Advantages of direct hire in the area of Information Technology in a Colombian oncological entity

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Abstract : The area of Information Technology has become the fundamental base of any institution, sinceitprovides support for the development of the internalactivities, in addition to storing, securing and disposing of information. For the case of thisstudy, the methodologiesusedwereinternal and externalsurveys, a benchmarking to takeintoaccount the operation of thisdepartment in othermedicalentities and the riskanalysis of the IT department, once this information wasinterpreted, itwasheld as a pillar For the design of 14 proceduresthat are properlyadapted to the oncological institution, the personnel thatshouldbe part of the departmentwerealsoestablishedsothat the aforementionedprocedures are executedinternally, thatis, without the dependence of a third part , thisrestructuringadds value to the processalongwithindicators to evaluateitseffectiveness and thatimplylowercostscompared to the outsourcing.

Keywords–IT area, benchmarking, outsourcing, indicators, restructuring, risks.

I. INTRODUCTION

One of the most important factors that contributes to the competitiveness of an organization is the response time that is given to the requirements of customers, for this reason it is essential to have structured information systems, taking into account the high data flow, to provide real-time attention, these requests can be handled internally or through outsourcing.

Nowadays [1] "Information technologies (IT) are a structural part of modern companies and have become the basis for managing assets, keeping accounts and finances, managing clients, suppliers and human resources, applying controls and automate a host of activities that support growth "so it is necessary to have a structured IT area to manage operating systems and provide support to users of institutional computing equipment in order to ensure smooth operation of the hardware and its software to facilitate the use to all the other areas of the institutions. On the other hand, the large volume of data that companies have and the control that should be given to them to ensure their confidentiality, shows the importance of information systems today that according to [2] "It is a organized combination of people, hardware, software, communications networks and data resources that gathers, transforms and disseminates information in an organization "which are managed by the IT process and which is transversal in the operation of the entities and has been become a strategic area to compete in the market.

In the case of the present study, there were opportunities to improve the structure of the IT process, which is currently outsourced and does not allow an adequate data management policy to be operationalized, especially due to the sensitivity of this issue that is handled in the health sector. On the other hand, response times are very long, which causes internal procedures to be delayed and affect the promise of quality given to customers, which is why the restructuring of this area is recommended.

To this end, a preliminary diagnosis is made with the objective of detecting the problems that arise in the process of the department of the entity around the factors mentioned above, including others that are pointed out by the organization's officials; caused mainly by the intervention of the external entity in charge of the area.

In the development of the article, the methodology to redesign the IT department is presented, with the implementation of complementary procedures that allow to solve the existing problems, thus achieving an effective response to the requests of the internal officials and providing an excellent service to their patients. , therefore, it is expected the increase in the competitiveness of the institution against the national market, in addition to incorporating 100% of the procedures within the company.

II. METHODOLOGY

This case study was conducted in a Colombian oncology institution in the area of Information Technology, where it was necessary to start with a diagnosis in order to determine its current status, using as a first measure a survey of 37 officials who made use of the technological resources of the organization. In this survey, different questions were posed, focused on the degree of satisfaction of the support process as well as their perception of the performance of the available technological tools. Second, an interview was conducted with the assistant director of the area in order to identify what were the possible problems within the department and the causes that generate them. The results obtained were compared with a SWOT analysis that [3] "consists in making an assessment of the strong and weak factors that, as a whole, diagnose the internal situation of an organization, as well as its external evaluation, that is, the opportunities and threats. "which was carried out by external auditors hired for this purpose. Finally, a benchmarking was carried out as [4] "fundamental tool in the external search of ideas, strategies and methods for the improvement of the own organization", comparing the department of information technologies in four health entities, having take into account factors such as the personnel with whom the area counts, the procedures that are carried out, the physical structure and the technological resources.

Thanks to the results obtained in the aforementioned tools, it was possible to determine the proposal of the new structure of the information technology area, and design the procedures aimed at continuous improvement, as well as the indicators to measure its effectiveness and the charge profiles that are required for the development of the respective tasks in said process. Additionally, flow charts were generated with structured average times for each of the steps established in the procedures. For this, it was necessary to hold meetings with three systems experts, who, due to their knowledge and experience in the development and execution of the same, had clarity about the time required in their operation.

