

The Management of Support processes in Cuban Universities

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ABSTRACT

Universities, in the current context, demand the use of modern management approaches, so the application of process management tools becomes a priority. In this sense, in Cuban universities the need to improve the management of support processes has been identified and, together with this, there are insufficiencies in the management of the accommodation process. The objective of the article is to propose a procedure that integrates tools of process management, risk management and applied control for validation in the accommodation process of the University of Holguín. The used procedure integrates tools of process management, risk management and management control, which contributes to decision making with a systems approach. The procedure implementation at Holguín University, made it possible to design the accommodation process file, the strategic map, the balanced scorecard, among other results, all of which contribute to the improvement of the management of this process. The model and procedure designed for the management of university management support processes and their implementation in the organization under study provided important process and risk management tools to achieve greater effectiveness in decision-making.

Keywords: University management, Support processes, Accommodation process, Risk management, Management control.

INTRODUCTION

The increase in competitiveness and complexity of the environment at a national and international level demands the design and introduction of new management technologies that contribute to achieving greater effectiveness in planning, organization, control and improvement of processes and in decision-making, with an inclusive approach at all management levels. Which is also a necessity in universities.

Among the most innovative approaches to achieve greater effectiveness in organizational management is that of processes (Medina León et al, 2019; Mennuto et al., 2021; Brancalion & Lima, 2022; Al Diabat, 2022; Jawahar & Mohammed, 2022; Bazan & Estevez, 2022); and more recently, emphasis is placed on the relevance of its application in universities, which is evidenced in the research carried out by Ortiz Pérez et al. (2015), Ricardo Herrera et al. (2020), Campaña Lara (2020), among others.

In this sense, several authors in the international arena have carried out research that includes models and procedures for the improvement of university management (Araújo & Gomes, 2021; Zúñiga Arrieta & Camacho-Calvo, 2022). Similarly, in Cuba progress has been made in the conception of models and procedures for higher education institutions (HEIs) (Ortiz Pérez et al., 2015; González Hernández, 2014; Jaquinet Espinosa, 2016; Pérez Fernández et al., 2022). These authors have focused on the fundamentals of strategic and substantive processes; however, less treatment is observed in support processes, highlighting the contributions of Alpízar Santana (2018) and Ricardo Herrera et al. (2020).

The Ministry of Higher Education (MES) in the strategic planning in the period 2017-2021, defined a process called material and financial resources, which has among its priorities, the improvement of the infrastructure, which impacts the study conditions, work and life of the university community, and efficient and effective university management, with proper use, registration, and control of material and financial resources.

In correspondence with the above, the accommodation process is considered as a support process that is part of the study, work and life conditions of the university community, therefore its efficient and effective management is essential for the development of activities generated by strategic and substantive processes.

At the University of Holguín (UHo), based on the analysis of the balance of the fulfillment of its objectives, and taking as reference the investigations of Ortiz Pérez et al. (2015) and Herrera Ricardo (2020), a series of limitations were identified in the management of the accommodation process, among which are the following: insufficiencies in the control and in the application of management tools by processes, lack of a system of indicators, risks are not identified by processes and techniques are not applied for their determination and in a general sense it was evidenced that the accommodation process does not ensure the satisfaction of all the demands generated by the university processes.

That is why the article aims to propose a procedure for the management of support processes in Cuban universities. The contribution focuses on the development of a procedure for the management of support processes in Cuban universities, which integrates process management tools (process file, flowchart, manual of standards and procedures), risk management (diagnosis and classification of risks, qualitative and quantitative evaluation, risk matrix and prevention plan), and management control (strategic map, system of indicators and balanced scorecard) and the results of the application are shown in the accommodation process of the University of Holguín.

The following theoretical and empirical methods were used in the research:

- Analysis and synthesis of the information obtained by reviewing specialized literature and documentation, as well as the experience of consulted specialists,
- inductive - deductive: for the conception and application of the procedure for the management of the hosting process,
- systemic: to develop the theoretical analysis of current trends in the management of support processes and the management of the hosting process,
- modeling: for the elaboration of the procedure and the proposed tools,
- Statistical methods: descriptive statistics, with the analysis of the measures of central tendency and those of variability in the study of models and procedures for the management of support processes in universities, as well as the analysis of social networks to determine the authors. and more central variables,
- case study: for the practical validation of the procedure through its application in the accommodation process of the University of Holguín, and
- Empirical methods: interviews, direct observation, among others.

To process the information and obtain the results, the UCINET 6 software and the Statistics Program for Social Sciences (SPSS) software were used.

DEVELOPMENT

Next, a review of the literature on the management of support processes in universities is carried out, of the models and procedures provided by different authors in the period 2009-2022 and it concludes with the characteristics of the accommodation process at the University of Holguín.

Models and Procedures for the Management of Support Processes in Universities

Ortiz Pérez et al. (2015), after analyzing the concepts of university management present in the literature, defines it as the planning, organization, implementation, control and improvement of university processes in an integrated way, to increase their quality, in the search for excellence and the satisfaction of society's demands (efficacy), through greater effectiveness in decision-making and rationality in the use of resources (efficiency).

This author emphasizes the need for integrated management and to increase efficiency and effectiveness, associated with the optimal use of resources, criteria with which Jardel et al. (2020), stating that universities are complex organizations with multiple products and limited budgets to fulfill their mission and need to have management tools that allow the effective and efficient implementation of their strategies and policies.

In recent years, there has been a trend in the increase in research on process management in universities, with new proposals that advocate integrated management (Ortiz Pérez et al., 2015) or combine it with strategic analysis (Veliz Briones et al., 2017) and quality management (González Hernández, 2014; Campaña Lara, 2020; Pérez Fernández et al., 2022) and propose methodological tools to increase efficiency and effectiveness in management (Medina León et al, 2019).

