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2018-12-06

Deposited version:
Post-print

Peer-review status of attached file:
Peer-reviewed

Citation for published item:
Pereira, J., Martins, A. L. & Pereira, R. (2018). Process analysis using business process management: a case study on incident management. In Leandro Añibano, Rogério Marques Serrasqueiro (Ed.), XVIII Encuentro Internacional AECA. Lisboa: Asociación Española de Contabilidad y Administración de Empresas.

Further information on publisher's website:
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Publisher's copyright statement:
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PROCESS ANALYSIS USING BUSINESS PROCESS MANAGEMENT: A CASE STUDY ON INCIDENT MANAGEMENT

Pereira, João (*) | Martins, Ana Lúcia (**) | Pereira, Rúben (***)

(*)

Name: Pereira, João

Function: Master student, Instituto Universitário de Lisboa (ISCTE-IUL), Lisboa, Portugal

Address: ISCTE-IUL, Instituto Universitário de Lisboa,

Av. das Forças Armadas

1649-026 Lisboa

Portugal

Phone number: 00351961960840

Email address: jmspa11@iscte-iul.pt

(**)

Name: Martins, Ana Lúcia *(corresponding author)*

Function: Assistant Professor, Instituto Universitário de Lisboa (ISCTE-IUL), Lisboa, Portugal

Address: ISCTE-IUL, Instituto Universitário de Lisboa,

Av. das Forças Armadas

1649-026 Lisboa

Portugal

Phone number: 00351217650459

Email address: almartins@iscte-iul.pt

(***)

Name: de Sousa Pereira, Rúben *(corresponding author)*

Function: Assistant Professor, Instituto Universitário de Lisboa (ISCTE-IUL), Lisboa, Portugal

Address: ISCTE-IUL, Instituto Universitário de Lisboa,

Av. das Forças Armadas

1649-026 Lisboa

Portugal

Phone number: 00351966474901

Email address: Ruben.Filipe.Pereira@iscte.pt

Theme area: C) Management and Organization

Key words: Business Process Management; Case study; Incident management; Process analysis

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ABSTRACT

Business process management is widely used to improve companies' competitive level. Incident management is a critical process as it supports the main services of an organization. Its speed and accuracy are paramount to companies. This research aims at analysing an incident management process of a global company and produce managerial recommendations on how to improve its performance. A case study approach is conducted. Process analysis is conducted based in interviews, direct observation, and focus group to assure data triangulation. Process improvement is based on the goals of the process and managerial recommendations are provided to support that improvement.

Keywords: Business Process Management; Case study; Incident management; Process analysis

INTRODUCTION

Change and competition are a constant in business. Organisations need to be competitive to succeed. To remain competitive, organisations should look to continuously innovate and to increase productivity, which calls for an intense focus on their functioning or, in other words, their business processes (BP) (Conger, 2010; Harmon, 2014). For this, process-oriented organisations comprehensively apply business process management (BPM) (Kohlbacher, 2010). BPM is considered a mature discipline, both in organisations and in research domains (vom Brocke *et al.*, 2014; Aalst, La Rosa and Santoro, 2016), with several studies produced. By providing a set of methods and tools, BPM seeks to analyse and understand business processes (BP) in detail, with the main objective of manage and improve their performance. Solid and thorough BP analysis is an essential basis for further improvements and innovation. Thus, it is a step of BPM that should not be lightly taken.

The aim of this research is to analyse the incident management (IM) process of an organisation that supports its information technology (IT) services using BP analysis and produce managerial recommendation of how it can be improved under the scope of the relevant issues for both the service company and its customers.

For the organisation, the IM process is one of vital importance for IT support services, once it is an indicator of customer satisfaction with the IT services and is an early spotter of potential failures. There is the need to understand what the current state of the process is, by documenting it, and how it is being performed, regarding the established objectives, understanding the existing problems and challenges in the service operation.

One can find several works in the literature regarding BPM. However, few researches have been produced that apply an BPM approach to the IM process, with only 3 studies found (Bandara, Rosemann and Cornes, 2005; Conger, 2010; Mahy, Ouzzif and Bouragba, 2016) regarding the subject.

