Modeling of the Certification Process for Physiotherapy services

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Abstract

Gaining attention in all nations, the service sector, among other things, guarantees improved standards of living for the population. When it comes to health services, some accreditation and certification models already exist in the hospital environment, encompassing both these aspects. Currently, in Brazil, a certification model for specific Physiotherapy service providing companies exists, which comprises infrastructure, services, and consumer satisfaction aspects. This article aimed to describe this certification process using the IDEF model for modeling processes. Research results show that the IDEF method allows for a high level of process detailing, and that developing a framework for the certification process for Physiotherapy services provides a better understanding and presents a structured description of the process.

Keywords: Physiotherapy services; Certification Process; Service quality; Health services.

1. Introduction

According to Fitzsimmons e Fitzsimmons (2014), the services sector is notable in all nations, providing not only employability, but also improved quality of life for the population. Divided into different categories, there are types of service that demand a high level of expertise from the providers, among which are health, consulting, and education services.

Also, according to Fitzsimmons and Fitzsimmons (2014, p. 11), "the nature of services economy is undergoing a transformation: from a transaction-based nature to relations based on experience". With that, two observable components of quality in health services are found: operations (transactions process) and client perception as to the customer service that is offered (experience) (BITTAR, 1999).

Observing and measuring quality in services is a complex task, mainly because of characteristics such as concurrence, perishability, intangibility, and multiplicity. For the services sectors, various accreditation and certification models are made available so that companies may guarantee the quality of their products based on preestablished standards. In the services sector, and more specifically in the health services sector, initiatives like ISO standards began around 1924 with the Hospital Standardization Program (HSP) developed by the American College of Surgeons, according to Feldman, Gatto and Cunha (2005).

Over the years, other Hospital accreditation programs have emerged and propagated throughout the world. In Brazil, the National Accreditation Organization (ONA) stands out as the main agency in the hospital

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health area (FELDMAN; GATTO; CUNHA, 2005).

The ability to guarantee quality standards of services offered to clients has become vital for organizations that are part of the globalized market. Certification programs represent a method that facilitates the development of standards for continued improvement of patient assistance and of organizational performance (NOVAES, 2015).

Within the sector of health services are Physiotherapy services, which can occur in a hospital, ambulatory or home environment, and are provided by independent professionals or those who are a part of companies that provide these services. The different explorable scenarios of the profession and the elements that should be observed, such as the professional´s autonomy to develop a treatment plan and adequate conduct for each case, hinder standardization for certification and quality.

Taking these preconditions into account, Mandelli (2016) developed a model for the evaluation of quality in Physiotherapy services, contemplating the perspective of the manager. Presented as a dissertation under the title "Constructivist Model for the evaluation of quality in Physiotherapy services from the perspective of the manager," this model deliberates three broad areas to be observed: infrastructure, services, and satisfaction.

Currently, this is the only certification model in Brazil for quality certification available to Physiotherapy service companies, accessible through the National Federation of Entities of Physiotherapy Service Providing Companies (FENAFISIO).

To comprehend the steps of the certification process for Physiotherapy service providers made available through FENAFISIO, the present article aims to describe this process.

2. Literature Review

This section conceptualizes and presents some characteristics related to process management and process modeling.

2.1 Process management

Varvakis et al. ([20--?], p. 14), define a process as "any activity that receives input, undergoes transformation to add value, and generates an output for an external or internal client." They also point out that when an organization can understand its processes, it gains potential for systemic vision and more easily presents competitive advantages.

Gonçalves (2000, p.7) remarks that "no product or service offered by any given company exists without a business process. In the same manner, it makes no sense for a business process to exist which does not offer a product or service." Thus, it becomes necessary that all such processes be managed, considering their continuous improvement and alignment within the complex system that is an organization.

According to Varvakis et al. ([20--?]), executing process management will allow the organization to continuously improve its activities by identifying necessary support activities, eliminating obstacles, and increasing customer satisfaction.

The notion of processes, initially highly connected to Production Engineering, springs from the premise that activities that comprise processes are composed of input and output. That is, the necessary resources (information, personnel, and technology) are inserted in the activity, which then process and return the activity, resulting in a product or service, according to Figure 1.

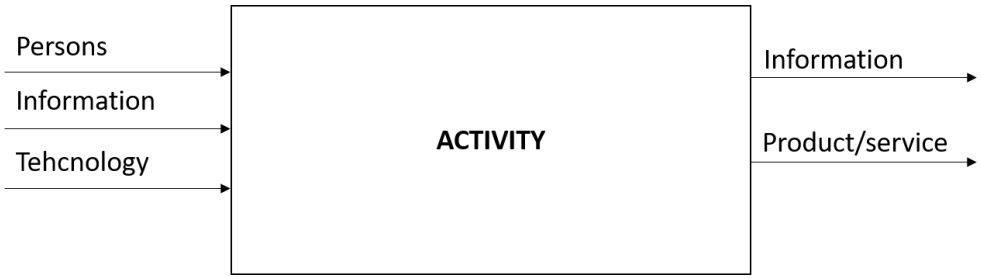

Figure 1 – Activities and their inputs and outputs

Source: Authors (2017)

These activities are related to other activities that compose a process, which in turn, when connected to other processes, form a system. Such existing complexity within organizations demands attention and management. As for the processes concept, Gonçalves (2000, p.7) states that "a process is any activity or group of activities that receives input, adds value to it, and renders an output for a specific client."

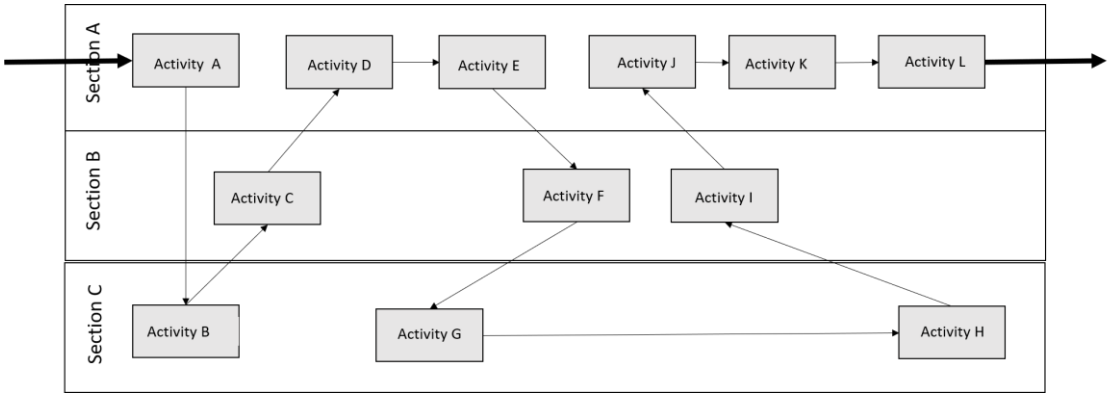

Figure 2 - Organizational process

Source: Authors (2017)

To obtain such knowledge about the structure of organizational processes, creating a model becomes necessary. This can occur in different formats and with different levels of detail, according to the needs of the company. Detailing can occur at smaller levels, when the macroprocess is defined, directed towards subprocesses, and finally, by detailing activities and tasks.

Modeling organizational processes will provide support for managing such processes, allowing involved parties to have a broad understanding and to easily identify obstacles, thus facilitating continuous improvement. The next item addressed this topic.

