

Standardization Process of Agreements, Portfolio and Treasury for an Oncological Organization

Ever Ángel Fuentes¹, Manuel David Rodríguez Beltrán², Sergio Andrés Flórez León³

¹(MBA, Universidad Libre, Colombia)

²(Ingeniería industrial, Universidad Libre, Colombia)

³(Ingeniería industrial, Universidad Libre, Colombia))

Corresponding Author: Ever Ángel Fuentes

Abstract: This article shows the development of the standardization process of Agreements, Portfolio and Treasury from the administrative and finance department in an oncological organization in Colombia, aiming at improving and integrating the procedures of the institution using diagnostic tools, documentation, time studies based on the International Labor Organization (ILO), performance and evaluation indicators, and impact evaluation through the Leopold Matrix. As a result, the matrix of documents and the standard time for seven procedures were obtained. In addition, eight performance indicators were established, and the impact of the expected benefits were compared against the objective of the established processes.

Keywords – Documentation, indicators, improvement, Leopold matrix, processes

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I. INTRODUCTION

Nowadays, many organizations are forced to implement standardization processes as an improvement tool due to the high competitiveness within the market, demanding greater productivity and quality in the development of products and services. This improvement strategy achieves cost savings, greater customer satisfaction and improved competitiveness [3].

The ISO defines a standard as a document, established by consensus and approved by a recognized body, which provides, for common and repeated use, rules, guidelines or characteristics for the activities or their results, aimed at achieving the optimum degree of order in a given context [1].

Standardization means creating a uniform measurement of performance in various divisions or locations. The expected results are processes that consistently meet their cost and performance objectives, using a well-defined practice; therefore, standardization reduces the risk of failure within organizations [2].

Historically, standardization has shown an increase in the production performance of organizations, since it is possible to establish achievements and objectives through stages and procedures which are subject to evaluation and improvement systems. In the end a well-done standardization can improve the quality and productivity which allows companies and organizations to be more competent within the market.

II. METHODOLOGY

This methodology is proposed so that any institution can standardize its processes allowing it to improve the control of its operations, making possible the measurement and evaluation of the performance of the procedures. This study consisted of the following steps:

2.1. Diagnostic

For the diagnosis, three tools were used: 1. Observation, which main objective was to identify processes, procedures and instructional materials, formats, annexes, and manuals regarding the activities carried out on a day-to-day basis, and also to analyse the activity frequencies and the people in charge. The observation process lasted two weeks where workers were addressed to obtain information about their performance and problems in the area.

2. A 10 question Survey, which was applied to 10 workers aimed to know the perspective of the workers about the procedures they perform on a day-to-day basis.

3. VSM (Value Stream Mapping), a tool that is widely used in production organizations. It was necessary to use the adaptation for VSM services (Value Stream Mapping Services) [5]. Authors such as [6] explain that this tool helps to visualize and understand the process; also allows to recognize the value of this, differentiate it from waste and create an action plan to eliminate it if necessary.

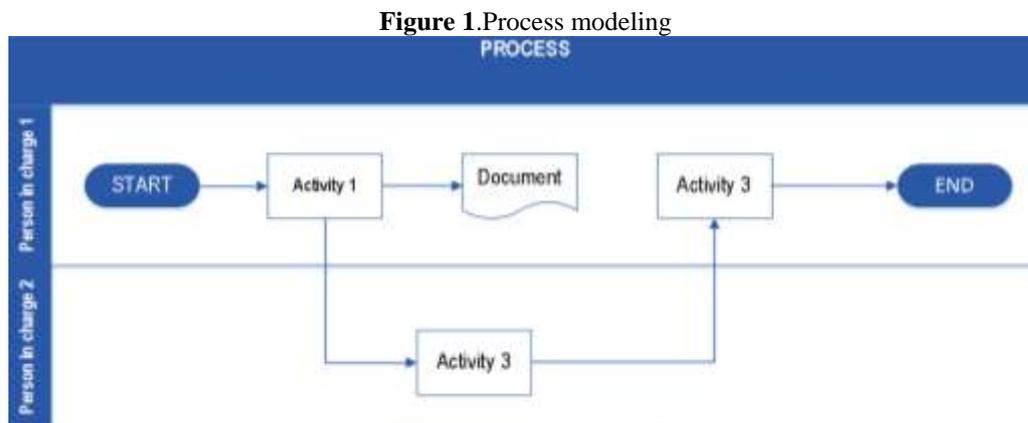
For the application of the VSM it is necessary to identify the inputs and outputs of the processes, which will allow knowing the flow of activities carried out in the area. This diagram was designed with the data collected from the observation and surveys, in addition to the accompaniment and opinion of an expert in the area.