This research is then aiming at the dual goal of contributing to both theory and practice. As there is lack of research in process analysis in the area of IM, this research aims to contribute to fil that gap. In parallel, as it is based on a real situation in which a specific company is aiming at improving its IM process, the outcome of this research also aims at producing results that contribute to an improved future state of the process and, consequently, the competitive position of the analysed company.

A single case study research is conducted. According to Yin (2013), the case study approach is the most appropriate for this research, as it concerns a contemporary topic that has not been much explored in literature.

Considering the identified research methodology and the conceptual BPM approach, this research starts by providing a theoretical background on BPM. Then, a brief description of the research methodology and its design is provided. Following, the case study is presented and the analysis specific goals are defined, also providing an understanding of the IM process, its stakeholders and its value. Next, the BP analysis itself – data collection and process modelling – is conducted, and results of the current situation are extracted. Conclusions and limitations regarding the results of the research are the last part of the article, where topics for further research are also suggested.

THEORETICAL BACKGROUND

Business process: paradigm and definition

BP became relevant in practice and research domains when, in the last century, organisations changed their functioning basis to a more process-oriented customer-centric perspective, instead of functional and hierarchical structures (Reijers, 2006; Kohlbacher, 2010).

One of the most well-known definitions of BP is the one by (Davenport, 1993, p. 5), which states that a BP is "a structured, measured set of activities designed to produce a specified output for a particular customer or market. It implies a strong emphasis on how work is done within an organization, in contrast to a product focus's emphasis on what. A process is thus a specific ordering of work activities across time and space, with a beginning and an end, and clearly defined inputs and outputs: a structure for action." BP is an important concept that facilitates the collaboration between people and other resources in an organisation to achieve business objectives (BO) in an efficient and effective manner (Weske, 2012a).

The process design and performance has logical impacts on both the quality perceived by the customers and in the efficiency of the whole process (Dumas *et al.*, 2013). As the business environment changes and market competition intensifies, BO and BP standards change as well, such as the quality perceived and efficiency, obliging organisations to manage and improve BP to stay competitive and succeed (Harmon, 2014).

Table 1 - BP approaches before BPM

Disciplines	Development	Focus
Total Quality Management	1970s	Continuous organisational improvement to achieve a higher product and service quality
Six Sigma	1980s	Identifying and removing causes of defects to achieve 99.99966% of effectiveness in BP (Conger, 2010)
Lean Management	1990s	Identify and eliminate different types of waste in BP, in order to improve them and make them more efficient
Business Process Reengineering	1990s	Projects that help to radical restructure organisations focusing on their BP with a strong contribution of IT tools

Source: adapted from Harmon (2010)

Process-oriented organisations have to employ methods and tools that allow to control and redesign BP on a continuous way (Kohlbacher, 2010). Throughout the years, different disciplines suggested ways to set methods of how to manage and improve BP. Table 1 (above) presents some examples of such situations.

Business process management: conceptual approach

BPM started to be developed at the beginning of the 21st century, which is a logical evolution and combination of different management theories with technological developments.

Harmon (2010) presents BPM as the logical result and evolution of "three BP traditions":

- Business management (ex: Michael Porter's management theories, balanced scorecard)
- Work simplification/quality control (ex: total quality management, six sigma, workflow management)
- IT tradition (ex: business process reengineering, enterprise resource planning)

The origins of BPM can be traced back to Taylorism and Fordism, to Adam Smith's division of labour, and even mention the evolution of workers' capabilities since the prehistoric times (Harmon, 2010; Aalst, 2013; Dumas *et al.*, 2013).

Table 2 - BPM definitions

(Author, Year)	Definition
(Weske, 2012a, p. 5)	"Includes concepts, methods, and techniques to support the design, administration, configuration, enactment, and analysis of business processes".
(Aalst, 2013)	"Discipline that combines knowledge from information technology and knowledge from management sciences and applies this to operational business processes".
(Dumas *et al.*, 2013, p. 1)	"The art and science of overseeing how work is performed in an organization to ensure consistent outcomes and to take advantage of improvement opportunities".

BPM has become a mature discipline, being acknowledged as such by the industry and in the research domain (Aalst, 2013), although Ko, Lee and Wah Lee (2009) argue that the practical domain is more developed than the theoretical domain, with systems and software being the main contributors for that difference. In the literature, different definitions can be found. Table 2 (above) provides some examples.

