A Technique for Program and Project Portfolio Prioritization: RAB²/E Matrix

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ABSTRACT

The propose of this paper is to present some Techniques those can be use as tool for Program and Project Portfolio Prioritization according the aspects of the solution to be build and external facts that can be perceived. After that, any Project Management Methodology – such as PMBoK© [1], PRINCE2® [2] and ZOPP [3] – can be applied to control the tasks which have to be done. Beyond this propose, also this article introduces a new Technique as an extended version of *Matriz RAB - Rapidez, Autonomia e Benefício* (RAB Matrix - Rapidity, Autonomy and Benefit) [4] which will be called as "*Matriz RAB²/E - Rapidez, Autonomia e Benefício / Estendida*" ("RAB²/E Matrix - Rapidity, Autonomy and Benefit / Extended").

Keywords: Strategy Planning; Project Management; Program and Project Portfolio Prioritization; MCDM; RAB²/E Matrix, Cost Control, Risk Control; Exogenous Factors.

1. INTRODUCTION

A Program and Project Portfolio Management System should provide elements for the Organization's Executives can decide which initiatives best reflect business needs. That is, "do the right thing," according to Drucker [5, pp. 50-60], which in its context of Program and Project Portfolio Management, means mapping the most relevant opportunities and selecting the Programs and Projects most aligned with the Organizational Strategy.

In the beginning of 2000 decade, the subject of Program and Project Portfolio Control became more prominent in the Program and Project Management literature, partly due to the growing importance of activities in the Project Area in Corporations, and partly due to the problems arising by the coexistence of multiplex Programs and Projects, simultaneos and concurrents, inside the same Organization. Examples of authors those researched this theme are Dye & Pennypacker [6], Reyck, Grushka-Cockayne, Lockett, Calderini, Moura & Sloper [7, pp. 524-537] and Carvalho & Rabechini Jr. [8].

The alignment between the Enterprise's Business Strategy and its Program and Project Portfolio – exemplified by PMI [9], Ghapanchi, Tavana, Khakbaz & Low [10 pp. 791-803], Costantino, Di Gravio & Nonino [11, pp. 1744-1754] and Böhle, Heidling & Schoper [12, pp. 1384-1392] – has been debated with interest by students and by organizations and some models have emerged in both Academic and Corporate scenarios.

Thus, it is recognized that an effective Program and Project Portfolio Management, inside the Organization, can provide strong support that can collaborate to administrate the constant and growing need of the Corporate World in to be able to meet the demands of their Clientele, as well as, to keep ahead of the competition regarding the functionalities and the quality of the services and products provided. This must happen, always when the PMO - Project Management Office is actioned to respond to this scenario, by making available new solutions that correspond to these expectations of the Business Areas.

Additionally, of the Section "1. Introduction", the exposition of the text of this paper will follow the below Nomenclature Table and its Sections as presented in Table 1:

Table 1. Article Sections Nomenclature Table

2	Problem approach
3	Author expertise
4	Methodology applied
5	Theory references
6	RAB²/E Matrix
7	Paper Conclusions
8	Final considerations
9	Bibliographic references

In the topic "Problem approach" are presented the questions that this work intends to propose a way of workaround and solution. In the topic "Author Expertise" is described the academic and professional conceptualization that the author possesses for subsidizing the formalization of his proposal driven by this article. In the topic "Methodology applied" is defined how the proposed solution was constructed. In the topic "Theory references" are presented the fundamentals of the literature on the techniques of Program and Project Portfolio Prioritization discussed. In the topic "RAB²/E Matrix" are addressed the points those drove up the proposal of extended the original RAB Matrix to this new version. In the topic "Paper conclusion" are analyzed and highlighted the contributions that this work intends to offer to the field of this research. In the topic "Final considerations" are pointed out other alternatives that can be aggregated to evolve this study. And finally, at the end of this article in the topic "Bibliographic references", are described the textual materials researched to support the assembly of this proposal.

2. PROBLEM APPROACH

An issue that is always under discussion in Organizations is how to decide, with a scientific method, which strategy is the better to follow, what means, where to invest money with fast financial feedback.

