Early Study of IT Outsourcing in Public Organizations in the Province of Manabí - Ecuador

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Abstract—**The Outsourcing of information technology (IT) is the contracting of technological services between a public or private organization and another that are dedicated to the provision of one or several specific services to meet their requirements. In the outsourcing of IT services, there are several difficulties such as limited knowledge of IT personnel about the risks of Outsourcing, poor understanding of vulnerabilities, threats, and the growth of complexity to manage Outsourcing as it expands in the organizations, among others. Due to the problems, we posed the following question: What is the actual situation of the IT outsourcing in public organizations in the province of Manabí - Ecuador? The objective of this research is to measure the results through the field study about the knowledge, problems, the impact of the risks of IT Outsourcing from the perspective of IT managers and IT Professionals of the public organizations in the province of Manabí, Ecuador. The methodology used is a survey aimed at 113 people working in 40 public organizations. The conclusions more important are that more of half of respondents do not know about of IT outsourcing processes in public organizations. However, the have knowledge, indicated that the frequency that occur the IT outsourcing risks is very high, being the technical areas the most affected.**

Keywords-IT outsourcing risks, areas of IT outsourcing organizations, perspective of the managers of IT, perspective of the IT professionals.

I. INTRODUCTION

Today, organizations rely on information technology (IT) to make decisions in the growth of their business, and due to the fundamental importance of the demand for IT [8]. IT can be considered as a key technology for public and private organizations, due to this situation it is necessary for the IT department to properly manage the diverse requirements that its internal or external clients can present. This range of requests based on IT requirements forms part of the management of IT demand [13].

Taking into account that the use of IT is applied to the different productive areas of organizations, during the last years many publications have been developed and different conceptual models have been created in relation to IT governance [9], considering the outsourcing of IT as one of the IT services [13], which has increased its application in organizations.

From the beginning, it was considered that IT Outsourcing entailed a risk that can lead to undesirable consequences, such as costly contractual amendments [3]. Organizations in the public sector have faced difficult challenges, some flaws and other results when using IT Outsourcing as a tool to measure the results of the management of the processes that have been contracted. [7] [10].

For this reason, many organizations have changed the concept and business management, adopting outsourcing as their main strategy, focusing on the competencies and capabilities that organizations specialized in key activities can manage [15].

The different publications are oriented to the study of IT outsourcing risk factors [11]. Public organizations can reduce risk and investment with foreign labor because they are cheaper and do not have to invest in additional training or the use of new technologies [16]. IT outsourcing is accepted in organizations, since technological innovation generates competition in the contracting of services, to improve information management, concentrating its efforts on activities that have greater knowledge. At present, when there is a high level of competitiveness between different organizations, expectations are generated for the services offered to users.

For organizations, the use of IT Outsourcing is important because the decisions of senior management involve personalized innovation of the projects (public versus private sector, organizational culture, participation and involvement of the administration) and involve a high degree of risk [1].

According to the review of the literature, different problems were found as indicated below:

- The domestic policy changes of the country is the main problem of public organizations to obtain economic resources because it hinders the management of senior managers responsible for improving technological innovation, delegate activities and control the processes carried out by different areas of organizations.

- Changes in the domestic policy of the country are the main problem of public organizations to obtain economic resources, this makes difficult the management of the managers responsible for improving technological innovation, delegate activities and control the processes generated by the different areas of the organizations.

- There are different means to measure the impact of IT Outsourcing risks as tools and methods that support the phases of risk management, where public organizations lack these means to measure the scope and evaluation of the services that generate Outsourcing of you.
- There are empirical conclusions about the importance of information security risk factors for IT outsourcing projects, which focus on two main categories, threats and vulnerabilities [14].
- The IT projects that are generated in public organizations require specialized technical support in specific activities, which requires solving any problem that may arise in the organization.
- As IT outsourcing grows in complexity, organizations require evaluation tools to mitigate risks.

