

BPM as a tool for analysis and redesign of High Complexity Procedures authorization process in health plans companies

André Henrique Da Cunha* – andrehdacunha@hotmail.com

Fernando Antônio Forcellini* – forcellini@gmail.com

*Universidade Federal de Santa Catarina – (UFSC), Florianópolis, SC

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Abstract: Healthcare in Brazil is a delicate matter, especially in regulatory issues. Notorious is the cases of law non-compliance, the healthcare operators are notorious violators of these same laws. The purpose of this paper is to analyze and describe a process relevant in healthcare operators, prior authorizations of high complexity services. So, therefore, in their components can be identified the bottlenecks, in order to understand its functioning and carry out an efficiency analysis, based on a reference framework notation model. We conclude that with reshape of this process we made changes that mainly eliminate the bureaucratic aspects of the process (keeping it correct by the law) and narrowed the channel of communication between the applicant and the query and analysis area in order to speed up the outcome of the requested authorizations, focusing more on the technical functions and not in administrative, decreasing the waiting times while improving the quality and accuracy of service.

Keywords: BPM; Operations Management and Improvement; BPMN

1. Introduction

A hard reality is reflected by the indices published regularly by the National Health Agency. Only in 2014 were suspended 161 health plans for 36 health plan operators throughout Brazil. Only in Santa Catarina State where this research took place, were suspended 10 health plans (which serve approximately 50,000 people) of a single operator for lack of compliance with legal minimum requirements.

The purpose of this paper is to analyze and describe a relevant process in health plan operators, prior authorization of high complexity procedure, so that their components are identified as bottlenecks, limiting and strengths in order to understand its functioning and carry out an analysis, grounded in the reference model of good practice in Business Process Management Common Body of Knowledge - BPM CBOK to restructuring proceedings.

Initially, in this work, we present the health system organization in Brazil, the situation of private health plans in the country, definitions about managing business processes and the need and the use of Business Process Model - BPM Business Process Model and Notation - BPMN. Next will be presenting the organization chosen for analysis, the business function analyzed in detail, description, composite activities, identify bottlenecks, problems, and strengths, and then propose a process redesign following the improvements suggested in the guidelines proposed by BPM CBOK for the operation and life cycle of the process.

2. Health system organization in Brazil

From Elias and Gold (2011), the definition of health system organization is as follows:

"They are social constructions that aim to ensure appropriate means for individuals to make against social risks such as falling ill and assistance need, for which, by themselves or by the State, would not be able to provide. Thus, health systems have an overriding commitment to ensure access to goods and services available in each society for the maintenance and recovery of health of individuals."

In Brazil, according to the same authors, the health system financial basis consists of two parts: fully financed by public funds (composing the Unified Health System - SUS) or private funds (direct disbursement, co-payment, co-operative). According to Souza (2002), concerning health policies, the inherent complexity of this area is also related to: multiple determinations on the health status of the population and individuals; diversity of health needs in a population; different types of activities and services needed to deal with these needs;

personnel training and technological resources required to meet them; interests and market pressures in healthcare business (equipment marketing, medicine brands, production services, etc.) tense to a structuring system underpinned to the concept of health as a citizenship right.

An important institution for the organization and supervision of products and services in the medical field is the National Health Surveillance Agency - ANVISA. Thus was born the National Supplementary Health Agency, regulatory agency linked to the Ministry of Health responsible for the health insurance industry in Brazil. The agency has the task to promote the public interest in supplementary health care, to regulate sectoral operators - including in relations with providers and consumers - as well as contribute to the development of health actions in the country (ANS, 2014).

2.1 Business Processing Management & Notation

The definition adopted by the Association of Business Process Management Professionals (2010) is as follows, taken as standard by professionals:

"Business Process Management (BPM) is a disciplined approach to identify, design, implement, document, measure, monitor, control and improve automated business processes or not to achieve the desired results consistent and aligned with the strategic goals of an organization. BPM involves the deliberate setting, collaborative and increasingly assisted by technology, improvement, innovation and managing business processes end-to-end leading to business results, create value and allow an organization to fulfill your business goals with faster. It enables an organization to align their business processes to your organizational strategy, leading to efficient performance across the organization through improvements in specific work activities in one department, the organization as a whole or between organizations."