As a way to be followed, the PMO - Project Management Office can help with this issue by effectively administrating the Program and Project Portfolio, by applying Prioritization Techniques that consider as important some strategic factors, such as the "fast financial feedback", to organize the development order of these.

As his academic contribution, the author of this paper presents which could be – in his view – some new criteria to be included in one already existent Prioritization Techniques known as *Matriz RAB²/E* (RAB²/E Matrix) for Program and Project Portfolio Management, in order to achieve the goal, of better support the Organizations in its decision for investment in the development of one Program or Project instead of another.

These criteria are presented, in the Appendix B, in the form of a Table of Criteria of Prioritization (built in a Spreadsheet MS®-Excel© from Microsoft) and are described in this Article and commented in the body of its text.

3. AUTHOR EXPERTISE

The perception of those criteria, which were the focus of this paper, was the result of the accumulation of experiences throughout the professional career of more than 45 (forty and five) years of the author of this paper in software projects of various types, besides their additional Technical Certifications in the field of Project Management (PMP© - Project Management Professional/PMI© - Project Management Institute) and Process Management (CBPP® - Certification in Business Process Professional/ABPMP® - Association of Business Process Management Professional).

4. METHODOLOGY APPLIED

This Article is the result of several years of work of the author in the area of IT - Information Technology, where in his activities, he encountered problems existents in this theme related to how decide which Program or Project will return faster the results for the attending of the expectations and requirements.

Therefore, the author used his procedures/*constructos* designed to solve these issues that were presented in this work, also having been these, validated as effective in several opportunities.

However, to be able to justify which Scientific Methodology was applied to the execution of this Article, we can say that these were the Bibliographic Research (to relate the practice to the theory), the Data Survey (to understand the criteria that should be considered for setting up the new proposal for a Program and Project Portfolio Prioritization Technique) and the Laboratory (since the theory studied was applied in practice in the real world on several occasions).

5. THEORY REFERENCES

As already presented, besides proposing a new version for the *Matriz RAB - Rapidez, Autonomia e Benefício* (in English, RAB Matrix - Rapidity, Autonomy and Benefit, as a free translation since was not found any publication in English refering this theme) [4], which will be called as "*Matriz RAB²/E - Rapidez, Autonomia e Benefício / Estendida*" ("RAB²/E Matrix - Rapidity, Autonomy and Benefit / Extended") throughout this text, this Article also intends to introduce some techniques applicable to Program and Project Prioritization defined as Multi-Criteria Decision-Making (MCDM).

Regarding the mentioned techniques applicable to Program and Project Prioritization, that this paper will also present, these are listed in alphabetical order for not imply any indication of one be better than another. Its names are: AHP - Analytic Hierarchy Process [13], BWM - Best-Worst Method [14, pp. 126-130], MACBETH - Measuring Attractiveness by a Categorical-Based Evaluation Technique [15, pp. 489-500], PROMETHEE - Preference Ranking Organization MeTHod for Enrichment Evaluations [16, pp. 275-299] and TOPSIS - Technique for Order of Preference by Similarity to Ideal Solution [17, pp. 302-315].

AHP - Analytic Hierarchy Process

The AHP - Analytic Hierarchy Process, from an American management professor Thomas L. Saaty [13], is an international decision-making technique. It is intended to help people or Organizations make the right choice in complex decisions. A concrete choice can be made using a prescribed calculation and based on seemingly abstract decision-making criteria.

A value is assigned to the criteria relevant to making the right choice, after which possible solutions are mathematically calculated and determined. The Analytic Hierarchy Process is, therefore, both a psychological and mathematical method. The Figure 1, in Appendix A, shows a diagram about this Technique.

BWM - Best-Worst Method

The BWM - Best-Worst Method [14] is a multi-criteria Decision-Making Method that uses 2 (two) Comparisons Vectors in pairs to determine the Weights of Criteria.

First, the Best (e.g. most desirable, most important) and the Worst (e.g. least desirable, least important) criteria, are identified by the Decision-Maker, and after that, the Best Criteria are compared for choosing the Best Criterion of all. The Figure 2, in Appendix A, shows a diagram about this Technique.

