Designing a Program Management Maturity Model (ELENA)

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***Abstract*:** *A series of different maturity models have been proposed to improve the performance of organizations based on how well they are doing. The majority of the models miss the macro levels such as program management and they just focus on the project management level. The assessment of maturity in organizations which have implemented program management is a subject which has not been discussed academically in detail as it has only recently been brought to light, and due to this there is an insufficient amount of maturity models at this level.*

In this research, a model for assessing the maturity of the programs with a systematic approach based on the Elena guide for program management has been designed. Standing on the literature review there was an attempt to build up a model which besides keeping the advantages of previous models, would fix their problems and improve it by studying different models. Also, considering the various factors affecting program management, the maturity is measured continuously and discretely in three dimensions of concepts, processes and documentation; each one is defined at five levels and it offers four ways for assessment.

Keywords: *Program management, Maturity model, Maturity model of project management, Maturity dimensions, Maturity levels, Elena.*

1. Introduction

Project-oriented organizations cannot reach their goals or achieve lasting success unreasonably or accidentally. Therefore, these organizations should devise plans to succeed and progress. Here, the question arises as how they can develop project management processes. One possible strategy is to facilitate project management through acceptance of management processes and assessment of gradual improvement and maturity (Cooke‑Davies, 2004).

The term "maturity" refers to complete or perfect development. It indicates how success can be achieved and what approaches are necessary to fix or prevent problems (Berssanete et al., 2008). Moreover, a maturity model describes the ideal progress towards goals, using different successive stages (TJ Man, 2007). Overall, it is necessary to analyze the "complete" image of effectiveness in an organization. Accordingly, maturity models are growing in popularity (Backlund, Chronéer and Sundqvist, 2014).

In a maturity model, practices of an organization are analyzed and compared with the ideal practices to plot a structured path towards improvement (Pennypacker and Grant, 2003). Maturity levels can indicate certain aspects of reality, e.g., capabilities, which present qualitative attributes for classifying a competence object into a set area. Diverse classes are normally classified in a sequential manner (Kohlegger, Maier and Thalmann, 2009).

A project-management maturity model allows the organization to examine its goal assessment criteria and degree of repeatability (Voivedich and Jones, 2001). Maturity models facilitate constant improvement of different aspects of a business. Duffy (2001) has highlighted the importance of strategy development and formulation of responses to change, suggesting that "the value of a maturity model lies in its use as an analysis and positioning tool".

Maturity models provide the tools for individuals and organizations to assess the maturity of various aspects of their performance against benchmarks and prioritize improvement actions. A mature organization can be seen as one that is competent in meeting its needs by using standardized approaches, while an immature organization discards these processes (Office of Government Commerce [OGC], 2010).

According to previous research, organizations with high maturity are expected to show high effectiveness and efficiency; as a result, in the marketplace, they have a competitive advantage (Backlund, Chronéer and Sundqvist, 2014). Based on reports by SEI, organizations with a maturity model show major improvements in the return of investment. Overall, 75% and 85% reductions in cost and defects have been reported in mature organizations (OGC,2010).

Success and its importance in organizations bring us to the discussion about the necessity of maturity models at macro levels (e.g., program). Various maturity models have been proposed to determine how organizations are progressing to improve their performance. Most of these models are at the project-management level and discard other levels, such as program management. The literature review on the existing maturity models shows inattention to organizational contexts in the assessment of project success. With this background in mind, the objective of this study was to assess project performance in a broader domain by examining organizational considerations. In this regard, presenting an integrated maturity model in form of a program maturity model is increasingly important. Different maturity models were studied and investigated to present a program-management maturity model, which takes advantage of previous models and fixes their problems. This paper will establish a new type of program maturity model, known as ELENA, which has distinguishing attributes, compared to previous maturity models.

