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The impact of Decision Automation: How decision automation will change the work of the Business Process Analyst?

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Abstract (Max. 200 words):

As scholars and specialists are calling for decision oriented rather than process-oriented automation, the work of the Business Process Management (BPM) is also subjected to continuous change. This research seeks to examine the relationship between the Decision Automation Services (DAS) and the role of Business Process Analyst (BPA) in BPM. To achieve this objective, the research analyses the changes that occur in the work design of the BPA role when DAS is introduced into the work of an organization. Through a detailed analysis of the empirical data, the research revealed a strong correlation between the work characteristics of the BPA role and the use of DAS. Furthermore, the study offered a new theoretical framework that helped examine how the work characteristics of knowledge workers changed with the introduction of a new Information Systems Developments (ISD). Moreover, the research findings related to task variety, identity, and skill variety, set the foundation for a clearer definition of the BPA position and its required competencies. In this sense, the study identified changes such as: decreased ambiguity in the BPA role, better defined task identity, more direct channel of feedback from the BPA to the top management and a centralized BPA position in relation to IT and business people.

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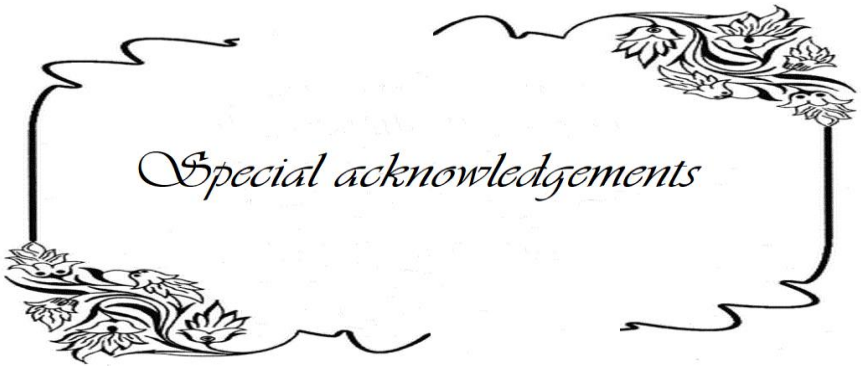
I would also like to thank my teachers and my colleagues for teaching me how to think critically and enriching my journey for the entire duration of the master program.



Aș dori să-i mulțumesc iubitei mele pentru tot sprijinul acordat. Multumesc mult!

هذا العمل ما كان ليتم لولا عائلتي التي أحبتني بكل عيوبي ونواقصي أمي برعاتها وصلواتها وأبي بتوجيهي وتربيته ❤ وكل إخوتي الذين ملؤا حياتي بمزاحهم

Ett stort tack till den fantastiska svenska familjen som har stött mig hela vägen under min professionella och personliga resa som endast min familj skulle göra:
Erik & Henriette

List of abbreviation

1- Business Process Management (BPM).
2- Business Process Analyst (BPA).
3- Business Decision Management (BDM).
4- Decision Automation Services (DAS).
5- Decision Automation Services with Decision-Centric Approach (DAS-DC).
6- Business Rules (BR).
7- Business Process (BP).
8- Decision Modelling and Notation (DMN).
9- Business Process Modelling and Notation (BPMN).
10- Operational Decisions (OD).
11- Information Systems (IS).
12- Information Systems Development (ISD).
13- Work Characteristics (JC).
14- Knowledge Characteristics (KC).
15- Role Characteristics (RC).

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1 Introduction

1.1 Background

The incremental development in Information Technologies (IT) and Information Systems (IS) has a continuous effect on the decision-making processes and the organizational structure in the organization (Huber, 2000). This effect requires organizations imperatively to change their work design to accommodate developments concerning the business question who will do what (Parker, Wall, and Cordery, 2001). Parker et al., (2001) asserted that flexibility is a determinant requirement when it comes to accommodating new IS development methods and technologies since it aids the work design process. Furthermore, Work design is an essential concept in the change of the organization that has a direct influence on the organizational performance (Hackman and Oldham 1976; Parker et al., 2001; Morgeson and Humphrey, 2006; & Huang, 2011). Therefore, it is important for companies – when introducing new methods and technologies for the IS – to understand who will use these methods and technologies, how they will use them and what changes are required in the work design (Hackman and Oldham, 1976; & Huber, 2000).

Notably, Business Rules (BR) and Business Process (BP) are deemed to be the essence of any IS (Holmberg and Steen, 2011). Therefore, Holmberg and Steen (2011) argued that organizations strive to develop and improve their methods and approaches in relation to the automation of BR and BP. In addition to that, Taylor (2013) suggested that prioritizing decisions as the primary link between BRs and BPs when automating the organization's workflow can proportionally improve and develop the IS. Hence, he designed a new IS development and incorporated it into the business decisions management (BDM). The concept of "Decisions First" offered by Taylor (2013) sparked the debate on whether to separate BDM, as an independent discipline from business process management (BPM) or not. Although this debate has not been settled, several suggestions to specialize the roles in BDM have been offered, for instance, the role of decision analyst (Lohmann & Zur Muehlen, 2015). Accordingly, Lohmann and Zur Muehlen (2015) postulated that introducing Taylor's new concept as an ISD approach to various organizations may bring forth the need for a new role. However, it can be argued that their suggestion is perfunctory since they did not justify the claim with the necessary data. On the other hand, prioritizing operational decisions in the automation phase and the modelling of processes can be considered the first step in delimiting the borders of BDM as an independent discipline (Taylor, 2013). Moreover, it changes the duties and the work of the BPM and its relationship with the BDM.