Taking into account, the problems found in the review of the literature on the risks of IT Outsourcing and with the participation of IT managers and IT professionals that working in the public organizations of Manabí province, Ecuador, we propose the following question:

What is the actual situation of the IT outsourcing in public organizations in the province of Manabí - Ecuador?

Considering the general question, we need get information about of five important aspects of the public organizations employees:

1. ***What is the level of knowledge of IT outsourcing in public organizations?***
2. ***What is the perception of efficiency levels of IT outsourcing in public organizations?***
3. ***How often do IT outsourcing risks occur in public organizations?***
4. ***In which areas of IT outsourcing are risks presented in public organizations?***
5. ***Identify the risks that occur in the areas of IT outsourcing in public organizations?***

The objective of this research is to measure the results through the field study about the knowledge, problems, the impact of the risks of IT Outsourcing from the perspective of IT managers and IT Professionals of the public organizations in the province of Manabí, Ecuador.

This research work is structured as follows: Chapter 2 details important concepts such as the risks of IT Outsourcing and the areas of the organization. Chapter 3 shows the methodology, which includes the way in which field research was developed. Chapter 4 the results are detailed by means of different tables and statistical figures. Chapter 5 includes a short discussion of the relevant data of the investigation. Finally, we find the conclusions reached in this investigation.

II. THEORETICAL REVISION

This research is based on the following themes of the revision of literature:

A. Risks of IT Outourcing

Risks are essential in the activities carried out during the execution of IT Outsourcing. It is important that organizations plan how risk management will be in the implementation.

Risk management is a particular implementation of a commonly accepted phased approach (identification, analysis, evaluation, control, etc.), which may be slightly different in organizations; for example, not all companies implement a risk committee. The risk is present in a task or process as an attribute of the environment in which it is developed; the ignorance of the risk will increase the probability of threat to the project [5].

The risks of IT Outsourcing in organizations must be measured according to the market's competitiveness, being important that the top managers of the organizations have a professional group that supervises the management of IT Outsourcing processes, the actions of this group It will be important in the evaluation of risks to significantly mitigate the problems that may arise in a certain sector [12]. According to the article by the authors [4] they make a classification of IT outsourcing risks in public organizations.

B. Areas of IT Outsourcing in the Organization.

In organizations the management of IT outsourcing is limited to manage service contracts. It is important to determine that the areas of IT outsourcing are related to the duration of the contract, this depends on whether the contract was renewed or terminated. [6].

The processes generated in the areas of IT outsourcing have competitive advantages because they are linked to the capacities of the organizations. IT outsourcing requires the partial or total environment of the administrative part and the operation of the activities of the organization. Organizations should consider the costs and benefits of using IT outsourcing if the organization continues to use the services should consider the cost benefits relationship to achieve real costs and expected benefits in the project. [2].

Organizations need to reach the initial objective of providing services with the support of technology in the administrative processes that require improving performance. This is achieved with hardware software, networks, administrative processes, technology and personnel to reduce costs, improve the quality of service, acquire new technical skills and achieve management skills. Organizations think that contracting external IT outsourcing can have trained personnel, know new technologies and use more advanced processes and methods according to the areas of IT outsourcing in the organization.

The areas of IT outsourcing are the following: Finance [15], Commercialization / Business, Technical [15] [16], Organizational, Human resources, Clients / Users, Development processes, Externalization [16], Techniques, Policies and Environment [15].

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III. METHODOLOGY

To fulfill the purpose of the research, a survey was applied in 40 public organizations in the province of Manabí in the Republic of Ecuador, applied to 113 people (40 IT manager and 73 IT professionals) of the decentralized autonomous governments (GAD), ministries, educational and health districts and public sector universities in the province of Manabí. To carry out this research, a questionnaire was used, which was applied to IT managers and IT professionals who work in the departments or IT areas of the organizations involved.

To collect the information, the visits to participating organizations were made with the permissions of the authorities of each organization, taking into account the policies, regulations, internal rules, schedules and other agreements with each of the respondents of the organizations.