2. Literature Review

Different institutions (PMI-OPM3, SEI-CMMI-PPMMM Gartner, OGC-P3M3 and others) and researchers (Crawford, 2002 - Kerzner, 2004 - Ibbs and Kwak, 2000 - Cooke and Davies, 2004 and others) have recently addressed maturity in project management and have introduced models to examine the maturity of project management with respect to ideal practices to promote continuous improvement and arrange the working methods. To know the advantages and disadvantages of the existing maturity models, they were compared based on some criteria collected from the results presented in Nikkhou (2015) research as shown in Table 1.

TABLE I. Criteria for Comparison the Maturity Models

Maturity models Comparison criteria	
•Alignment with organization strategy	•Appropriate definition of maturity
•Flexibility	•Citation to a standard and methodology
•Difficulty of assessors training	•Maturity levels
•Collectivity of assessment	•Kind of output (discrete or continuous)
•Simplicity and being understandable	•Targeted field
•Acceptability of the model	•Cost of assessment
•Commitment to sustainable improvement	•Tangibility of results
•Offering Solution for improvement	•Continuous assessment
•Difficulty of assessment	•Solution prioritization

Then the mentioned criteria were categorized into the following groups to simplify the interpretation and comparison of the models:

- Generic features of the models
- Validity of the supporting theory
- Evaluation of the effectiveness of the organization
- Assessment of models
- Flexibility
- Sustainable improvement
- Simplicity of models

Comparative results indicated the common features of models, which are perceived as the model advantages, design approaches, and structures. These are summarized below:

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- Definition of mature and immature organizations in most models
- Five levels of maturity in the models
- Discrete (staged) output of most models (continuous output in some cases)
- The goal of most models is implementation of a project management standard
- Use of tools to determine the current situation

On the other hand, the shortcomings of models, which are actually their disadvantages and deficiencies, were classified as follows:

- No citation to any standards or a poor supporting theory
- Appropriation of the model to a specific industry and inflexibility of the model
- Complexity of the model
- Weakness in sustainable improvement
- Lack of a simultaneous, continuous or discrete (staged) assessment result
- Lack of evaluation of tacit knowledge and intangible assets of the organization

3. Design of the Model

In light of the above-mentioned findings, we attempted to develop a model by considering the benefits of current models. Therefore, the following features were considered as the basic achievement factors and prerequisites for planning the model, which distinguish it from others:

- Having both continuous and discrete (staged) approaches for assessing maturity
- Capability of tailoring
- Simplicity of concept and practice
- Assessment of 3 dimensions of maturity, including processes, concepts, and documents of organizations
- General usage and application to all types of organizations and industries in different environments

4. Elena Program Maturity Model

4.1. Elena Program Management Guidance

This section introduces the supporting methodology. Elena is a structured approach, which can manage all levels of organization (Project, Program and Portfolio) effectively. It uses a five-face system to manage the program:

- Principles
- Concepts
- Process
- Tools
- Tailoring

As shown in the Fig. 1, the first face Principles are the context of forming concepts, process, tools and tailoring. In fact, these principles are general, public and common foundations and best practices between all programs which are not peculiar to any special organization. Elena octet principles include: alignment with organization strategy, portfolio governance, accountability, knowledge optimization, consequences leading and managing, leading and managing the project and service phases, leading and managing the events and being programmable.

The second face concepts are the elements of leading and managing program. Same as principles; concepts are octet too. Elena concepts include: organizing, planning, efficiency, effectiveness, risk, event, progress and communication.
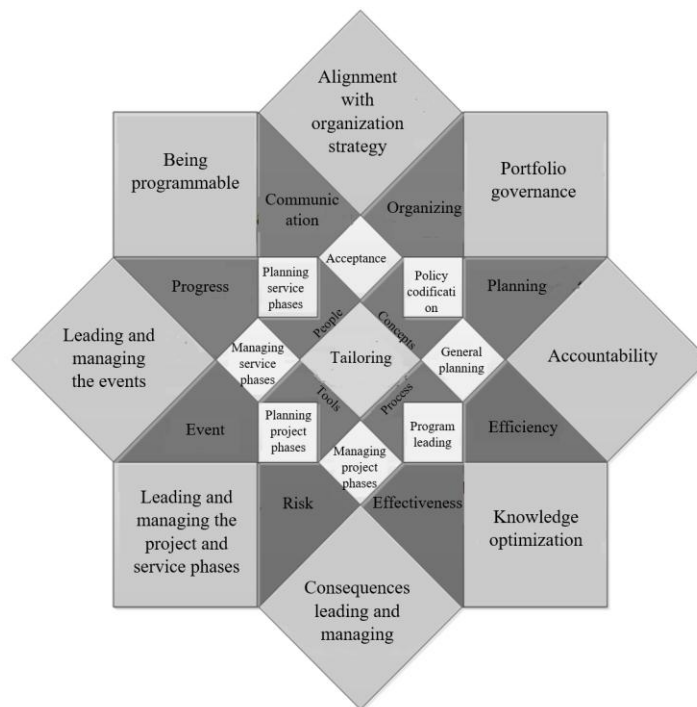
Fig1. Elena program management guidance

