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Method For Determining The Level Of MaturityIn An Organization: An Adaptation To The Oil Sector

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Abstract

This paper offers a method that will serve as a guide to evaluate the level of maturity of informatics organizations in Venezuela. For this purpose, the tool used by the SEI was adapted to the real-life situations in systems development companies in Venezuela, specifically to those with an internal systems development department, such as in the case of the oil industry. An algorithm for the interpretation of the results was likewise defined in order to place the organization in a specific level of maturity **.**

1. Questionnaire

The questionnaire used in this paper is an adaptation of the questionnaire used by the American Software Engineering Institute (SEI) [PAU et al 93] for its evaluation methods. This questionnaire was reviewed and adapted to the real conditions of the systems development companies in Venezuela and specifically to companies with an internal systems development organization such as in the case of the oil industry. The procedure for adapting the questionnaire was the following: 1.- Review of the original questionnaire; 2.- Adaptation of the questionnaire to the characteristics of the sector being studied; 3.- Drafting of the first version; 4.- Consultation with experts in the field; 5.- Adjusting the first version and drafting of the final version; 6.- Selection of the sample of people who are going to fill out the questionnaire and 7.- Filling out the questionnaire.

The original questionnaire is structured based on 18 key areas in the process which correspond to the areas present in the CMM maturity model. The adapted version contemplates 22 key areas, the 16 original areas plus four key areas that were included inasmuch as they were considered to be important within the Venezuelan context. These areas are: Herrarchy of the systems development projects, permanence of the systems thoughout times, reuse of existing products, the integration of the systems organization of the rest organization.

Likewise, inasmuch as new key areas were included, the Systems configuration management area, which is present in the original questionnaire, was changed for The management of versions. The original questionnaire contemplates the key area of Integrated Software Management which was not included in the adapted questionnaire, inasmuch as it does not apply in organizations with systems development suborganizations. It was changed for Systems Development Process Definition by Project.

2. The Maturity Model And Its Capabilities, Version 1.1

Most organizations try to solve their productivity problems by emphasizing technology-oriented solutions [YOU 93]. But before giving tools, such as CASE, to each systems engineer, and prior to adopting trends, such as object orientation, the organization must analyze if it is ready to adopt a new technology [YOU 93]. In November 1986, the SEI, backed by Mitre Corp., started the development of a reference framework on the maturity of the software development process, that would help its developers to improve this process. In September 1987 the SEI produced the first version of this reference framework, published in the book entitled "Managing the Watts Humphrey Software Process" [HUM 89]. After four years of experience using this reference framework and the maturity questionnaire, the SEI developed the Capabilities and Maturity Model (CMM) as an evolution of the initial reference framework [PAU et al 93c]. The CMM presents a set of recommended practices in different key areas of the process that have been identified to improve software development and maintenance capabilities. It comprises five levels. Each level of maturity is divided into several parts. Except for level 1, the division of each level starts from the abstract definition and reaches its operational definition divided into key practices, as shown in figure 1. Each level of maturity includes various key areas in the process. Each key process area is organized into five sections called common characteristics, which specify the key practices that, when carried out, enable the process key area to achieve its goal [PAU et al 93a].

3. Algorithm For The Interpretation Of The Results.

The algorithm is structured into three parts:

1.Analysis of the level of applicability of the questionnaire.

2.Analysis of the level of dissemination of information in the organization.

3.Determination of the maturity profile for the organization and determination of the organization's level of maturity. The stages of this part of the algorithm are described as follows:

3.1 *Analysis of the answers regarding questions associated to the goals in the different key areas of the process.*

3.2 *Analysis of the answers regarding questions associated to common indicators in the various key areas of the process*.

3.3 *Interpretation of the results and determination of the level of maturity*.

4. Results

Once the questionnaire was validated and corrected, the last version obtained was submitted to a sample of the population of systems management analysts working for the subsidiary. The population comprises 82 analysts, 29 project leaders, 7 department heads and one second-line manager, for a total of 118 persons. The sample selected is non-probabilistic inasmuch as certain characteristics were taken into account, such as for instance the professional quality, availability and willingness to answer the questionnaire. The sample included 40 employees: 33.8% of the total population. The questionnaires were self-administered. The respondent was contacted, one questionnaire was given to him, he answered it and gave it back for its corresponding analysis**.**

5. Interpretation Of The Results And Determination Of The Level Of Maturity

Based on the foregoing results, it can be deducted that the organizational maturity questionnaire is totally applicable to the organization subject to this study, as refers to the process of developing informatics systems and that it could be used by other similar organizations in our country, inasmuch as the opinion of

the sample shows that the different indicators and key areas measured apply to similar organizations which develop software in Venezuela.

6. Conclusions

The method obtained in this paper was based on the CMM, the questionnaire of which was adapted to the real conditions of the Venezuelan sector being studied, specifically as concerns the development of information systems. An interpretation algorithm was also developed for the analysis of the results. This algorithm is used for interpreting the results of applying the questionnaire. The two main aspects of the method offered in this paper are the adapted questionnaire to which process key areas applicable to Venezuelan organizations were added and several areas that would have no validity in Venezuela were deleted and on the other hand, the algorithm developed which allows for a detailed interpretation of the results obtained as a product of applying the questionnaire.

7. References

[PAU et al 93] Paulk M., Weber C., Garcia S., Chrissis, M Capability Maturity Model, Version 1.1. IEEE Software, 1993.