To fulfill the objective of this study, the survey was structured in three sections as follows:

I.   General information related with the survey.
II.   Series of questions about of the IT outsourcing.
III.   Company and interviewee data.

A. Context

Within the context of research development, were considered the public institutions of the province of Manabí, as shown in Fig. 1, with 60% of the results obtained from the municipalities (GAD), 18% Government ministries, 17% of the districts and the 5% of the universities.
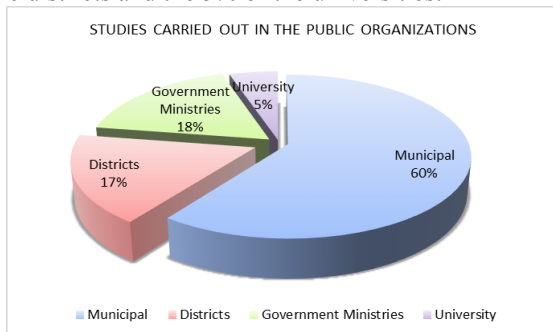

Figure 1. Studies carried out in the public organizations.

In the context of research, the level of studies of personnel that work in the public organizations is also taken into account, as shown in Fig 2:
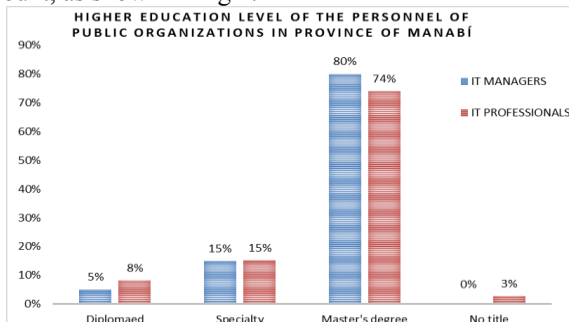

Figure 2. Higher education level of the personnel of public organizations of the province of Manabí.

According to Fig. 2, the IT managers 80% have an academic master's degree, 15% of have a specialty academic degree and 5% have a diploma academic degree.

The IT professionals, 74% of have an academic master's degree, 15% have a specialty academic degree, 8% have the academic degree of a diploma and 3% are in the process of obtaining an academic degree.

As a sample of this research, the survey was conducted with 40 IT managers and 73 IT professionals. It is important to determine that there is IT managers and IT professionals who have more than two academic degrees. In this research we consider the highest academic degree that the organization's personnel have.

We are interested in knowing the level of knowledge of IT managers and IT professionals working in public organizations in the use of IT for administration; the results are shown in Fig. 3.
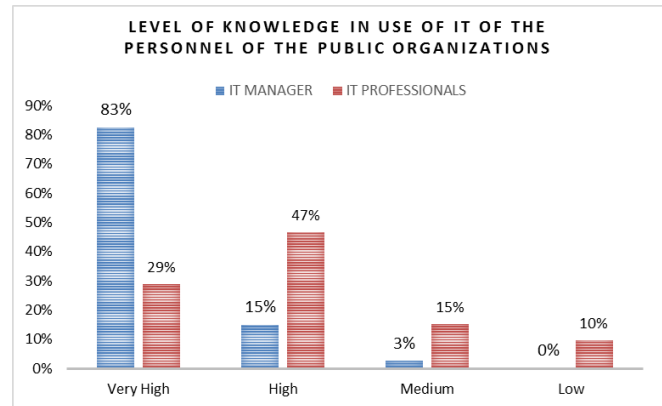

Figure 3. Level of knowledge in use of IT personnel of the public organizations – IT managers.

The results found in Fig. 3, the IT managers 83% indicated that the level was very high because they have received training and have experience in the use of information and communication technologies, 15% indicated that the level of knowledge is high because they are part of IT projects and 3% indicated that the average level of knowledge because it is limited to a certain sector of the staff in updating knowledge. Similarly, the IT professionals indicated that 47% have a high level of knowledge because they have experience on the subject, 29% is very high because they participate in IT projects, the 15 % is medium because they have knowledge but do not participate in the projects and 10% indicated that they have low knowledge because they have no experience in IT outsourcing.

