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Thesis Overview

Value-Based Information Systems and Technologies Governance Quality Assessment

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The quality is a degree of excellence, and what is excellent is new. The evaluations of the quality of the organizations, departments, functional areas, activities, products and services have been recognized by the goodness of their results beginning to be mandatory and of increasingly strict application in the search of the fulfilment of its purposes [1].

The organization has taken a qualitative leap in the last 30 years in all countries. It has changed its business and technology in architecture, specialized its staff, increased the number of projects and become more sustainable with public and private funds. Many organizations create and support on information systems with the latest technology in a clear competition with traditional organizations. This situation presents a clear problem needed to be corrected from the organization itself. The shareholders, counselors, directors, administrators and staff members of the organization participate in this desire for improvement. In a general sense, the quality targets of the corporate governance team will always be focused on achieving efficiency and effectiveness at all levels of the administration [2]. Achieving quality for a government that focuses on the Technologies and Information Systems (TIS) is a challenge, because organizational leaders increasingly expect that the leaders of TIS innovate and deliver value across the organization and, at the same time, support to the operation at the highest level; that is to say, looking for the perfect balance between the business and the operation.

The quality has been a goal of many countries. In Ecuador, the Constitution establishes that the public administration is governed by principles, among others: the quality. This involves the participation of the people to ensure the actions in the organizational context. The quality has an impact on people, activities, processes and outcomes; all guided toward excellence. An intention of quality (not exclusive from the point of view of the analysis of other models) and at the same time of the Government of the TSI is the application of good practices of the Ibero-American Model [3] and of the standard ISO/IEC 38500 [4], respectively.

Therefore, a balance of the concepts, models of excellence, standards and related works that contextualize the scope of this research, was taken. In this last part, through a systematic review of studies, 14 works were selected; none of them focused in this doctoral work and mostly related to the management and operation of the TIS. Then, the Ibero-American quality model was analyzed, the principles that responded to the characterization of the new model along with expert opinion were determined. Two principles of quality, 6 criteria, 9 sub-criteria, 34 dimensions, 3 hierarchical evaluation levels and 5 categorized evidences that characterize the evaluation model that largely coincide with the guidelines of models of excellence and the standard of work used, were identified and conceptualized. This would lead to the development of a series of mathematical formulas based on the concepts of successions and series, in order to determine the measures of dimensions, sub-criteria and criteria. Five phases were defined immediately to comply with the self-assessment process as part of the process of continuous improvement. The proposed model was called VBISTGQM and is shown in figure 1.