BPM serves as a decision-making tool for managers as well as an analysis guide, allowing you to view the connection of processes involved and its duties and functions thereof, for greater strategic alignment. Within the BPM, one can glimpse the size and significance if the events that make up the organizations business processes. The main goal of BPMN, according to the Business Process Management Notation Group (BPMN V2, 2010), is to provide a notation that is readily understandable by all business agents, from business analysts who design and feature early versions of clarifying the process, through technical developers responsible for refinement, adaptation, and application of embedded technology in these to the organization's managers, responsible for coordination and management of processes.

According to the BPMN V2 (2010), this specification is the essence of best practices for modeling business processes in order to define the notation and semantics for the

collaboration diagrams, process diagrams, and choreography diagrams. Each of these is built using visual elements, process elements, semantic process modeling attributes and associations, tools that aid in assembly, structuring, and identification of processes, providing visual and attributive instructions to the elements that compose it, feeding the model with rich and useful information about the functions that make up these processes.

3. Methodology

This study is characterized as an exploratory and descriptive field research with a qualitative approach, developed through a case study using the method of content analysis through data collection and on-site interview with the organization's managers. Initially a review of relevant literature to the themes was held, followed by the development of a case study following the methodology by Miguel (2011): (i) definition of the conceptual - theoretical framework; (ii) direct observation, interviews and document analysis of primary data; (iii) analysis of the results; (iv) conclusions and final report of the study.

Therefore, to be investigative and directly related to the tasks of a specific organization, driving approach was defined in this study as a Case Study. Yin (2014), argues that the case study is a form of research (with empirical nature) that seeks to seek the preservation of holistic and meaningful characteristics (which cover the situation as a whole in the subject matter in question) events and organizational processes (whether operational, administrative or external). The Case Study is, therefore, a search method that enables a qualitative analysis. This case study will seek to detail a specific business process pertaining to health care operator's client regulated by the ANS arranged legal duties. The business process in question is chosen the Prior Authorization for High Complexity Procedures - HCP. It was used thematic analysis as a means of data analysis, along with the perception of researchers, to finally cover the current list of skills and activities relevant to the process, exploit their weaknesses, bottlenecks, and propose appropriate amendments to the improvement and management of studied process, which has high impact in importance and the organization's finances in question.

3.1 Management high complexity procedures authorization (HCP)

Medicine is a very broad field of study and needs, by nature, constantly seeking improvements procedures that permeate his performance. Elias and Dourado (2011) explain the main drivers of the area:

"There are at least three elements involved in defining the levels of care: technology incorporated materials (machines and diagnostic equipment and therapeutic) personnel training (social cost required for training) and the target population morbidity profile. However, it should be warned that the possible arrangements in the distribution of these three elements in health systems often are not as regular as they depend on the characteristics of the system in terms of financial, material and personnel available and implemented health policies each country."

The study object organization (Supplementary Health Management Solutions) provides prior service of high complexity service, managing the use of materials and the correct and appropriate prescription of services and supplies used in surgical procedures of medium and high complexity, based on negotiations with partners and suppliers, seeking to follow technical criteria (Evidence-Based Medicine and recommendations of the Technical Board) to release or not these procedures, finding the best balance between cost and efficiency to their customers. This is relevant because the advances in medical materials are impressive: The speed with which come on the market the new surgical materials are a reflection of the ease with which you have access to information these days. These materials, in most cases, are costly materials, which carries a geometric increase in the operators' health insurance costs, due to strict control, government, unable to pass on these costs to its beneficiaries.

According to Pagnoncelli (2010), the misuse of medical technologies and inadequate absorption of new technologies in the area has been identified as one of the main costs of Health Plans. Inadequate management of authorizations to highly complex queries can financially cripple a Health Operator, besides affecting their attendance rates and social responsibility supervised and legally mandated by the ANS. It is necessary a maximum of certainty (guarantee) that the material used is that which will best assist the needs of a particular patient, always considering the ideal cost and the full and effective recovery of the pathology. The indiscriminate use of resources expensive and cutting-edge technologies is not feasible due to three main reasons

- a) Security for patients (need proof of efficacy and of service, which usually takes time to join);
- b) Cost (pay for efficiency and dubious effectiveness); and
- c) Co-responsibility ethics and civil (if material shows low quality or leads to adverse effects, late follow-up, the patient, the operator and the doctor, together with the manufacturer, will be held accountable).

