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Development of the Operations Management System for the Real Estate Startup Casa 360

MBA Ever Ángel Fuentes[1], Daniel Guillermo Ibáñez Morales[2], Gustavo Suarez Suarez[3]

[1]*Bogotá D.C., Universidad Libre, Colombia*
[2]*Bogotá D.C., Universidad Libre, Colombia*
[3] *Bogotá D.C., Universidad Libre, Colombia*

Abstract: *Over time, management systems have become more relevant in the product and service industries, this is due to the good results that occur under a successful design and implementation, the use of different tools allows detecting problems and errors, providing solutions optimal in different fields and areas in each company; at CASA 360 factors such as the non-standardization of processes, insufficient staff training, the assignment of unbalanced workloads, the lack of metrics that allow to sustain the principles of continuous improvement, however, the organization has achieved growth Constant commercial activity, which is positive from a financial point of view, implies a significant increase in the activities carried out by the personnel, which hinders the optimal and responsible progress of CASA 360 as a Colombian company. Based on the above, a management system is developed according to the needs of the entity, focused on the collection of data through interviews, the taking of time in the processes to standardize them and the financial analysis, which become the reference point for taking corrective, follow-up and control measures. Thanks to the structuring of processes, restructuring of existing ones and standardization of times, it is possible to obtain increases at the production level of up to 14%, being the simulation the tool that allows to validate the results of the investigation through different scenarios where analyzes the behavior of critical variables in one of its key procedures, the design of virtual tours.*

Keywords: *Simulation, continuous improvement, metrics, tools, management system*

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I. INTRODUCTION

In all organizations it is observed that they have in mind the administration of operations since they are dedicated to the production of goods or the provision of services.These range from the idea of the product or service to the client and its result depends on producing or providing them in order to meet their expectations [1]. For this reason, management systems have become a fundamental part of organizations, both for products or services, allowing them to make more efficient standardized processes and with control plans that facilitate continuous improvement.Another definition that can be observed is the direction and control of the processes through which inputs are transformed into finished goods and services[2]. In this way it is decisive for each type of organization because it can only achieve its goals through the correct management of people, capital, information and materials. In 1911 Frederick Taylor's studies of work methods and his views on the roles and responsibilities of workers and managers revolutionized Operations Management.

Many of his ideas and techniques are still being put into practice. This school of thought seeks to discover the best method of working using the following scientific approach: 1) observation of current working methods; 2) development of an improved method through scientific measurement and analysis; 3) training of workers in the new method;4) constant feedback and management of the work process [3].Likewise, it is observed how a management system helps an organization to establish the methodologies, responsibilities, resources, activities among others that allow it to plan oriented until obtaining those "good results" that it wants, or what it wants. Himself, obtaining the established objectives [4].At first glance, it might appear that manufacturing operations don't have much in common with service operations; however, both are seen as a transformation that is incorporated into supply chains. In manufacturing, raw material, energy, labor, and capital inputs are converted into finished products; in service operations, the same types of inputs are converted into service products [5]. That is why, in one or the other, this function is the engine that allows once properly planned, organized and controlled, to create profits in the company, generate added value, increase quality and productivity, improve customer satisfaction, among others.

There are four basic techniques for measuring work and setting standards. These are two methods of direct observation and two of indirect observation. Direct methods are time study, in which case a stopwatch is used to measure work times, and work sampling, which involves keeping a record of random observations of a person or teams while they work. The two indirect methods are the default time and motion data systems (SPTM), which sum data from generic motion time tables that have been developed in a laboratory to find the time corresponding to the job - the most used are the proprietary systems : Methods Time Measurement (MTM) and Most Work Measurement System (MOST) - The technique chosen will depend on the degree of detail desired and the nature of the work itself: Repetitive work usually requires a time study and analysis data for predetermined times and movements. On the other hand, when the work is carried out using fixed-time equipment for processing, elementary data are usually used so that direct observation is not so necessary. When work is infrequent or involves a long time within the cycle, work sampling is the advisable instrument [6]. As with the study of methods and by application topics, the most common ones will be explained in detail. From another point of view it is clear that there are different perspectives from which it can be investigated; and different types of research, which may depend on important characteristics such as the object of study, the depth of the study carried out, the data that is analyzed, the time required for the study, the methods used to obtain data, among others. ; it was possible to determine when conceptualizing each one of them, that the most applicable to the reality of the project and that it adjusts to the work to be executed is the descriptive type [7]**.**

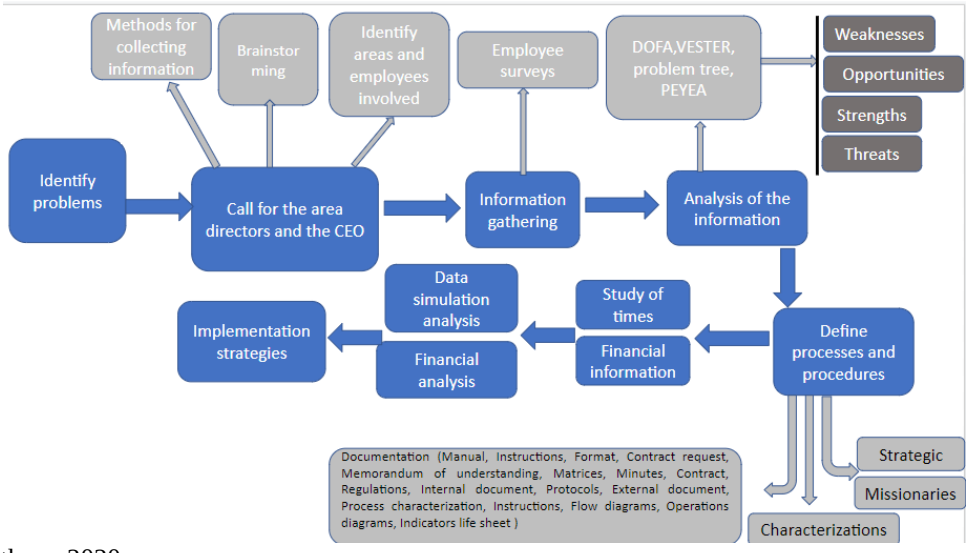
This type of research is characterized by the fact that new knowledge is obtained and applied to describe a specific reality in a complete way and thus solve questions and / or situations of interest; In addition to this, it is distinguished, because it collects data on the basis of a hypothesis or theory -which for this case is the effectiveness of the implementation of an operations management system to improve their performance and then analyze them thoroughly and draw meaningful generalizations.Therefore, during the development of this project it will be possible to find, in addition to the presentation of the different events, situations, processes, people and other factors that generate the aforementioned problems; an interpretation of the current situation and a proposal or action plan in the face of the necessary modifications to be made, within all planning we must take into account the business dimension is the value dimension and the creation of value for both customers and customers. Stakeholders (people interested in the good running of the company such as employees, shareholders, suppliers, etc.)[8].

The new type of organization focused on processes, however, contains the previous form of structural organization, adding to it the concept of adding value to a recipient (internal or external customer) and requires addressing, not only the internal factors of the system. (Technical, etc.), but also the requirements of said value production.This purpose is the same as that considered in the Value Analysis method as the purpose of satisfying customer needs [9].

II. METHODOLOGY

Next, the development of the operations management system for the CASA 360 Startup is described, where the methodology is defined from the identification of the problem and the steps to obtain information as presented in Figure 1.

Figure 1. Methodology



Source: Authors, 2020.

III. FINDINGS

The main agents that influence the most important problem of the company today, poor development, without standardization, finally stain as a consequence less-optimal processes without a strategy to solve and control the problems that arise during their development; The exposition of the previous ones validates the need for the development of an operations management system for the improvement of the current situation of the company; These mainly focus on 4 main axes, administrative, personnel, process problems and, last but not least, environmental problems than the previous ones.

A company's strategies are an integrated and coordinated set of objectives and actions designed to take advantage of opportunities, provide value to customers, and grow the company.It is not a simple task, it requires an analysis of the environment, an internal diagnosis and competitive intelligence [10].