This research follows the definition given by Dumas *et al.* (2013). BPM is described as a discipline that includes a set of methods and tools, from IT and management worlds, to manage and improve BP in a continuous manner (Recker and Mendling, 2016). For the purpose of improvement, BPM authors and researchers (see Table 3) propose a cyclical set of methods to control, measure, analyse and reconfigure BP, being usually referred to as the BPM lifecycle.

Although there are different depictions by authors who present different stages and goals, the essence is the same – a closed cycle of management, analysis and improvement of BP. This research follows the BPM lifecycle proposed by Dumas *et al.* (2013).

Improvements and redesign of BP make possible for organisations to adapt to change and define new BO (Harmon, 2014). However, the starting point for a solid and well-made redesign is a proper and exhaustive analysis of the BP in its current state (Dumas *et al.*, 2013). BP analysis is part of the first stages of BPM, where "surveys on the business processes and their organizational and technical

environment are conducted" (Weske, 2012a, p. 11). Being an evolution of different BP traditions, some BPM techniques and tools are already known from other disciplines to BP analysis (Conger, 2010).

Table 3 - BPM lifecycle in the literature

(Ko, Lee and Wah Lee, 2009)	(Houy *et al.*, 2011)	(Weske, 2012a)	(Aalst, 2013)	(Dumas *et al.*, 2013)
Process design	Strategy development	Design and analysis	(Re)design	Process identification
System configuration	Definition and modelling	Configuration	Implement/ configure	Process discovery
Process enactment	Implementation	Enactment	Run and adjust	Process analysis
Diagnosis	Execution	Evaluation		Process redesign
	Monitoring and controlling			Process implementation
	Optimization and improvement			Process monitoring and controlling

Note: being in the same line does not mean that the stages of different authors are equivalent

Improvements and redesign of BP make possible for organisations to adapt to change and define new BO (Harmon, 2014). However, the starting point for a solid and well-made redesign is a proper and exhaustive analysis of the BP in its current state (Dumas *et al.*, 2013). BP analysis is part of the first stages of BPM, where "surveys on the business processes and their organizational and technical environment are conducted" (Weske, 2012a, p. 11). Being an evolution of different BP traditions, some BPM techniques and tools are already known from other disciplines to BP analysis (Conger, 2010).

Business process analysis: methodology

Commonly known methods of evidence-based, interview-based and workshop-based for discovery and validation can be employed when disclosing the initial situation of the BP (Weske, 2012a; Dumas *et al.*,

2013). Mapping and modelling are recommended as steps and tools for a joint understanding of BP activities and flows, its structure and who the actors in it are (vom Brocke *et al.*, 2014).

BP analysis is performed to evaluate the BP performance in its current state, revealing the existing imperfections and inefficiencies, which allows a first glance of what can be improved and redesigned (Weske, 2012a; Aalst, 2013; Dumas *et al.*, 2013). This evaluation is key for managers to perceive BP improvement opportunities and take decisions towards that change (Dumas *et al.*, 2013). A proper analysis allows process owners to have an inside end-to-end look of BP and understanding which issues are to be addressed in the process as a whole (Aalst, La Rosa and Santoro, 2016). It also gives an overview of what key performance indicators (KPI) are being or not being achieved. Mansar and Reijers (2004, 2005) propose a framework to evaluate redesign best practices in four dimensions – cost, time, quality and flexibility.

RELATED WORK

As vom Brocke *et al.* (2014), Aalst, La Rosa and Santoro (2016) argue, BPM is an established discipline both in research domain and organisations. There are several studies under this topic and case studies in different industries developed. Among others, it is possible to find applications in small and medium organisations (see, for instance, Sanka Laar and Seymour, 2017), applications in healthcare (see, for instance Netjes *et al.*, 2009; Becker *et al.*, 2007), in the banking sector (Küng and Hagen, 2007), or in the automotive industry (Hertz, Johansson and de Jager, 2001), just to name a few examples. provide a case in the automotive industry. Several other cases can be found in the literature, however few concerning the application in IT processes. Examples of those scarce situations are the application of applications of BPM in the IM process (see, for instance, Mahy, Ouzzif and Bouragba, 2016; Conger, 2010; Bandara, Rosemann and Cornes, 2005).