The “highly complex procedure authorization” process existence is justified in avoiding the patient’s security errors, over budget costs and co-responsibility, as cited by Pagnocelli (2010) because those kinds of mistakes can foreclose the operations of health insurance companies. This is the process that this paper seeks to explore, presenting here an analytical case study of a relevant business process in a health insurance company.

4. The business process of high complexity procedures authorization

This work has focused on the business process of high complexity authorization, relevant health plan providers. The modeling process followed the indications and the good practice guide related to BPM, BPM CBOOK (2009). Here will be presented the outline of the steps and events relevant to the process, the case/function matrices devised by the researchers based on events occurring in the process and its operation diagram to analyze aspects of design and operation of the business process in question.

4.1 Process description

It is initiated with medical consultation the process and patient care, as the starting point for the whole process, justified its onset by direct request of the patient or determined by a chain of events (appointments, tests and external indications). It is at this point that the course of action for treatments determined. Identified the need, the doctor asks the managing company health plan authorization for the procedure of high complexity. This request can be sent via health management company plan management system plan previously installed in the medical care office computer or there is the possibility of sending the request by form. When the request is done by the doctor or directly in the management plan system, automatically happens to validate some information such as the validity of the medical code required procedure, contractual coverage and related examinations performed by the patient. This information is a lodge to the physician's attention for better decision making over the course of action on patient's treatment.

When the request is by form, the administrative assistant on the health plan company does the inclusion of information related to the request for authorization on the system and if inconsistencies are generated the form goes back to the requesting physician. Having the request in the health plan company management system the administrative assistant makes a checklist of documentation and information, as other results of tests that complement the high complexity procedure authorization request. Then the administrative assistant sends all the documentation to the medical consultant of the health plan company to for technical analysis. The

administrative assistant also makes a contractual analysis looking for partial or complete coverage of the requested procedure and venue, as well as a financial analysis of the client's situation regarding the obligations with the company. If the contractual assessment finds any hindrance continuity of HCP authorization process the obstacle information found is sent via the system to the requesting physician who directs the patient to health plan company to remedy the problem, otherwise the authorization process follows to step technical analysis.

In technical analysis stage, medical consultant perform the analysis of the medical guidelines for implementing the required procedure and special materials involved, concomitant procedures and hospitalization time checking that they are as expected for the detected pathology, case the consultant completion is compatible with the physician's request, the authorization is granted and the information goes back to the administrative assistant who informs the requesting physician and the patient. Otherwise, the medical consultant passes the questions to the administrative assistant or the negative inference on the authorization request. The administrative assistant has to pass to the requesting physician, this cycle lasts until the impasse is resolved or the authorization is denied.

4.2 Case/function matrices

The next step was to assemble the business process using the guidelines proposed by the BPM CBOK (2009). Below are described the guidelines of the analysis and design process.

1. HCP requests have the same ensured channel of processing, so there is no vertical division;
2. There is no multiplicity in the process of inflow, therefore there are no vertical divisions required;
3. There are processes division: Application, Analysis, and Results;
4. Divisions on activities uptime: Application and Analysis;
5. There is physical separation between Application, Analysis, and Results (on-site, outside the organization, multi-channel communication);
6. Do not apply;
7. Reference models do not apply to the case;
8. Same as guideline 3.

Implemented such guidelines, the case/function matrix was elaborated for the business process in question, here represented by Figure 1.