MACBETH - Measuring Attractiveness by a Categorical-Based Evaluation Technique

The MACBETH [15] is an interactive multi-criteria Decision-Support approach used to create a Quantitative Value (numerical, determined by real data) and Qualitative Measure (non-numeric, determined by subjective judgment) model.

The Degree of Attractiveness is established by the smallest range in the Measure Scale (by Criteria Category) of numerical and non-numerical compilation. The Figure 3, in Appendix A shows a diagram of this Technique.

PROMETHEE - Preference Ranking Organization Method for Enrichment Evaluations

The starting point of the PROMETHEE Method [16] is an evaluation matrix of the alternatives with respect to a set of criteria. Then, a Preference Function is assigned to each of the criteria.

The Preference Function of a criterion describes how the preference of the decision maker changes with the difference between the Performance Levels of the possible alternatives to this criterion. In Figure 4, in Appendix A, it is possible to see a software screen about this Technique.

TOPSIS - Technique for Order of Preference by Similarity to Ideal Solution

This Method [17], which is very similar to BWM - Best-Worst Method, refers to making choice of the best alternative from among a finite set of Decision Alternatives in terms of multiple criteria, usually conflicting. The TOPSIS selects the alternative closest to the ideal solution and the farthest from the negative alternative.

The Method is based on capturing information about attributes provided by the Decision Maker, such as, numeric data. Its purpose is to evaluate, prioritize and select inputs by assigning weights to subjective criteria. The Figure 5, in Appendix A, shows a diagram about this Technique.

6. RAB²/E MATRIX

The *Matriz RAB - Rapidez, Autonomia e Benefício* (RAB Matrix - Rapidity, Autonomy and Benefit) [4] considers these 3 (three) Points to graduate the Project to be evaluate in order to prioritize it later.

The *Rapidez* (Rapid) means how quickly is possible to deliver the expected results from Project, the *Autonomia* (Autonomy)

means if it is necessary external contributions or if your Project Team can solve it themselves and the *Benefício* (Benefit) means the level of positive impacts that will be generated when the solution will be putted in place.

Hence, measuring these 3 (three) Points with grades, is possible better define the need of prioritize and focus in some Projects than in others.

For the *Matriz RAB - Rapidez, Autonomia e Benefício* (RAB Matrix - Rapidity, Autonomy and Benefit) in its original version, as was said previously in this article, the purpose of this paper is to propose a new version for it. This new version, is proposal named as "*Matriz RAB²/E - Rapidez, Autonomia e Benefício / Estendida*" ("RAB²/E Matrix - Rapidity, Autonomy and Benefit / Extended"), in which, more new 3 (three) Points were included with the objective of became more precise the evaluation. These new 3 (three) Points are: Cost, Risk and Availability (Financial) (*Custo, Risco e Disponidade (Financeira*)).

For the 3 (three) Points of the original RAB, as well as for the new 3 (three) Points of the proposed RAB²/E, are presented 1 (one) direct question – with 3 (three) possible answers – those have different Significance Values, representing a higher status, a medium status, and a lower status, which also have different Mathematical Weights (to enable their measurement and rank in the Portfolio Program and Project Priority List).

For the 3 (three) Points of the original RAB, the 3 (three) direct questions, and its 3 (three) possible answers, are:

Criterion RAPID: - How long can be met the Demand?
1. EXPRESS = 1 to 3 months;
2. STANDARD= 3 to 6 months;
3. COMPLEX = 6 months to 1 year;

Rmk.: - The above range of numbers are suggestions inserted in the Spreadsheet MS®-Excel© from Microsoft presented in Appendix B, which can be changed to fit new realities.

Criterion AUTONOMY: - What is the involvement of the Areas to meet the Demand?
1. MAXIMUM= Your Area can perform alone;
2. AVERAGE = Needs other Areas;
3. MINIMUM = Needs Higher Decision.

Criterion BENEFIT: - How far will the results go by meeting Demand?
1. EMBRACING= For all Organization;
2. RESTRICTED= Only for one Area;
3. PERSONAL = Only for own use.

