of the organization. These frameworks offer organizations the flexibility to adopt a combination of project management practices to suit individual projects within the portfolio. In this way, hybrid PPM maximizes project success rates while accommodating the unique characteristics and requirements of the various projects.

Emerging implementations of these frameworks are currently driven by cutting edge technologies, including:

- **Artificial Intelligence (AI)**: AI is nowadays disrupting most application areas and PPM won't be the exception to this rule. AI-powered PPM frameworks are expected to play a significant role in automating project selection, resource allocation, and risk management processes. For instance, machine learning algorithms can be used to analyze historical project data, identify patterns, and provide predictive insights regarding the expected impact of the various projects. Such insights can accordingly enable organizations to make data-driven decisions swiftly.
- **Blockchain**: Distributed Ledger Technologies (DLT) (also known as blockchain technologies) hold the promise to improve the transparency, trust, and security of PPM. DLT technologies enable immutable and decentralized storage and verification of project data. Moreover, they can enhance project governance and foster seamless collaboration among different PPM stakeholders.
- **Analytics for Data-driven Decision Making**: Nowadays, organizations generate and collect unprecedented volumes of data about their projects. Hence, they also increasingly leverage data analytics and project management software to make informed and objective decisions.

The implementation of the above-listed PPM frameworks hinges on the specification of specific mechanisms and tools for processes like strategic alignment, project prioritization and risk management. In this context, project portfolio scorecards are among the most popular tools used to evaluate and rank projects based on set criteria. Such scorecards provide a quantitative measure for comparing projects within a portfolio and help to identify the projects that deliver the maximum value with available resources. Some of the most popular project portfolio scoring mechanisms include:

- **Balanced scorecards**: Balanced scorecards provide a strategic framework for evaluating projects based on multiple perspectives, such as financial, customer, internal business, and learning and growth perspectives [Romano13]. This approach ensures that all aspects of the organization's strategy are considered to provide a well-rounded view of the organization's health.
- **Decision matrices**: Decision matrices are a simple tool to evaluate and compare projects based on predefined criteria. Decision matrices provide a framework for allocating weighted scores to each criterion and determining the relative importance of each criterion [Enz13].
- **Multi-criteria decision analysis**: Multi-criteria decision analysis (MCDA) provides a framework for evaluating projects based on multiple criteria while accounting for the interdependence of these criteria [Taherdoost23]. This approach enables decision-makers to assess projects' trade-offs and find optimal solutions to maximize the portfolio's overall value.

All the above methods emphasize the selection of proper criteria for scoring and ranking different projects, as well as for constructing sub-portfolios of prioritized project. In this direction, there is always a need to design a set of practical scoring criteria, along with concrete guidelines for their integration in a comprehensive scoring and ranking mechanism. The proposed PS methodology outlines a set of scoring criteria for digital transformation projects, along with mechanisms for using them towards ranking projects within a portfolio. As such it can be considered a value scorecard tool that can support the implementation of the above-listed PPM frameworks in terms of project

selection and prioritization. The PS methodology is tailored to portfolios of digital transformation projects that are destined to achieve ambitious digital transformation targets.

3. Portfolio Scorecard Overview and Scoring Criteria

As already outlined the Portfolio Scorecard (PS) methodology aims at facilitating the selection of a small subset (e.g., 10%-15%) of the projects of a large portfolio that are of strategic importance and are likely to have the highest impact on achieving the strategic objectives of an organization in terms of digital transformation (Figure 2). This subset is designated as the "Transformation Portfolio" (TP) of the portfolio, while remaining projects will be designated as part of a “Production Portfolio” (PP). By and large the distinction between TP and PP is as follows:

- **The projects of the 'Transformation Portfolio' (TP)** will be the ones to be prioritized for monitoring and management as the ones that are best suited to provide a representative view of the progress of the portfolio’s implementation and of its realized impact.
- **The projects of the "Production Portfolio" (PP)** are likely to have a less significant contribution to the overall impact of the portfolio on the digital transformation of the organization. Nevertheless, selected projects of the PP may have significant organizational impact as well.