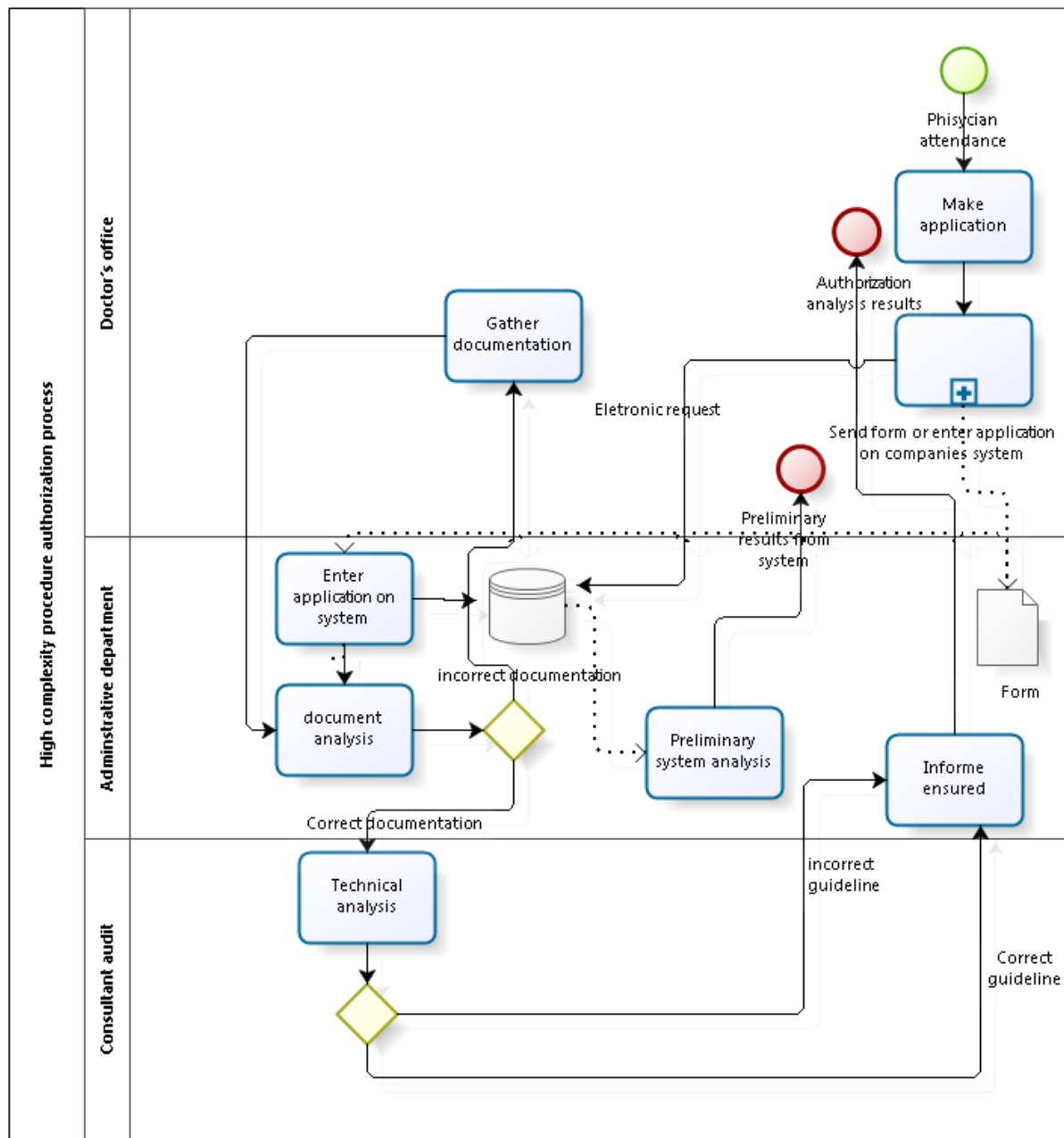
Figure 1- Case/function Matrix

FUNCTION		CASE			
		Ensured	Administrative assistant	Consultant	
Physician attendance	Identify pathology	X			Application
	Fullfill form	X			
Administrative analysis	Enter eletronic request	X	X		Analysis
	Enter eletronic request		X		
	Documentary analysis	X	X		
	Contractual analysis		X		
Thecnical analysis	Documentary analysis	X	X	X	Results
	Consultant analysis	X	X	X	
Results delivery	Authorization granted		X		Results
	Authorization denied	X	X	X	

4.3 BPM diagram

The Bizagi ® software was used to build business process diagram. The diagram of the HCP authorization process construction was due to the perception of researchers and the analysis of information obtained through interviews and material supplied by the process supervisors and following the BPMN standard. See the diagram in Figure 2 about the studied process.