By performing a BPM approach to the IM process, this research tries to contribute to close the existing gap in the application of BP analysis to IT processes, a relation that does not have been much explored. Such relation can be the basis to have a better management view over IT processes and to improve them in order to become more customer-centric.

RESEARCH METHODOLOGY

The research methodology used is a single case study approach as proposed by Yin (2013). Accordingly, this research is conducted based on the following steps: designing the case study, conducting the case

study, analysis of the collected data and, last but not least, develop conclusions. This case study was performed from September 2017 to February 2018.

In order to fulfil the goal of this research, BPM will be used as it is a recent and broader methodology, which encompasses several methods and tools of different BP traditions, as seen in the literature review. Dumas *et al.* (2013) proposal will be used as it is the most recent and detail approach (due to the number of stages it includes) for this purpose.

Based on (Dumas *et al.*, 2013) BP modelling is conducted, as it provides a visual understanding of the process and details its activities, actors and flows, being key to conduct a proper process analysis. BP model and notation (BPMN) are used, in its most recent version, BPMN 2.0 from 2011. It is a recent language that tries "to identify the best practices of existing approaches and to combine them into a new, widely accepted language" (Weske, 2012b, p. 206).

Data collection was based on documentation, archival records and interviews, following Yin (2013) recommendations.

Existing documentation provided an initial source of insights about the process and support service, and their context in the organisation.

Next, three rounds of formal interviews with 17 team members and predefined guides of topics were conducted with the team that supports the analysed process:

- The 1st round provided insights of the service performed by the team and the role its members take in the IM process. Processual inquiries – regarding activities, flows, decisions and roles, among others – were also conducted in order to have a draft version of the process. The interviews took approximately 30 minutes each and the answers were written.
- The 2nd round faced the team members with the first draft version of the process. Errors and omissions were identified and enabled, to conclude the final model. The interviews took approximately 20 minutes each and the answers were written.
- The 3rd round explored existing issues identified by the team members in the process and in the service, and possible solutions to them, on a qualitative perspective. The interviews took approximately 20 minutes each and the answers were written.

The ultimate output of these three rounds was the as-is model and the issues surveyed with the team.

After that, the data records generated by the service operation relative to period from October 2017 to December 2017 were consulted and analysed. Such analysis provided general information about the process performance, nuances and deviations. A Pareto analysis was conducted, which allowed the authors to determine how many IT services are supported by the team and which are the most demanded.

Finally, a focus group of 1 hour with the whole 18 team members was convened to validate the modelled process and the information analysed.

CASE STUDY CHARACTERIZATION

The case study focuses on the IM process performed by a team in Lisbon that provides IT support services to the global human resources (HR) department of an organisation. The organisation is a multinational conglomerate, present in more than 190 countries and having more than 300.000 direct employees, in different industrial areas. This IM process is one of several processes that provide IT support services to the organisation itself, being the team part of the corporate IT services division.

The IM process is mainly grounded on the Information Technology Infrastructure Library (ITIL) framework, one of the most used IT framework to manage IT services (de Sousa Pereira and Mira da Silva, 2012; BMC and Forbes Insights, 2017). By implementing and performing this process, the organisation under analysis aims to receive incident tickets and manage all their lifecycle, in order to restore normal service operation as fast as possible and minimize the impacts in business operations, as advised in the ITIL framework (TSO, 2011). An incident is classified as an “unplanned interruption to an IT service or reduction in the quality of an IT service or a failure of a configuration item that has not yet impact an IT service” (TSO, 2011, p. 72). In this case study, the IM process analysed is adapted to the support structure that performs it.

The customers are the IT services of the global HR department of the organisation, which hire the support service to solve their incidents. Considering also that this IM process is one of many that consist the support service, the service provided can be classified as B2B service.

Regarding resources, there are several actors across this support service that can participate in the resolution of the incident, depending if they are required or not. The team analysed is one of those actors and is composed by 18 people. The team is considered the IM process owner, being its main goal of the team is to solve the incidents as fast as possible, in order to restore normal service to the customers – so they can return to their normal working – and to comply with contracts.

After the analysis of data records, it was concluded that demand is stable over time. Any variation is usually predictable. An example of this is the month of December, when a lower volume of demand occurs, due to Christmas, New Year and other festivities.