In order to identify, evaluate and analyze the problems in each of the areas, tools such as the survey, SWOT, cross SWOT, EFE-EFI, PEYEA, VESTER matrix and problem tree were used.Through the survey, the necessary information is obtained to establish the criteria that represent a risk and a problem within each area, this is achieved by assigning a numerical value corresponding to its importance, relevance and incidence within each process and in this way these results obtained are worked on the following tool such as the DOFA.

The DOFA This method performs an internal and external analysis. In this case the strengths and weaknesses are internal; While the opportunities and threats are external, both companies and individuals use this tool to know their current state and in this way have enough information to make decisions after obtaining the results of this analysis, a company will know what is helping it achieve its objectives. And you will also know which obstacles you need to overcome or minimize to achieve the desired results[11].

The analysis DOFA OR FODA

It consists of carrying out an evaluation of the strong and weak factors that as a whole diagnose the internal situation of an organization, as well as their external evaluation; that is, the opportunities and threats.

It is also a tool that can be considered simple and allows to obtain an overview of the strategic situation of a given organization [12].

This tool clearly shows that the company shows quite a few weaknesses, basically in the lack of follow-up to the processes and procedures, collecting and analyzing information which subsequently allows its control, likewise several opportunities were observed in the management of operational direction and permeability of the company he implementation of tools that improve the strategic management of the company, the company must take advantage of the strengths it presents in the perception of customers and the extensive knowledge of the market as seen in figure 2 and based on the results we analyze them in the DOFA through which strengths are crossed with opportunities, opportunities with weaknesses, strengths with threats and weaknesses with threats and in this way present improvement strategies for each of these crosses which are explained in Figure 2.

Figure 2. CASA 360 cross DOFA

Casa 360° Colombia - Panamá		STRENGTHS						WEAKNESSES						
		F1	F2	F3				D1	D2	D3	D4	D5	D6	D7
OPPORTUNITIES	O1 O2 O3 O4 O5 O6	Generate a better flow of information between the different areas of the company based on the quality of information that is currently available and the good flexibility on the part of the operational management. Generate time empowerment within the company which allows all areas to have access to the most relevant information and through the cula a corporate link is created allowing flexibility between the different administrative and operational areas.						Implement strategic planning in the company by making a diagnosis in different tools which allow optimizing the use of information that is available, which allows setting clear, measurable and achievable objectives. establish clear procedures which allow the recording of information, establish management indicators and control them in order to design continuous improvement plans.						
THREATS	A1 A2	Keep the market studies updated periodically and in this way design contingency plans against new government policies and real estate speculations that in previous years had negatively impacted the market.						Vincular los diferentes stakeholders en los estdios de mercado con el fin de obtener mayor informacion en base a esta poder detectar problematicas tanto internas como externas de la compañía dando una idea mas clara para fijar los objetivos y los indicadores que nos ayudaran a medir como se estan llevando a cabo nuestros procedimentos y que acciones debemos tomar para mejorar.						

Source: Authors, 2020.

The EFE-EFI matrix is a tool that allows an internal audit of the organization's administration, allowing to analyze the effectiveness of the applied strategies and to know in detail their impact; within the instrument it allows to evaluate the most relevant strengths and weaknesses in each area and thus formulate strategies that are capable of solving, optimizing and reinforcing internal processes [13].

The EFI matrix, which gives a rating of 1.77, this means that the company is in weak conditions internally to be more competent where the factors of the most important strengths are:

- Flexibility in communication by the Operational Directorate with its collaborators
- The reality of the market is known through periodically updated market studies
- The perception by end customers of the relationship between the costs of the service offered and the quality is satisfactory.

The EFE matrix gives a rating of 2.09, which means that the company is in a weak position to compete externally. Where the most important opportunity factors are:

- Documentation of the processes, procedures and function manuals of each of the positions related to the support and marketing departments
- Analysis of results, control of indicators, decision-making and reporting by management.

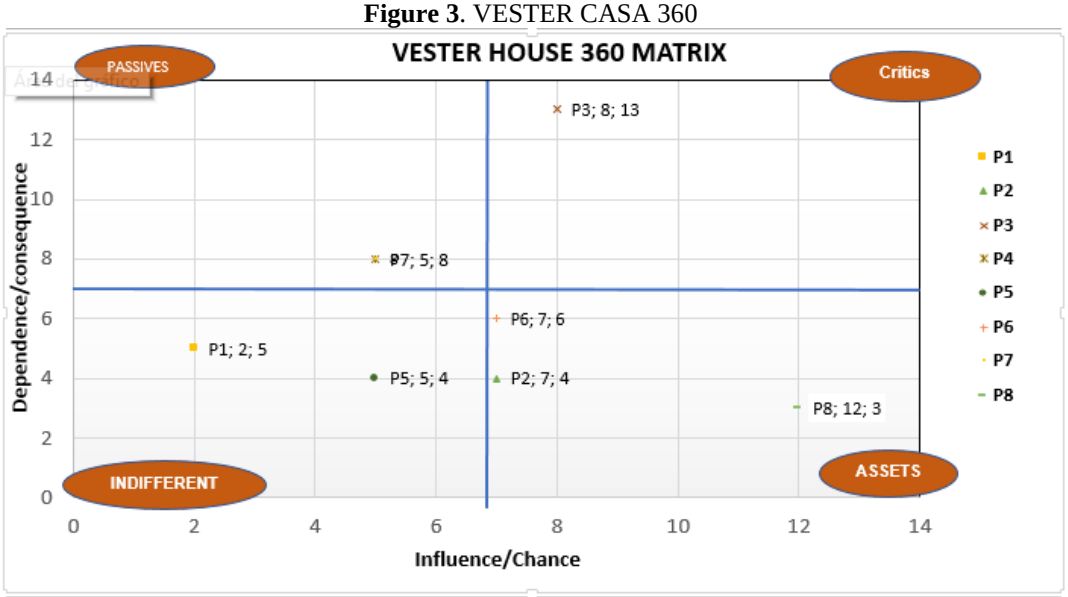
The PEYEA matrix and the problem tree, from the matrix the position of the company with respect to Financial Strength (FF), Environment Stability (EE), Industry Strength (FI) and Competitive Advantage (VC) is observed) positioning CASA 360 as a company that must take advantage of and exploit its favorable position in the market, the organization is in a magnificent position to use its internal forces to take advantage of external opportunities, overcome internal weaknesses and avoid external threats.The entity can evaluate the diversification of products.

Finally, the Vester matrix and the problem tree are worked on, the VESTER matrix is an instrument developed to investigate the neuralgic causes of situations presented, the tangible causes that occur in a community, site or place are listed and contrasted between them by assigning them a numbering or score[14].

The problem tree technique, situational analysis or problem analysis, this tool allows you to map or diagram the problem.The structure of a problem tree is a way of representing the problem, achieving at a glance understand what is happening (main problem), why it is happening (causes) and what it is that is causing (the effects or consequences), which allows you to do various things in project planning, as you will see below in the advantages[15].