For the new 3 (three) Points of the proposed RAB²/E, the 3 (three) direct questions, and its 3 (three) possible answers, are:

Criterion COST: - What is the investment to meet the Demand?
1. SMALL = 100,000;
2. NORMAL= 500,000;
3. BIG = 1,000,000.

Rmk.: - The above range of numbers are suggestions inserted in the Spreadsheet MS®-Excel© from Microsoft presented in Appendix B, which cab be changed to fit new realities, in the same way that, the Cost Unit must be defined.

- Choose the number closest the value that was informed.

Criterion RISK: - Is there any factor that impacts meeting the Demand?
1. NONE = Unidentified;
2. FORECASTED= During the Project;
3. IMMEDIATE = At the beginning of the Project development.

Criterion AVAILABILITY:- Are resources already available to meet the Demand?
1. ALL = No Exception;
2. MOST = More than 50% of the necessary;
3. MINORITY= Less than 50% of the necessary.

Note: - The "Minimum" and "Maximum" fields in the "Prioritization Level" (in the Spreadsheet MS®-Excel©) table are for establishing the Score Range for High, Medium, and Low prioritization;

- Also, in this same Spreadsheet, the data (graphics) and the procedure actions are shown in its tabs.

Of course, exogeneous factors can interfere in the initial grades, for more or less, before to achieve the final grades to be considered for sorting the Project Portfolio list in an order that means what should be developed first.

For more details about the possible kinds of exogeneous factors those can interfere in a Program and Project Portfolio Prioritization, some articles of the same Author of this paper can be researched [18] [19] [20] [21].

7. PAPER CONCLUSIONS

In the Appendix B, in the Figure 6, is presented the "RAB²-E Matrix= Portfolio Prioritization Spreadsheet {V.02e} Scope= ..... - Scenario= ....." ("*Matriz RAB²-E= Planilha de Priorização de Portfólio {V.02e} Escopo= ..... - Cenário= .....*"), in MS®-Excel, what is a real contribution from the Author. The 2 (two) "....." fields can be used to better define the context of the Spreadsheet.

This Spreadsheet is been used in several Organizations with different realities, aiming to collaborate, with the decision making process based on a strongly structured Program and Project Portfolio Priority List.

Perhaps, the method that could be consider of little bit similar with the *Matriz RAB²/E* (RAB²/E Matrix), proposed in this Article, would be the "Solution Selection Matrix" [22] even with the peculiar differences between both and the structured implementation presented in this Article for the *Matriz RAB²/E* (RAB²/E Matrix), which defines questions – for each one of 6 (six) Points – and the respective options of 3 (three) answers in order to attribute criteria (with Significant Values) and enable to build a Sort List of Programs and Projects development priority.

Indeed, by the supervised manner with that this work was built (long and large research/survey and assembled according to the feedback of the application of its proposition in the field by many year), it is possible to verify the usefulness of the proposal presented.

Also, can be concluded that its results can be considered as effective management and planning tool in corporate real world and, in additional, how practical this proposal is for the reality of Organization in its day-to-day activities.

8. FINAL CONSIDERATIONS

Among suggestions for future work, one of these could be the study of new criteria to implement more the current 6 (six) Points of "*Matriz RAB²/E - Rapidez, Autonomia e Benefício / Estendida*" ("RAB²/E Matrix - Rapidity, Autonomy and Benefit / Extended"), what means, the previous 3 (three) Points: Rapidity, Autonomy and Benefit (*Rapidez, Autonomia e Benefício*) – from the original *Matriz RAB (*RAB Matrix) – and the new 3 (three) Points: Cost, Risk and Availability (Financial) (*Custo, Risco e Disponidade (Financeira*)) – from the new proposal of *Matriz RAB²/E* (RAB²/E Matrix).

These new candidate criteria can be perceived during more utilization of the *Matriz RAB²/E* (RAB²/E Matrix), in the next PMO - Project Management Office implementations. However, even with the possibility of studying the inclusion of some more criteria to be added to the current proposal of RAB²/E, this should not be too complex in order to maintain the original idea of RAB, which is to be direct and simple, although its original 3 (three) Points are very subjective, what is resolved, by the inclusion of the new 3 (three) Points proposed by RAB²/E.