2.1 Process management

Donadel (2007) believes the representation of processes aims to reproduce the current model or to build an abstraction of organizational processes. Oliveira e Rosa (2010, p. 162), on the other hand, state that "process modeling refers to identifying and diagraming the process as it is executed. It is an activity which is relative to the execution and enhancement of an organizational process." Varvakis et al. ([20--?]), in turn, define modeling or process representation as a combination of graphic elements that yield visualization and understanding of the process.

Different tools or methods may be used for modeling processes, among which are: Traditional Flowchart, Service Blueprint; Service map; IDEF; and CommonKADS – described in Table 1.

Table 1 – Methods for modeling processes

Method	Definition
Traditional Flowchart	"Flowcharts describe the sequence of activities of a business process. Thus, flowcharts use a standard symbology which adopts, among other symbols, rectangles to represent activities, diamonds to represent decision points, and arrows to indicate the direction of flow. These symbols are followed by text that describes the activities and directs the course of the process" (SANTOS, 2000, p. 38).
Service blueprint	Fitzsimmons e Fitzsimmons (1998) apud Santos (2000, p. 39-40), believe that a blueprint is "a map of all transactions that comprise the process of service delivery. This map identifies both the front-end activities and back-office activities, separated by the aforementioned visibility line."
Service map	"the service map tries to integrate the various dimensions involved in service management, from managing the business all the way to the client. To that end, it divides the service processes not only in two parts (front-end and back-office), but into five different zones: client zone; front-end zone; back-office zone; support zone; and management zone" (SANTOS, 2000, p. 42).
IDEF	Based on the Structured Analysis and Design Technique (SADT), Integration Definition (IDEF) is a process modeling technique that allows safe and sustained development, which describes in graphics the entire development life cycle of a system" (OLIVEIRA; ROSA, 2010, p.162).
Common KADS	"A KAD system is represented as a group of models, each representing a part of the system." (URIONA et al., 2008, p. 5). Moreno et al. (2001) describe two main component of KADs: knowledge mastery and knowledge control.

Source: Authors (2017) based on Santos (2000)

Santos and Varvakis (2001) developed a comparative chart (Figure 3) with different process representation techniques, comparing them across five requirements. Among those mentioned, the IDEF 3 adapted method stands out as the technique that meets four of the fives requirements and one of them partially.

Figure 3 – Methods analysis for modeling processes

	PROPOSED REQUIREMENTS				
TECHNIQUE	**Adequate for the project and the analysis of service processes**	**Description of experience of service from client´s perspective**	**Graphic representation based on diagrams**	**Ease of use**	**Support for performance evaluation of process**
Traditional flowchart	●	○	●	●	○
Service blueprint	●	◘	●	●	○
Service map	●	◘	●	●	○
Structure for client processing	●	◘	●	●	○
IDEF0	●	○	●	◘	◘
Walk-through-audit	○	◘	○	●	●
Service transaction analysis	○	●	○	●	●
Adapted IDEF3	●	●	●	●	◘
Representative language for service processes project	●	●	●	○	●
● Meets requirement		◘ Partially meets requirement		○ Does not meet requirement	

Source: Santos and Varvakis (2001, p. 15)

Based on this, the present study proposes to use the IDEF method for modeling the process of Physiotherapy services certification. In the following section, aimed at presenting the research method, the IDEF is explained in detail.

3. Methodological procedures

The search for knowledge about the process included semi-structured interviews with the directors of FENAFISIO. In this phase of the research, their knowledge of the processes was documented for posterior model development. At the time, the president, the quality director, and the financial director were heard, all of whom were directly involved in all phases of the process.

The IDEF method was chosen for the development of the Physiotherapy services certification process. It is a method that allows for a detailed description of a process or system. Developed by the United States Air Force, the IDEF derives from the graphic language of Structured Analysis and Design Technique (SADT) (IDEF0, 2013; SANTOS, 2000).

Since its initial format, the IDEF has developed. Currently, as per Oliveira e Rosa (2010), 14 different formats of IDEF exist, being that the IDEF0 is among the most popular, also used for modeling decision making and organizational processes (Table 2).

IDF Methods	
IDEF0	*Function Modeling*
IDEF1	*Information Modeling*
IDEF1X	*Data Modeling*
IDEF2	*Simulation Model Design*
IDEF3	*Process Description Capture*
IDEF4	*Object-Oriented Design*
IDEF5	*Ontology Description Capture*
IDEF6	*Design Rationale Capture*
IDEF7	*Information System Auditing*
IDEF8	*Using Interface Modeling*
IDEF9	*Scenario-Driven IS Design*
IDEF10	*Implementation Architecture Modeling*
IDEF11	*Implementation Artifact Modeling*
IDEF12	*Organization Modeling*
IDEF13	*Three Schema Mapping Design*
IDEF 14	*Network Design*

Table 2 – IDEF Methods

Source: Oliveira and Rosa (2010, p. 163)

To develop a model using IDEF0, it is necessary to understand its design composed of boxes and arrows (Figure 4), where boxes define the process or activity in question and arrows represent input, controls, mechanisms, and output.

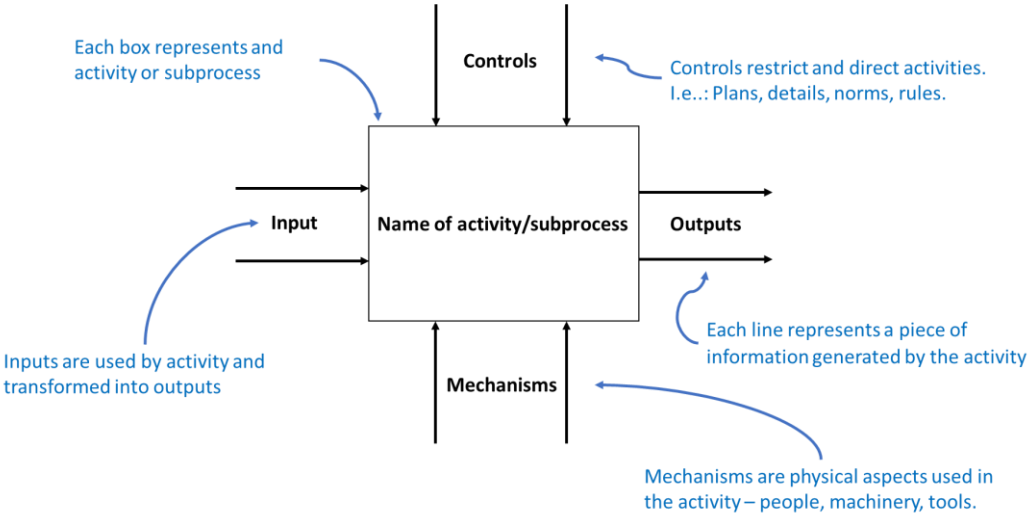

Figure 4 – Basic elements of description for IDEF0

Source: IDEF0 (2013, p. 2)

The modeling process begins with a single box called A0, which describes the process in a generic form. As the A0 box opens and unfolds, the IDEF develops into layers of activity detailing.

According to IDEF0 (2013, p. 3) "this hierarchical decomposition repeats itself for each box of the diagram, and then for each box of the resulting diagrams, and so forth, until the process is fully described," as shown in Figure 5.