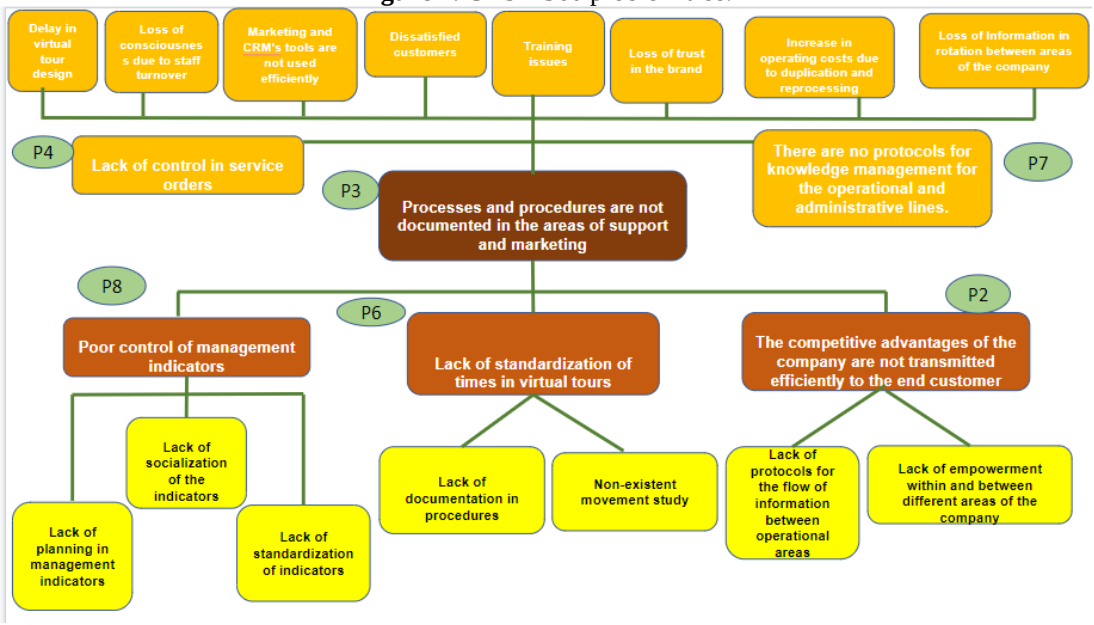
From Vester's matrix, it is possible to determine and organize the problems identified in the company, for the realization of the matrix, eight problems are taken that are more relevant, the next step is reflected in the table in order to relate each of them and Determine the causal relationship by assigning a value between zero for a null causal relationship and five for a high causal relationship.After tabulating the results of the table, these are graphed in a matrix which will show in what state each passive, critical, indifferent or problem is found. assets, in the case of CASA 360 the critical problem was P3 "No processes and procedures are documented in the support and marketing areas" which will be the main problem for the elaboration of the problem tree and problems P2, P6, P8 being located in the area of assets and the problems P4 and P7 within the liabilities as shown by the PEYEA in figure 3, already analyzed the problems of the graph are designed the problem tree figure 4.

Figure 3. VESTER CASA 360



Source: Authors, 2020.

Figure 4. CASA 360 problem tree.



Source: Authors, 2020.

When carrying out the analysis of the times within the different processes, an important variability was evidenced in the execution times of some procedures such as those of, creation of virtual tours, acquisition of real estate and commercial and operational training, each of these generating various problems. Creation of virtual tours: It is found that there are no standardized times in the process because each of the people who are part of the marketing team carries out the work with their own methodology, there are no entry controls of the requests or quality controls of the deliveries, this implying a high rate of reprocesses and discomfort with the franchisees in the face of deliveries with errors and the number of tours carried out per week can be shown in table 1

Table 1. Control of elaborated and reprocessed tours

	S1	**S2**	**S3**	**S4**	**S5**	**S6**	**S7**	**Total**
Tours elaborate	45	57	47	57	53	59	55	373
Tours reprocessed	11	14	12	14	10	13	10	84
% reprocessing	**24%**	**25%**	**26%**	**25%**	**19%**	**22%**	**18%**	**23%**

Source: Authors, 2020.

Although the table generates a report of 373 tours delivered in 7 weeks, with 23% reprocessing, it can be inferred that it really is as if 2.75 ≈ 3 tours per worker / day actually delivered were developed, different from the suggested metric the total of those made.

Real estate acquisition: By observation, there are differences in the development times of digital campaigns for real estate acquisition, which is one of the most important contractual commitments that we have with franchises, the execution time of the campaigns can suggest annoyances At the level of customer satisfaction, since franchises have metrics to meet, when detecting this, they are overloading campaign requests to one part of the team more than the other, which is decisive for the fulfillment of all their functions. Commercial and operational training: This procedure, as it was not standardized, had one of the highest variabilities (in terms of time of duration) within those analyzed, since the range of time that a training could take ranged between 4 and 6 hours, to Because of this important variability, other problems arise such as a) the franchisee does not have more time than scheduled and decides or starts the training, which suggests changing the training agendas and time of a resource in order to finish the procedure or b) That all the The trainer's schedule of scheduled commitments is further modified by the general office agenda, the latter being more serious because the widespread and unscheduled use of common resources such as meeting rooms translates into possible discomfort within the organizational climate. As a "solution" by the trainers, a strategy was demonstrated to compensate for the time management problems: Stop exposing or "skip" some training topics, which generates two more important problems i) A poorly trained franchisee and / or ii) A client upset by the breach of a contractual commitment because the training itinerary is described in the franchise contract.

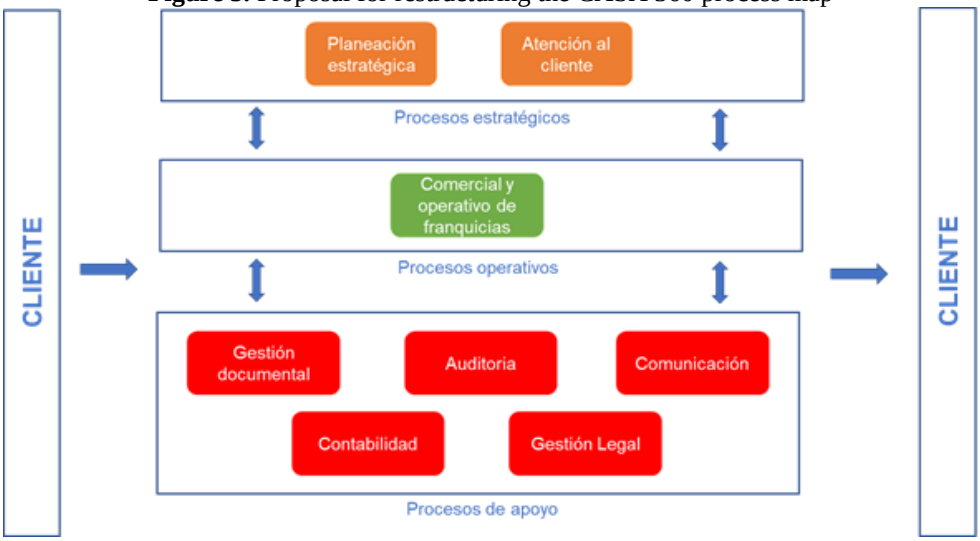
IV. RESULTS

1. Process standardization

In accordance with Werkema, standardization is an important tool for reducing the variability of a process, as well as the tasks and procedures performed in a standardized way by all the operators in a company reduces the chances of making mistakes in said task or procedure.[16]. Starting from the idea that Casa 360 is a very young company that has been "built" according to its day-to-day life, the documented and planned non-existence of processes leading to its work being disorderly and with high variability in its results , the first point to work on was its process map that was not aligned with the organizational objectives.

As a result of the analysis, it was found that CASA 360 had the concept of process distorted, since mission processes, that is, recruitment, franchise support and marketing, are actually procedures related to a macro process in which the commercial and operational department converge, with Based on the foregoing, it was decided to restructure the company's process map with special emphasis on operational processes, the proposal can be seen in Figure 5.

Figure 5. Proposal for restructuring the CASA 360 process map

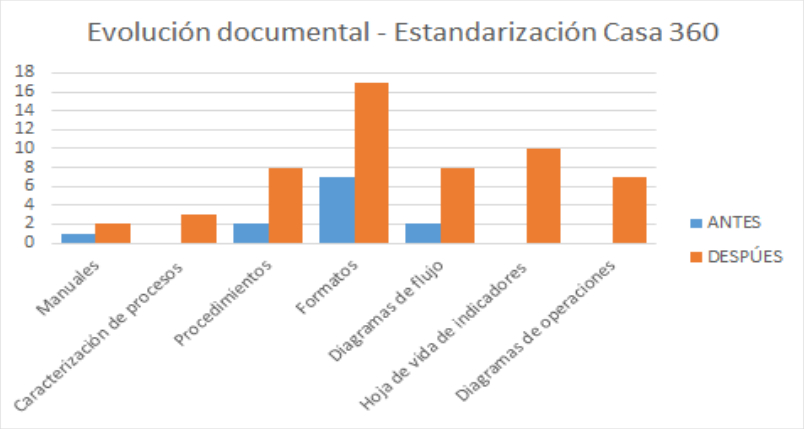


Source: Authors, 2020

The proposal contemplates creating a single operating process, for the current state of the company, which will be called commercial and operating franchises, since, for reasons stated above, it can be evidenced that the commercialization of the franchises and the start of operations of a new franchisee, they are processes that converge in a single process, which have the same supplies in common and as a final result the same objective, the satisfaction of the franchisee (client), three procedures emerge from this process: franchise marketing, training commercial and operational and acquisition of real estate.These with their respective flowcharts can be evaluated in the corresponding formats.