Figure 2 - Diagram Business Process Analyzed



Source: Authors

4.4 Case/Function Matrix

It was observed many inconsistencies and disorganization in the business structure in between what the organization imagines and the HCP process really does towards the legal provisions of regulations involved. Explained: during the data collection process, not any information about organized or systemic way process was found. The only record of tasks and events related to the documented process were from the Public Notice No. 0056/201 forth in Chapter 4. According to this, you can check the following process flow from Table 1.

Table 1 - Duties of the High Complexity Procedure Authorization

Who	How	Observations
Administrative assistant on doctor's office	Used the ensured card or enter data on healthcare plan operator for application, remember to ask ensured for some ID. In case of any trouble call operator authorization support center	After clear authorization send patient to medical attendance.
Registered Physician	Applies for procedure authorization	In case of there is nothing to proceed then the process is closed.
Administrative assistant on doctor's office	Status: authorization granted-schedule procedure. Authorization denied-call operator authorization support center for guidance. Standby-time for administrative and technical analysis (from 48 hours up to 5 days).	If the procedure requires medical expertise, schedule with call center.

Source: Public Notice 0056/2013(2013) translated by authors

Indeed, the perceived need of the description of the business process was born a few weeks before the start of this study, so that the work was in progress, but also in an uncoordinated manner, without specific assignments to any of the questioned supervisors.

The data extraction was done through a direct interview with the organization's managers and supervisors of the process in question. Some aspects were identified:

- a) Sending the request to the system can be done directly by the doctor or the issue of gathering guides so recommended by the National Supplementary Health Agency, but the nature of the process already disturbs because there is no uniformity of application response time;
- b) The flow of information between the applicant and the administration is excessive in the analysis area. The documentary analysis should be wholly assimilated by the Administrative, which does not happen;
- c) The biggest problem identified by respondents was in the event of disagreement between the physician and the technical consultation. The administrative acts often as a mediator of conflicts between consultation area and the requesting area. The direct channel does not happen and there are disparities that are not passed because of lack of knowledge (and training) of the administrative sector. This creates a bottleneck in the handling of cases as indications of problems in care are unclear;

- d) The company relegates the positive authorization only for the administrative sector but conditions the negative result to two other participants in the process without the participation of the administrative, which is not very logical to the sequence of work;
- e) Overload and dependence on the administrative sector.

5. High complexity procedure authorization process reshaped

Observed, understood and analyzed the process, it is now proposed a change in the business process in question, based on the BPM lifecycle presented by BPM CBOK (2009) and used as a reference for the design and assembly of the new business process.

5.1 The new process description

The proposed new business process starts with a medical consultation after inference and analysis applications for authorization must be inserted in the health plan management system and is already carried out a preliminary consultation on the beneficiary's health plan. The system already indicates tests previously performed avoiding any examination to be redone within the period of validity of the latter. The administrative assistant, in possession of the information provided in the system, checks the contractual issues to check if the patient health care plan covers part or all of the requested procedure. As well as, a financial analysis of the client's situation regarding the obligations of the plan with the company.

Verified and approved these conditions, the request is transferred to an analysis of the consultant doctor of the management company's health plan; otherwise, it returns the customer to contact the management company and set the situation. Released the administrative examination starts the technical analysis of the application, analyzing the medical guidelines for implementing the required procedure and the use of special materials (as orthotics and prosthetics), measurement of concomitant procedures and length of stay (in a hospital) are as expected for the detected pathology. Also, if the completion of the consultant doctor is compatible with the request of the requesting physician authorization is granted and the requesting physician and the customer are informed via the management system; otherwise, questioning is sent to the referring physician from medical consultant until the settlement is made on medical guideline or request is denied. In the latter case information on the reasons for their disagreement should be recorded for future control of standard deviations that can be traded or standardized.

5.2 The new process Case/Function Matrix

Made the description of the redesign of business process, was drawn up a case/function Matrix representing this job. The matrix may be seen in Figure 3.