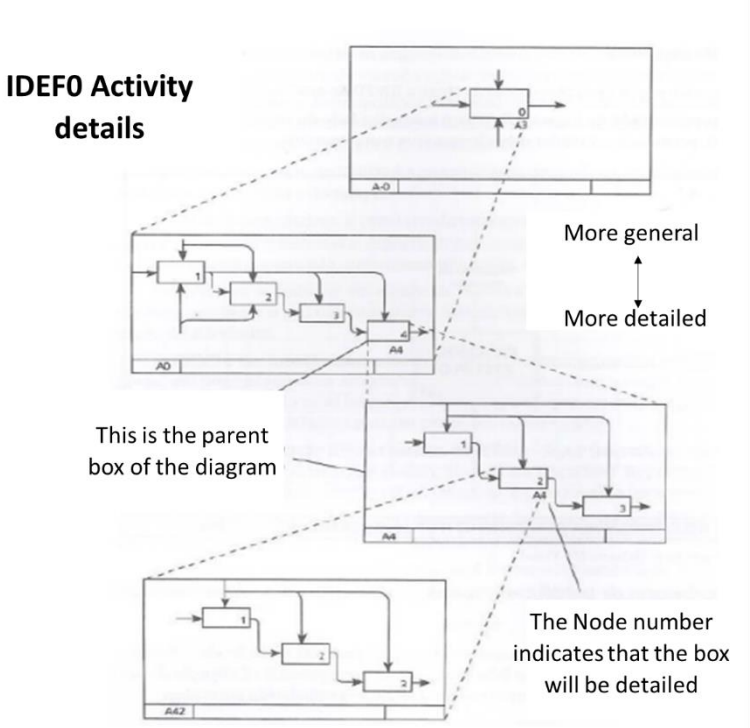

Figure 5 – Details of IDEF0 activities

Source: IDEF0 (2013, p. 3)

It is suggested that the users be identified before beginning the outlining process, as well their level of understanding of what will be represented, point of view after which the process will be modeled, and the decomposition strategy to be used, which may include: functional, documentation, through subsystems, and life cycle (IDEF0, 2013).

4. Modeling of the certification process for Physiotherapy services

4.1 Context of application

Certification is a process through which a government organization or classified association certifies or officially guarantees that an entity or individual has fulfilled certain predetermined qualifications (BITTAR, 1999). It could be said that a certification is a procedure through which an impartial officially recognized entity formally attests that processes, products or quality systems of a given institution are in conformity with specific standards.

Since 1989, The World Health Organization (WHO) has pointed to evaluation programs for health quality as being the strategic element for developing quality in Latin America. In the early 1990s, an agreement was made between the Pan-American Health Organization (OPAS), The Latin American Hospitals Federation and the Health Department to develop the Manual for Accreditation Standards for Latin America (FELDMAN; GATTO; CUNHA, 2005).

In Brazil, by means of the Health Department, the government began to focus on quality through hospital evaluation in the 1970s. Norms and Guidelines were published which regulated mechanisms for the implementation of systems that could evaluate quality of health assistance. However, according to Gonçalves et al. (2010) no attention was directed towards the quality of the services provided.

Currently, in Brazil, there are certification institutions for health, which are private companies responsible for evaluating and certifying the quality of health services nationwide.

In 2016, the National Federation of Entities of Physiotherapy Service Companies (FENAFISIO) began a program for evaluating the quality of physiotherapy services. Its main goal is to propose a program for continuous improvement that offers extended education for service providers.

Nevertheless, so that FENAFISIO may be successful with its quality certification program for Physiotherapy providing services, the proposed process must be thoroughly understood, deeming it necessary to build a model to better understand it.

4.2 Modeling

Following the guidelines described in the Research Method, the process to be modeled, the users and their level of knowledge, the point of view after which the process will be modeled, and the decomposition strategy to be used were identified (Table 3) in order to begin modeling through IDEF0.

Table 3 – Initial information for process modeling

Process to be modeled	Certification of Physiotherapy services
Process model users and their level of knowledge	FENAFISIO administrators – medium level of knowledge Administrators of the validating company– high level of knowledge Clients – low level of knowledge
Point of view after which the process will be modeled	Representation will take place from the same point of view as that of the administrators of the validating company.
Decomposition strategy to be used	"Functional Decomposition – activities according to 'what' is done instead of 'how' they are done." This is the most common strategy" (IDEF0, 2013).

Source: Authors (2017)

Sequentially, box A0 was defined, with a general exposition of the process that will be detailed, as per Figure 6.

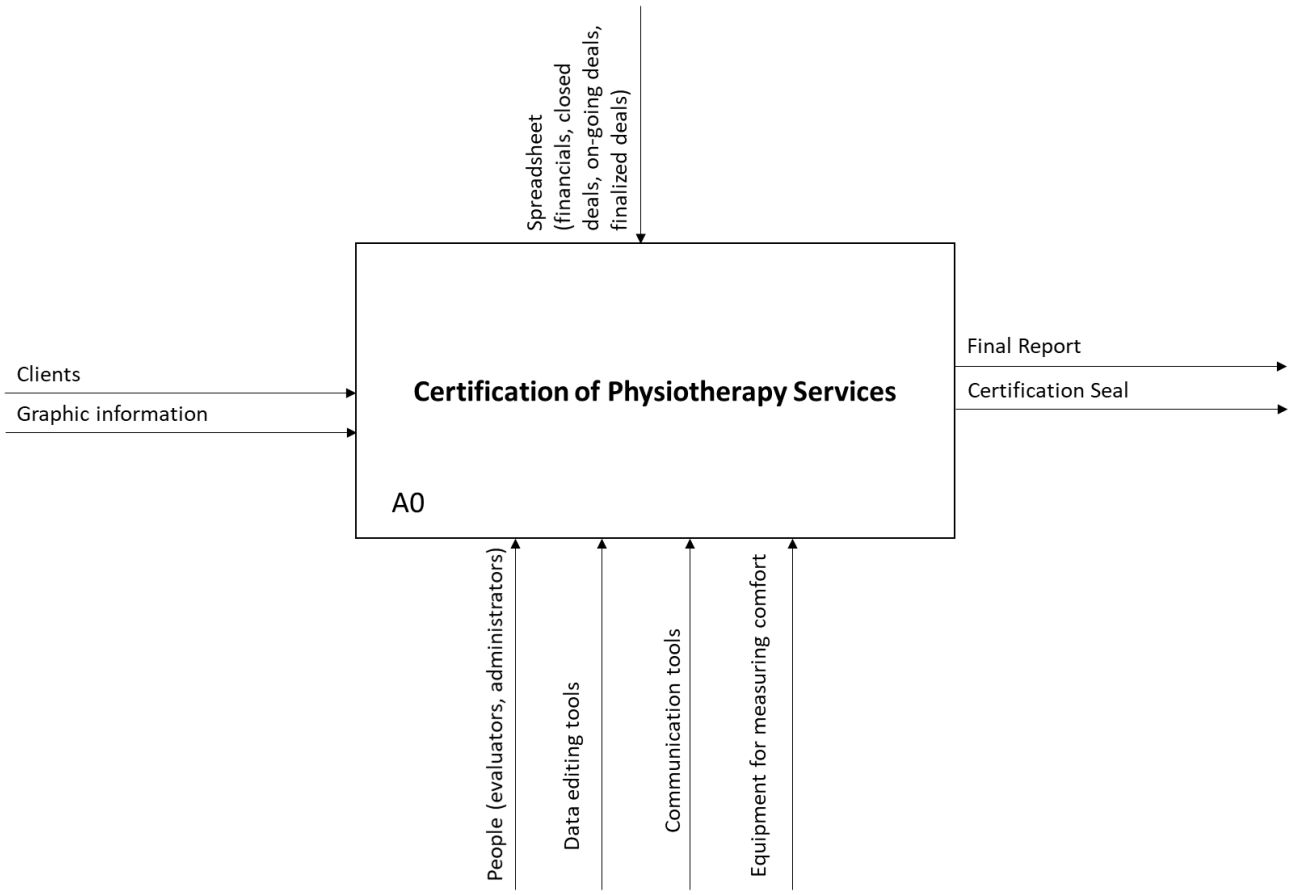

Figure 6 - Box A0 – Description of general process

Source: Authors (2017)