Incident tickets (tickets) coming from the customers are the artefacts flowing along the process, being generated when a customer reports an incident to the support team. Tickets have different priorities, according with the urgency and impact of the incident, which affects the respective SLA. Also, tickets are classified according with the IT service where the incident occurred.

PROCESS DISCOVERY

Process discovery consists on modelling the as-is process, identifying all the participants, activities and flows that characterize its design.

Customers

The customers of the IM process are the IT services of the HR department. These customers have contracts with the company so that it receives and handles its incidents. However, the final customers are the IT services users who report incidents. These users can be either employees or IT services managers. The organisation has contracts with the IT services establishing service level agreements (SLA). These SLAs are part of the measured indicators in the service operation, such as:

- Reaction time: this indicator relates to the time the ticket awaits in queue before its processing starts.
- Resolution time: this indicator concerns the time the team takes to solve the issue and restore customer's normal service.

The quality for customers is having the incidents solved complying with the established SLA.

Process contextualization

The process is triggered when a customer reports an incident to the support service. The reception of the tickets can happen in two different ways:

- An email sent by the customers, which generates automatically a ticket in the IM system.
- A call to the support team, who creates a ticket manually as a consequence of that call.

The process is finished 14 days after the ticket is labelled as resolved by the support expert, if there are no reopening requests made. However, some alternative endings may exist:

- If a ticket enters with critical priority, the support agent immediately stops the normal IM process and deploys the critical incident procedure, which exists to answer those specific cases and has a different design adapted to the IT service impacted.
- If the support expert determines that the incident is not valid under the scope of services that office has available, he cancels the ticket, ending the IM process.

Service structure

Although the team is the owner of the IM process, it is part of a structure that has more participants dedicated to incident solving. This vertical structure is composed by two support levels (SL) – 2nd SL and 3rd SL – and IT suppliers, that interact and share tickets between them to solve incidents, depending on their complexity. The objective of the division in two SL is to have different specialization of skills and a better distribution of workload through the support service structure, instead of having just one SL where all incidents of all complexities would converge. Some IT services outsourced the 1st SL. However, being the incoming tickets from that 1st SL processed the same way as other tickets, this 1st SL is also considered a customer. Table 4 resumes the actors that may participate in the IM process.

Table 4 - Actors and roles in the IM process

Group	Role	Description
Customer		All entities that report incidents to the support service. Can be its users, managers or the external 1st SL
2nd SL	Support agent	Element in charge of the initial reception, processing, and dispatching of tickets to the respective support expert
	Support expert	Expert in the resolution of incidents, allocated by IT services
3rd SL	IT specialist	At a deeper level of support and expertise, the IT specialists handle tickets that the 2nd SL was not able to resolve. These are part of different development teams
IT supplier		External entities that originally produced and provided the IT service. They are usually called to the process when there is an issue that nobody at the support structure can solve

The team under analysis is in the 2nd SL and it is considered the main support element, but also has some 3rd SL elements. The team is composed by 2 support agents, 12 support experts, and 3 IT specialists. These last 3 elements are the ones in the team that perform 3rd SL roles. The 3rd SL are development teams for the different IT services spread across the organisation. Inside each SL there are functions that play different roles in the processing and resolution of incidents. Each role has a different set of skills, knowledge and permissions designed for its functions in the IM process. IT suppliers are third parties to the organisation, the original providers of the IT services.

Activities

The IM process performed is based on ITIL framework proposed workflow. There are no full-manual activities, being all performed with the support of an IM system. The tasks and details of each activity may vary according with the service where the incident occurred. However, the activities are standard and transversal to the IM process that the team performs. These activities also provide an insight of what are the functions and required skills of each role.

Table 5 - Activities performed by a support agent

Type	Activity	Description
Ad-hoc sub process	Answer call	Answer the customer calls to identify the incident, register (log) the issue into a ticket and prioritize it accordingly
User activity	Incident identification	Identify the service impacted and the nature of the incident
User activity	Incident categorization	Categorization based on the service impacted and the incident nature
Throw message activity	Assign to support expert	Based on the categorization given, assign to the respective support expert
Catch message event	Review returned incident	Review the returned ticket by the support expert, when ticket is wrongly assigned initially

The support agent is responsible for the initial dispatching of the incoming incidents. Its functions include: answering the calls of customers to open a ticket; the processing and allocation of tickets to the

designated support experts, according with the given classification. Its activities are detailed in the Table 5.