Based on the diagnosis, the process was characterized based on the PDVA (Plan-Do-Check-Act) cycle proposed by Deming [7]. This methodology is very useful to structure and execute projects to improve quality and productivity at any hierarchical level in an organization, offering solutions such as: Improve quality, reduce costs, improve productivity, reduce prices, increase participation in The market, survival of the company, provides new jobs, increases the profitability of the company [8]. The variables that were taken into account for the characterization were: inputs, outputs, suppliers, customers, activities, objective, scope, indicators and risk matrix.

2.2. Collection of documentation

One of the limitations we can find in standardization process it is the different ways in which employees perform the same task. The education, experience and skill levels of the employees determine their own styles and the differences in their styles cause variations in the production of the process. If you can document well the ways of performing the tasks of a process, then a company can standardize their operating procedures in their best ways. And, when employees follow these procedures, variations will be minimized and products or services of the highest quality will be offered to customers [9].

For the collection and updating of documentation, it is recommended to define the following variables of the processes: Name the process, person interviewed, tools used or needed, description of the tasks performed, problems and improvements [7]. For this, the development of standardized procedural, manuals and annexed formats was necessary, where aspects define by Quality department such as color, font size, structure, flowchart and coding were defined. To determine the flow of activities, an approach is made with each of the workers to define step by step, person in charge, documents related to the activities of the procedure and the improvements to be implemented, as well as making a comparison with other organizations. It was modeled as shown in Fig 1.



Source: Authors, 2019

2.3. Time studies

The study of time was based on the methodology proposed by Niebel [10] and the International Labor Organization [11]. The authors recommend taking into account: a) The choice of the operator: Due to the low number of workers and that each of them performs a unique task, all the workers in the area were selected for the development of the activities, b) Position of the observer: The author states that no type of conversation and distraction should be established on the selected worker, c) Significant information record: Information was recorded when the process was interrupted by external factors that could increase or distort the observed times. d) Division of the operation into elements: The procedures were structured by means of steps where the responsible party and related documents were identified. e) Valuation: This variable was assigned according to the speed of execution of the activated tasks and depends directly on the worker's performance. f) Supplements: The supplements applied for this study were basic fatigue supplements 5%, supplements for personal needs 5%, and supplements for eventualities 5% for a total of 15%.

To define the number of timestamps, the methodology proposed by [8] was applied, where by means of a preliminary 4-time sample, the size of the sample is determined, which varies according to the dispersion of the data of the times obtained. The formula represented in Fig 2 guarantees 94.45% confidence and an error of $\pm 5\%$.

Figure 2. Formula to calculate number of observations

$$n = \left(\frac{40 \sqrt{n' \sum x^2 - \sum(x)^2}}{\sum x} \right)^2$$

Source: international Labor Organization, 1996

n = Size of the sample that we want to calculate (number of observations)

n '= Number of observations of the preliminary study

Σ = Sum of the values

x = Value of the observations.

40 = Constant for a confidence level of 94.45

From the variables presented above, the calculation of the standard time is determined in Fig 3.