The initial development of the process begins by opening box A1, resulting in Figure 7.

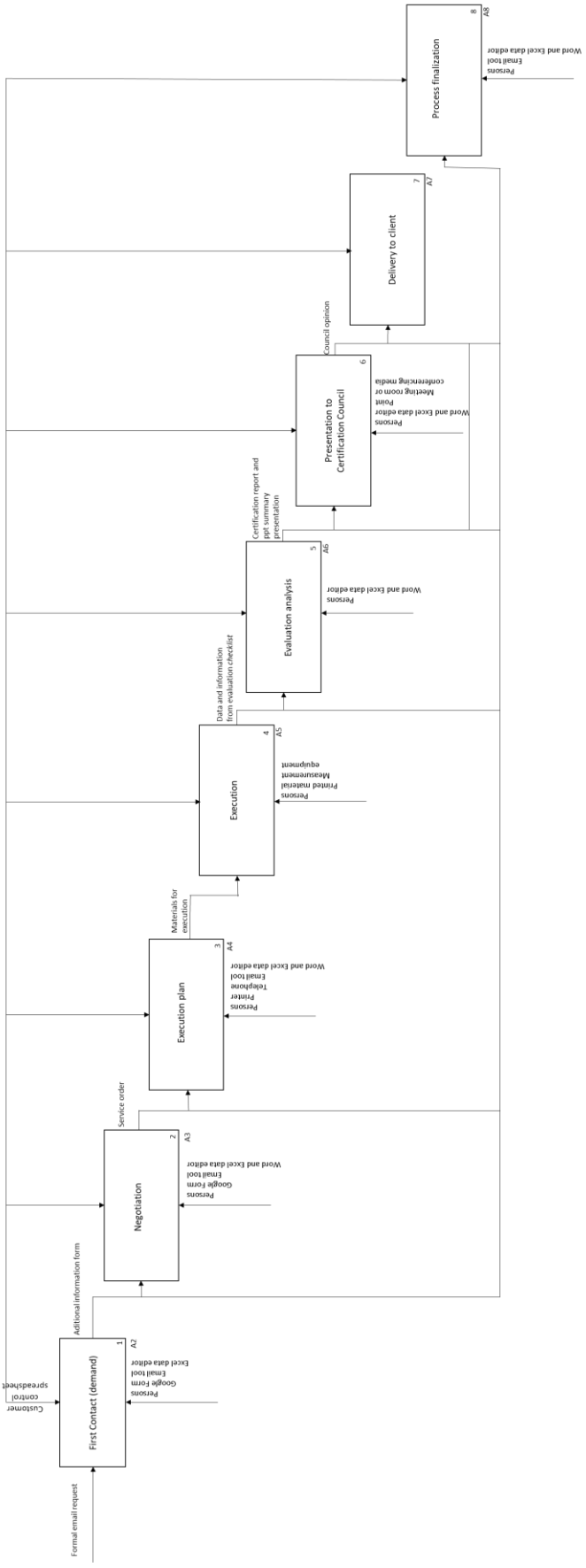

Figure 7 – Opening box A1

Source: Authors (2017)

Eight steps were identified in the certification process of physiotherapy services, which are: Initial contact/receiving demand 2) Negotiation; 3) Execution plan; 4) Execution; 5) Evaluation analysis; 6) Presenting to Certification Board; 7) Delivery to client; and 8) Process finalization. Figure 8 demonstrates the IDEF0 as it opens from A0 into A1.

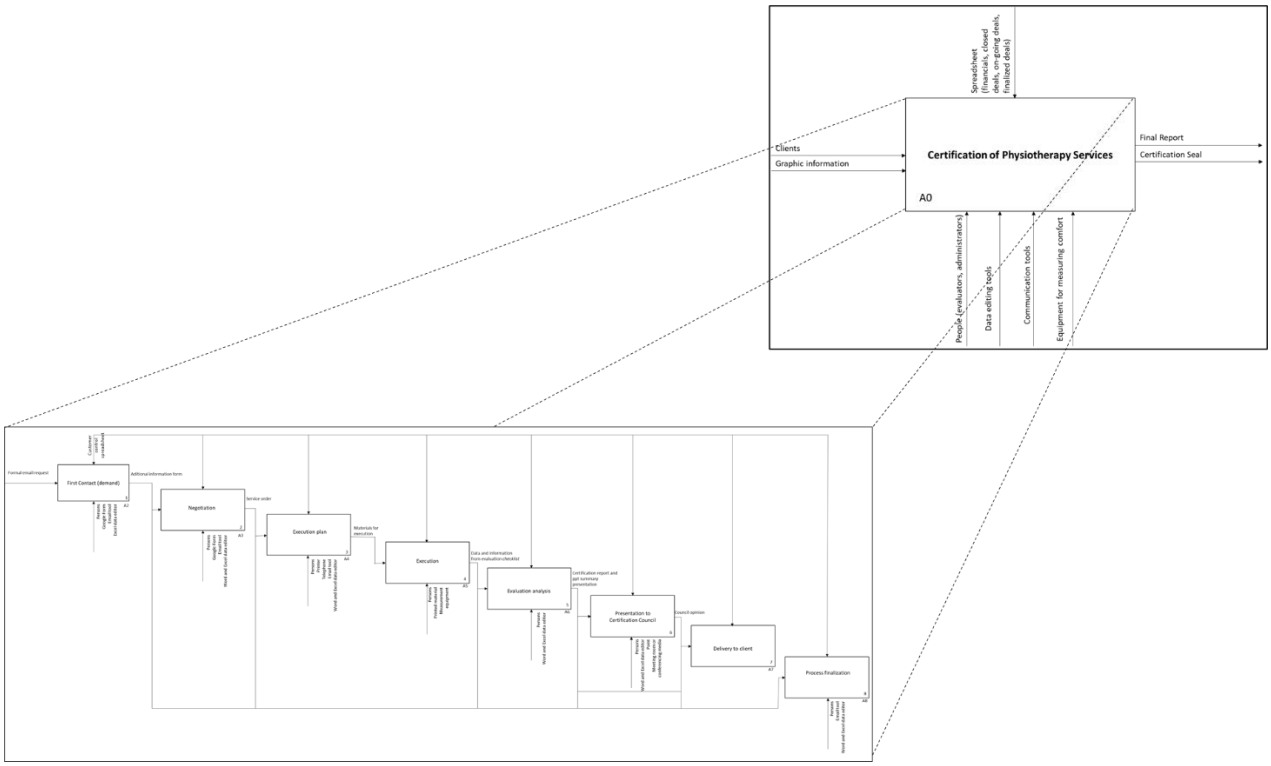

Figure 8 - IDEF0 Opening A0 into A1

Source: Authors (2017)

Each of the identified steps in box A1, which demonstrates a general scope of steps to be followed, generates a new box to describe the activities inherent to it.