Figure 3 - The new process case/function matrix

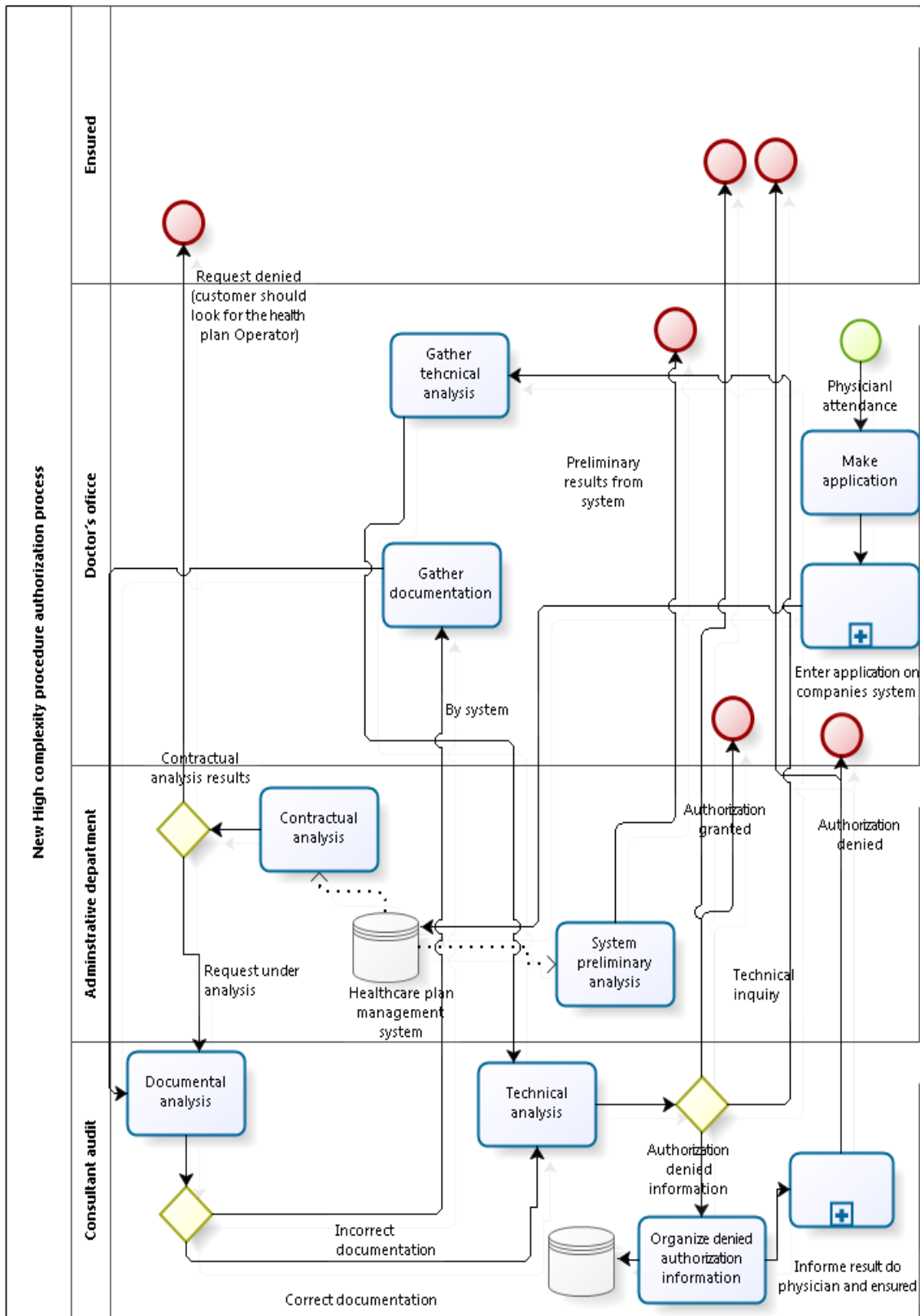
FUNCTION		CASE			
		Ensured	Administrative assistant	Consultant	
Physician attendance	Identify pathology	X			Application
	Fullfill form	X			
	Enter eletronic request	X			
Administrative analysis	Enter eletronic request		X		Analysis
	Documentary analysis		X		
	Contractual analysis				
Thecnical analysis	Documentary analysis	X		X	
	Consultant analysis	X		X	
Results delivery	Authorization granted				
	Authorization denied	X		X	

Source: Authors

5.3 New Business Process Diagram

The Bizagi ® software was used for making diagram business process object of this study. The redesigned business process diagram is shown in Figure 4.