Once the processes have been standardized, the strategic risks that could arise taking into account the proposal of the new structure of the area and considering criteria such as personnel, infrastructure and technological resources already defined, in order to generate a matrix with the effects, controls, qualifications and improvement plans; in this analysis, it was possible to determine those risks that could have the greatest impact on the process, as well as the controls needed to mitigate the events that may affect the department, which were evaluated according to ISO 27001 which [5] "specifies the requirements to establish , implement, operate, monitor, review, maintain and improve an ISMS (Information Security Management System) documented within the context of the overall business risks of the organization. "

Finally, and with the objective of evaluating the viability of the proposal defined with the new structure, processes and procedures of the information technology area, a comparison was made between this and the option to outsource said service. In this analysis, the following factors were taken into account: Operating costs, information security, number of maintenance performed and response time given to the requirements of the officials; subsequently, each of them was assigned a percentage of importance according to the specific needs and expectations of the institution. On the other hand, the two alternatives (proposal and outsourcing) were evaluated in the four aforementioned factors, giving them a score in a range of one to five, with one being the lowest and five being the highest.

Having already defined the percentage of importance for each of the factors and the qualification obtained both for the option to implement the proposal and for the contracting of the service externally, a total value obtained from the multiplication between these two variables could be established; In this way, it was possible to quantitatively compare which of the two alternatives would be the most convenient for the institution.

III. RESULTS

For each of the activities carried out during this study and which were already described in the methodology, different types of data, analysis and conclusions were obtained as results that will be indicated and explained below:

3.1 SURVEYS

This diagnostic tool was specially addressed to the officials of the institution, where it was possible to identify the most frequent nonconformities that were had regarding the area of Technologies enunciated in TABLE 1. The main needs were classified to which the department had to respond in the execution of its processes and procedures to provide the support expected by the institution; These were mainly issues related to the proper assurance and disposition of the information as well as the use of optimal software for the execution of the activities carried out by each official.

On the other hand, it was detected that the four areas that present the greatest frequency of inconveniences in the use and disposition of technological tools are the pharmaceutical, administrative, financial and accounting service areas, due to problems with the software used by them.

TABLE 1. Problems detected through the surveys

Some equipment does not have the necessary characteristics for the development of specific activities
Lack of preventive maintenance in computer equipment and printers
There is no dissemination of the procedures that are executed in the IT area
Dependence of an external company to support the requirements of the officials
Interface problems with corporate software
Inefficient software
Lack of staff
Loss of information for not performing security backup procedure
Slowness to respond to the requirements
Lack of training on the management of software used within the organization

3.2 INTERVIEW WITH THE DEPARTMENT'S DEPARTAMENT

Thanks to this interview and the questions asked in it, different inconsistencies were found within the department, such as, for example, the failure to comply with the documented procedures, the dependence of third parties on the execution of the same, the lack of reliable software that would allow the correct storage of the sensitive information handled in the institution, the lack of personnel in the area, besides that there was no management of the strategic risks for said process.

3.3 BENCHMARKING

The benchmarking process is carried out with 4 health entities in the criteria represented in TABLE 2.

We worked with entities that had different characteristics despite being the same sector, with the objective of reviewing the structure of the IT area based on the processes that are developed, taking into account: size, city, installed capacity, services, amount of officials among others.

TABLE 2. Benchmarking

Criteria	Entity of study	Entity 1	Entity 2	Entity 3
Procedures	6	8	5	5
Staff in the systems area	1	9	12	3
Number of computer equipment	63	450	259	30
Number of servers	1	13	-	1
Do you have an Information Security Management System?	No	In process	No	Yes

The information obtained about each one of the mentioned factors was compared in the four institutions, from there it was possible to identify the good practices that were had in the different departments and which were taken into account when designing the new structure of the area, adjusting, to the size, characteristics and needs of the institution.