Step	1 (A1)	2 (A1)	3 (A1)	4 (A1)	5 (A1)	7 (A1)	8 (A1)
Opening	A2	A3	A4	A5	A6	A7	A8

Chart 4 – Opening process

Source: Authors (2017)

Step 1 (A1) – Initial contact or demand is composed of 3 tasks: check email, feed controls spreadsheet, and send form requesting more information from the client. Figure 9 presents the activities diagram and Figure 10 shows the opening process in layers.

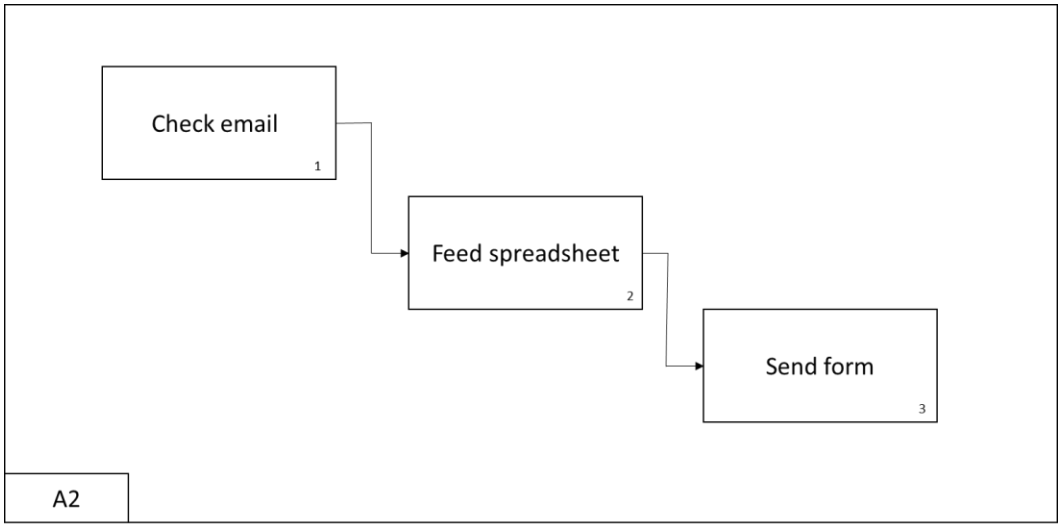

Figure 9 - Diagram of box A2 activities

Source: Authors (2017)

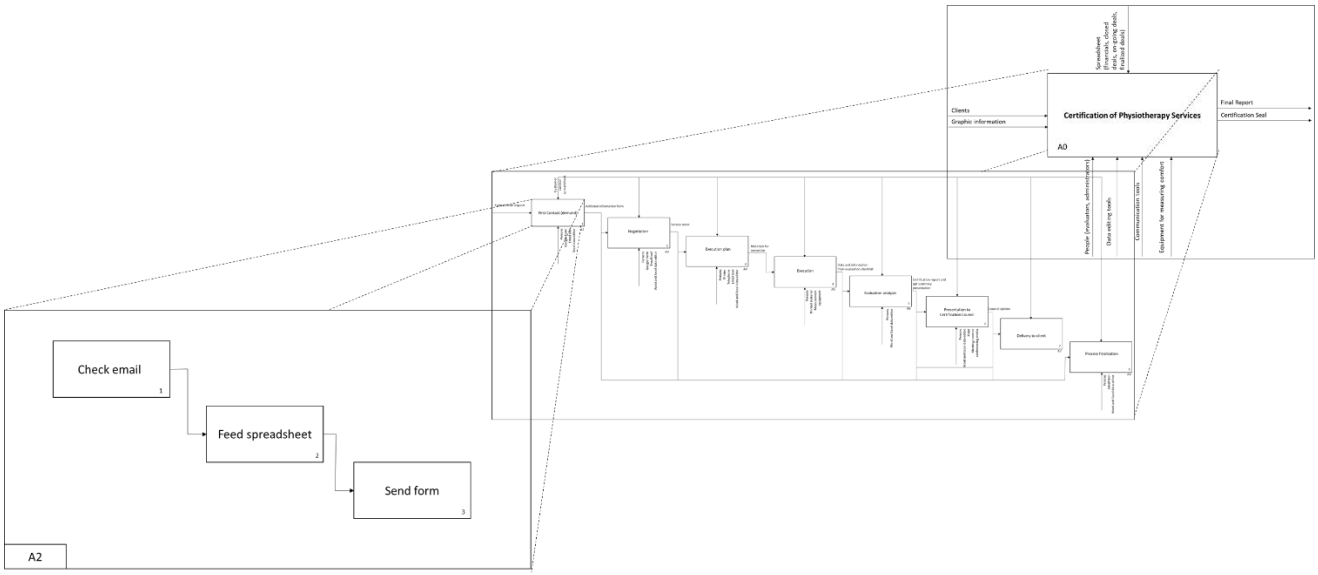

Figure 10 – Opening layers A0, A1 and A2

Source: Authors (2017)

The Negotiation 2 (A1) step is subdivided into 6 tasks shown in box A3, which are: verify form information from prior step, analyze what is needed to execute the job, contact the client for financial negotiations and contract details, develop and send contract, issue and send invoices to client, and produce work order so the next steps may development (Figure 11).