Figure 4 - New Business Process Diagram



Source: Authors

5.4 Identified changes in the new process

The implementation of the proposed changes in the analyzed process aims to promote greater agility business process. As it was proposed a model with a single entry only happening in the doctor's office/customer service location. It displays adherence to resistance from referring physicians, which is a factor to work. By simplifying the insertion of the request process by eliminating the second entry is achieved lower wait time, establishing a direct channel of communication between the referring physician and medical consultant for resolving impasses during the technical validity of the request analysis. It is proposed the creation of a bank of information about request negative, seeking to store knowledge and data on the issued negative authorization, creating possibilities of comprehension and analysis of factors that influence the operation of the process, ready for greater responsiveness and workflow.

6. Conclusions

Based on the data collected and using BPM as a method base and BPMN as notation, we tried to build the flow of the business process as the organization sees it. Then the process, with the identification of bottlenecks, improvement, strengths, and weaknesses where we studied, based on these, an analysis of the process now and a new process value stream was we proposed, and weaving conclusions about what was analyzed and proposed.

This process needs a maximum of certainty (guarantees) that the material used is what will best to assist the needs of a specific patient and a cost considered ideal, leading to an improvement of proven pathology. The current authorization process for the care of high complexity procedures developed in the study subject company lacks information, indication of responsible and procedures adopted throughout the process, adaptation to current legislation, to name a few. The process, as it is, results from a negative outlook for the company at both the organizational level and in operational: how many people have not had unnecessary delays in applications of this nature? There were legal provisions (which reported that the organization itself does not need to follow these regulations as if it were a competitive edge follow and not a moral and legal obligation), what is the confidence that a health system passes on to its customers?

Understanding their problems and the lack of organization involved in the design of the business process flow, we proposed a new process model for this organization, it did not aimed to reshape the whole process, but made changes that mainly eliminate the bureaucratic aspects of the process (keeping your legality front normative ANS) and narrowed the channel of

communication between the applicant and the query area and analysis in order to speed up the outcome of the requested authorizations, focusing more on the technical functions and not in administrative, which, as noted in the process as it is currently implemented, it is the sector with the highest participation in the activities involved in it.

REFERENCES

- ABPMP – Association of Business Process Management Professionals - BPM CBOK v2.0 - São Paulo, 2009.
- ANS – Agencia Nacional de Saúde Suplementar Report of the ANS– Available at < Website: <<http://www.ans.gov.br/aans/quem-somos>>. Accessed in 23th June, 2014.
- Elias, P. E. M., & Dourado, D. A. (2011). Sistemas de saúde e SUS: saúde como política social e sua trajetória no Brasil. In: IBANÉZ, N. et. al. (orgs.) Política e gestão pública em saúde. São Paulo, Cealag: Hucitec Editora.
- Miguel, P. A. C., Fleury, A., Mello, C.H.P, Nakano, D.N., Lima, E.P., Turrioni, J.B., Ho, L.L., Morabito, R., Costa, S.E.G., Martins, R.A., Sousa, R., & Pureza, V. (2010). *Metodologia de pesquisa em engenharia de produção e gestão de operações*. Rio de Janeiro: Elsevier.
- Ndonline –Available at < Website: <<http://ndonline.com.br/florianopolis/noticias/166652-ans-suspende-a-venda-de-10-planos-de-saude-da-unimed-florianopolis.html>> Accessed in 23th June, 2014.
- Pagnoncelli, A. M. (2010). *Estratégia competitiva e eficiência operacional: um estudo de caso no setor de operadoras de planos de saúde do Brasil*. Master thesis. Universidade Federal do Rio Grande do Sul, Brazil.
- Souza, F. (2002). O sistema público de saúde brasileiro seminário internacional tendências e desafios dos sistemas de saúde nas américas. São Paulo, Brazil 11th until 14th August, 2002.
- Yin, Robert K. (2014). *Case study research: Design and methods*. Sage publications.
- Zairi, M. (1997). Business process management: a boundaryless approach to modern competitiveness. *Business Process Management*, 3(1): 64-80.