3.4 PROCESSES AND PROCEDURES

The results obtained in the three tools previously described, allowed to establish the necessary processes and procedures for the Department of Information Technologies, adjusting to the needs and expectations of the institution, mitigating the inconveniences that were continually presented by officials and increasing the commercial competitiveness of this entity.

Taking into account that in order to determine the characterization of a process, [6] "it is recommended to take into account the activities or tasks to be carried out in each procedure, starting from the precise and clear knowledge of them", was defined for each of the fourteen procedures proposed in TABLE 3, its objective, scope, the steps that should be followed in each case and the average time it could take a professional to perform them, all with strict order to ensure their understanding and compliance, this, because the standardization is considered as a tool that [7] "facilitates organizations to define their strategic, key and support processes to achieve results within the framework of their institutional strategic plan and guide the organizational development of the company".

TABLE 3. Proposedprocedures

Maintenance of computer equipment
Printer maintenance
Maintenance of servers
Technical service of computer equipment or printers
Application technical service
Technical service of telecommunications infrastructure
Software installation or update
Guarantee of technological resources
Equipment drop
Purchase of parts and / or technological resources
Backups
Administration of databases
User administration
Development and implementation of software or tools

With the design of these new processes and procedures, it was sought [9] "to solve problems to serve individual and corporate development; to influence the customer service, the quality of the products, the speed of decision-making and the effectiveness of the health organization ". In addition to [10] "improve efficiency among available resources such as personnel, financial and integration of internal relations in each area, as technical support to the strategic objectives of each institution".

On the other hand, considering the importance that the handling of confidential information plays in this case, some parameters given by the ISO 27001 standard were taken into account, which is the guide to implement the Information Security Management System [8]. "That is established to generate guidelines, develop and maintain programs, controls and policies to preserve the confidentiality, integrity and availability of information, anticipating any computer attack".

3.5 RISKS

According to the procedures already established, the existing IT risks for each of them were defined [11] "taking into account that the IT risks refer to the uncertainty existing due to the possible realization of an event related to the threat of to computer goods or services such as computer equipment, peripherals, installations, projects, computer programs, files, information, confidential data, among others ". In addition to including others related to the development of procedures and the consequences that entail for the department. A total of 13 risks related to human and technological resources were determined, of which four were categorized with extreme severity due to the importance they have in the Information Technology process since any eventuality arising from these could seriously affect the institution. TABLE 4 describes those risks that have extreme severity in order to know which are the risks that may affect the process to a greater extent.

TABLE 4. Riskswith extreme severity

Risk	Severity	Control
Lack of equipment maintenance	Extreme	The IT Department should guarantee that periodic maintenance of the equipment is carried out
Unawareness of the technological portfolio to establish the age of the equipment	Extreme	Determine the institutional technology portfolio to identify which equipment needs updating or change
Ignorance of the legal procedures of software administration	Extreme	The IT area must have all current contracts and copies of insurance policies that support the contraction in your file
Lack of endorsement of Institutional databases	Extreme	The IT Dept. should guarantee that the Institutional servers make backup copies on a regular basis

3.6 INDICATORS

The indicators according to the concept coined by the authors of the work "Indicators of performance in the public sector": Juan CristóbalBonnefoy and Marianela Armijo; [12] "are measures that describe how well the objectives of a program, a project and / or the management of an institution are being developed". For this

case, they are directly related to the effectiveness of each of the procedures that are executed in the Information Technology area of the oncological entity, which leads to the continuous improvement of the process due to the control exercised over the department's results. In the case study, 14 indicators were defined, some of effectiveness and others of effectiveness to measure the behavior in the response generated from the area towards the organization's officials. Each one was defined its objective, the periodicity of measurement and the corresponding formula to calculate it, in TABLE 5 the names of three relevant indicators are presented to know the process.