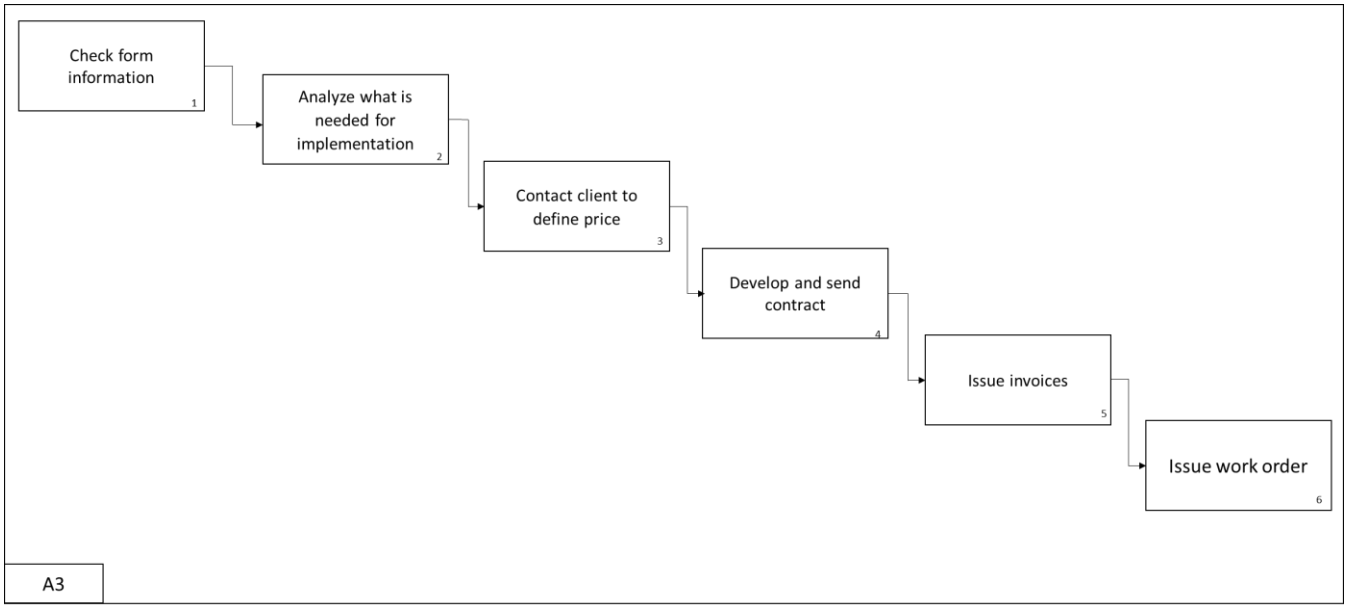

Figure 11 – Box A3 tasks for Negotiation step

Source: Authors (2017)

Box A4 describes activities related to the Execution Plan step composed of six tasks, where task two will open into box A4.1 to describe 5 activities. Figure 12 shows the opening of box A4, Figure 13 shows the opening of box A4.1, and Figure 15 shows the layered view that the model IDEF0 affords.

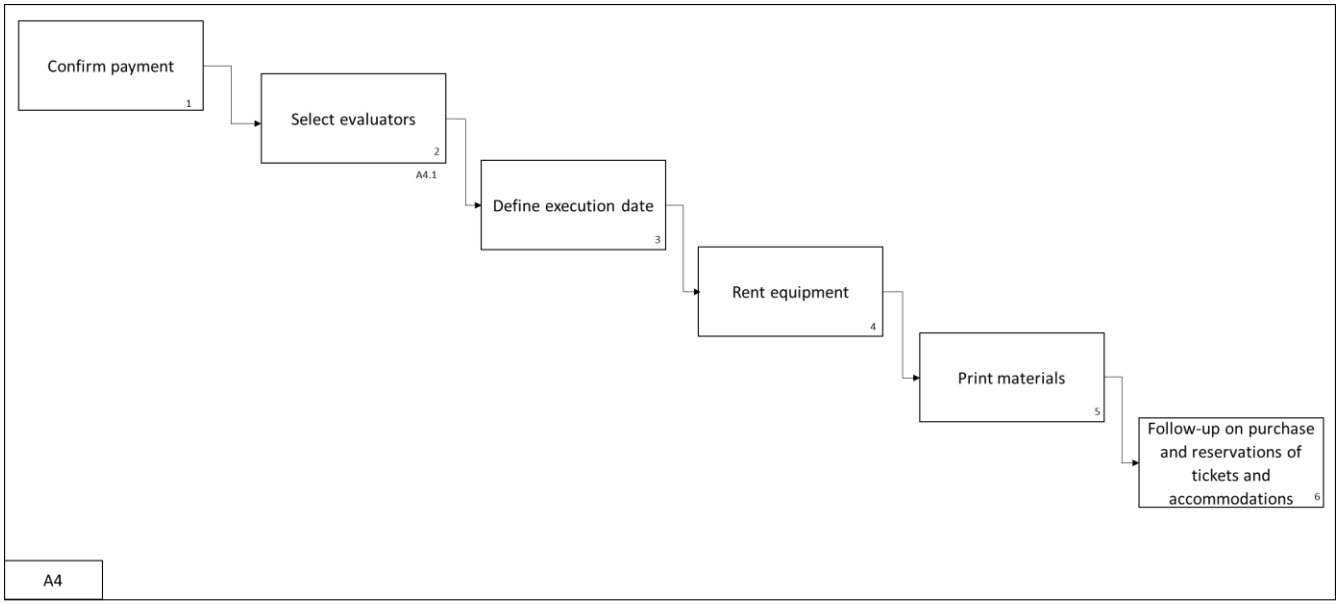

Figure 12 – Opening A4 related to the Execution Plan step

Source: Authors (2017)

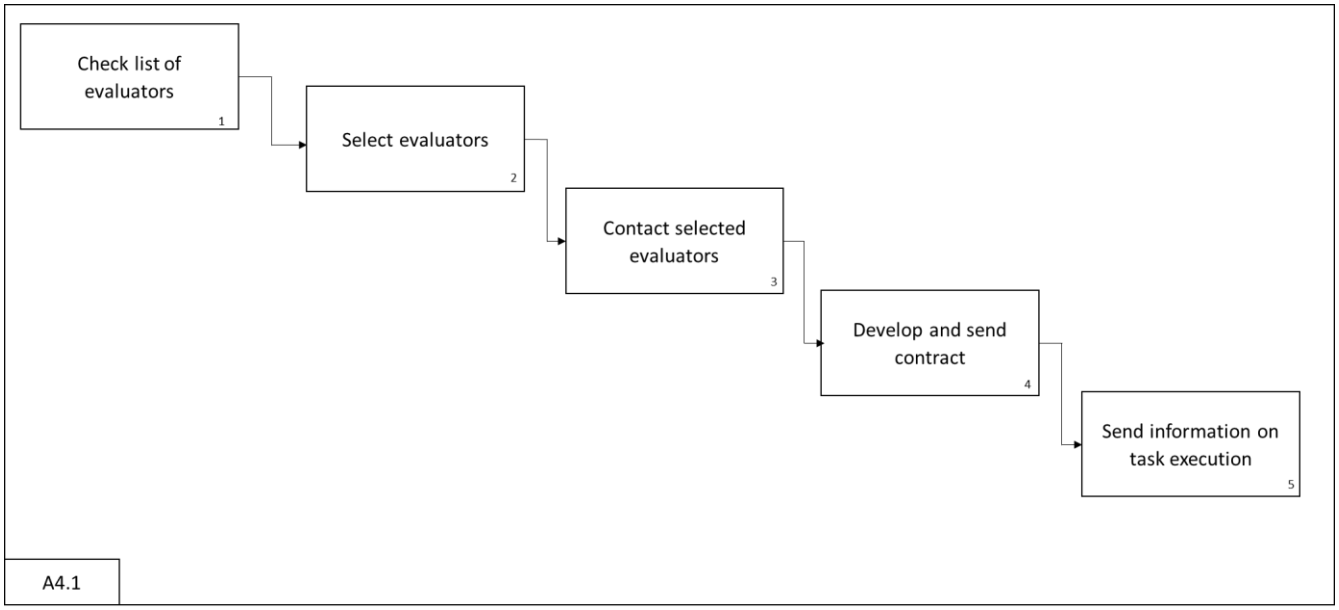

Figure 13 - Opening A4.1 related to the activity of Selecting Evaluators

Source: Authors (2017)