The third face process, is the steps of concepts utilization including: program acceptance, program policy codification, general program planning, program leading, managing the project phases, planning the project phases, managing the service phases, planning the service phases.

The fourth face is the tools, which is relative to the program properties and content.

The last face (tailoring) offers a framework, including people, concepts, tools, and processes, which facilitate a simple and flexible management approach for different kinds of programs.

4.2. Structure of Elena Program Maturity Model

The structure of Elena maturity model has 3 important dimensions including

- Maturity dimensions
- Maturity levels
- Attributes

Maturity Dimensions

As demonstrated by Pasian (2011), process-oriented factors dominate the existing management maturity models, as most of them are based on process-oriented methodologies (Tahri and Kiatouni, 2015). Consequently, just process maturity is measured in these models. Moreover, in this model, the process maturity is measured, as well as two other maturity dimensions are measured, too. ELENA maturity model assesses program maturity in three dimensions:

- Conceptual maturity
- Process maturity
- Documentary maturity

Model is based on the program management of ELENA and maturity dimensions are attributed to the multifaceted approach of ELENA program management. Program maturity is evaluated in three dimensions, based on ELENA program guidance. Since there is a need for principles and tools through concepts and process, maturity dimensions are defined based on concepts, process, and documentation.

The conceptual maturity and process maturity of all organizations can be assessed through this model, and it is not specific to those using ELENA program guidance as the methodology. On the contrary, documentary maturity evaluation is specific to organizations using ELENA program guidance as the program management methodology. The flexibility of ELENA maturity model allows organizations to assess each of the three maturity dimensions.

Maturity Levels

Maturity is neither attained in one attempt, nor applied as a quick fix to tactical problems. It is a planned, properly managed, and continuous improvement effort (Yimam, 2011). Continuous improvement can be achieved through various small and evolutionary steps, rather than radical revolutionary measures (Sarshar et al., 2000). In a maturity model, ideal progression towards the desired improvement is described in different successive levels or stages (Tahri and Kiatouni,2015). In fact, maturity level represents an evolutionary plateau for achieving a mature process (Paulk et al., 1993). These models bear resemblance to each other at first sight, as most of them use five basic maturity stages (Supic, 2005). This model divides program management maturity into five levels:

- Level 1- Recognition
- Level 2- Forming
- Level 3- Dynamism
- Level 4- Wisdom
- Level 5- Property

In this model, a program, which cannot use all its capacities and capabilities, is called an immature program; nevertheless, a mature program is one using all its potential capacities to attain strategic objectives. Programs in the first two levels, i.e., level 1 and level 2, are known as immature programs and those in level 3 to 5 are known as mature ones. The characteristics of each level are described in table 2.