Specifically for the management of support processes, proposals have been developed by authors such as Alpízar Santana (2018); Murillo Mora & Reyes Espinosa (2018) and Ricardo Herrera et al. (2020), who also define them as support processes, not appreciating differences between one term and another, agreeing that they are the basis for the development of strategic and substantive processes, and guarantee material, financial and technological resources, so their customers are internal to the organization, criteria shared by Ortiz Pérez et al. (2015) and Ricardo Herrera et al. (2020).

In this context, the research carried out by Ricardo Herrera et al. (2020) stands out, when proposing a technology for the management of material and financial assurance in HEIs, defining it as the process of planning, organization, implementation and control of material and financial resources in a strategic, systemic and integrated approach for the improvement of study, work and life conditions that contribute to the development of substantive processes, with the efficient use of resources.

In the investigations of Ortiz Pérez et al. (2015) and Ricardo Herrera et al. (2020), the accommodation process is classified as one of the support processes that are developed in Cuban

universities and on which the research is focused as it is essential for the assurance of the activities of the substantive and strategic processes.

Next, the study of 19 models or procedures for the improvement of the management of support processes that appear in the literature published in the period 2009-2022 is carried out and their main contributions and limitations are analyzed, based on five variables of interest for research, related to the process approach, risk management and management control (strategic map, indicator system and Balanced Scorecard).

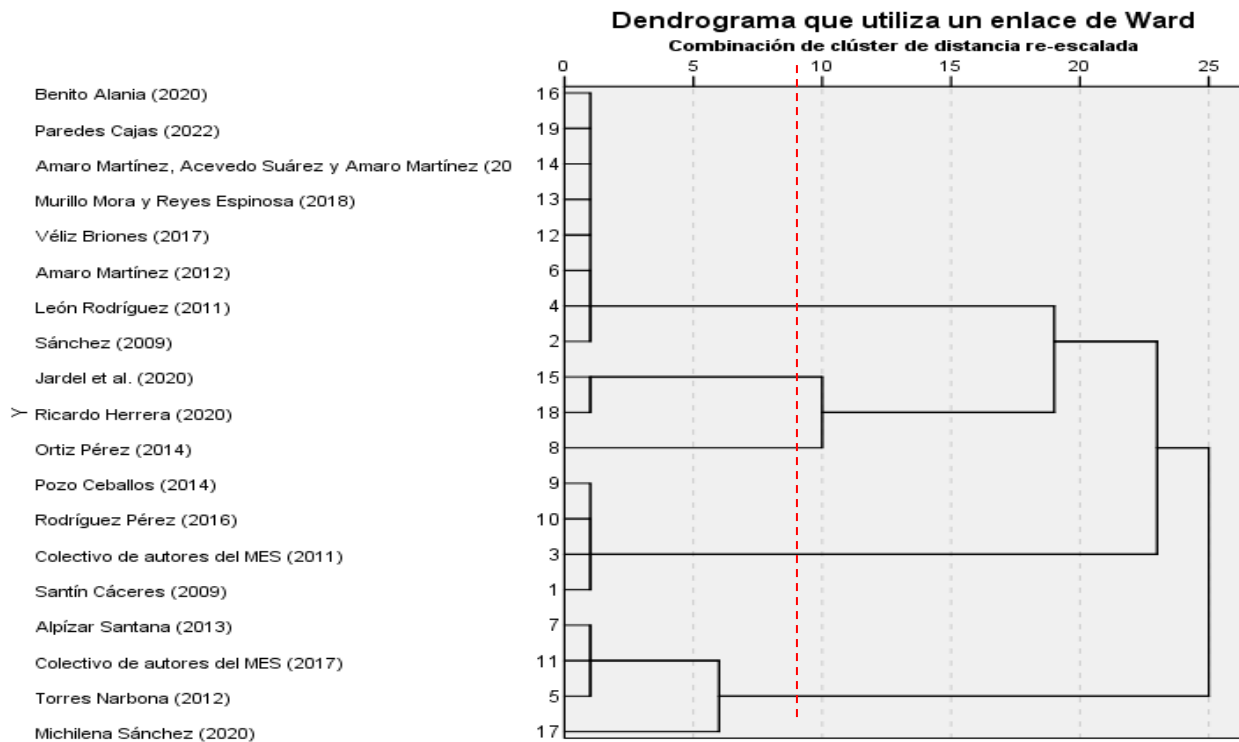
Among the most used approaches in organizational management in recent times are process management and management control (MC), the close relationship that exists between them has been the subject of several investigations (Medina León et al, 2021), from which it can be concluded that both complement each other in order to improve the processes and their effectiveness. In this sense, the tools used in the MC for decision-making are numerous and varied, as are the authors who address them (Ortiz Pérez et al., 2015; Vega de la Cruz et al., 2022), who agree on the need to design the map strategy of the organization, the system of management indicators (SMI) and the balanced scorecard (BS), so that in the research that is carried out these variables will be the object of study as a complement to the management by processes.

In the same way, risk management as part of internal control is essential to achieve the objectives of the organization, the relationship between management by processes, management control and internal control has been analyzed in studies carried out by Vega de la Cruz and Ortiz. Pérez (2017), Vega de la Cruz et al. (2022) and Vega de la Cruz and Marrero Delgado (2021), specifically in the context of universities, the application of the tools of these three approaches can be seen in the procedure proposed by Ortiz Pérez et al. (2015), which includes the identification and classification of risks, the risk map and the prevention plan, which are considered fundamental for the management of the accommodation process.