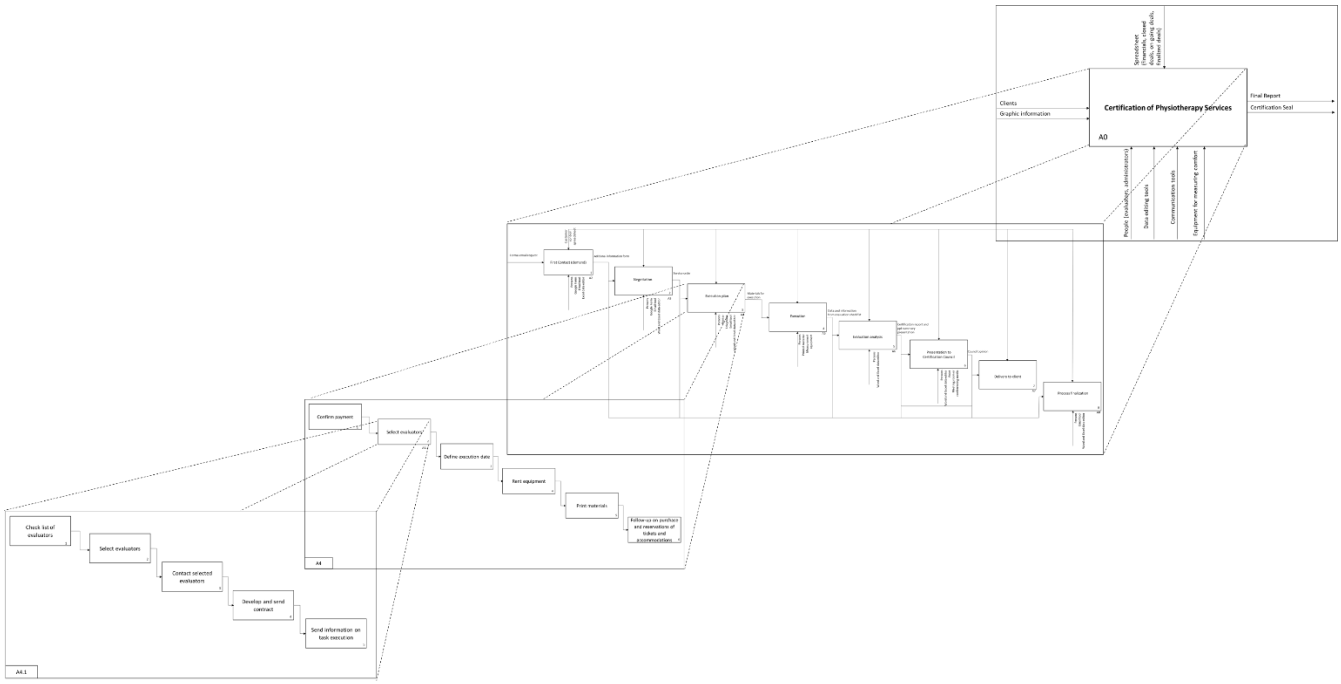

Figure 14 - Layered view of model IDEF0 - A0, A1, A4, A4.1.

Source: Authors (2017)

Figures 15, 16 and 17 show the opening of boxes A5 developing from step 4 (A1) Performance, box A6 developing from step 5 (A1) Evaluation analysis, and box A7 developing from step 7(A1) Delivery to client, respectively. A5 is composed of three tasks, A6 of 4 tasks, and A7 has 6 tasks.

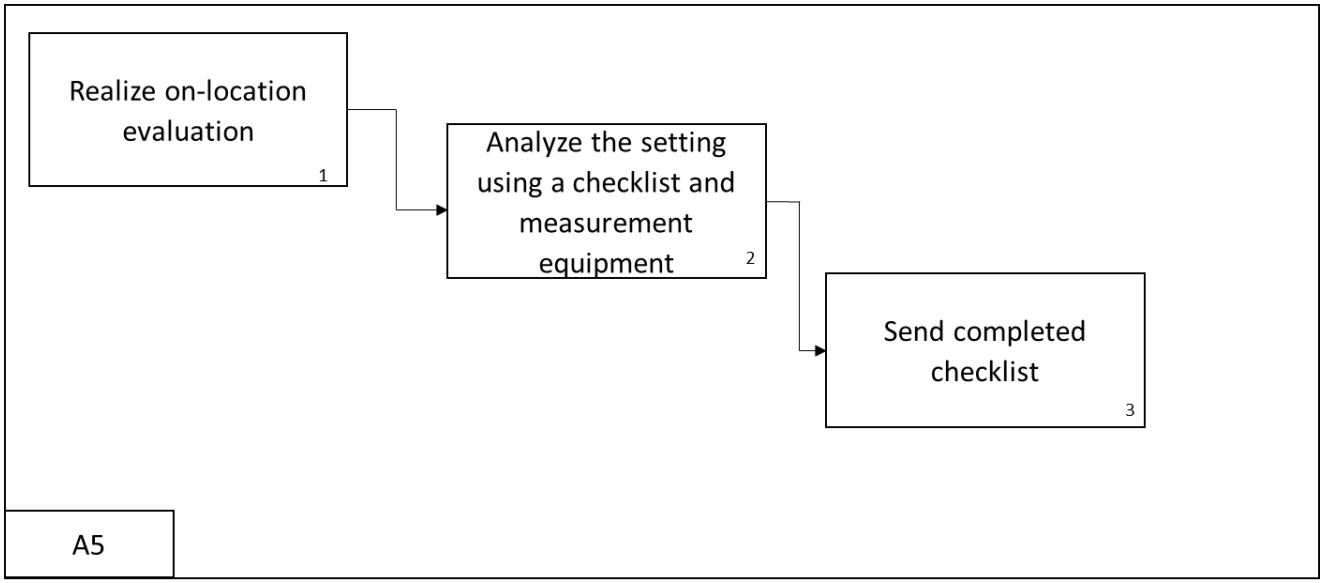

Figure 15 - Box A5 refers to step 4 (A1) - Execution

Source: Authors (2017)

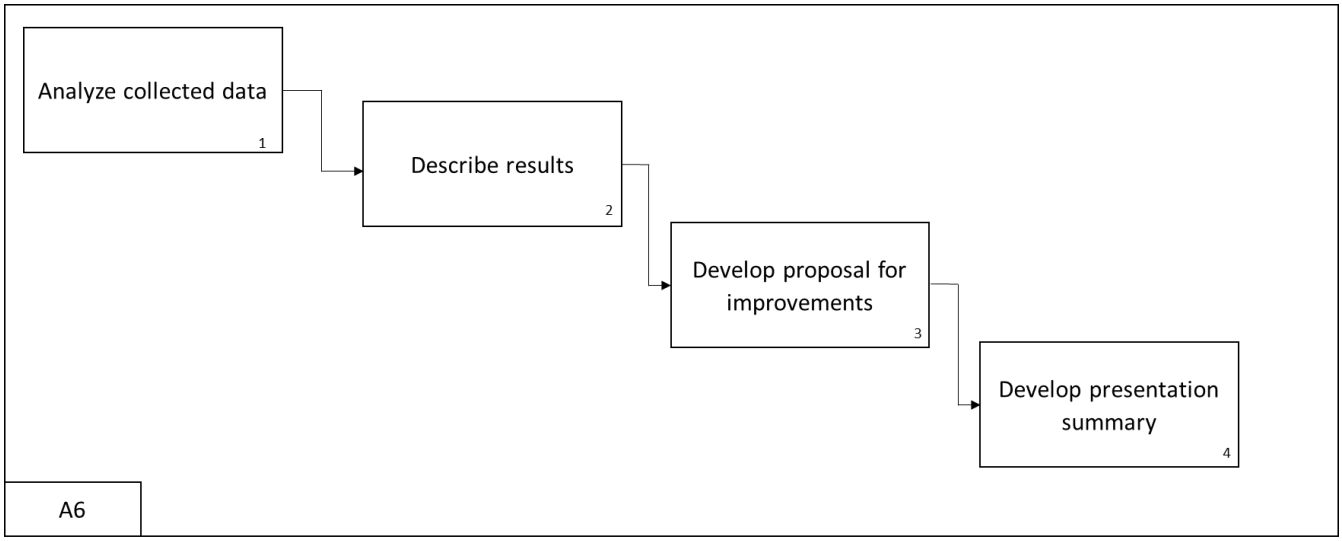

Figure 16 - Box A6 refers to step 5 (A1) - Evaluation analysis

Source: Authors (2017)