In the light of the above, BPM is still considered to be the bridge between the IT, on one side, and the business with its processes and requirements, on the other side (Trkman, 2010). Moreover, BPM is also perceived as a top-level component in the organizational hierarchy (Harmon, 2015). In this sense, the importance of the discipline evolved steadfastly based on continuous technological developments such as workflow automation (Dumas, La Rosa, Mendling, and Reijers, 2013; & Rosemann and Vom Brocke, 2015). Rosemann and Vom Brocke (2015) advocated that this growing importance of BPM derived from its significant impact on many factors that determine the existence of an organization. Furthermore, one can

argue that the roles of BPM are knowledge roles since their responsibilities consist of managing the essence of IS (Holmberg and Steen, 2011; and Huang, 2011). In addition to that, Lohmann and Zur Muehlen (2015) asserted that BPM roles demonstrated a high level of IS development skills such as data modelling, hence, emphasizing BPM roles are knowledge roles.

On the other hand, Huang (2011) described knowledge workers as those who are specialized in IS or capable of conducting cognitive work for companies. In addition to that, the evident development of IS and IT is engendering a substantial growth in the numbers of knowledge workers compared to the blue-collar workers (Huang, 2011). Therefore, organizations are nowadays required to examine their work design and their knowledge requirements to cope up with emerging ISDs (Parker et al., 2001; & Morgeson and Humphrey, 2006). Accordingly, changes in the work of an organization are usually executed by the BPM which is responsible for answering the business questions of who will do what and how (Dumas et al., 2013). Furthermore, the study of Lohmann and Zur Muehlen (2015) showed an increased demand for employees that could perform the responsibilities assigned to the Business Process Analyst (BPA) role. Correspondingly, the BPA role was portrayed in their study as the main pillar of the BPM since the BPA employee is responsible for a wide range of process related duties. As an illustration, BPA's responsibilities consist of strategic alignment of processes, methods, IT skills, of helping people to understand the process, process knowledge management and process education (Lohmann and Zur Muehlen, 2015). Moreover, Kirchmer & Franz (2014) argued that BPM could also be examined and redesigned when introducing new approaches to its work. For instance, integrating the concept of "Decisions First" by Taylor (2013) into the work of BPM demands that the work design and work characteristics would be investigated (Parker et al., 2001; & Morgeson and Humphrey, 2006).

1.2 Problem area

According to Taylor and Purchase (2016) introducing decision automation with a focus on the concept "Decisions First" will offer several benefits, for instance will contribute to increased accuracy in decisions. In addition to that, the new ISD will simplify the business processes and by extension will reduce the complexity of the automation processes (Taylor and Purchase, 2016). Furthermore, decision modelling and process modelling are interconnected and progress in parallel during the time of the automation process (Object Management Group, 2016). However, BDM as an independent discipline could - through decision automation - become more specialized. In addition, the decision to separate or not decision automation from process automation after introducing "Decisions First" will impact the work of the BPA role since process modelling is its primary responsibility (Sonteya & Seymour, 2012). This debate on how to integrate decision automation with a decision-centric approach to the work of BPM urged scholars to offer several suggestions. In this respect, Lohmann and Zur Muehlen (2015) determined that applying a decision-centric approach when automating operational decisions will set the foundation for a new specialized role.

In a similar way, understanding the impact of the new developments and technologies on the business component before starting to accommodate them would be of high relevance to the organizations (Huber, 2000). Nevertheless, most of the research regarding decision automation services and a decision-centric approach discussed only the competencies gap in the BPA portfolio (e.g. Sonteya and Seymour, 2012; &Lohmann and Zur Muehlen, 2015). In this sense, the introduction of a decision automation service required the BPA to have more skills in the

field of decision automation and modelling (Lohman and Zur Muehlen, 2015). However, some preliminary work was conducted in the late seventies in relation to the impact of new technology on the work characteristics of a group of employees (Billings, Klimoski and Breaugh 1977). Yet, no study has offered a framework for the examination of the ISD impact on the work design of knowledge workers like the examination of DAS effects on the BPA role. In addition to that, many studies have tried to examine work design and characteristics, but most of them omitted to differentiate between work and knowledge work (Hackman and Oldham, 1976; & Billings, Klimoski, and Breaugh, 1977).