Therefore, it was decided to carry out the study of the variables process approach (PA), strategic map (SM), proposal of indicators (Ind), BS and risk management (RM) and their treatment in models and procedures developed specifically for the management of support or general university management processes but which include support processes in their conception.

A binary matrix was constructed based on the presence or absence of the variables and SPSS was used to perform a hierarchical cluster analysis by authors, through which the dendrogram shown in Figure 1 is formed at level eleven the existence of four groups is delimited. The first group is represented by Sánchez (2009), León Rodríguez (2011), Amaro Martínez (2012), Véliz Briones (2017), Murillo Mora and Reyes Espinosa (2018), Amaro Martínez et al. (2019), Benito Alania (2020) and Paredes Caja (2022).

Figure 1. *Cluster analysis by authors.*

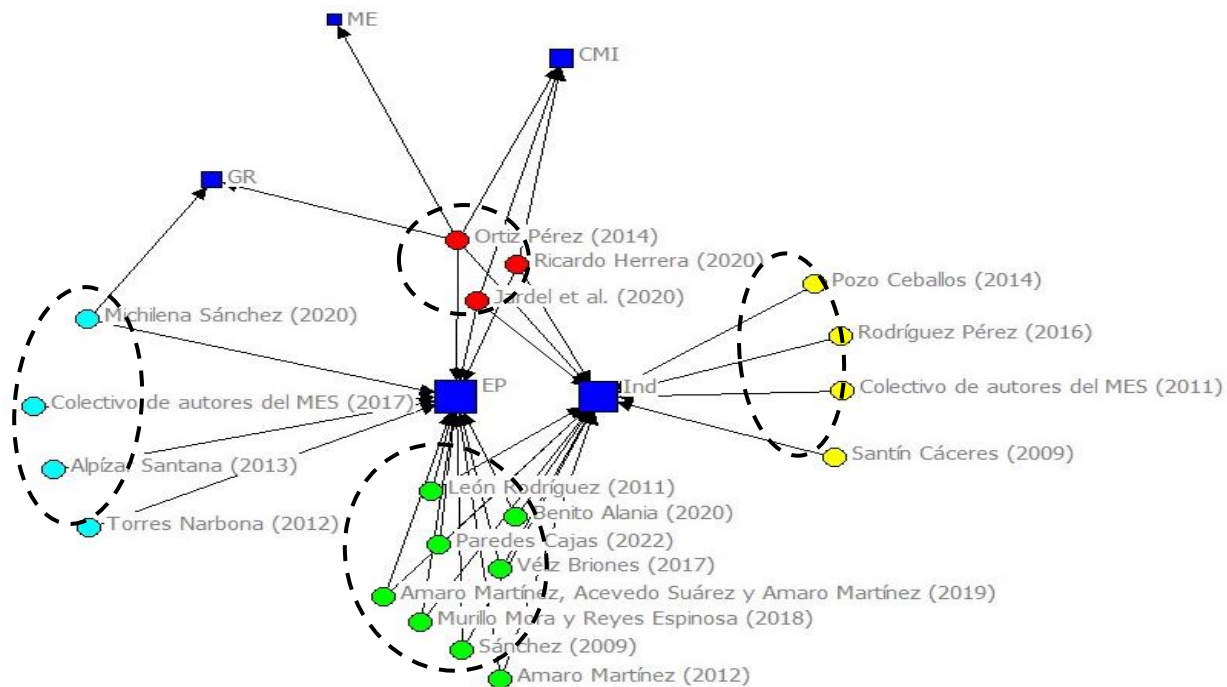


Note: Own elaboration.

In the second cluster, Ortiz Pérez et al. (2015), Jardel et al. (2020) and Ricardo Herrera et al. (2020). The third composed of the authors: Santín Cáceres (2009), Collective of MES authors (2011), Pozo Ceballos et al. (2017), Rodríguez Pérez et al. (2015); and the fourth by Torres Narbona (2012), Alpízar Santana (2018), MES et al. (2017) and Michilena Sánchez (2020).

To visualize the relationships established between these groups of authors and the variables they deal with, the matrix is processed in the UCINET software. With the NetDraw application, the relationship network shown in Figure 2 is obtained, corroborating the existence of four clusters.

Figure 2. Network of relationships between the variables of the models-procedures and authors.



Note: Own elaboration.

The conglomerate represented by Torres Narbona (2012), Alpízar Santana (2018), MES (2011, 2017) and Michilena Sánchez (2020) emphasizes the process approach, but only the proposal by Michilena Sánchez (2020) includes management in this case, the fundamental contribution lies in the conception of a comprehensive financial risk management model for a public higher education institution based on financial and budgetary evaluation in Ecuadorian universities.

The proposals by Santín Cáceres (2009), Collective of MES authors (2011), Pozo Ceballos et al. (2017) and Rodríguez Pérez et al. (2015) only include the analysis of indicators, while more recent authors represented in the conglomerate made up of Sánchez (2009), León Rodríguez (2011), Amaro Martínez (2012), Véliz Briones (2017), Murillo Mora and Reyes Espinosa (2018), Amaro Martínez et al. (2019), Benito Alania (2020) and Paredes Caja (2022) complement process management tools with management indicators.

As can be seen when analyzing the structure of the network, the most central authors are Ortiz Pérez et al. (2015), Jardel et al. (2020) and Ricardo Herrera et al. (2020), making up the most representative conglomerate by containing in their proposals a greater number of variables that include: risk management, the design of strategic maps and the BS.

Jardel et al. (2020) conceives a budget management model based on activities, their research is based on the process approach and they design a strategic map and system of management indicators for universities in Argentina.