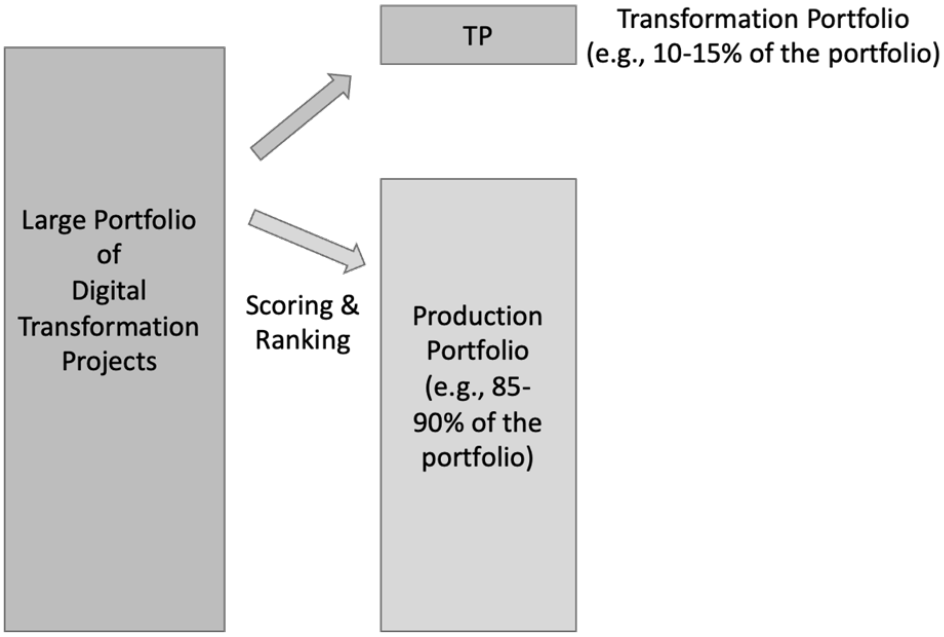


Figure 2: Porfolio Segmentation in Sub-Portfolios (Transformation, Production)

To identify the projects that comprise the transformation, there is a need for producing a global ranking of all the projects of the portfolio. In this direction, the PS suggests considering the following criteria:

- **C1 - The intensity of the contribution of each project to the Key Performance Indicators (KPIs) of the Digital Transformation of the Organization.** This criterion will aim at quantifying the density of a project’s contribution to the outcomes and impacts of the digital transformation of the organization, as the latter are reflected on the KPIs that are usually linked to the strategic objectives of the digital transformation of the

organization. Specifically, each strategic objective is commonly associated with KPIs like the number of processes of the organization that that will be digitized, and the total number of digital transactions conducted by the organization in a given timeframe. Projects that contribute more intensively to these indicators receive a higher score in this criterion than projects with a lower contribution to the same indicators.

- **C2 - The strategic importance of the project in relation to the implementation of other projects**, and especially whether it is an infrastructure project on which other projects depend. This criterion aims at signifying the importance of infrastructure projects for the implementation of a portfolio of digital transformation projects. Several of the projects of such a portfolio may have little direct contribution to the KPIs listed in C1 above. Nevertheless, there are always projects that build the digital infrastructures, which support many other projects that do contribute to the various KPIs. Prominent examples of such projects are the ones dealing with the development of networking and communications infrastructures, the development of middleware infrastructures, the deployment of security measures, as well as with the deployment and operation of data centers infrastructure. Many such projects are usually prerequisites for the implementation of a host of other projects. Therefore, this criterion is introduced to consider and reward the indirect but strategic nature of infrastructure projects.
- **C3 - The Project Budget**. The successful completion of large-budget projects is considered a success criterion of a digital transformation strategy. This is because larger projects are expected to contribute more to the successful implementation the digital transformation projects portfolio, when compared to lower budget projects. This criterion assumes that the dimensioning and the budgeting of the different projects considers their "value for money". This assumption is generally valid, even if not always correct.
- **C4 - The relevant importance of the project in the portfolio**, which includes the strategic importance of the project for the implementation of goals and priorities of the digital transformation strategy of the organization. This criterion is introduced as a tool for evaluating the strategic importance of projects. A credible scoring of this criterion requires feedback from the owners of the various projects of the portfolio, as well as from other relevant stakeholders. In essence, the criterion provides the means for incorporating stakeholders' feedback in the methodology.
- **C5 - The sectoral focus of the project (i.e., the thematic area and the sector concerned by the project)**. This criterion will be used as a qualitative criterion to support the best projects of each area of the digital transformation strategy through the application of a quota mechanism. It is a criterion destined to support scoring of projects that belong to very large portfolios that cover multiple sectors. This is for example the case with the digital transformation of the public sector, which typically includes projects in different areas like healthcare, transport, and tourism. The application of this criterion can ensure that the "Transformation Portfolio" will include at least 2-3 projects from each thematic area or sector. As outlined it is a qualitative criterion aiming to boost specific projects in the ranking. Hence, it is is not considered in the quantitative part of the scoring process.