TABLE II. Maturity Levels

Level	Maturity		Description
1	Immature	Recognition	There are no signs of concept, process and documentation existence in the program and organizations just have perceived the importance of them, So they try to recognize the foundation of knowledge, concepts, process, tools and program management documentation.
2		Forming	Program management process, Concepts and documentation are defined and documented. Organization focus on creation a common definition more than implementation throughout program. However, this definition has a symbolic aspect and not practical.
3	Mature	Dynamism	The documented concepts, process and documentation are ideally implemented and program tries to build up stability and constancy in all dimensions.
4		Wisdom	Reaching to a suitable vision about concepts, documentation and program management process is known as program knowledge. All three maturity dimensions are assessed and controlled and the lessons learned added to knowledge base of the program.
5		Property	The gained knowledge becomes the property of the program organization and it is continuously being optimized for use in other incentives of the organization. At this level, the organization evaluates the information obtained through benchmarking and similar techniques and continuously improves its processes, concepts and documentation.

Attributes

ELENA has proposed two types of attributes, as mechanisms to assess the maturity of programs in implementing each dimension:

- Generic attributes
- Specific attributes

Generic attributes are common among all octet items of each dimension at each level of maturity. Besides, specific attributes are specialized and only related to a particular item from each dimension of octet concepts, octet process and octet documentation.

4.3. Assessment Mechanism

Through assessment, we can have an initial understanding of management status in an organization and simultaneously set the stage for progress (Demir and Kocabas, 2010). In this model, the highest maturity score of a program is 120, and it is calculated as follow:

Octet concepts, process, and documentation have been defined, and five levels of maturity are achievable for each; therefore, the maximum score of a program is equal to 120 (8*3*5=120); accordingly, mature and immature programs and their maturity levels are recognizable. In this method, comparison of the maturity status of several programs is possible, as the relative maturity status of programs can be compared based on the scores. Division of program maturity levels based on gained scores are shown in Table 3.

TABLE III. Scores of Program Maturity Level

Immature program		Mature program		
Level 1	Level 2	Level 3	Level 4	Level 5
Score 1-24	Score 25-48	Score 49-72	Score 73-96	Score 97-120

Therefore, the maximum score of each maturity dimension is equal to 40 (8*5=40). Thus, mature and immature programs and their maturity levels are recognizable in terms of maturity dimensions, and comparison between three dimensions of maturity (concepts, process, and documentation) in several programs is possible. Division of triple Dimensions maturity levels based on gained scores corresponds to Table 4.

TABLE IV. Scores of Triple Dimensions Maturity Level

Immature program		Mature program		
Level 1	Level 2	Level 3	Level 4	Level 5
Score 1-8	Score 9-16	Score 17-24	Score 25-32	Score 33-40

Four different ways can be used to assess the maturity of program, which can lead to different interpretations for different audiences. They are as follows:

- Assess based on attributes
- Self-assessment
- Detailed assessment
- Assessment by assessor

The first method is suitable for high-status program managers, who intend to evaluate the general maturity of organizations.

In the second method, the user can choose the maturity level for each concept, process, and documentation through questionnaires. The assessor or user's score on each item of maturity dimension ranges between 1 and 5; the scores of all items are summed up to determine the maturity level of the program.

The third method facilitates a more precise evaluation using a detailed questionnaire; in addition to attributes, some indices are applied, as well. The results of this questionnaire specify differences in maturity at each level; therefore, both continuous and staged approaches are satisfactory. The rate of maturity at each level is determined in the continuous format; besides specifying the maturity level of a program in the staged approach. The questions of maturity evaluation of maturity dimension items are codified in Table 5 according to mentioned indexes:

TABLE V. Maturity Levels Attainment Indexes

Maturity level	Attainment indexes
Level 1- recognition	Familiarity with concepts
	Preliminary definition
Level 2- forming	Unit definition
	Documentation
Level 3- dynamism	Continues implementation
	Informing
	Tailoring
Level 4-wisdom	Assessment, analysis, measurement
	Control
	Recording in program knowledge base
Level 5-property	Benchmarking, regular revision to improve
	Recognizing the reason of weak performance
	Supplying improvement plan
	Using improved experience and lessons learned

Considering the equal weight of attainment indices at each level and their number, continuous percentage of maturity is specified at each level. For instance, two indices have been identified at level 2; therefore, weigh of each index equals 50% and achieving one of them means achieving half of the considered level.