Figure 3. Formula to calculate the standard time

$$TS = \sum(TP * V * S)$$

Source: International Labor Organization, 1996

TS = Standard time

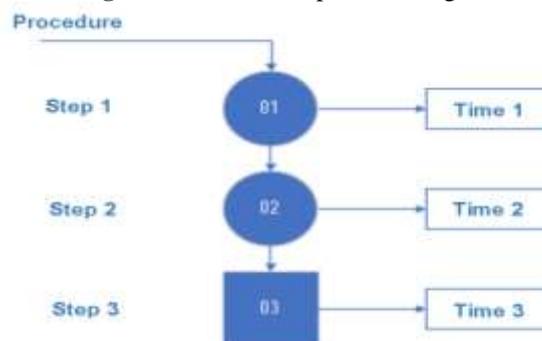
TP = Average time (Average of observed times)

V= Performance value

S= Supplements

Lillrank and Liukko [12] propose a classification of the procedures according to the nature of their frequency in activities of standard, routine and non-routine type. Based on what was previously stated by the authors, the elements of the procedures for taking times were classified. For the non-routine elements due to its low frequency of execution, it was necessary to consult with experts external to the organization, and for the routine elements the standard time was established according to [7] [8]. From the times obtained for each procedure, a modeling was performed in an operation diagram Fig 4

Figure 4. Procedure operation diagram



Source: Authors, 2019

2.4. Indicators

Key performance indicators (KPI) are identified as financial and non-financial indicators that organizations use to estimate and strengthen their success, aiming at previously established long-term objectives. The appropriate selection of indicators that will be used to measure is crucial. The organization of the business process is necessary to make a performance measurement or system as effective and efficient through KPI [13]. Other authors, like Angelica Mondragón [14], define it as a tool to clarify and define more precisely objectives and impacts; they are verifiable measures of change or result designed to have a standard to evaluate, estimate or demonstrate progress with respect to established goals. They also facilitate the distribution of inputs, producing products and achieving objectives.

For the selection of indicators it was necessary to answer the following questions: What ?, Where ?, How?, When ?, Who ?, and Why?. For each of the selected indicators a curriculum was made, in which it was necessary to define the objective, formula, unit of measure, name of the variables, source of information, periodicity of report and report, type of indicator, and level and goal, aiming at generate greater traceability and control over the processes of Agreements, Portfolio and Treasury.

2.5. Impact evaluation

The Leopold matrix is a method used to evaluate the environmental impact of a project and also can be used in variety of applications. The novelty in this method, which is presented in this document, refers to the evaluation of the planned activities of the project in relation to a group of criteria regarding to: importance (spatial dispersion), probability and duration of the impact. [15].

Because the impact evaluation sought is not environmental, the same methodology was used, choosing two variables that would allow evaluating how the project impacts the institution. For this project, the variables used were: Benefits expected from standardization and the objectives of each of the procedures. This tool will allow to have as a result, the iterations of each of the objectives with the expected benefits and their impact value

III. RESULTS

The results obtained applying the propose mythology are shown as follows

3.1 Diagnosis results

With the diagnosis made, the result was the identification of documents of the Agreements, Portfolio and Treasury processes, as shown.

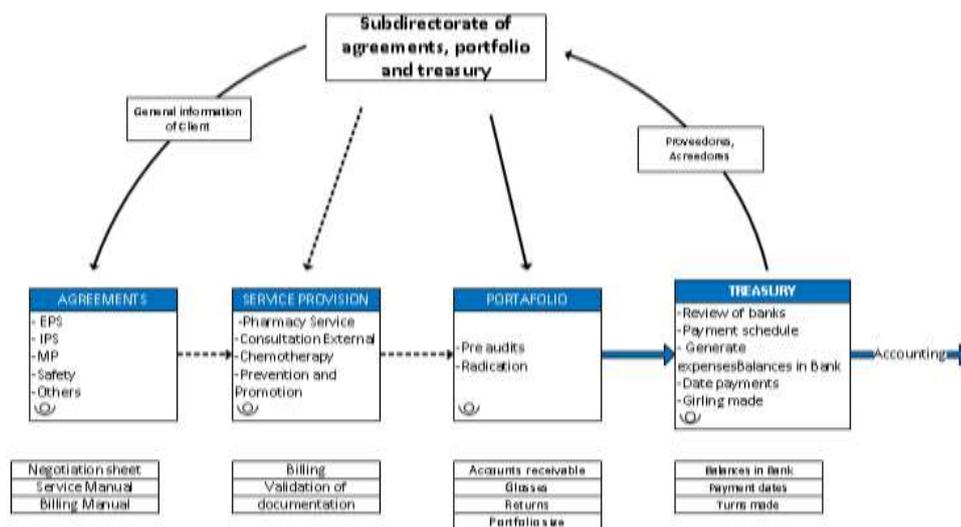
Table 1. Diagnosis of documents Portfolio, Agreements and Treasury process