The technology for the management of material and financial assurance in Cuban higher education institutions (HEIs) by Ricardo Herrera et al. (2020) is essential for the study. This

research focuses on support processes and performs an analysis of the accommodation process as part of the of these. It applies process management tools, designs a SMI and the BS, in the same way it constitutes a reference in the improvement function.

Ortiz Pérez et al. (2015) develops a technology for the integrated management of processes in universities, this proposal is taken as a reference in the design of the procedure for the management of the accommodation process, as it contains all the variables under study, integrating tools from the process management, risk management and MC.

When carrying out an analysis by variables, it is observed that the most central variables are the process approach and the design of management indicators, present at the same time in 78.9% of the analyzed investigations. However, it is appreciated that the application of risk management tools and management control (RM and MC) is insufficient, the risk management variable is only present in two of the proposals studied, while the BS in three and the strategic map only in one.

From this study, it can be concluded that the models and procedures analyzed make relevant theoretical and methodological contributions to the management of support processes; However, the need to develop a procedure that integrates tools for process management, risk management and management control is evident, as well as its necessary adaptation to the characteristics of the accommodation activity as a support process in universities.

Management of the Accommodation Process. Characteristics at the University of Holguin

The accommodation process constitutes one of the support processes that are developed in Cuban universities and that serves as support for the activities of the strategic and substantive processes. In this context, the UHo is part of the network of MES universities and is classified by its characteristics (number of careers, undergraduate and postgraduate enrollment, programs, and staff) as a group one university, in which 14 processes are developed, of them, three are strategic, four are substantive, four are supportive, and two are considered transversal. In the same way, the accommodation process is classified as support and the accommodation department (AD) as responsible for its management, in it the need for its improvement was identified given the increase in its level of activity due to the multiple demands generated by the strategic and substantive processes, fundamentally the quality management process, with the increase in external evaluations of university programs and in the research process the activities generated by the UHo events system.

The process for its study is broken down into three fundamental sub-processes: accommodation in academic postgraduate residence, accommodation in hotel facilities and accommodation in facilities in other provinces. The treatment for each category depends on the customer type, the reason for which the service is requested and the level of priority defined by the empowered authority. Customers are divided into national and foreign.

The main national customers are:

- UHo workers who have a high level of priority due to their status as internal customers,
- personnel from institutions belonging to the MES, and

- Institutional staff from other agencies of the central state administration, government, and other ministries.

Foreign customers are grouped into academic undergraduate and postgraduate, for students who are undergoing this type of study in the country. Common points in the accommodation process include: issuing and receiving requests for the accommodation service, managing the service with the required quality in accordance with the established standards and managing collections and payments for services. The differences lie in the period and way of making the request, the type of reservation, the method of payment and its accounting.

From the study carried out to characterize the accommodation process at the UHo and taking as reference the investigations of Ortiz Pérez et al. (2015) and Herrera Ricardo (2020), a series of limitations were identified in the management, among which are: insufficiencies in control and in the application of management tools by processes, lack of a system of indicators, risks are not identified by processes and techniques are not applied for their determination and in a general sense it was evidenced that the accommodation process does not ensure the satisfaction of all the demands generated by the university processes, for which the need arises to apply a procedure that allows achieving greater effectiveness in its management. Intentionally selecting the accommodation process of the UHo as a case study within the support processes.

METHODOLOGY

The proposal of a procedure for the management of support processes in Cuban universities is made, it is structured with the logic of the management cycle and is shown in figure 3. In the transversal stage of communication and training as well as in from planning to implementation and control, the proposal of Ortiz Pérez et al. (2015) is adapted to the characteristics of the accommodation process. The fundamental tools that are used for each stage and that will be applied in the UHo are described.