Structured the process map of CASA 360, where the procedures that compose it can be identified, with clarity in the relationship between them and carrying out the documentation under the methodology of the PDCA Cycle, important changes are achieved in the work “mentality” of the company, that is to say, the entire human talent that compose it, since as evidenced in figure 6, an important documentary evolution process was created within the company, what was previously done in an artisanal or intuitive way is now part of a culture orderly organizational.

Figure 6. Evolution of the CASA 360 document standardization process



Source: Authors, 2020

The standardization process generates in the company important changes such as in the way of planning, executing and controlling and measuring the activities that are part of the daily work, all of the above with a single purpose, guaranteeing quality in the performance of each one[17]. This, with regard to the operation of the company, promotes an organized and systematic view of the activities, optimization of times, reduction of operational ambiguity, quality, productivity, and other factors that impact customer satisfaction, economic stability of the company and positioning. Of the Brand [18]. Finally, standardized work is the initial step for continuous improvement. "There can be no improvement where there are no rules" [19].

2. Taking times

Time taking was carried out taking into account the time standard such as: qualified operators, using a normal work rhythm and developing a specific activity. By studying times, efforts and costs are reduced, in addition to allowing to discover the best working method [20].The optimal sample size is determined by the following formula:

$$n = \left(\frac{40\sqrt{n' \Sigma x^2 - \Sigma(x)^2}}{\Sigma x}\right)^2 \text{ (i.e. (1))}$$

The number of samples to be taken is a total of 34 per worker, with a confidence level of 95%.The data distribution functions were obtained using Promodel's Stat Fit software, which will later allow the generation of random data with the same characteristics as the supplied sample data. The times were made to 3 specific procedures, creation of virtual tours, real estate acquisition and commercial and operational training. The following results are obtained per procedure:

2.1. Creation of tours

The data collection process regarding the development of virtual tours was carried out in two ways:

- Toma de tiempos con cronómetro por especialista en el lugar de trabajo, los primeros 30 días del proceso
- Toma de tiempos apoyados en material audiovisual (Grabaciones) de las sesiones de trabajo de cada una de las personas que componen el equipo de trabajo encargado del desarrollo de los tours virtuales, esto se realizó durante los 40 días restantes del piloto de toma de tiempos

  De la toma de datos se clasifican los tours de acuerdo a las características descritas por la tabla 2.

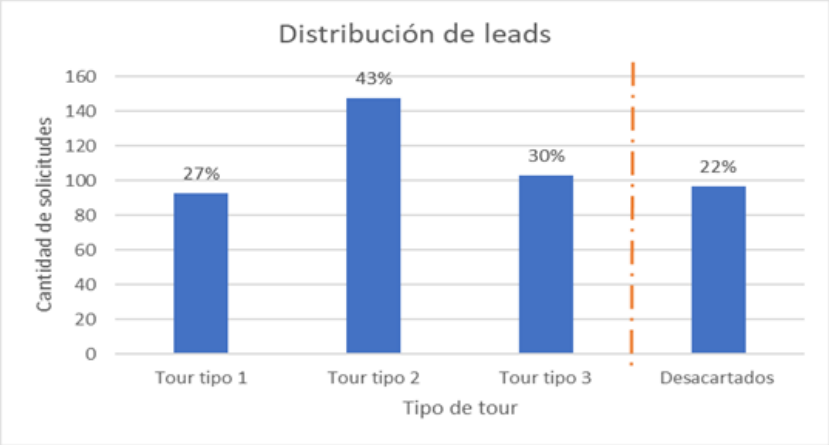
Table 2. Classification of tours in CASA 360

Tour type	Number of photos
Tour type 1	Until 30 Photos
Tour type 2	Between 31 y 60 Photos
Tour type 3	More of 61 Photos

Source: Authors, 2020

In total, during the 70 days of study the team received a total of 440 requests for tours. Of the 100% of the registered data, 22% is rejected because they do not meet the total requirements for the development of the tour. Of the amount of information that is workable, the types of tours are distributed according to figure 7.

Figure 7. Distribution of tours by type



Source: Authors, 2020.

The average times obtained from the three workers in charge of the development of the virtual tours in Casa 360 is shown in table 3, they occurred under the following conditions a) at a normal, constant, resolved work rhythm, without haste, as an unpaid worker piecework, but well managed and guarded; It seems slow but does not purposely waste time while observing it, for this reason a 75% assessment is given and b) understanding that the workers suffered periods of basic fatigue, have personal needs, and in their work process they are not exempt from eventualities, for these reasons 15% supplements are loaded as evidenced in table 4

Table 3. Average times of the virtual tour creation procedure

PROCEDURE - VIRTUAL TOUR CREATION				
No.	**Exercise**	**Average times in min. (Team)**		
		Tour type 1	**Tour type 2**	**Tour type 3**
1	Data review	5,05	5,86	6,56
2	Download photos	6,29	7,00	8,54
3	Photo transformation	6,34	8,91	13,45
4	Tour development (production)	29,22	43,42	72,93
5	Bug review	4,94	5,74	6,39
6	Upload to server	46,37	65,60	82,62
		98,21	**136,54**	**190,49**

Source: Authors, 2020.

Table 4. Standard times of the virtual tour creation procedure

PROCEDURE - VIRTUAL TOUR CREATION					
No.	**Tour type**	**Average time**	**Rating 75%**	**Supplement 15%**	**Total Time (Min)**
1	Tour type 1	98	74	11	85
2	Tour type 2	137	103	15	118
3	Tour type 3	191	143	21	164

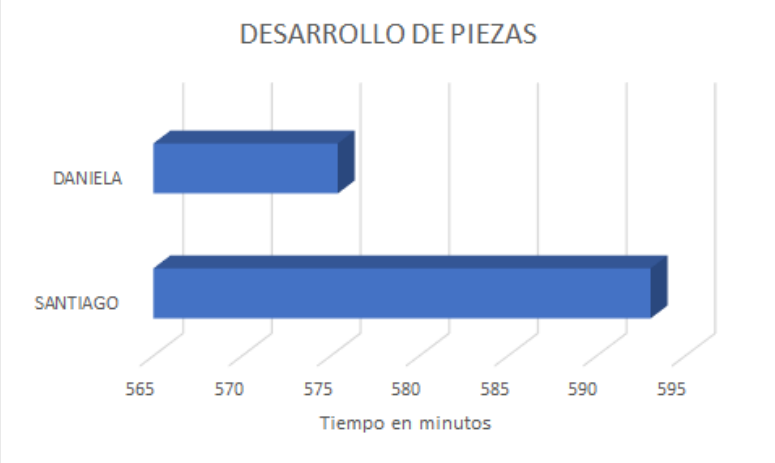
Source: Authors,2020.

The standardized times for the creation of virtual tours are the basis for the simulation of the proposal to improve this procedure, which generates a high level of reprocessing for the company, largely due to its non-standardization.

2.2. Real estate acquisition

The real estate acquisition process is very important for the company as it is part of one of the contractual commitments with the Casa 360 franchisees, this is divided into 7 activities within which there is one that weighs 60% of the procedure time, the creation of graphic pieces for the development of digital campaigns.Within the data analysis, an average difference of 18 minutes was found in terms of the development of the graphic pieces between the two workers in charge of the procedure, as evidenced in figure 8, for which the standardization of times in the procedure is imperative process.

Figure 8. Development of graphic pieces for the property acquisition procedure



Source: Authors, 2020.