TYPE OF DOCUMENT	TOTAL
PROCEDURE	13
FORMATS	3
ANNEXES	1
VIDEOS	1

Fuente: Autores 2019

Furthermore, with the surveys conducted and applying the VSM tool, a flow of activities, inputs and outputs from the Agreements, Portfolio and Treasury process was obtained as shown in Fig. 5. Due to the restructuring of the area and the creation of new procedures, the organization did not have information about the times of the process. For the previously explained, the tool of the VSM was used only to know the flow of activities because the times would be taken after the documentation of the area.

Figure 5. VSM process Agreements, Portfolio and Treasury



Source: Authors, 2019

3.2 Collection of documentation results

For the process of collection of documents, it was necessary to restructure the area procedures so the objectives set in each process of the area were met. The result is shown in Table 1. It is important to emphasize that the documents initially identified served as the basis for their restructuring. The result of the survey is the information shown in Table 2.

Table 2. Document diagnosis process Agreements, Portfolio and Treasury

TYPE OF DOCUMENT	TOTAL
PROCEDURE	7
FORMATS	21
ANNEXES	17
INSTRUCTONS	17

Source: Authors, 2019

As Table 2 shows, the volume of the procedure was reduced due to the unification of these, but there is a significant increase in formats that went from 3 documents to 21, instructions 0 to 17, annexes from 1 to 17. Of 18 documents initially identified in the area of Agreements, Portfolio and Treasury, there were 62 documents.

3.3 Time study results

Applying the formula of figure 2, the number of observations to be applied was obtained for each one of the defined elements of the procedures as shown in table 3, an example of the calculation of the number of observations to be taken of 4 elements of the document filing procedure

Table 3. Example calculation number of observations

SENDING DOCUMENTS					EX	EX^2	N° Observations
1	93	109	108	105	415	43219	6
2	228	258	249	229	964	232990	5
3	165	187	181	187	720	129924	4
4	57	61	55	64	237	14091	6

Source: Authors, 2019

From the number of observations obtained, the missing time measurements were taken for the yield factor and the supplements. Table 4 shows the average time (AT), valuation (VL), basic time (BT), supplements (S), standard time (ST). This methodology was applied to all 9 procedures: 1 of Agreements, 5 Portfolio and 1 of Treasury.

Table 4. Example calculation of standard time

N°	OBSERVED TIMES (seconds)										AT	VL	BT	S	ST
	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10					
1	99	109	108	105	97	101	107	102	97	95	102,00	125	127,50	15%	147
2	228	258	249	229	232	244	240	239	215		237,11	125	296,39	15%	341
3	175	187	181	187	183	191	184	189			184,63	125	230,78	15%	265
4	57	61	55	64	58	60	65	57	62	59	59,80	125	74,75	15%	86

Source: Authors, 2019

To establish the standard time of the non-routine activities, a weighted average was performed with three times, two of them from external experts of the process and the last one by the internal time of the procedure with the following weighting: External experts (40%) and internal time of the organization (20%). Ten non-routine activities were identified in the agreement procedure, in addition to the administrative reports made in the area.

3.4 Result of indicators

For this phase, an analysis of each process was proposed in search of evaluation criteria that will allow the periodic measurement to identify problems within the process and exercise improvement actions

The proposed indicators allow the area of Agreements, Portfolio and Treasury to compare the data and results of its performance. It must be said that the organization already had some established indicators and that these were taken as reference to perform an update. As a result, the indicators proposed for each process can be observed in Table 5.