IV. RESULTS

In this section the results are presented according to the investigation. We start with the level of contracting IT Outsourcing in public organizations.

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A. Level of Knowledge of IT Outsourcing in Public Organizations.

Regarding on the level of knowledge about of IT outsourcing in public organizations, the respondents was 40 IT managers and 73 IT professionals, the results are shown in Figure 4.

Considering the results in Figure 4, for continue with search of information, only are takes into account the results of respondents who answered that have a known totally or partially about IT outsourcing (19 IT manager and 25 IT professionals). From this information, in the following sections the questions were limited this group of people.
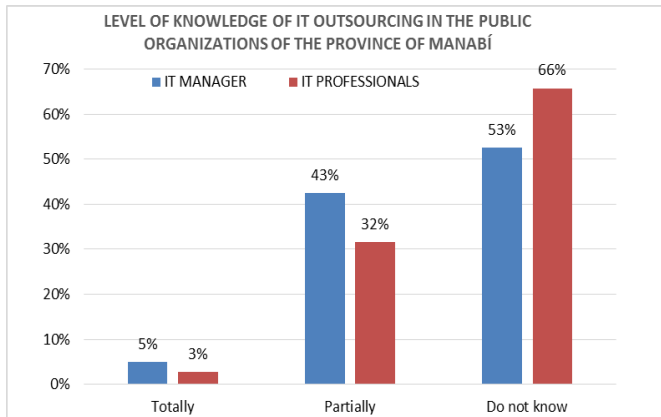

Figure 4. Level of knowledge of IT Outsourcing in the public organizations.

B. Perception of Efficiency Level of IT Outsourcing

The respondents on the perception of efficiency level of IT outsourcing was 19 IT managers and the 25 IT professionals, the response are shown in Fig 5.
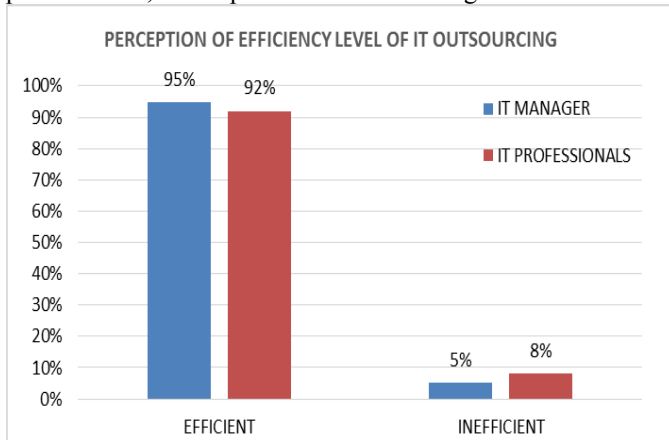

Figure 5. Perception of efficiency level of IT Outsourcing.

C. Frequency of Occurrence of IT Outsourcing Risks

The results of the survey on the frequency of occurrence of the IT outsourcing risks in the administrative management processes, the respondents that answered was

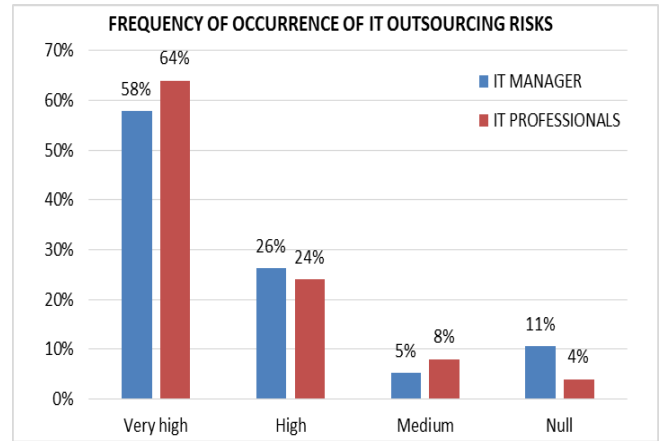19 IT managers and the 25 IT professionals as well as are shown in Fig. 6.