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AHP - Analytic Hierarchy Process

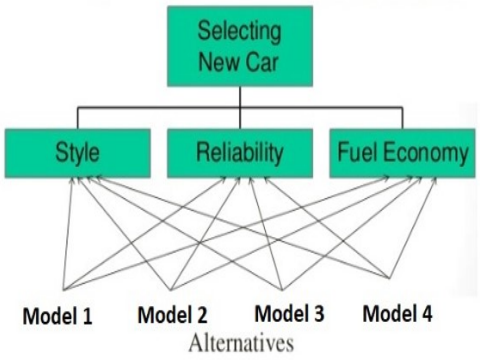

Figure 1 - AHP - Analytic Hierarchy Process

BWM - Best-Worst Method

Goal: selecting the best mobile phone	Basic requirements	Physical characteristics	Technical features	Functionality	Brand choice	Customer excitement
Basic requirements						
Physical characteristics						
Technical features						
Functionality						
Brand choice						
Customer excitement						

Figure 2 - BWM - Best-Worst Method

MACBETH - Measuring Attractiveness by a Categorical-Based Evaluation Technique

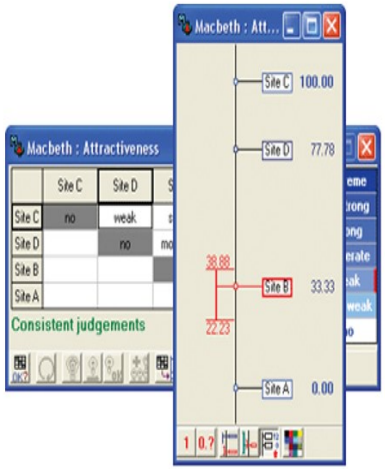

Figure 3 - MACBETH (Source: http://www.catalyzeconsulting.com/software/hiview3/macbeth-in-hiview3/)

PROMETHEE - Preference Ranking Organization Method for Enrichment Evaluations

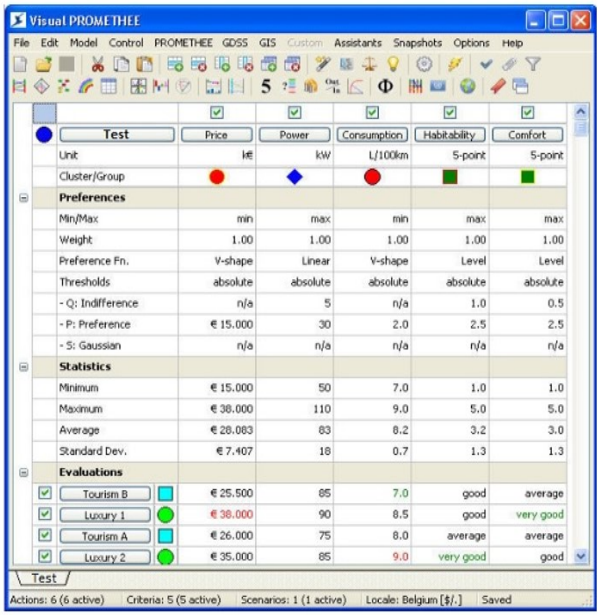

Figure 4 - PROMETHEE (Source: http://www.visualpromethee.com/)

TOPSIS - Technique for Order of Preference by Similarity to Ideal Solution

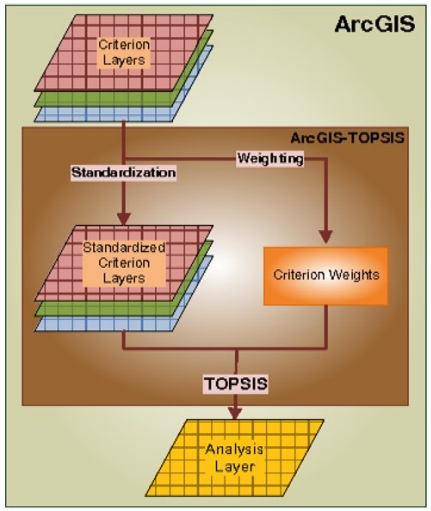

Figure 5 - TOPSIS (Source: https://www.arcgis.com/index.html)