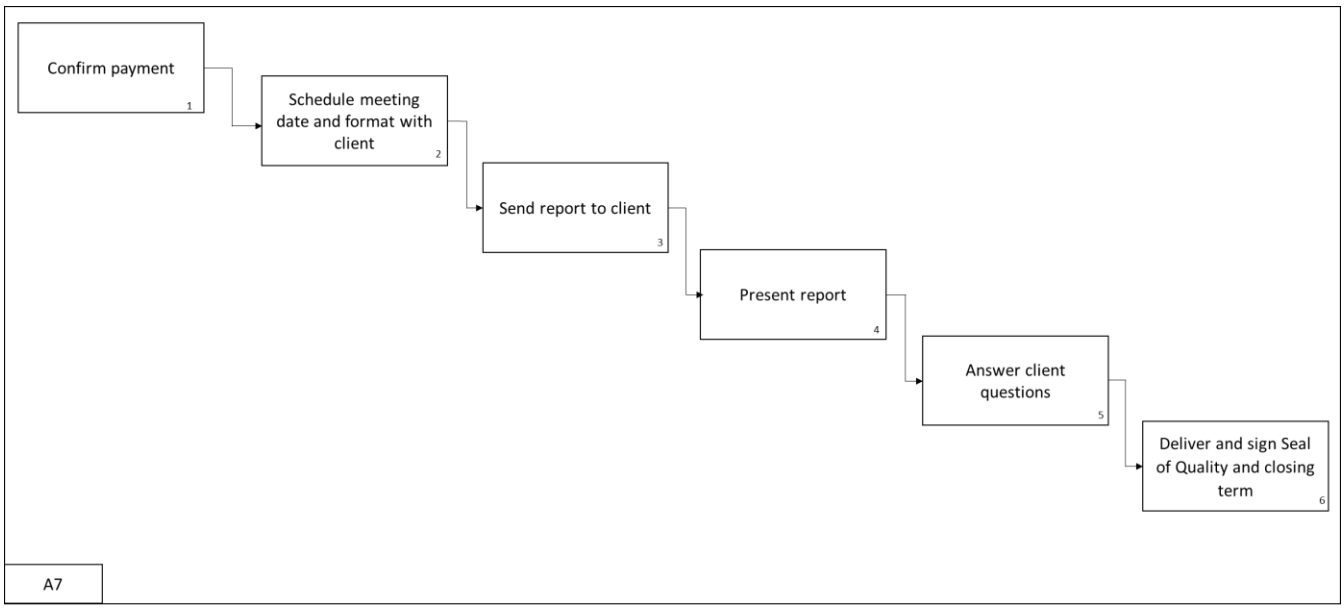

Figure 17 - Box A7 refers to step 7 (A1) Delivery to client

Source: Authors (2017)

Finally, box A8 refers to step 8 (A1) Process finalization, comprised of 4 activities. The last of these produces the output of this phase of the process "Final Report of process" (Figure 18).

However, due to limitations in this research, the relation between this process and other processes of the organization, such as marketing and after-sales, were not presented through graphics.

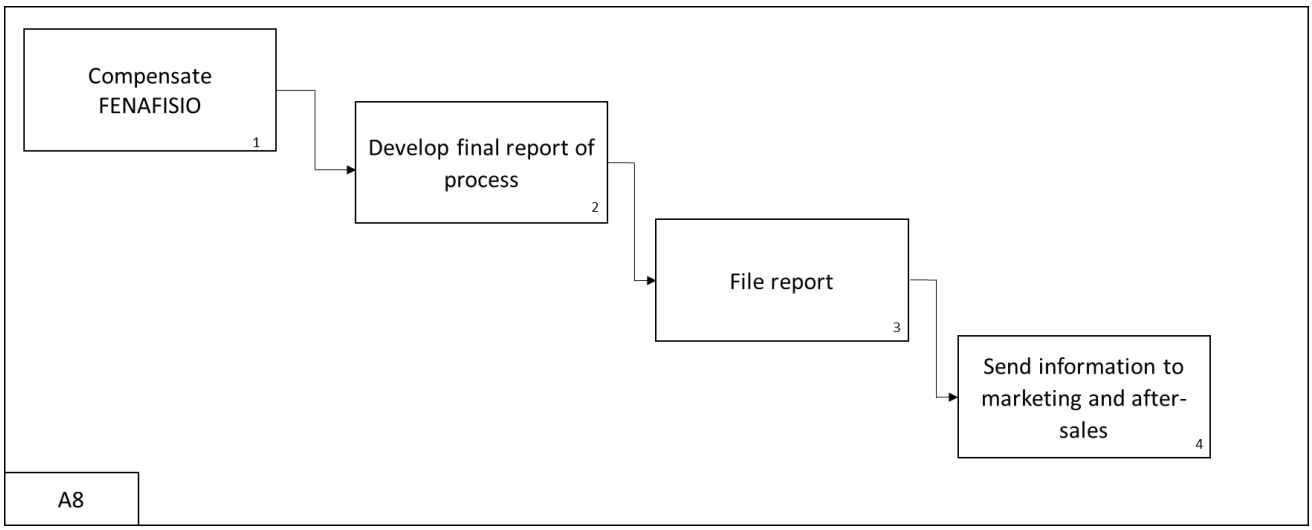

Figure 18 - Box A8 refers to step 8 (A1) Process finalization

Source: Authors (2017)

It is noteworthy to mention that this design represents the current configuration of the certification process of Physiotherapy services. Therefore, an analysis of what has been described is advised to identify further obstacles or existing positive points that may still be improved.

5. Final considerations

Withing the scenario of health care provider services, of which physiotherapy services are a part, the discussion about cost, quality, access to information, safety and guarantee of services provided to users becomes a strategic factor for organization. Implementing quality programs followed by certification programs proves to be of great importance, considering that physiotherapists do not graduate with the necessary training for management.

Process modeling provides an ample view with a broader understanding of the flow of documents and information between parts. Therefore, modeling makes it possible to identify obstacles, to make the process more efficient, and to have greater command of information to relay it to others.

Using the IDEF0 method for modeling processes renders a detailed view of subprocesses and activities that it comprises, helping to develop an organizational systemic view. Another positive point of using the IDEF0 method is that it allows for detailing the inputs, outputs, controls, and mechanisms that are necessary for realizing the process as a whole and in detailed steps of each related activity.

6. Acknowledgement

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