Figure 6. Frequency of occurrence of IT outsourcing risks.

D. Occurrence of Risks in the Areas of IT Outsourcing in Public Organizations.

According to the results of the survey on the risks that occurrence in the areas of IT outsourcing in public organizations, the respondents that answered was 19 IT manager and the 25 IT professionals, as well as are shown in the Fig. 7.
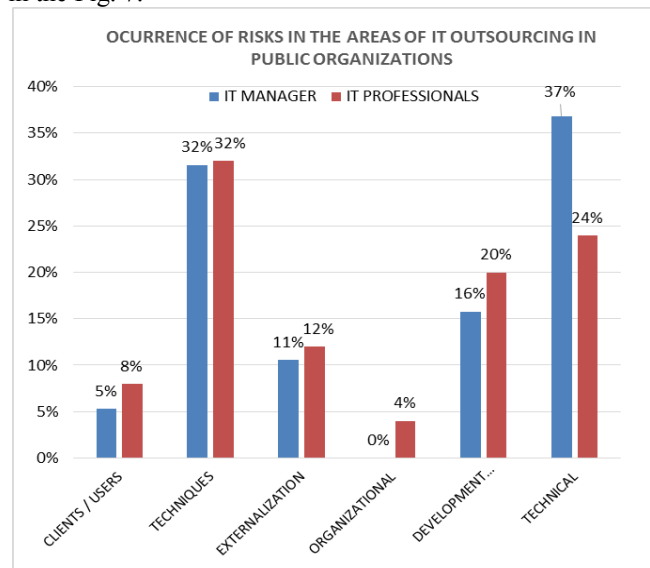

Figure 7. Occurrence of risks in the areas of IT outsourcing in public organizations.

E. Risks that Occur in the Areas of IT Outsourcing in public Organizations

In this research related to risks of IT outsourcing, in the literature review, we find 85 risks. Taking into account these results of the research, we asked to the 19 IT managers and 25 IT professionals to identify into their public organizations, the IT outsourcing risks that occurring and

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have the greatest impact on the Manabí province. In the results only were takin in account whose answers are in the range greater than or equal to 15, as well as are shown in Fig. 8.
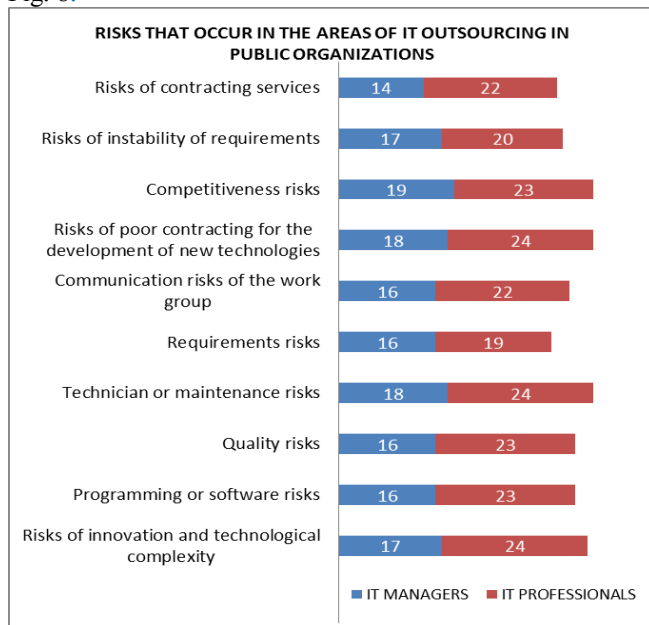

Figure 8. Risks that occur in the areas of IT outsourcing in public organizations.