The support expert is placed in the main SL, being its goal the resolution of incidents, sending tickets to the 3rd SL on if-necessary criteria. The functions of this role include the diagnosis, resolution and closure of tickets, communicating with the customer when necessary. In situations where the ticket is reopened, the support expert is also responsible to reanalyse the incident and rework on the ticket. The activities for this role are detailed in Table 6.

Table 6 – Activities performed by a support expert

Type	Activity	Description
Catch message activity	Initial diagnosis	Initial analysis of incoming incidents after being dispatched, where an initial short analysis is made to understand the incident, its nature and relevancy
User activity	Investigation and diagnosis	After the initial diagnosis and checks, more detail analysis of the issue to understand its root causes and the possible resolution
User activity	Resolution and recovery	Solve the incident and restore the normal service, after finding the original cause
User activity	Incident closure	Communication with the customer to notify him that the incident is solved and the ticket labelled as resolved, asking for feedback or not, depending on the service
Throw message activity	Return to dispatching	If the scope of the arriving ticket is not the same as the support expert it is returned to support agent
Throw message activity	Assign to 3rd support level	If the root cause of the incident can't be found and/or requires IT specialist intervention, the ticket must be assigned to the respective 3rd support level
Catch message intermediate event	Incident ticket returned	Tickets returning from the 3rd support level, after the incident is resolved and the service recovered by the IT specialist
User activity	Incident reanalysis	Analysis of the reopening request and new information, to understand what failed and needs to be done

The IT specialists are part of the different development teams that consist the 3rd SL. The function of its IT specialists in the IM process to resolve the more demanding incidents that the 2nd SL is not able to solve and that require a higher set of skills and knowledge of the service impacted. Once the resolution is done, IT specialists return the tickets to the 2nd SL. They are the last resort available in the organisation to solve incidents. However, if they are unable to do so and the incident requires the IT supplier intervention, the IT specialist is responsible to make that interaction. The respective activities are described in Table 7.

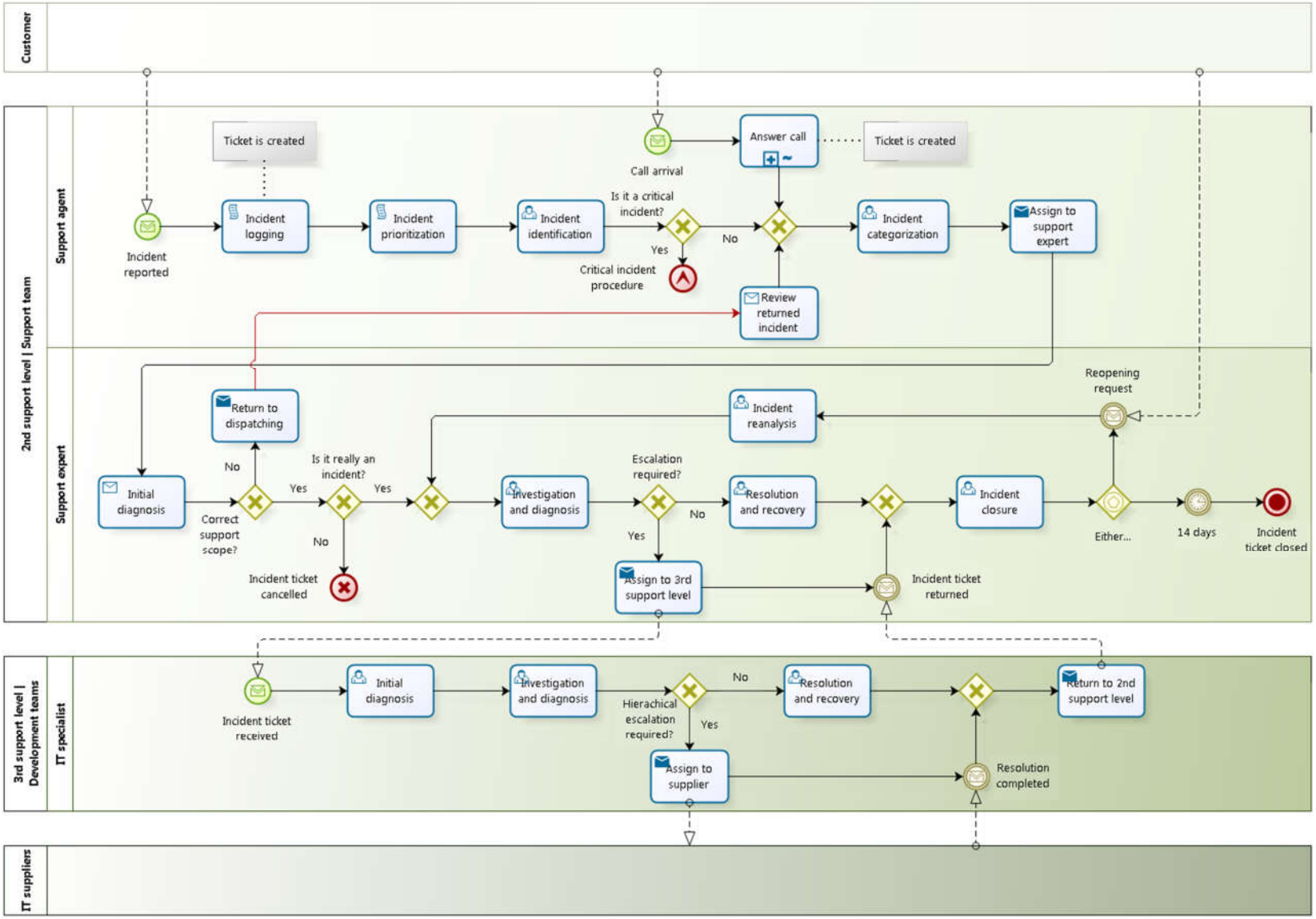
Table 7 - Activities of the IT specialist