These criteria serve as inputs to scoring formulas that are illustrated in following paragraphs towards assigning a strategic importance score to each project of the portfolio. In this direction, there is a need for a well-defined process for grading a project in each one of the above-listed criteria. The

following tables (i.e., Table 1, Table 2, Table 3, and Table 4) provide a guide for this process i.e., they drive the project's grading in each one of the quantitative criteria. Specifically, each of the tables specifies how a project portfolio manager can grade a project in one of the criteria. In practice, the tables can be combined to an integrated project-level scorecard. Nevertheless, there is no table for C5, which is meant to act as a booster criterion, in cases where applying an "application area" criterion is deemed necessary.

C1 – Grading the project's contribution to the impact KPIs of Portfolio
Scale (0-5):
0: The project is will definitely provide no contribution to any output or impact KPIs of the digital transformation portfolio
1 (Poor): The project is not likely to contribute to any output or impact KPIs of the digital transformation portfolio
2 (Fair): The project will most likely provide a limited contribution to one or few KPIs of the digital transformation portfolio
3 (Good): The project will most likely provide a moderate contribution to one or few KPIs of the digital transformation portfolio
4 (Very Good): The project will most likely provide a considerable contribution to one or few KPIs of the digital transformation portfolio
5 (Excellent): The project will most likely provide a considerable contribution to many KPIs of the digital transformation portfolio

Table 1: Guide for Grading a Project's Contribution to the impact KPIs of Portfolio

C2 – Grading the project's contribution to developing digital transformation infrastructures
Scale (0-5):
0: The project is definitely not developing any infrastructure(s) that will be used by other projects of the digital transformation portfolio
1 (Poor): The project will most likely develop infrastructure(s) that will be used by one or few projects of the digital transformation portfolio
2 (Fair): The project will definitely develop infrastructure(s) that will be used by one or few projects of the digital transformation portfolio
3 (Good): The project will most likely develop infrastructure(s) that will be used by many projects of the digital transformation portfolio
4 (Very Good): The project will definitely develop infrastructure(s) that will be used by many projects of the digital transformation portfolio
5 (Excellent): The project is developing infrastructure(s) of large scale and significance that will be used by almost all projects of the digital transformation portfolio

Table 2: Guide for Grading a Project's Contribution to Developing Digital Transformation Infrastructures

C3 – Grading a project according to its budget
Scale (0-5):
0: Reserved score value that should be used, as each project has a budget over zero
1 (Poor): The budget of the project is among the 20% percentile of the projects with the lowest budget
2 (Fair): The budget of the project is among the 40% percentile of the projects with the lowest budget, yet it is not among the 20% percentile of the projects with the lowest budget
3 (Good): The budget of the project is among the 60% percentile of the projects with the highest budget, yet it is not among the 40% percentile of the projects with the highest budget
4 (Very Good): The budget of the project is among the 40% percentile of the projects with the highest budget, yet it is not among the 20% percentile of the projects with the highest budget
5 (Excellent): The budget of the project is among the 20% percentile of the projects with the highest budget

Note: The scale of this criterion is based on the segmentation of all the projects of the portfolio in five different classes (Class 1, Class 2, Class 3, Class 4, Class 5) according to their budget in ascending order. The 20% of the projects with the lowest budget (Class 1) scores 1, while the 20% of the projects with the highest budget (Class 5) score 5. Overall, the project's budget score (C3) depends on the budget class it is assigned to. The zero (0) score of the scale is not used in this context.