V. DISCUSSION

A. Level of Knowledge of IT Outsourcing in Public Organizations.

The results found in Fig. 4 on the level of knowledge of IT outsourcing in public organizations, 53% of IT managers and 66% of IT professionals do not know the use of IT outsourcing within of the organization, while 43% of IT managers and 32% of IT professionals have partial knowledge about the use of IT outsourcing. 5% of IT managers and 3% of IT professionals indicated that they have knowledge totally.

The results show that the majority of IT managers and IT professionals do not have knowledge of consultancy or application of IT Outsourcing in public organizations of the province of Manabí by external companies and those that have knowledge are those that intervene in the projects in execution of IT Outsourcing services, which are generated by technology departments for the same organization.

B. Perception of Efficiency Level of IT Outsourcing

The results found in Fig. 5, respect to the perception on the level of efficiency of IT outsourcing, 95% of IT managers and 92% of IT professionals indicated that the level of knowledge is efficient, while 5% of the IT managers and 8% of IT professionals indicated that the results are not efficient.

In the perception of the efficiency level of IT outsourcing, a large group of IT managers and IT professionals indicated that the results obtained from IT outsourcing services within the organization are efficient because the required processes are satisfactory. While for another group of IT managers and IT professionals the results are inefficient caused by internal problems caused by the technological platform used by organizations.

C. Frequency of Ocurrence-of IT Outsourcing Risks

The results found in Figure 6, related to the frequency of occurrence of IT outsourcing risks, 58% of IT managers and 64% of IT professionals indicated that the level of presentation frequency of the risks are very high, 26% of IT managers and 24% of IT professionals indicated the frequency of presentation of risks is high, 5% of IT managers and 8% of IT professionals indicated that the level of frequency of risks is medium level, while 11% of IT managers and 4% of IT professionals indicated that the level of frequency of risk exposure is null in the organization.

For a group of IT managers and IT professionals, the frequency of presentation of IT outsourcing risks is very high because they do not have impact measurement processes in different areas of the organization. For another group of IT managers and IT professionals, the frequency of IT outsourcing risks is high because they lack knowledge in the integration of internal projects with the management performed by IT outsourcing. Alternatively, to a group IT managers and IT professionals who indicated that the frequency of the risks is medium considering the difficulty of being part of the IT projects. While for a group of IT managers and IT professionals they indicated that the level of presentation is null because they have no knowledge of the incidence of affectation.

D. Occurrence of Risks in the Areas of IT Outsourcing in Public Organizations

The results in Fig. 7, related to the occurrence of risks in the areas of IT outsourcing in public organizations: 32% of IT managers and IT professionals indicated that they are the techniques area; 37% of IT managers and 24% of IT professionals indicated that they are the area of technical; 16% of IT managers and 20% of IT professionals indicated they are the area of development process, 11% of the IT manager and 12% of the IT professionals indicated are the area of externalization; 5% of IT managers and 8% of IT professionals indicated are the client / user areas and 4% of the IT professionals indicated are the organizational area.

The results obtained by IT managers and IT professionals on the areas of IT outsourcing that have problems with IT outsourcing risks: the technical areas present problems in the execution of the processes because they are regulated by other areas outside the company organization causing technical problems due to the complexity and the technological innovation, this causes inconveniences in the different processes of the organization.

The technical areas are also important because the personnel who manage these areas have no experience in solving the problems required as well as the areas of the development process because the clients have difficulties in the selection of products or requirements that do not have preference and not wish to contribute to the development and organizational areas this creates problems to develop new processes, difficulties to create facilities according to the requirements, difficulties to acquire materials, knowledge and IT resources. Other areas that have problems are the outsourcing areas because they have no experience in managing the client and the provider at the time of hiring or have few providers, the client / user areas because they lack knowledge, support and experience in the projects and the organizational areas that have problems to develop new processes and difficulties in hiring personnel and economic and technological resources.

E. Risks that Occur in the Areas of IT Outsourcing in Public Organizations

The results presented in Figure 8, we consider the 10 major risks with the highest selection in the survey, and these risks have the greatest impact on public organizations of the Manabí Province.