Type	Activity	Description
User activity	Initial diagnosis	Initial short analysis of arriving tickets from the 2nd support level, to understand the incident and the work done so far
User activity	Investigation and diagnosis	After the initial diagnosis, more detail analysis of the issue and work done to understand its root cause and the necessary resolution
User activity	Resolution and recovery	Solve the incident and restore the normal service, after finding the original cause
Throw message activity	Return to 2nd support level	After the resolution and recovery of the service, return the ticket to 2nd support level
Throw message activity	Assign to supplier	If the root cause of the incident can't be found and/or requires supplier intervention, the ticket must be assigned to it

Process model as-is

Based on the collected information in the 1st and 2nd interview, detailed above, the as-is model of the IM process is modelled using the BPMN 2.0 language, as presented in Figure 1, which is the final as-is version, validated by team.

Figure 1 - IM process model as-is



PROCESS ANALYSIS

Data records analysis

The analysis of data records was based on the operational reports generated by the IM system. This analysis focused on the data generated from October 2017 to December 2017, with a volume of 6385 tickets being processed over those 3 months. The outputs of this general analysis were:

- By filtering the tickets by category, it was found that the support service provides support to 46 different IT services.
- Regarding process entries, 94.36% of tickets arrived through email while the remaining 5.64% were reported through calls to the support service.
- The critical incident procedure was only deployed 8 times, which makes it a very low volume process. The average resolution time of these situations was 1 hour and 44 minutes, with all the situations complying with the stipulated SLA.
- 99 tickets – 1.55% of the total volume – were cancelled by support experts, while 191 tickets – 2.99% of the total volume – were reopened by customers after a first resolution, which is still below the 5% maximum stipulated.
- Approximately 66% of the tickets were fully resolved in 2nd SL, with no need to go deeper in the service structure, which is a value that is in line with the operational target of a 60% self-solving quota.
- Comparing the reported dates with the resolution dates, it was verified that approximately 13.72% of the incidents were not solved in the same month has they were created, meaning that they transitioned as unsolved volume to the next month. This is due to the whole processing of the tickets not being fully processed at once by the actors, as the resolution may be pending on customers or IT suppliers' answers.
- Not a single ticket transgressed the given SLAs of reaction and resolution time, which is a sign that the service operation is being well performed, but it can also mean that the SLAs may not be well adjusted.