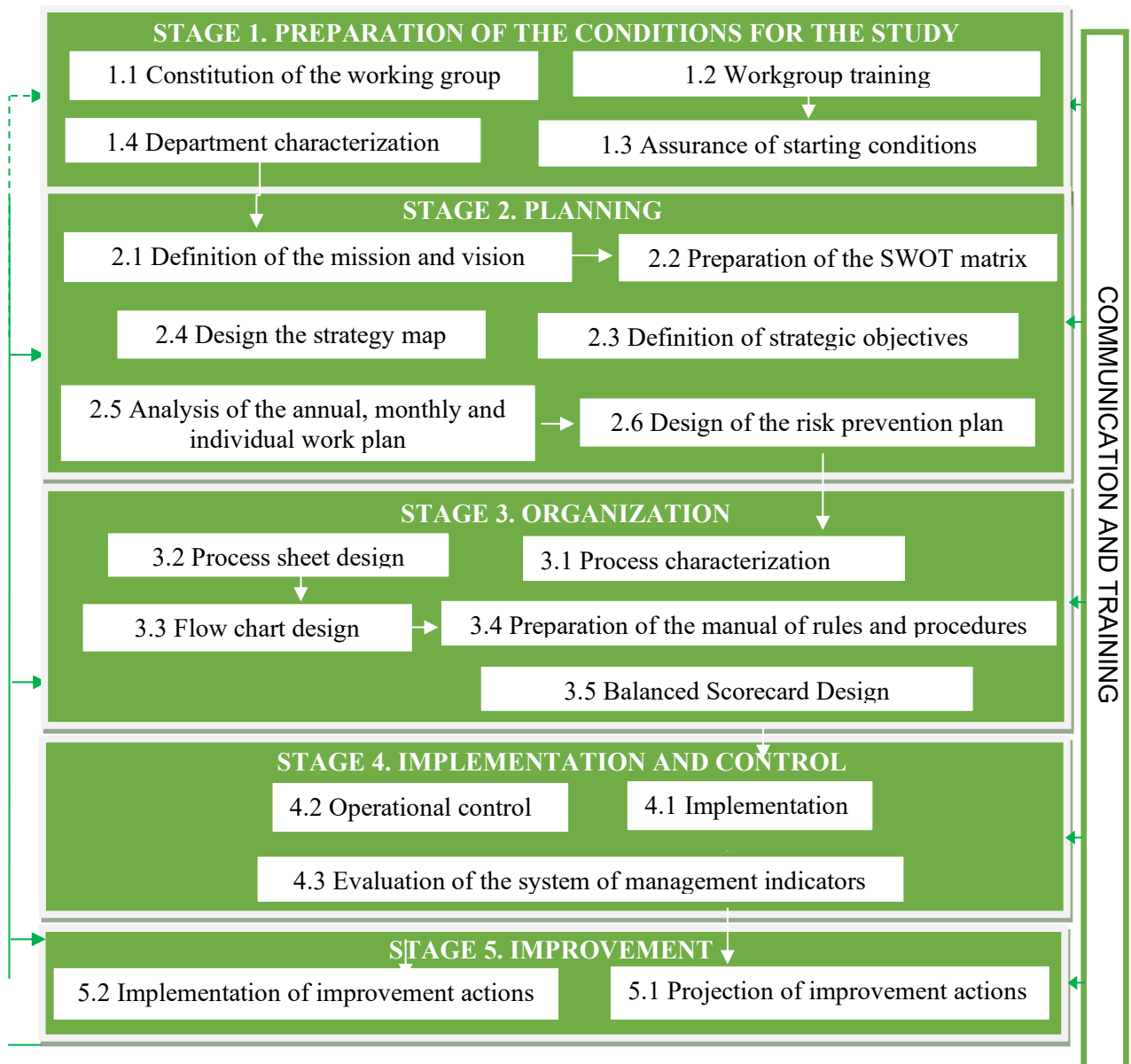
Strategic Map Design

The strategic map provides the foundations on which the BS is built, Ortiz Pérez et al. (2015) proposes the following steps for its design:

1. Define the perspectives and their order. In universities, non-profit organizations, the financial perspective is not the end, but a means to achieve the end (satisfaction of society), the order of the perspectives is as follows: financial, training and development, internal processes and customers.
2. Define the objectives of each perspective. For this, it is considered that the universities have as sources of financing the state budget and the commercialization of products and services that are the support of the perspective of training and growth in which the necessary human and technological resources are found to be able to act on the processes (efficiency), that in their integration the satisfaction of the demands of society is achieved (efficiency), which is the supreme objective of university management.

3. Establish relationships between perspectives. This step consists of establishing the relationships between the actions to be carried out in the different perspectives, in this way it will be easier to visualize the goal to be achieved. The name of the perspectives can change depending on the interests of the organization, but the location within the strategy map must follow a causal logic.
4. Represent relationships. The strategic map is conceived graphically, through arrows whose direction will indicate the dependency relationships between one objective and another, which can be done manually or using software designed for this purpose.

Figure 3. Procedure for the management of support processes in Cuban universities.



Note: Adapted from Ortiz Pérez et al. (2015).

Design of the Risk Prevention Plan

The risk prevention plan is a working tool for management to systematically monitor control objectives. For its elaboration, the steps proposed by Ortiz Pérez et al. (2015) are adapted to the characteristics of the support processes:

1. The risks of the areas responsible for the management of support processes are identified.
2. The risks are defined by processes and sub-processes.
3. The qualitative evaluation of the risks is carried out according to the probability of occurrence, for which the frequency (infrequent, frequent and moderate) and the impact (catastrophic, serious, moderate and slight) are considered.
4. The risk map is designed, the impact is represented on the Y axis and the frequency on the X axis.
5. Priorities are established, based on the consideration that:
 - High priority is given to those risks whose impact is catastrophic or serious,
 - Medium priority those whose impact is moderate,
 - Low those with a slight impact, and
 - Within these categories, those risks whose probability of occurrence is frequent have priority.
6. The risk prevention plan is designed according to the model of Annex B from Resolution 60/2011 of the General Comptroller of the Republic of Cuba.

Prepare Process File

For the development of the files, one must begin with the review and analysis of all legal, regulatory and technical documentation in force, as well as conducting interviews with the directors and experienced professors of the university with the aim of knowing the particularities of the processes and make their description.

In addition to the general records of the processes, the records of the sub-processes are elaborated for a better organization and understanding of the same. The following steps are suggested:

1. Identify the elements that will make up the process file.
2. Identify risks, as established in Resolution 60/2011.
3. Define the indicators.

The file template proposal is shown in Table 1.

Table 1. *Process file template*

Logo and identifier of the university		Process name	
Responsible:		Objectives:	
Threads:			
Legal, regulatory and technical documents:			
Inputs:		Outputs:	
Suppliers:		Customers:	
Process description:		Generated logs:	
Process risks:		Relations with other processes:	
Indicators:			
Prepared by:	Date:	Reviewed by:	Date:

Note: Adapted from Ortiz Pérez et al. (2015).

Balanced Scorecard Design

The design of the BS will be carried out taking as a reference the proposal of Ortiz Pérez et al. (2015), developing a classification of indicators by perspectives and impacts in a single tool. It is done from the steps described below:

4. Characterization of the indicators: considering the name, units, glossary, objective, reference levels, person in charge, reading point and periodicity.
5. Classification of indicators: the indicators are classified by the perspectives defined in the strategic map and by impacts.
 - Classify the indicators by perspectives: the indicators are classified considering the customer, process, training and development, and financial perspectives.
 - Classify the indicators by their impact: to assess the degree of compliance with the objectives, the indicators are classified by their impact on efficiency and effectiveness.