The IT Managers and IT professionals who responded are the following: A group of 42 people indicated that occur competitiveness risks, risks of poor contracting for the development of new technologies, and technician or of maintenance risks. Another group of 41 people indicated that occur risks of innovation and technological complexity. A group of 39 people indicated that occur programing or software risks, and quality risks. Another batch of 38 people indicated that occur communication risks of the work group. 37 people indicated that occur risks of the instability of requirements. 36 people indicated that occur risks of contracting services and 35 people indicated that occur requirements risks.

The occurrences more frequency that is presented in the areas of IT outsourcing highlight the competitiveness risks arise because the organizations include new personnel in the projects, changes market prices and generates new requirements for IT services [13]. Risks of deficient contracting for the development of new technologies originate when the objectives of the contract do not know. Technical or maintenance risks are generated when there is ignorance, experience and insecurity of the personnel. The risks of innovation and technological complexity are the probabilities presented by innovation, complexity and new trends in the integration of new technologies. Programming or software risks originate from insecurity, loss of control failures and mitigation of failures in the technological programming. Quality risks originate from the problems of customer requirements. Communication risks of the work group are likely to arise due to the lack of coordination of the team that participates in the projects. Instability risks of requirements are originated with changes of address,

customer requirements. Risks of contracting services are the probabilities presented in the contract due to lack of experience generating cost to services not included and the requirements risks originate from the requirements of technologies and changes in communication and requirements.

Responding to the main research question:

What is the actual situation of the IT outsourcing in public organizations in the province of Manabí - Ecuador?

More half of respondents, considering to IT managers and of IT professionals do not know on the subject of IT outsourcing within of the public organizations in Manabí Province.

According the results obtained, we answer to the questions presented in Chapter 2:

Q1. What is the level of knowledge of IT outsourcing in public organizations?

The knowledge of IT outsourcing is low because public organizations do not socialize about the IT projects that are executed in the different departments, causing ignorance about the use of IT outsourcing

Q2. What is the perception of the efficiency levels of IT outsourcing in public organizations?

The knowledge of IT outsourcing is efficient because the organization makes periodic updates of the technological platform to obtain better results in the different departments.

Q3. How often do IT outsourcing risks occur in public organizations?

The frequency of IT outsourcing risks is very high, since organizations do not act in accordance with the severity of the risks and the processes that are carried out in the different departments of the organization are hampered.

Q4. In what areas of IT outsourcing do risks occur in public organizations?

In the results found in public organizations indicate that the technical areas of IT outsourcing are the most affected because they have difficulties in hiring personnel in the technological processes required by IT projects.

Q5. ¿Identify the risks that occur in the areas of IT outsourcing in public organizations?

The research identified the risks of competitiveness and the risks of poor contracting for the development of new technologies as the risks that have the greatest impact on organizations because they cause problems to the results in the processes in execution.

In the results found in public organizations indicate that the technical areas of IT outsourcing are the most affected because they have difficulties in hiring personnel in the technological processes required by IT projects.

VI. CONCLUSIONS

- The result of survey applied in 40 public organizations in the province of Manabí, Ecuador; we can conclude that more of half of respondents do not know about of IT outsourcing processes in public organizations.

However, of the respondents that know about of IT outsourcing processes, more 90% indicated that IT outsourcing is efficient. More of half of respondents indicate that the frequency that occur the IT outsourcing risks is very high. Regarding the occurrence of risks in the areas of IT outsourcing, the technical areas are the most affected.

- Regarding to the risks that has the greatest impact in the public organizations of Manabí, Ecuador is: competitive risks, risks of deficient contracting for the development of new technologies, technical risks or of maintenance, and risks of innovation and technological complexity.

- Future work will be extended to the majority of public organizations in the province of Manabí on the issues of risk factors of IT outsourcing, as well as know how public organizations manage and mitigate the risks of IT outsourcing.

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