Bearing in mind that under normal conditions the assessment given to workers is 75% and with a 15% load of rest and contingency supplements, standardization achieves a reduction in time close to 14% of the total procedure time, which It not only impacts resources in the use of time but also at an economic level.The standardized time is described in Table 5

Table 5. Standard times for the property acquisition procedure

	ITEM	TIMES (MIN)
MARKETING CAPTAIN	Notify Ok campaigns	1
	Develop graphic material	584
	Segment and georeferenced the market	73
	Activate advertising campaigns	15
	Linking forms to CRM	20
	Contact leads	4
	Campaign optimization	278
	TOTAL TIME	**976**
	ASSESSMENT	**75**
	BASIC TIME	**732**
	SUPPLEMENTS (15%)	**110**
	TYPICAL TIME	**841**

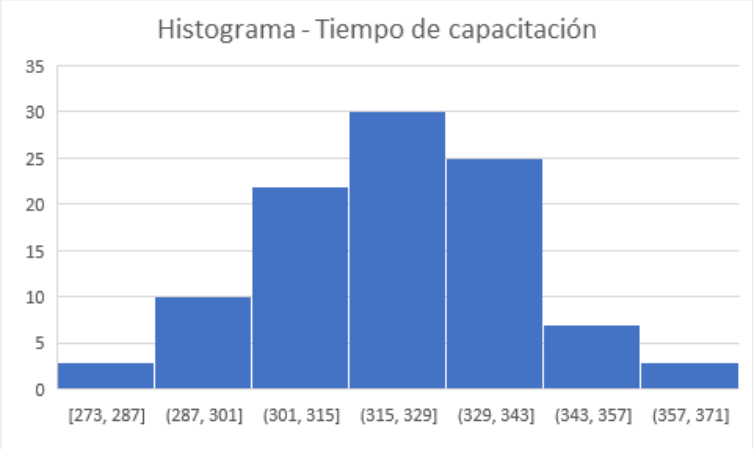
Source: Authors, 2020.

2.3. Commercial and operational training

A procedure that is susceptible to very high variability as it is not standardized is training, since it is influenced by different variables such as the trainer, those trained, the space, the place and even climatic conditions, after the analysis of the data obtained, the manages to identify a dispersion close to 27% between the data tails, these divided into seven time ranges, as evidenced in figure 9, after the standardization of times it can be seen in figure 10 the comparison before and after from standardization, a noticeable decrease in time

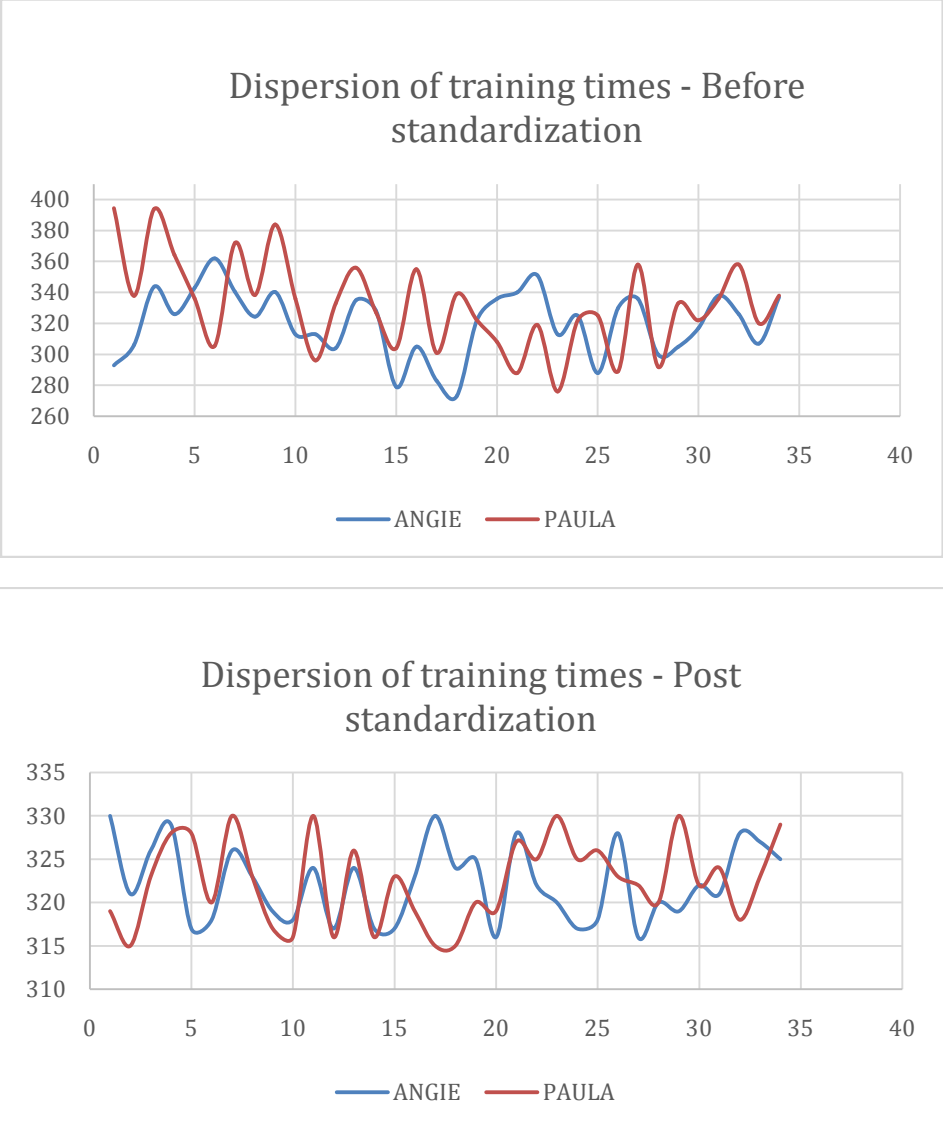
dispersion of ± 20 minutes, which is a reasonable time considering the ± 2 hours of the non-standardized procedure.

Figure 9. Histogram of the times of commercial and operational training



Source: Authors, 2020.

Figure 10. Comparison of the dispersion of training times before and after standardization



Source: Authors, 2020.

Bearing in mind that under normal conditions the assessment given to workers is 75% and with a 15% load of supplements for rest and contingency, standardization achieves a reduction in time close to 14% of the total procedure time. The standardized time is described in Table 6.

Table 6. Standard times for commercial and operational training

	ITEMS	DURATION (MIN)
COMMERCIAL AND OPERATIONAL TRAINING	Validation of the agenda and assignment of trainers	30
	Training team presentation	20
	Commercial presentation	147
	Operational presentation	148
	Equipment delivery	14
	Inspection viewed topics	15
	Request digital campaigns	3
	TOTAL TIME	**377**
	VALORACIÓN	**75**
	ASSESSMENT	**283**
	SUPPLEMENTS (15%)	**42**
	TYPICAL TIME	**325**

Source: Authors, 2020.

V. SIMULATION

To design the methodology, an input statistical analysis was performed in Stat Fit, in order to identify the behavior of the variables in the system. After conducting the goodness of fit and homogeneity tests, simulation is carried out in SIMIO in order to formulate to verify for the productivity of the system.

The existing and validated methodologies to carry out discrete event simulation studies are not similar, some authors propose different stages, these being complementary to each other [21].

Based on the analysis of the problem presented by the director of operations of the company, simulation is suggested as a validation method to determine if the restructuring proposal is the solution to the problems of time in the delivery of the tours.