Design of the Management System Indicators (MSI) Manual

The above steps allow for the design of the MSI manual. Table 2 shows a proposal for an indicator file. The MSI can be formed as a printed document or in electronic format, as part of the organization's information system, to serve as a consultation and work tool for managers and specialists.

Table 2. *Indicator sheet of the management system indicators manual*

Indicator name:		
Objective	It is necessary to clearly define the objective of the indicator, its <i>raison d'être</i> , which will allow a better understanding of the results obtained in its evaluation.	
Classification	Perspective	Perspective to which the indicator belongs
	Impact	It is classified into efficiency indicators and effectiveness indicators.
Equation	When it comes to quantitative indicators, the mathematical expression for calculating their value must be clarified, with the identification of the factors and the way in which they are related.	
Periodicity	It will answer the question: when to measure it?	
Source	Origin of the information for the measurement of the indicators.	
Reference level	It is associated with the desired state of the indicator, which will serve to compare it with the current state	

Note: Adapted from Ortiz Pérez et al. (2015).

RESULTS

The main results of the application of the procedure for the management of the accommodation process at the University of Holguín are presented in stages below.

Communication and Training

Communication and training are developed during the application, the fundamental actions carried out were: training in the board of directors of the AD and in the main departments of the UHo, to achieve the commitment and participation of the workers. In the designed work schedule, training activities developed in each stage of the procedure were specified.

Preparation of the Conditions for the Study

The working group was formed, made up of members of the AD, the economics department, the organization and planning department and the quality department, and the characterization of the AD was carried out. The AD, subordinate to the general management, has an approved staff of 70 workers (95.7% coverage). It has four postgraduate residences (170 rooms) distributed throughout the UHo headquarters and, in addition, contracts with other facilities in the country for national clients who require these services.

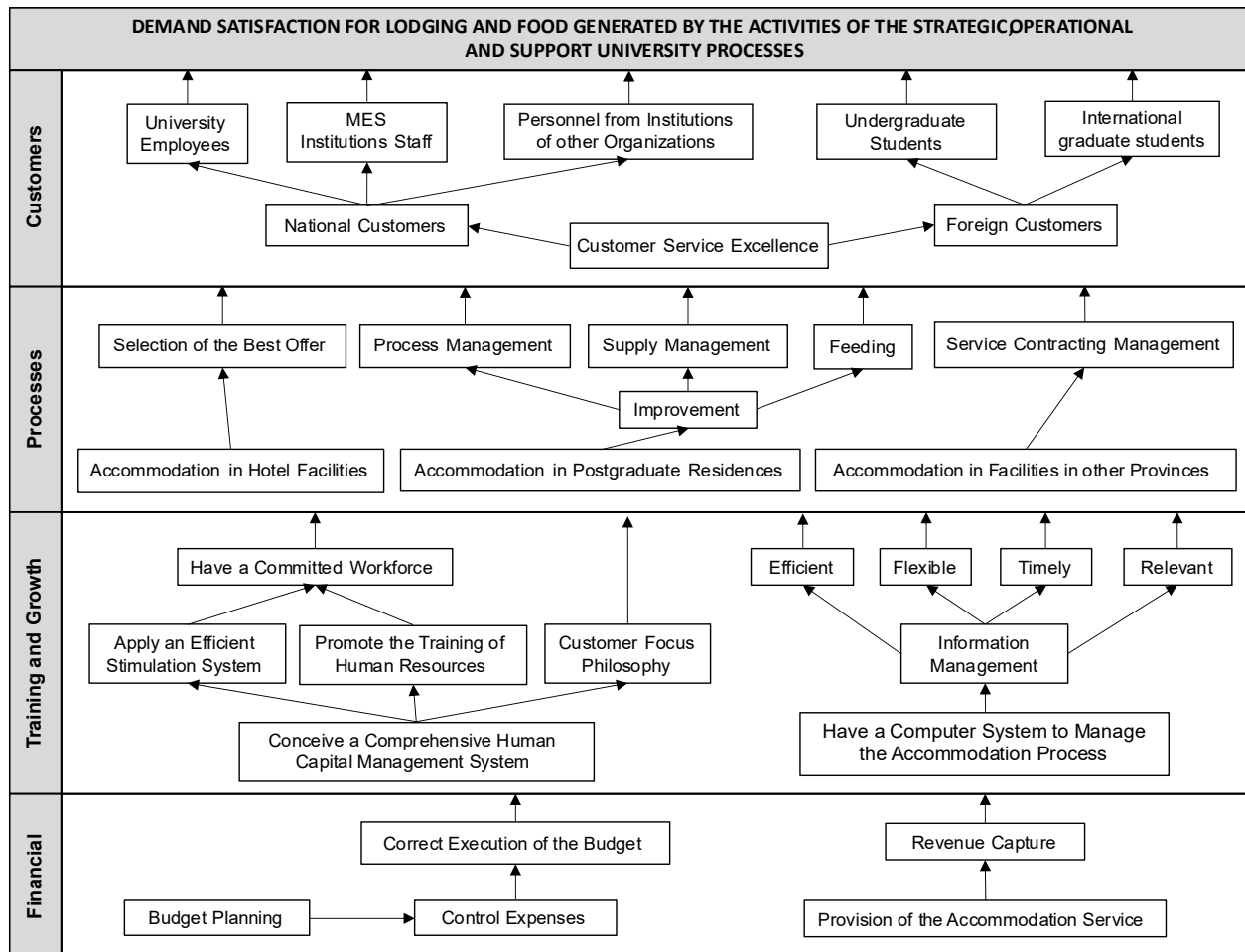
Planning

The AD had not defined the mission and vision, which is why the following proposal is made:

- Mission: The accommodation management meets the demands for lodging and food generated by the activities of the processes of the University of Holguín, aimed at national and foreign customers.
- Vision: Provide an excellent service based on continuous improvement, satisfying the demands for lodging and food generated by the activities of the processes of the University of Holguín, aimed at national and foreign customers.