Table 3: Guide for Grading a project according to its budget

C4 – Grading the strategic importance of the project
Scale (0-5): **0**: The project is not included in the digital transformation strategy and does not have any strategic importance **1 (Poor):** The strategic importance of the project is poor it is an auxiliary project that does not serve any strategic targets of the digital transformation plan of the organization **2 (Fair):** The project has limited strategic importance that is confined in a very specific and narrow segment of the digital transformation strategy **3 (Good):** The project is strategically important and stands out in the portfolio of projects in the digital transformation area where it focused **4 (Very Good):** The project is a flagship project in the policy area where it belongs **5 (Excellent):** The project is a flagship project for the digital transformation strategy as a whole and is strategically important beyond the digital transformation area that it primarily addressed

Note: C4 is a vehicle for engaging project owners and other key stakeholders and decision makers in the scoring process. The feedback has a strong subjective component, which is however based on the domain expertise of the project owner and/or the policy maker in their sector.

Table 4: Guide for Grading the Strategic Importance of the Project (as perceived by stakeholders)

4. Projects Ranking

Based on the above listed criteria a generalized scoring formula can be developed to allow for:

- Scoring the projects on the criteria (C1-C4) listed in the previous section.
- Ranking the projects according to their score.

The generalized formula for the score (S) of the project (P) (i.e., S(P)) is as follows:

$$S(P) = \frac{W_1 * C_1(P) + W_2 * C_2(P) + W_3 * C_3(P) + W_4 * C_4(P)}{5 * (W_1 + W_2 + W_3 + W_4)}$$

Where Cn(P) is the score of project P in criterion Cn. The score is normalized to the maximum possible score (i.e., the score in the denominator of the equation). The different weights (Wn) in the formula enable the portfolio manager to weight the various factors differently. This is a generalized approach that can accommodate different intentions in terms of the prioritization and the overall importance of the projects of the portfolio, as well as in terms of the criteria that will determine the classification of a project in the Transformation Portfolio (TP). For instance, the assignment of a small weight to one of the criteria can weaken its importance on the final scoring outcome. Likewise, a high weight for some other criterion can make it more decisive and important in the process.

It is also envisaged that the scoring formula could be adjusted or improved following a series of validation cycles with realistic data about the projects of the project's portfolio.

One of the simplest possible instantiations of the formula can be derived by considering an equal

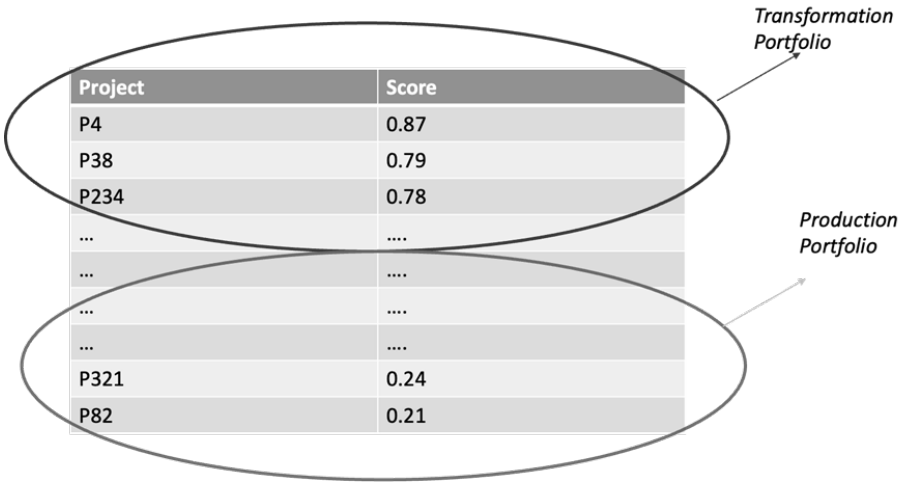
importance of the four different criteria to the final outcomes. In practice, this means that the formula was instantiated using:

- Weights equal to one i.e., W1 = W2 = W3 = W4 = 1.
- Scores to C1 , C2 ,C3 and C4 between 0 and 5, using the instructions presented in the tables of the previous sub-section (i.e., Table 1, Table 2, Table 3, and Table 4).