The performed Pareto analysis revealed that approximately 79,47% of the analysed ticket volume came from only 7 IT services, as described below:

- Service A, with 28.03% of volume and an average resolution time of 19.24 hours.
- Service B, with 16.66% of volume and an average resolution time of 8.09 hours.
- Service C, with 8.68% of volume and an average resolution time of 22.27 hours.
- Service D, with 8.27% of volume and an average resolution time of 8.81 hours.
- Service E, with 7.83% of volume and an average resolution time of 11.75 hours.
- Service F, with 5.39% of volume and an average resolution time of 18.37 hours.
- Service G, with 4.60% of volume and an average resolution time of 12.53 hours.

The differences in volume of each of these IT services are significant, with services A and B being the only ones to pass the 1000 tickets barrier in the three months analysed. This may be due to the nature of the IT services and the frequency that they are used on a routine basis.
A curious fact was also revealed: 23 IT services had no more than 10 tickets reported each. This reveals that half of the supported IT services have a very low volume of incidents.
Therefore, this Pareto analysis shows that are different profiles of IT services demand, which is reflected on how the teams' support experts are allocated. An example of this is the fact that 5 of the 12 support experts are allocated to the support of service A. These differences may be justified by the nature and complexity of the IT services and the frequency that they are required on a routine basis by the organisations' users.

Problems identified

The 3rd round of interviews gathered some issues that pose a challenge to team's work, and that can be opportunities for future improvement.

The most referred issue concerns the dispatching of tickets performed by the support agents, which the team argues that it can lead to wrong classifications, unnecessary rework and to too much waste of time – always requires a person to do it and calls with customers may take too long. The solutions suggested were to centralize the process entries, by receiving only emails and eliminating calls, and to fully automate the activities in the IM system.

Other operational issue is related to the time that some customers take to answer to pending information requests made by the team, which creates a queue of unanswered and stalled tickets. This is said to be one of the causes of why so many tickets are not being solved in the same month as they are reported. Some suggest that a time limit for answering should be settled, which would relief that queue and accelerate the resolution time.

The other problem identified refers to the IM system used, which has obsolete features and options that require to perform meaningless steps in its usage. The team complains that the system should be updated to a more recent and modern version, more interactive and user-friendly, with more automated features that allow to focus on the main tasks only.

DISCUSSION

The results of the process analysis reveal that the process performance is meeting its objectives. SLAs are being complied with, which guarantees the quality of services to the customers – a timely resolution of incidents. Targets such as self-solving quota and reopening rate are being more than accomplished. The Pareto analysis clearly shows that there is a great disparity between the most and least demanding IT services. This justifies the allocation and specialization of the team members by IT services.

However, some problems pose challenges to the current operation. Time seems to be a major concern, as the team complains about activities and small details that are time wasting and that could be easily improved.

As managerial recommendations, it is perceptible that an upgrade and improvement in the IM system that supports the service operation is a good investment, since it could solve two of the identified problems: automate the dispatching of tickets and remove unnecessary features. Also, renegotiate the contracts to establish a limit of days for the customers to respond to any request of information by the support service will allow a faster resolution, decrease the idle volume and reduce the rate of tickets that are not closed in the same month of creation.

CONCLUSIONS

BPM is a discipline that proposes a solid and detailed BP discovery and analysis, which provides managers with insights about the process current state and performance. The tools and methods allow both a quantitative and qualitative analysis to identify existing imperfections and problems that may not be observable at first sight. A good analysis is the basis from which managers can figure ways of improving processes to mitigate existing issues and to adapt to new challenges.

The application of BPM to analyse and improve IT services is scarce, but it can be a way to have a management approach to its processes that focuses on delivering value to customers. This analysis can be seen as an example of future researches that can be developed combining the two fields: BPM discipline and IT services.

In this research, the goals of conducting a BP analysis through a BPM approach was accomplished. The IM process was documented in its current state and some important characteristics and problems were unravelled. However, some limitations regarding process metrics and operational reporting didn't allow a deeper and more extensive analysis. Also, the features of the IM system don't allow to extract all the desired information of the data records.

For future researches, BPM is a methodology that can be applied to IT processes to bring a management perspective to an IT world. It can bring a better management and process improvements to approach to customers. For BP analysis, different BPM methods may be applied to bring more detailed information and results. However, in the IT processes area, it is advised a solid knowledge of informatics and process metrics.

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