A distinctive element in the development of this stage is the design of the strategic map, which is shown in figure 4.

Figure 4. *Strategy map of the accommodation process.*



Note: Own elaboration.

Design of the Risk Prevention Plan

It was possible to detect that the risk assessment is not carried out periodically and is not structured by processes. Eighteen risks were identified as shown in Table 3, which shows the qualitative evaluation according to the probability of occurrence and the impact.

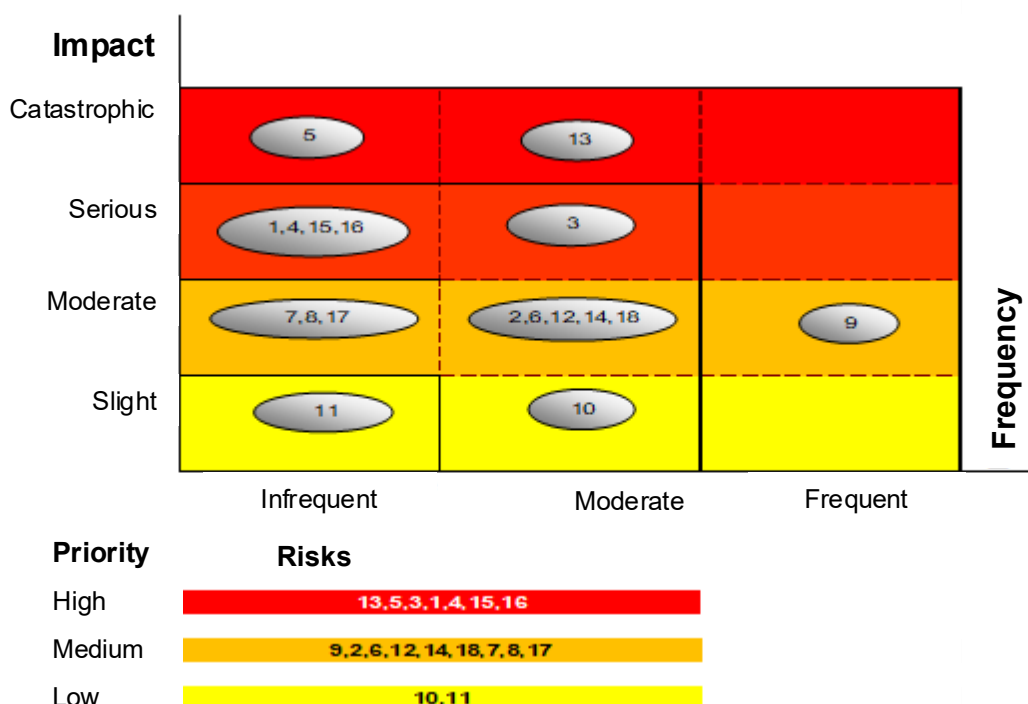
Table 3. *Qualitative risk assessment.*

No	Risks	Frequency	Impact
1	Diversion of resources.	Infrequent	Serious
2	Access of personnel from outside the facilities	Moderate	Moderate
3	Lack of control in the use of resources	Moderate	Serious
4	Operation of residences for unauthorized purposes.	Infrequent	Serious
5	Accepting bribes to favor suppliers or stakeholders in general.	Infrequent	Catastrophic
6	Failure to comply with the rules established for the accommodation activity in the postgraduate residence.	Moderate	Moderate
7	Failure to comply with the rules established for the activity of accommodation in hotel facilities.	Infrequent	Moderate
8	Failure to comply with the rules established for the activity of accommodation in facilities in other provinces.	Infrequent	Moderate
9	Customer dissatisfaction with accommodation conditions in postgraduate residences.	Frequent	Moderate
10	Customer dissatisfaction with accommodation conditions in facilities in other provinces.	Moderate	Mild
11	Customer dissatisfaction with the conditions of accommodation in hotel facilities.	Infrequent	Mild
12	Lack of correspondence between the quality of the service and the price.	Moderate	Moderate
13	Lack of supplies to develop the accommodation activity in postgraduate residences.	Moderate	Catastrophic
14	Poor conditions in postgraduate residences.	Moderate	Moderate
15	Waste, waste and diversion of energy carriers (water, gas, gasoline and electricity).	Infrequent	Serious
16	Violations in the use and control of tangible fixed assets and means in use.	Infrequent	Serious
17	Lack of suitability of managers.	Infrequent	Moderate
18	Insufficient preparation of the workers who carry out the accommodation activity in the postgraduate residences.	Moderate	Moderate

Note: Own elaboration.

Figure 5 shows the risk map, establishing priorities according to frequency and impact.

Figure 5. Risk map



Note: Own elaboration.

Once the previous steps have been completed, the risk prevention plan for the accommodation process is designed, an example is shown in Table 4.

Table 4. Risk prevention plan for the accommodation process (sample)

Risk prevention plan for the hosting process	
Risk	Failure to comply with the rules established for the accommodation activity in the academic postgraduate residence.
Negative manifestations	Breach of Resolution No. 63/2020 of the MES, which governs the fees for the collection of academic postgraduate residencies. As well as the procedure of the entity for the collection of accommodation and food
Measures to take	Control monthly the work of use and destination of the facilities, the results of the audits, and the control documents of the residences.
Responsible	Accommodation manager
Executes	Accommodation Management Technician
Date	January-December

Note: Own elaboration.