This instantiation of the formula results in scores between 0 and 1 for each project, as all scores are normalized to the maximum possible scoring of the various criteria. The latter is 20 when all four criteria are considered (4*5), yet it can be less when some of the criteria are disregarded. For instance, projects without budget have their scores graded in three of the four criteria (C1, C2, C4) and accordingly normalized to the maximum attainable score for three criteria (i.e., 15).

Based on the application of the scoring formula on the projects of the portfolio, each of the project can be assigned a score (S(P)). Due to the normalization, the score will be in the interval (0,1). This score will serve as a basis for the ranking of the projects of the portfolio in descending order based on their score (i.e., S(Pj) > S(Pk) > … > S(Pn)). The projects of the TP can be accordingly selected as the set of 10-15% of the total number of projects with the highest scores (Figure 3). Note however that in addition to the scores, the "booster" criterion (i.e., C5) can be used to increase the ranking position of some projects that address specific digital transformation areas. Specifically, the C5 booster can be used to ensure that the 2-3 highest ranked projects from specific application areas (e.g., healthcare) of a project's portfolio will be included in the TP regardless of their initial position in the ranking list. In this case, for every project Px that is among the 2-3 of a specific sector, the ranking process shall do the following assignment: S(Px) = Max (S(Px), S(Pn)+0.01), where S(Pn) is the score of the last project to the TP. This assignment will ensure that Px makes it to the transformation portfolio. In case its score is below S(Pn), the assignment will increase the score to a value greater than the score of the last project of the TP.

The portfolio manage may opt to avoid the use of a "booster" criterion in case they do not help meeting strategic priorities of the organization.



Project	Score
P4	0.87
P38	0.79
P234	0.78
…	….
…	….
…	….
…	….
P321	0.24
P82	0.21

Figure 3: Segmentation of the Ranked Projects in a Transformation Portfolio and a Production Portfolio

As already outlined, the presented methodology comprises different parameters that affect the construction of the TP. Specifically:

- The assignment of different values to the weights of the scoring formula can significantly alter the outcomes of the project.
- The boosters can change the projects that are included in the TP.

5. Conclusions

This article has introduced a scoring methodology for project selection and prioritization in the context of Project Portfolio Management (PPM) processes with emphasis on PPM processes for project portfolios that implement digital transformation strategies. The methodology helps identifying important projects of a digital transformation portfolio that are expected to contribute the most to the realization of the digital transformation goals of an organization. These projects are structured in a special "transformation portfolio" that is aimed to facilitate the monitoring of the digital strategy implementation progress, as well as its impact assessment. Our approach to constructing the transformation portfolio has been based on the specification and use of a scorecard that scores different project against a variety of criteria, including their contribution to the impact KPIs of the digital transformation strategy, their budget, their contribution to the development of core infrastructures of the digital transformation and more.

Earlier sections have presented general methodological considerations for the development of the scorecard, along with more specific guidelines for its instantiation and use in the scope of PPMs for digital transformation portfolios. Apart from the scoring of individual projects, the article has presented the process of ranking different projects, including the application of "booster" criteria for increasing the rank of specific projects.

The methodology is very flexible as it can easily configured to factor the various criteria differently. Moreover, it can serve as a didactic device for portfolio managers, who can experiment with different configurations to identify the best possible ways for assessing a specific digital transformation portfolio. Nevertheless, the effective application of the scorecard methodology hinges on the availability of quality data for scoring the various projects in the different criteria. For instance, the availability of accurate and quality information about the budget of the projects and their assessment by stakeholders. By using accurate, timely and high-quality data for each project of the portfolio, the introduced methodology can essentially contribute to an effective portfolio management process.

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