The data obtained from the tour arrivals, having times a very high dispersion, were subjected to a smoothing process by transformation by natural logarithm, after this, they were subjected to goodness adjustment tests where they fit a normal Log distribution reaching a p-value of 0.685 in the Kolmogorov - Smirnov test with a confidence level of 95% as evidenced in figure 11

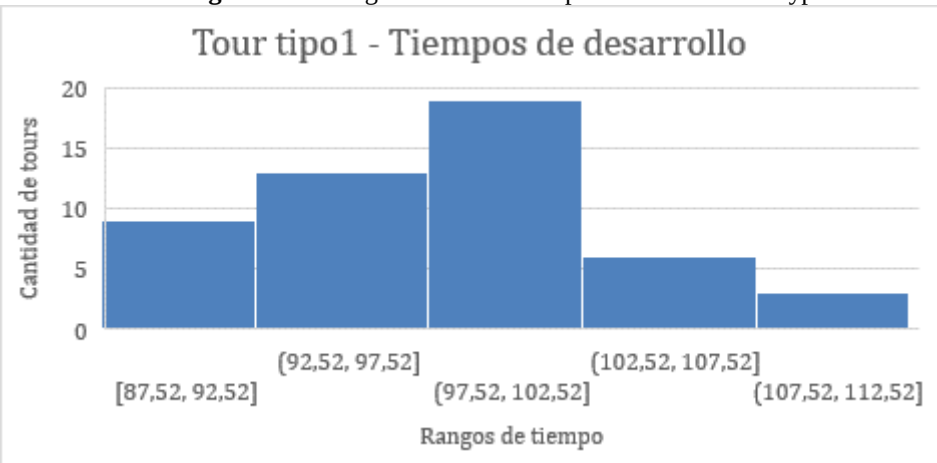
Figure 11. Goodness fit test - Input data

```
Lognormal
    minimum     =          2.86662
    mu          =          0.544949
    sigma       =          3.55139e-002
    Kolmogorov-Smirnov
        data points                    100
        ks stat                        7.46e-002
        alpha                          5.e-002
        ks stat(100,5.e-002)           0.134
        p-value                        0.607
        result                         DO NOT REJECT
    Anderson-Darling
        data points                    100
        ad stat                        0.525
        alpha                          5.e-002
        ad stat(5.e-002)               2.49
        p-value                        0.721
        result                         DO NOT REJECT
```

Source: Authors, 2020.

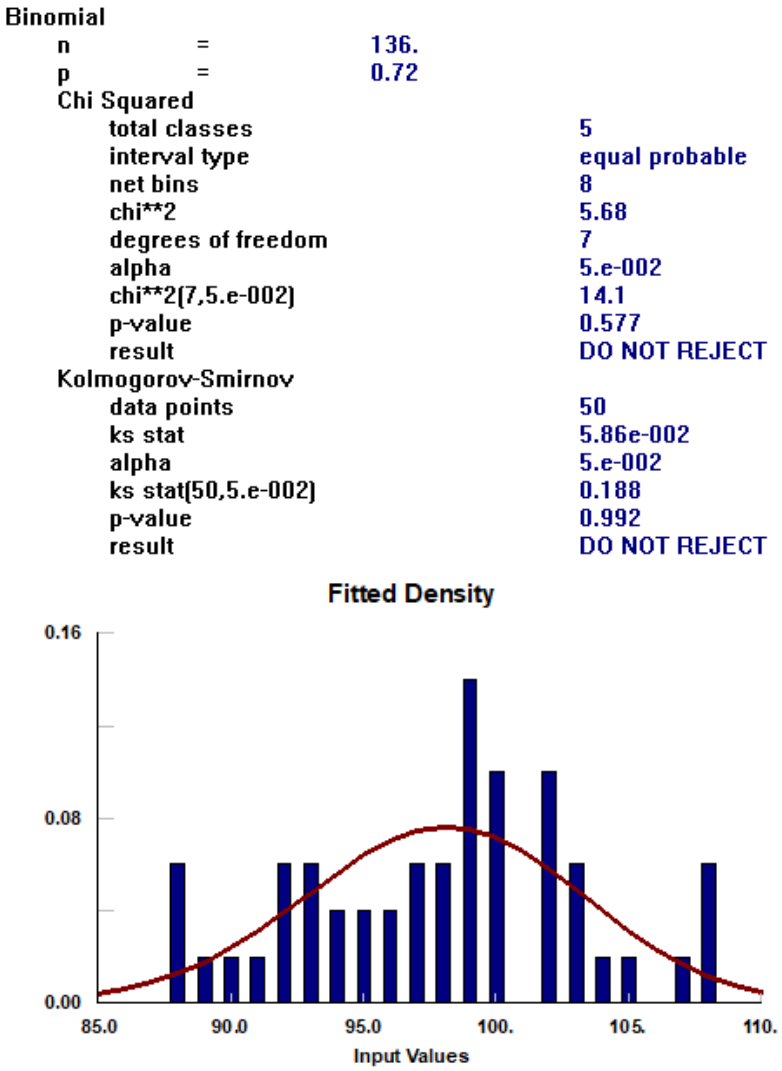
The data of the development times of the tours were analyzed by means of the Stat Fit software, in order to determine the distribution that best describes the behavior of the data, as a result of the analysis it was possible to determine that the data fit a binomial distribution.

Figure 12. Histogram of the development times of tour type 1



Source: Authors, 2020.

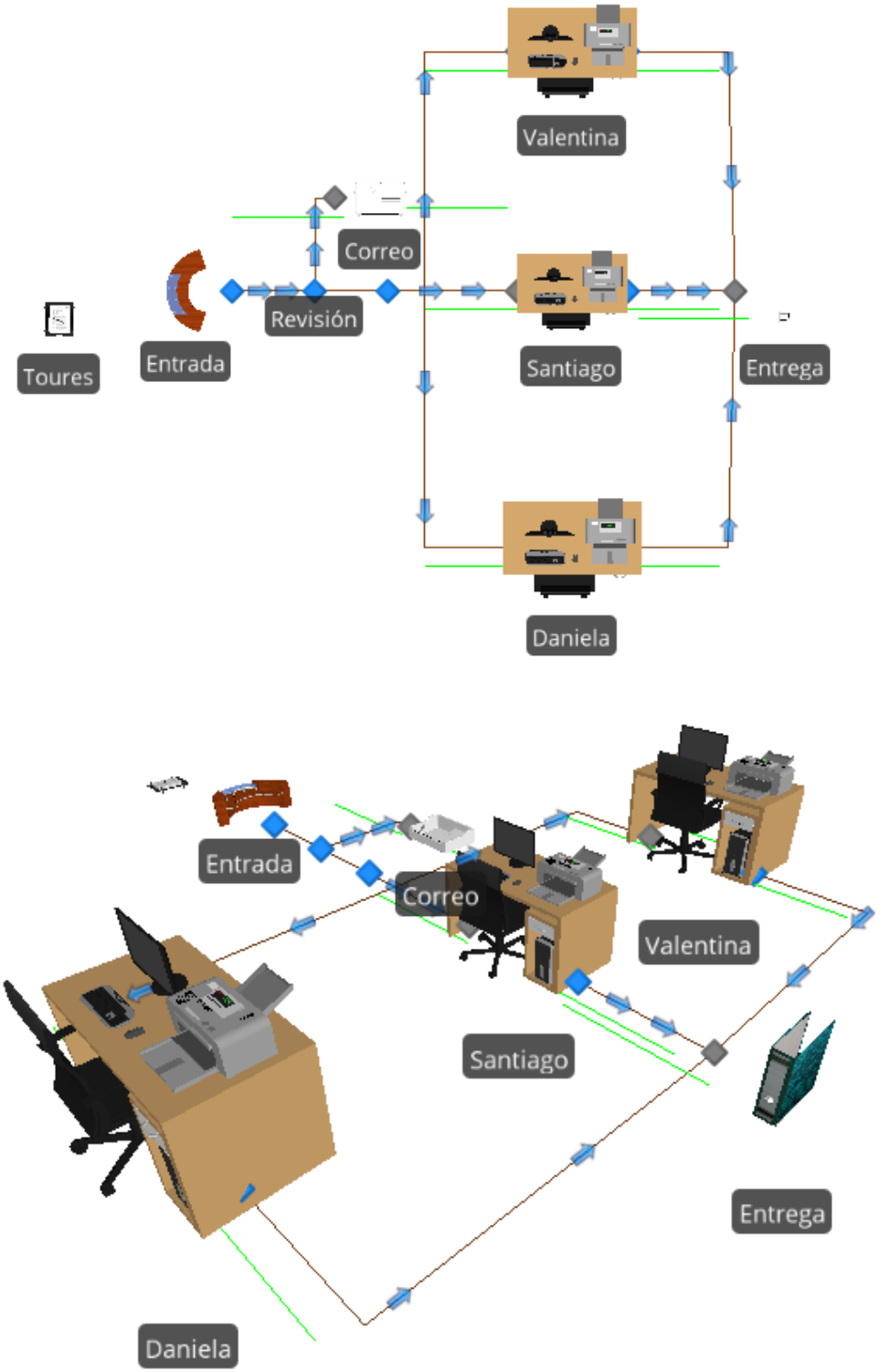
Figure 13. Goodness fit test, data obtained from tour type 1