5. Conclusion

As knowledge around the subject of program management has developed and organizations are thriving to progress and grow, more attention is directed towards the analysis of organizations' current status, their position on the learning curve, and the required actions for performance progress. Program management maturity surveys different areas of an organization to conclude the probability of achieving strategic objectives. This promotes the status of organizations in the marketplace, as they gain strong competitive advantages. Even though program management plays a major role in the success of organizations, an integrated model, which can evaluate different dimensions of program maturity, is not available. In addition, some current models have many deficiencies.

This paper successfully designed a five-level program-management maturity model, known as ELENA, which is based on structural program management of ELENA guidelines. The model incorporates the required processes, concepts, and documentation and can be adapted to various programs. Both qualitative and quantitative evaluations are made in this model, and therefore, continuous and staged outputs can be achieved; these properties are particular to this model. Moreover, this model has many other apparent attributes, such as tailoring potential, assessment of three maturity dimensions (processes, concepts, and documents), and simplicity of concept. Overall, program management has many advantages, and major progress can be made through achieving maturity.

6. References

[1] Backlund, F., Chronéer, D., & Sundqvist, E. (2014). Project management maturity models–A critical review: A case study within Swedish engineering and construction organizations. *Procedia-Social and Behavioral Sciences*, *119*, 837-846.

[2] Berssaneti, F. T., Carvalho, M. M. D., Lopes, F. B., & Muscat, A. R. N. (2008). Maturity and performance in project management: a survey of information technology professional. In *POMS ANNUAL CONFERENCE* (Vol. 19).

[3] Cooke-Davies, T. (2004). Project management maturity models. *The Wiley guide to managing projects*,1234-1255.

[4] Demir, C., & Kocabaş, İ. (2010). Project management maturity model (PMMM) in educational organizations. *Procedia-Social and Behavioral Sciences*, *9*, 1641-1645.

[5] Duffy, J. (2001). Maturity models: Blueprints for e-volution. *Strategy & Leadership*, *29*(6), 19-26.

[6] Kohlegger, M., Maier, R., & Thalmann, S. (2009). Understanding maturity models. Results of a structured content analysis (pp. 51-61).

[7] Man, T. J. (2007). A framework for the comparison of Maturity Models for Project-based Management. *Utrecht University*.

[8] Nikkhou, S., Taghizadeh, K., & Hajiyakhchali, S. (2016). Designing a Portfolio Management Maturity Model (Elena). *Procedia-Social and Behavioral Sciences*, *226*, 318-325.

[9] Office of Government Commerce (OGC), (2010). Portfolio, Programme and Project Management Maturity Model,V2.1.

[10] Pasian, B. L. (2011). Project management maturity: a critical analysis of existing and emergent contributing factors (Doctoral dissertation).

[11] Paulk, M., Curtis, B., Chrissis, M., & Weber, C. (1993). Capability Maturity Model for Software V1. 1 (Pittsburgh, PA.

[12] Pennypacker, J. S., & Grant, K. (2003). Project Management Maturity. *And Industry Benchmark, Project Managemet Journal, 2003Vol*, *34*, 4-11..

[13] Sarshar, M., Haigh, R., Finnemore, M., Aouad, G., Barrett, P., Baldry, D., & Sexton, M. (2000). SPICE: a business process diagnostics tool for construction projects. *Engineering, construction and Architectural management*, *7*(3), 241-250.

[14] Supic, H. (2005, June). Project management maturity of selected organizations in Croatia. In *Telecommunications, 2005. ConTEL 2005. Proceedings of the 8th International Conference on* (Vol. 2, pp. 647-653). IEEE.

[15] Tahri, H., & Drissi-Kaitouni, O. (2015). New design for calculating project management maturity (PMM). *Procedia-Social and Behavioral Sciences*, *181*, 171-177.

[16] Voivedich, B., & Jones, M. (2001). Developing and applying a project management capability maturity model. In *Proceedings of the 32nd Annual Project Management Institute Seminars & Symposium (PMI,2001)*.

[17] Yimam, A. H. (2011). Project management maturity in the construction industry of developing countries (the case of Ethiopian contractors). University of Maryland, College Park.