TABLE 5. Indicators

First name	Formula
Preventive maintenance of computer equipment	(Amount of computer equipment to which preventive maintenance was performed / Total of computer equipment) * 100%
Technical support of applications	(Number of technical supports in applications that satisfactorily comply with the requirements of the users / Total of technical supports in requested applications) * 100%
Manual backups	(No. of manual backups made / No. of requests for manual backups) * 100%

3.7 CARGO PROFILES

[13] "Globalization forces organizations to have a structured IT area to perform tasks such as the administration of operating systems and support for users of central or corporate computers"; in order to ensure the proper functioning of the machines, the software and facilitate the use of all other areas of the institution. Taking into account the proposed structure and the current conditions of the oncological entity, it was determined that two professionals are required as described below:

SUBDIRECTOR OF THE AREA

Whose objective is to administer the technological resources of the institution and to the personnel of the area watching over the good operation of the same ones and proposing improvements and new computer tools that contribute to the development of the activities in the different areas. This person must also have the following characteristics: Must be a university professional with a degree in Systems Engineering or related careers, have a specialization in systems, or information management and databases or computer security, 3 years of experience in similar positions, capacity to solve problems, leadership, commitment, discipline, effective solution to supports, excellent interpersonal relationships and ease teamwork.

TECHNICAL AREA OPERATOR

It is the person in charge of executing the activities that demand knowledge of norms, methods and technical procedures, established and of necessary application in the development of processes to guarantee the availability and operation of the technological tools of hardware, software and communications, in order to provide support in the development of the processes of the other areas of the institution. Additionally, you must have: a technical training qualification corresponding to Systems Engineering or related careers, 2 years of experience related to the position, results orientation, transparency, commitment to the institution, technical expertise and teamwork.

3.7 SCENARIOS

The two scenarios proposed for this analysis are, on the one hand, the alternative of implementing the structure, processes and procedures already specified throughout the document, as well as the direct contracting of the professionals who will carry out said activities according to the organizational structure and profiles of defined charge; On the other hand, the possibility of hiring a provider that deals with all the issues related to the institution's technology process without having an internal area for it is also contemplated. As already described in the methodology, 4 factors with a percentage of importance were considered, in order to evaluate each of the two options given previously.

Each rating and weighting can be observed in TABLE 6, it should be noted that the total score obtained for both the option to implement and to contract externally were 4.65 and 2.40 respectively.

TABLE 6. Scenariosapproach

Factors / Contracting processes	Weighing	Internalqualification	Outsourcing Qualification	Internal Total	Total Outsourcing
Cost	35%	4	3	1,4	1,05
Security of the information	40%	5	1	2	0,4
Percentage of completion of maintenance	10%	l5	5	0,5	0,5
Response time	15%	5	3	0,75	0,45
TOTAL				4,65	2,4

IV.   CONCLUSIONS

Leonardo Hernández in his thesis "Proposal of Organizational Structure for an Area of Information and Communications Technologies.", States that there are [14] "five main elements for design: Strategy, structure, processes, people and technology"; Throughout this document it has been possible to demonstrate that these same five elements were considered, in order to propose a new organizational structure, where the strategy was to give both an internal focus, looking for the main needs of the institution within the department. , as an external visual, identifying the best practices of this process in similar entities, in order to design a new structure of the area that has as its goal the quality and continuous improvement of the organization.

Although there was agreement regarding these factors, it is necessary to point out that in this case study the management of the risks of the process was taken into account as an additional element, where the controls to mitigate them were determined in the same way taking into account the ISO standard. 27001; It should be noted that in order to obtain an optimum follow-up in addition to an effective measurement of them and considering that different risks were identified for each procedure, the controls determined within the activities of these could be included, in this way it would be ensured that their due management and can be considered as an opportunity for improvement in the design of the processes and procedures of the department.

Likewise, Leonardo Hernández indicates that [14] "In order to identify the best option according to the requirements of the institution, an analysis of the possible types of structure for the ICT area is carried out"; In accordance with the above, it can be observed that for this study, a similar analysis was carried out through the scenario approach, where it was sought to validate which was the best alternative between performing the procedures by means of the personnel and the technological resources with which account the organization versus the hiring of external companies.

Finally, it should be noted that [14] "it is very important to have an adequate organizational structure that integrates the processes efficiently", therefore, taking into account that in this document the different activities carried out to achieve this have been described. Finally, it can be concluded that its development not only contributes to the department and institution that were the object of this study, but it can also be a guide for any organization that seeks to design or redesign the organizational structure of any of its areas of operation.

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