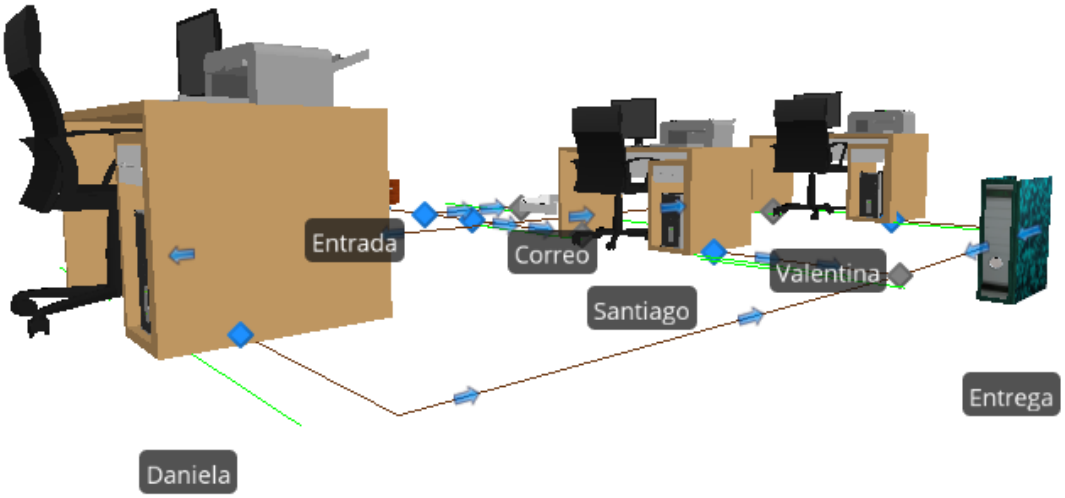


Source: Authors, 2020.

The simulation model is developed in the SIMIO software, based on the results obtained in the aforementioned analysis, previously the operation had been characterized as can be seen in figure 14, therefore the model comprises 1 input source, 1 entry control server, 3 workers, 1 exit, 3 servers that have different development times depending on the type of incoming entity and a behavior of data adjusted to the probabilistic distribution indicated above.

Figure 14. Characterization of the virtual tour creation procedure in SIMIO

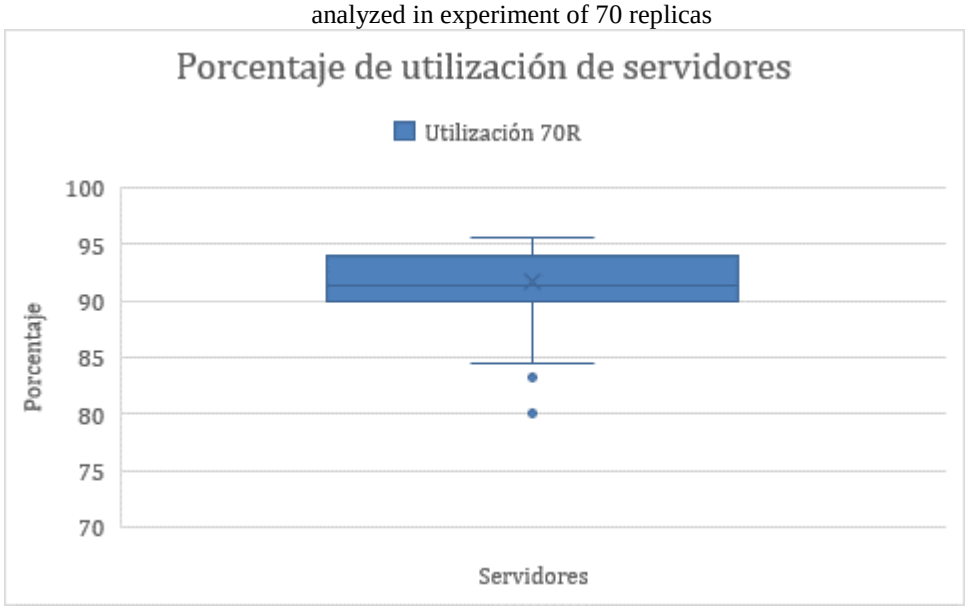




Source: Authors, 2020.

Two of the main goals when analyzing output data are to determine the absolute performance of the system configuration success and to compare the system configuration alternatives in a relative sense [22]. After the development of the model with 70 replicas, it is evident that the percentage of use of the servers (Work Team) is on average 91% and never exceeds 96%, as can be seen in figure 21.

Figure 15. Box and whisker scheme of the percentage of utilization of the workers of Casa 360 analyzed in experiment of 70 replicas



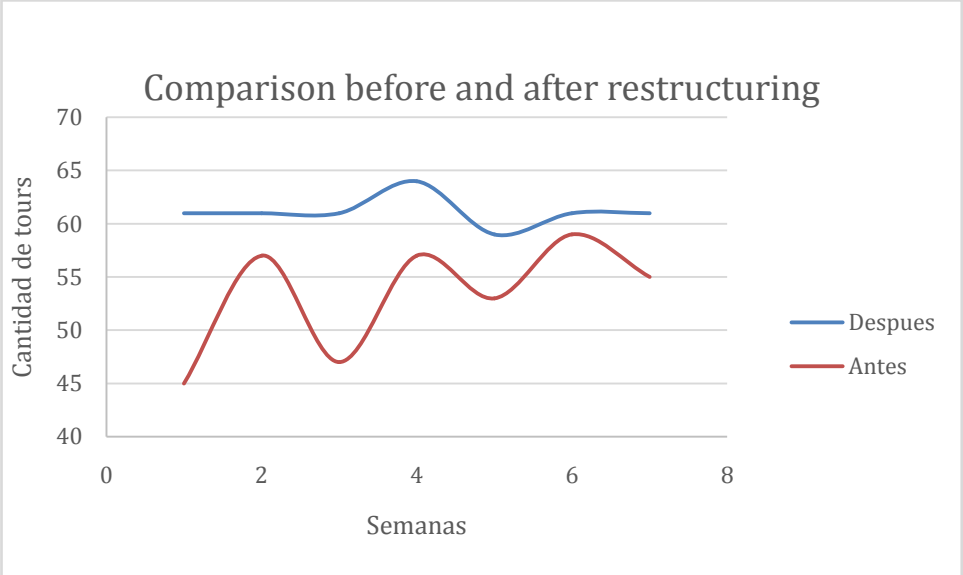
Source: Authors, 2020.

With the restructuring and standardization of times in the procedure, a general increase in productivity of 13% is achieved, as can be seen in figure 16, assuming a reprocessing margin close to 5%.And with standardization, it is possible to obtain an acceptable dispersion in deliveries that can be very useful to project the growth of the department and optimal hiring times.

Figure 16. Descriptive statistics of the delivery of tours in the experiment of 70 replications and comparative before and after the restructuring and standardization of the procedure

Delivery Tours - 70R

Half	60,9571429
Typical error	0,21384357
Median	61
Moda	62
Standard deviation	1,7891437
Sample variance	3,2010352
Kurtosis	-0,01061352
Asymmetry coefficient	0,09743475
Rank	8
Minimum	57
Maximum	65
amount	4267
Account	70
Confidence level (95,0%)	0,42660626



Source: Authors, 2020.

With these results we can infer that with the standardization and restructuring of the procedure in Casa 360, 4 tours per worker / day could be developed with a margin of ± 5% of error.