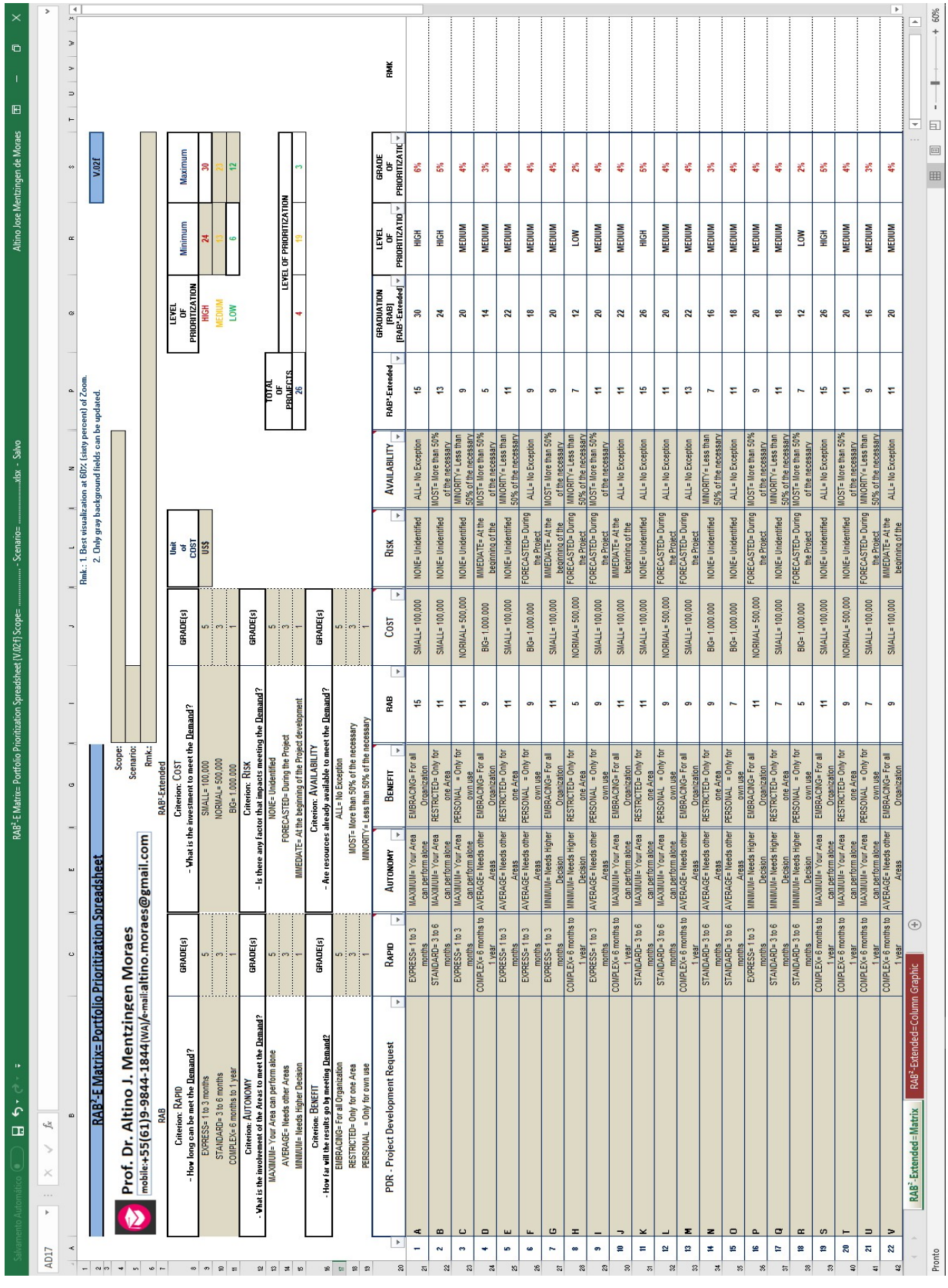

Figure 6 - RAB²-E Matrix= Portfolio Prioritization Spreadsheet {V.02f} Scope= ..... - Scenario= .....