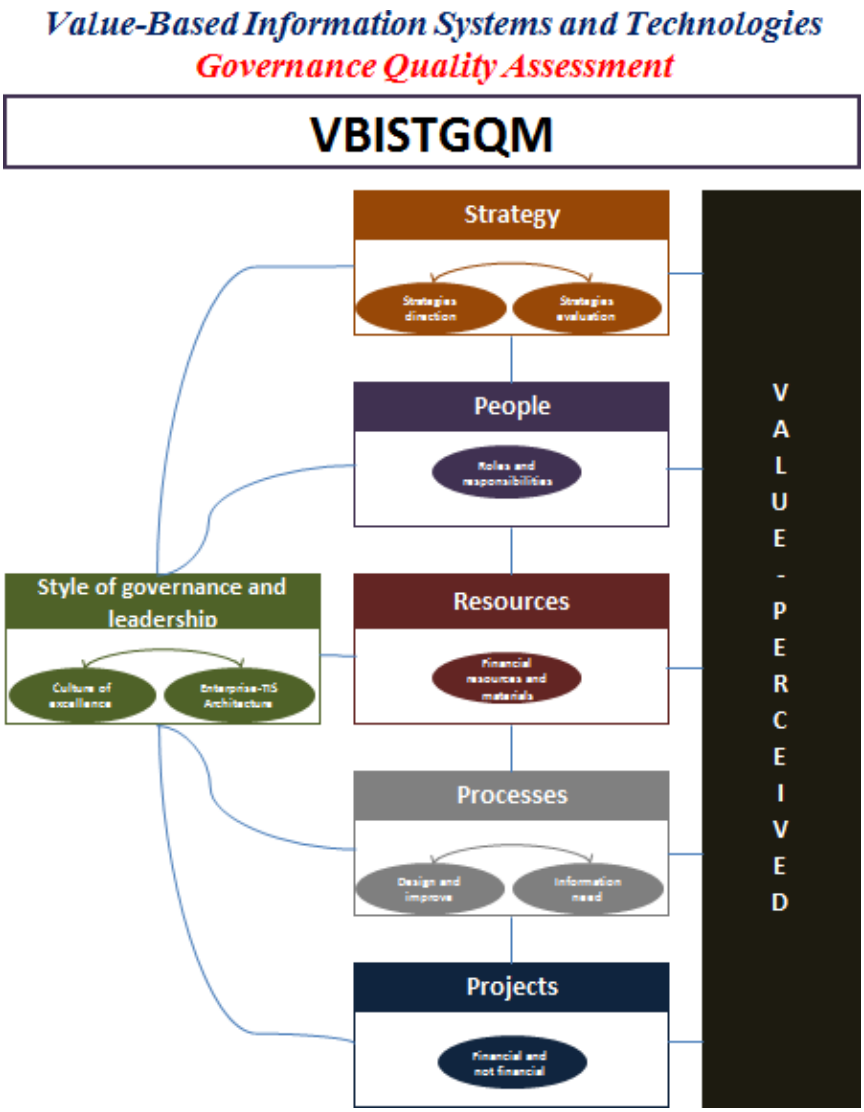

Figure 1
VBISTGQM model

Finally, with the purpose of validating the proposal in an empirical manner the opinion of 62 leaders of TIS that were taken into account in a selective manner and who were interviewed to give their point of view about the quality model was considered. The results were subjected to 5 types of analysis using statistical methods and techniques: Reliability analysis, descriptive analysis with normality test, Spearman rank-order correlation analysis, Kruskal-Wallis rank analysis of variance and factorial or main component analysis. Through the reliability analysis it was determined that the alpha index of cronbach is 0.877, which meant high internal consistency of the results obtained in the survey or considered as efficiency in the test which generated confidence by the quality of data for later analyzes. The descriptive analysis with a normality test determined that the quality criterion demonstrated by the leaders of TIS tends towards "Full importance", the distribution of frequencies is not normal which meant that the variables (sub-criteria) that conform the model of quality of TIS governance should be studied by applying non-

parametric methods that follow a population with non-normal frequency distribution, which makes the proposed model consistent from the point of view of the importance that TIS experts and leaders offer. The Charles Spearman's rank-order correlation analysis determined that all variables are positively related; however, to corroborate this, a test of significance of correlation coefficient of a student's t-tail was carried out, where the hypothesis of the research was to verify that there is a truly positive relationship between the ranges. From this process, both for levels of significance of 0.01 and 0.05, calculated values higher than the critical values were obtained, therefore, the research thesis was accepted and it was concluded that the results suggest that the variable that receives a high evaluation by a first evaluator, also tends to receive a high evaluation by a second evaluator.

In the analysis of variance by Kruskal-Wallis rank for ordinal data ordered by independent type ranges such as sector, gender, schooling and interval, it was determined that the calculated values were above the critical values

of significance 0,05 and that the coefficients ji-squares were below the critical values. In this sense there was no difference between the assessments expressed by the leaders of TIS; therefore, from a practical standpoint means that the evaluation model can be applied to any TIS governance model independently of the independent variable in which it operates. Finally, the Bartlett sphericity test and the Kaiser-Meyer-Olkin method (KMO) determined that it was pertinent to do a factor analysis with the purpose of optimizing the GoTIS model from the conformation of homogeneous groups of sub-criteria that would make the information of the respondents more interpretable. In order to determine the number of components that the model would have, two procedures were executed: Gutman-Kaiser and Screen test of Cattell; which determined the definition of 1 component with less variance than a greater number of components. In practical terms, this means that component 1 summarizes the correlational consistency between variables (in a balanced way) that could help to improve the formulations of the sub-criteria, criteria and, therefore, the GoTIS quality model. As it can be seen in equation 1, it represents the analytic expression associated with the GoTIS quality model and from which the model can be understood statistically.

$$CP1 = 0{,}158*V1 + 0{,}172*V2 + 0{,}151*V3 - 0{,}153*V4 - 0{,}137*V5 + 0{,}138*V6 - 0{,}154*V7 - 0{,}159*V8 + 0{,}144*V9$$

[Equation. 1]

So far, all the tests carried out have contributed to the verification of the research hypothesis, verification of errors and consistency of the responses expressed by 62 Ecuadorian leaders and managers with experience in the development of strategies related to the use of TIS. The results show a reliable conceptual model. Given the importance of the model, it was applied to a hypothetical case of evaluation in a public entity. The results show that the TIS Government quality measure is 3.82 out of 6 points.

This measure represents 63% of the maximum measure. This shows that 6 out of 10 governance quality conditions are met in the context of the organization; being the criteria of people and resources, in that order, those that generate greater impact in the quality and therefore the criteria to take into account to improve. According to the results obtained and the contributions made in this doctoral work, the model is expected to contribute to a greater adoption of the standard of governance by the TIS organization with criteria of excellence in the quality based on value.

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Additional information

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