Table 5. Indicators proposed for the area of Agreements, Portfolio and Treasury

Process	Name of the indicator
Agreements	Contracts
Portfolio	Sent documents
	Audit invoice
	Sent Invoice
	Glosses and returns
	Portfolio's rotation
	Collection of accounts receivable
Treasury	Payments made

Source: Authors, 2019

3.5. Impact evaluation results

The crossing of these two variables: Benefits expected from the standardization and the objectives of each of the procedures resulted in a total of 64 positive iterations on the expected benefits of the project as shown in Table 6.

Table 6. Impact evaluation with Leopold's Matrix

EXPECTED BENEFITS	ITERATIONS		IMPACTS	
	(-)	(+)	(-)	(+)
Improve compliance with procedural objective	0	8	0	78
Avoid rework	0	8	0	43
To satisfy the client	0	5	0	55
Increase the forecast of results	0	3	0	19
Reduction of errors and waste	0	8	0	58
Updated documentation	0	8	0	64
Greater control in the execution of procedures	0	8	0	69
Integrity between the procedures of the organization	0	8	0	43
Greater process reliability	0	8	0	78

Source: Authors, 2019

It is observed that there is a high iteration of the expected benefits with the objectives of the area procedures with an incidence of 64 positive iterations over the 74 possible ones with an impact equivalent to 507 points. This shows that the expected benefits obtained will help in a continuous way to the improvement and to the fulfillment of each of the objectives previously stated. The impact on the procedures of client planning, portfolio and payments attributed to the increase in the forecast of results can be emphasized. On the other hand, the reduction of errors positively affects the processes with tasks of high repetition and continuity. The standardization of the Agreements, Portfolio and Treasury process will not only affect the process, but also the entire organization due to the integrality of the procedures. One of the characteristics that makes a healthcare provider more competent is customer service, the improvement of support processes will allow patient care to be faster and more efficient.

IV. DISCUSSION

Gonzales [16] proposes the design of procedures for the improvement of processes adjusted to the structure and current operation of the company in order to improve times, and the level of customer service according to the required standards, using tools to establish standard times with sampling and timing. In the application of the methodology, a better organization in document management, improvement of the flow of

activities and establishment of standard times was evident. As the entity did not have a previous study of time, there were no baseline data to determine the level of improvement of the times of the processes studied, but with this study already established, it is possible to make these measurements and make the respective comparisons in future studies.

Anaya[17] proposes the design and standardization of billing processes for the portfolio of the IPS Fundación Cardiovascular de Colombia through the use of indicators such as total portfolio, portfolio age, portfolio rotation and pending payments per download. Out of the indicators proposed by the author, it was only possible to apply the portfolio rotation indicator. The omission of the other indicators was due to the nature of the data which comes from the Colombian Health System, which makes it difficult to identify certain variables for the calculation of these indicators. The omitted indicators are presented in the form of more general reports.

The standardization of processes in the health sector not only depends on intrinsic processes and the management will of these organizations, it also depends on the policies and guidelines established by the National Health System. This causes certain challenges when applying standardization methodologies like the one proposed, as evidenced in some of the phases of this study. It is important that there is constant communication between government entities and private entities providing health services to avoid ambiguities and thus contribute to the continuous improvement of administrative and financial processes, and this can translate into a system of national health that benefits all its users.

V. CONCLUSION

The diagnosis made showed a lack of information documented in the processes of Agreements, Portfolio and Treasury, which generated unawareness in the workers about some functions that should be performed in the area. With the new methodology applied the existing gaps in the document system were filled allowing current and future workers to know more about their roles and responsibilities in each of their positions, so that there are no doubts and ambiguities when carrying out their activities.

The study of times presented allowed to establish a standard time on the activities carried out by the workers, which will allow the institution to evaluate the process in the future in order to establish improvement actions. In relation to the indicators, only those that were useful regarding to the data obtained in the present study were applied.

The impact evaluation made with the Leopold matrix showed 64 positive iterations of the objectives of the portfolio, agreements and treasury processes over nine benefits with a value of 507 points of positive impacts for the process. showing the expected benefits by this methodology: improving compliance with procedural objectives, avoiding rework, satisfying the client, increasing the forecast of results, reducing errors and waste, updated documentation, greater control in the execution of procedures, comprehensiveness among the procedures of the organization, and greater reliability of the process.

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