Organization

Lodging is a sub-process of the material assurance process of the University of Holguín. This thread is divided according to three general categories: accommodation in academic postgraduate residence, accommodation in hotel facilities and accommodation in facilities in other provinces.

The treatment for each category depends on the type of client, the reason for which the service is requested and the level of priority defined by the empowered authority. Customers are divided into national and foreign. In this stage, the results of the tab design, the SMI and the BS are shown.

Design of Process File

After reviewing the legal, regulatory and technical documentation in force, the documentation of the process was made, as an example the file is shown in table 5.

Table 5. *Accommodation process file.*

 Universidad de Holguín DIRECCIÓN ALOJAMIENTO		Accommodation Process File
Responsible: Manager of accommodation		
Objective: Satisfy the lodging and food needs generated by the activities of the university processes, aimed at national and foreign customers.		
Legal, regulatory and technical documents:		
Inputs: Accommodation and food request for the activities of the UHo processes	Suppliers: Canned Vegetables TURQUINO, Holguín Meat Company, Holguín Dairy Products Company, Select Fruits, Holguín Fishing Company PESCAHOL, Food Products Wholesaler, Agricultural Supplier, UBE Transportation, Holguín Food Producer and Distributor Provincial UEB, Warehouse central of the UHo, MES, ETECSA, COPEXTEL S.A, Isla Azul Holguín, among others.	
Outputs: Satisfied customers, national and foreign	National customers: Workers of the UHo, personnel of MES institutions, of institutions of other organisms of the central administration of the state, the government and other ministries. Foreign customers: Compensated undergraduate for students who go through their higher studies in the country and international postgraduate.	
Records: - DGA-R-01 Request for services to the DA in academic postgraduate residences - DGA-R-02 Accommodation distribution - DGA-R-03 Control of entrances and exits to academic postgraduate residence - DGA-R-04 Guest card		

Note: Own elaboration.

Balanced Scorecard Design

The SMI design of the accommodation process was carried out. Table 6 shows the index card for the accommodation index in postgraduate residences as an example.

Table 6. *Indicator system (example).*

Accommodation index in postgraduate residences				
Objective	Determine the rate of accommodation in postgraduate residences			
Classification	Perspective	Internal processes		
	Impact	Effectiveness		
Equation	$Ia = \frac{Number\ of\ Satisfied\ Requests}{Number\ of\ Requests\ Received}$			
Periodicity	Monthly			
Source	Accommodation Departament records			
Reference level	Excellent	Good	Moderate	Bad
	1.00	0.85 - 0.99	0.60 - 0.84	< 0.60

Note: Own elaboration.

The BS of the process was designed, made up of 16 indicators classified by perspectives and impacts, as shown in Table 7.

Table 7. *Balanced scorecard of the accommodation process.*

Balanced Scorecard						
Indicators	Perspectives				Impact	
	Customer	Process	Training & Development	Financial	Efficiency	Effectiveness
Compliance with the training and development plan			x		x	
Compliance with the structure of job positions			x		x	
Accommodation index in postgraduate residences		x				x
Job satisfaction			x			x
Occupancy index in postgraduate residences		x				x
Room availability index		x				x
Provisioning index		x			x	
Response capacity of requests for accommodation in hotel facilities in the province		x				x
Response capacity of requests for accommodation in facilities in other provinces		x				x
Customer satisfaction with the food services of the postgraduate residence	x					x
Satisfaction with the material conditions of the postgraduate residence	x					x
Satisfaction of national customers	x					x
Satisfaction of foreign customers	x					x
Compliance with compensated undergraduate accommodation income plan				x	x	
Compliance with the international postgraduate accommodation income plan				x	x	
Budget execution				x	x	

Note: Own elaboration.

CONCLUSIONS

The results achieved are consistent with the contributions of previous research. They consolidate the contributions of Ortiz Pérez et al. (2015), related to process management, management control (Medina León et al, 2021), risk management (Vega-de la Cruz and Marrero Delgado 2021), strategic analysis (Veliz Briones et al., 2017), while achieving the integration of all these approaches in the proposed procedure and validated in its application in response to previous

demands or indications made by researchers such as Jardel et al. (2020). Likewise, the proposal presented responds to the need to develop tools with a high methodological character as indicated by researchers such as Murillo-Mora & Reyes-Espinosa (2018) and Ricardo Herrera et al. (2020). A distinctive aspect of this research is the application for its validation in a support process as specific as that of accommodation, which is very common in Cuban universities, but is not typical of many other universities in different contexts.

The models and procedures analyzed for management of support processes have made significant contributions to university management; However, the need to design a procedure that integrates process management tools, risk management and management control to achieve greater effectiveness in decision making was verified.

The proposal presented manages to integrate multiple dispersed or fragmented approaches developed in previous research, while responding to the needs for improvements or limitations identified in previous research, in various contexts. At the same time, it exposes the peculiarities that are manifested in the application of the methodology in support processes such as accommodation.

The stages established in the proposed procedure constitute a guide to more effectively develop the management of support processes, by integrating process management tools, risk management and management control, which contributes to decision making with a systems approach.

The implementation of the procedure at the University of Holguín, made it possible to design the accommodation process file, the flowchart, the norms and procedures manual, the preparation of the risk inventory, the qualitative evaluation, the risk matrix, the definition of priorities and the prevention plan; as well as the strategic map, the system of indicators and the balanced scorecard, all of which contribute to the improvement of the management of this process.

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