VI. FINANCIAL RESULTS

Financial analysis can be defined as a process that includes the collection, interpretation, comparison and study of the financial statements and operational data of a business.This implies the calculation and interpretation of percentages, rates, trends, indicators and complementary or auxiliary financial statements, which serve to evaluate the financial and operational performance of the firm is predicated, since profits are but one of the ingredients of value of the company [23].

Financial indicators are measures that try to analyze the state of the company from an individual point of view, they are used to show the relationships that exist between the different accounts of the financial statements; and they are used to analyze the liquidity, solvency, profitability and operational efficiency of an entity [24].

Financial indicators are used to show the relationships that exist between the different accounts of the financial statements; and they are used to analyze the liquidity, solvency, profitability and operational efficiency of an entity [25].

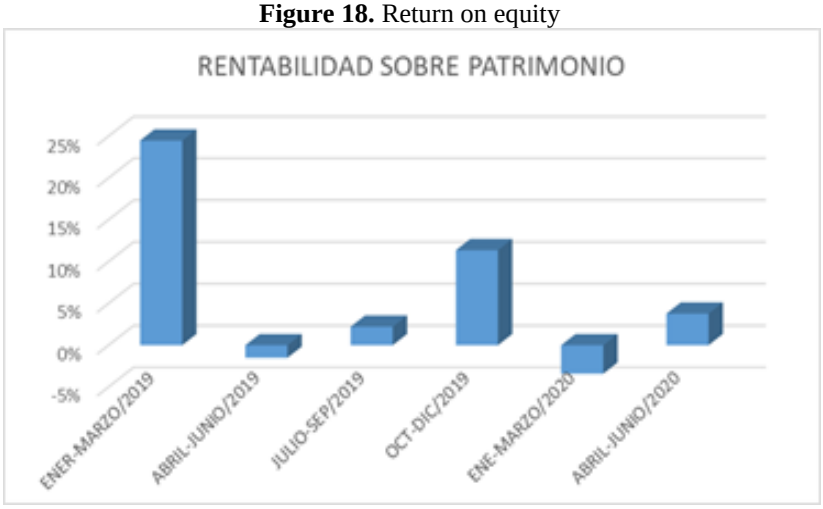
In the analysis, the quarters are consolidated in order to obtain clear and truthful information on the behavior of the company, for 2019 the average working capital was $ 42'214,619, equity profitability is also analyzed, which is 6% and return on assets which is 6% for this quarter.

As can be seen in figure 17 working capital, this indicator does not show much variability between its quarters, except for the last quarter of 2019, which presents a working capital well below the average, as for the other indicators, the return on equity and Return on assets presents an average of 6% with a lot of variability between quarters, this due to the fact that the company made investments and expenses in plant and technology that did not generate the expected commercial and economic impact, which was reflected in low or negative returns in the quarters where The investments were made as shown in Figures 17 to 19.

Figure 17. Working capital

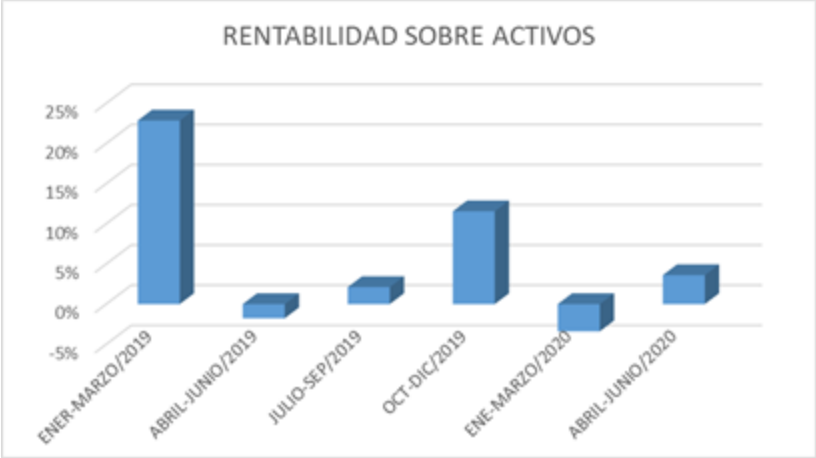
Source: Authors, 2020.

Figure 18. Return on equity



Source: Authors, 2020.

Figure 19. Return on assets



Source: Authors, 2020.

A projection is made for the next four quarters where it is taken into account that investments must be studied analyzing the risks within the company and in the market, as well as the optimization of processes is directly reflected in a small but constant growth, of this the average working capital is lower but returns will grow by 2 percentage points for equity and 7 percentage points for assets, this concludes that with less working capital, better returns will be generated.

VII. DISCUSSION

As the theory says, "proper administration and management of operations is aimed at producing a good and / or providing a specific service at the minimum possible time and cost"; therefore, it turns out to be a determining aspect in the strategic management of any organization, since it affects the performance of the company and the profits obtained in it.[26].

It was observed that as in his work "Design of the Process and Operations Management System for the administration of industrial maintenance in PopsyIce creams"[27], the implementation of the management system achieved an important improvement thanks to a planning, standardization and control of the processes, which allowed identifying problems to be solved.

Anyuly Cárdenas, in her work "Restructuring of operations at GESSTA LTDA" [28]. It was based on the identification, standardization and improvement of processes. For this, the information was collected and began with the determination of the most representative services of the organization. With this operational restructuring it was possible to lay the necessary foundations for the elimination of duplication in tasks, for the simplification of the different macro processes chosen and above all to guarantee the client the quality of the services provided as a direct consequence of what mentioned above, since the non-conformities that were taken as a basis in the diagnosis to make the different improvements were closed and gave way to control schemes regarding suppliers, collaborators and other resources that were not controlled or measured at the beginning.

Comparing the results of the aforementioned works, it can be said that these focus on the design of operations systems, limiting themselves to the structuring, restructuring of processes, in synthesis to a theoretical scope for subsequent implementation without leaving a clear idea of the possible impacts that could have, perhaps the greatest contribution of this research is the presentation of sustained results through the simulation of the data obtained, which gives a clear vision of how the management system will behave, which without a doubt is an incredible tool for responsible decision making in a company. However, not only is it analyzed whether the system works or not, but its validity at the economic level is supported, which in the end is the objective of each company, the projection of financial indicators through the analysis of the statements presented during the previous quarters and As with the simulation of data in the processes, an idea is obtained of how they will present growth according to the implementation of the designed tools.

The optimal solution to solve the problems mentioned and according to the articles and studies that support this research is the design and implementation of a system that will function as a framework and that will define the set of requirements that must be met to develop the operational activities of the CASA 360 commercial process.

VIII. CONCLUSIONS

With the implementation of the operations management system, they lead to an improvement in financial indicators by carrying out analyzes prior to investments, which minimizes the risk of losses and optimizes profitability, the implementation of the system must imply a rigorous monitoring and control where Any positive or negative variation within the financial statements and balance sheets are taken into account in order to take corrective measures for continuous improvement.

The importance of creating an operations management system is necessary for all organizations that, regardless of their size, pursue a clearly defined horizon (Mission, vision), companies focused on success and achieving achievements.For this it is important not only to build organizations that talk about processes, but also entities that "live" them, that communicate them to their collaborators always and of course always think about how to improve them.With the first tests underway of the management system designed for Casa 360, substantial changes have been noticed in the mentality of employees as it is more "structured" which, added to its innovative DNA, always to the exploration of new ideas and change have consistently generated a powerful complement to their growth plan.

La simulación como método de análisis de las operaciones de una empresa es una de las mejores herramientas sistemáticas para la toma de decisiones responsables [29] pues un modelo de simulación permite evaluar todas esas variedades de preguntas "y que tal sí" que vienen a la cabeza con respecto al modelo real [30]. La simulación del modelo de reestructuración del procedimiento de creación del tour virtual muestra resultados muy interesantes pues no solo logra impactar positivamente en la productividad sino también en la calidad del servicio, por ende, resulta imperativo poner en marcha el plan de implementación de este.

GRATEFULNESS

A CASA 360, its directors and employees allowing data to be obtained and providing the information and time necessary to carry out the project.

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