1.3 Research question and research objectives

The emerging BDM concept and the decision-centric approach are significantly involved in the BPM responsibilities and roles (Taylor and Purchase, 2016). Therefore, exploring the existing relationships between the BPA role and the automation of operational decisions would offer a wide range of research opportunities. In this respect, answering the following research question could further our understanding of the Business Process Analyst role in integrating DAS:

What impacts, if any, Decisions Automation Services have on the Work Characteristics of the Business Process Analyst role?

By applying a combination of existing work design frameworks in the examination of the BPA profession, we aim to obtain a greater understanding of the nature of changes that will occur when introducing DAS. The absence of a single framework that could examine the impact of ISD on the work design of knowledge workers shed further light on the complexities of decision automation and BPA and led ultimately to the construction of a new framework.

Furthermore, the study was conducted with the intention to explore the effects of DAS on the BPA work and to help organizations to identify the necessary organizational changes in work design to accommodate the new ISD. In addition to that, the study expects the collected data will give indicators on whether to separate BDM from BPM or to assimilate its functions and tools into the work of BPM. Moreover, the study aims to help managers to carry out a more effective work design and organizational change. Finally, this research is set out to offer more precise insights on the impact of DAS in relation to the BPA work characteristics. In this sense, the study is expected to contribute to the IS body of knowledge with the help of the empirical data.

1.4 Delimitation

Since the intersection between BDM, BPM and work design provided a broad spectrum of research opportunities, this paper aims to narrow down the topic to a specific area. By doing so, the research will only examine the impact of DAS on the business process analyst (BPA) position. In this respect, the study will limit itself to the work characteristics of the work design model and will not discuss the antecedents, the expanded outcomes and contingencies. Moreover, the targeted subjects of study will be strictly related to BPM and BDM with a narrow

focus on decision automation with a decision-centric approach - ‘decisions first’, and it will not discuss other approaches, for instance, the user-centric approach.

Furthermore, decision automation is mainly used for operational decisions and is strongly correlated with business process management. Hence, the primary focus will be on the practices of decision automation and on what impact they have on the BPA’s role. In addition to that, this impact will be explored in the limits of work design as a base for the work characteristics of knowledge workers (Huang, 2011).

2 Theoretical Background of the Research

This chapter will offer an in-depth understanding of the main concepts used in this research paper and will point out their role in relation to the research question. In this respect, the theoretical background will include a description of the Business Process Management concept (BPM) and its components, mainly its roles and functions. More focus, in this chapter will be allocated to the BPA position and responsibilities in organizations. Secondly, further literature will be introduced to better understand the concept of work design and the available frameworks used to answer the research question. Moreover, business decision management (BDM) will be explored with a focus on the concept of "Decisions First" and how it works when automation is required. In addition to that, a more detailed exploration of the decision-centric approach will be offered. Finally, the chapter will outline the main concepts of the research and explain their role in relation to each other.

2.1 Business Process Management

According to many scholars, high-quality products and services with low-cost production and delivery was the central concerns of many organizations and institutions (Dumas, La Rosa, Mendling, and Reijers, 2013). Moreover, the business field did not look out for components like activities, operations, tasks and decisions related to the production or delivery of products and services until the early 20th century (Dumas et al., 2013). The growing interest in posing questions such as what the best way to produce is or who will do this particular task brought forth the need for a process thinking perspective (Earl, 1994). The process thinking idea grew together with the need to enhance the performance of the organizations so that they could face competitors and sustain a specific business position in the market (Dumas et al., 2013). By the end of the 20th century, the tasks performed to organize and reorganize the workflows of the organizations started to assemble, promising the emergence of a new discipline that later received several different labels (Earl, 1994). In addition to that, the technological development urged the organizations to integrate new technologies into their business, hence, changing the way in which they do their work (Huber, 2000). The continuous development of IT and the uninterrupted change in the way business is conducted brought the need for a set of experts who can develop and design the business workflow in accordance to these changes (Rahimi, Møller, Hvam, 2016).

The organizations started to raise up several questions more seriously as an important indicator for their success, for instance, what task will be assigned to what employee and how the task will be conducted. (Dumas, et al., 2013; Rosemann and Vom Brocke, 2015; & Lehnert, Linhart, and Röglinger, 2016). The answer to these critical questions can be found at the foundation of the Business Process Management (BPM) that started to be recognized in the business field as the main driver for the work design of the organization and technology (Harmon, 2015; Rosemann, & Vom Brocke, 2015). The importance placed on the new BPM discipline derives from its ramifications in all the other disciplines of the organizations and its role as a major magnate in the firm's performance (Dumas et al., 2013).

Furthermore, BPM as a management discipline is known in the business field under various names as pointed out in Harmon's research article (2015), for instance, Six Sigma, Work

Simplification, or Business Process Reengineering. The BPM discipline consists of a wide range of essential functions that developed and multiplied once the complexity of the work increased (Rosemann and Vom Brocke, 2015). The purpose of these tasks was to determine the mechanisms of the business and was responsible for providing the roadmap the business had to follow to achieve its goals (Dumas et al., 2013). Dumas et al. (2013) argued that, although the BPM functions are not new to the history of business, assembling those functions in one single discipline is rather new.

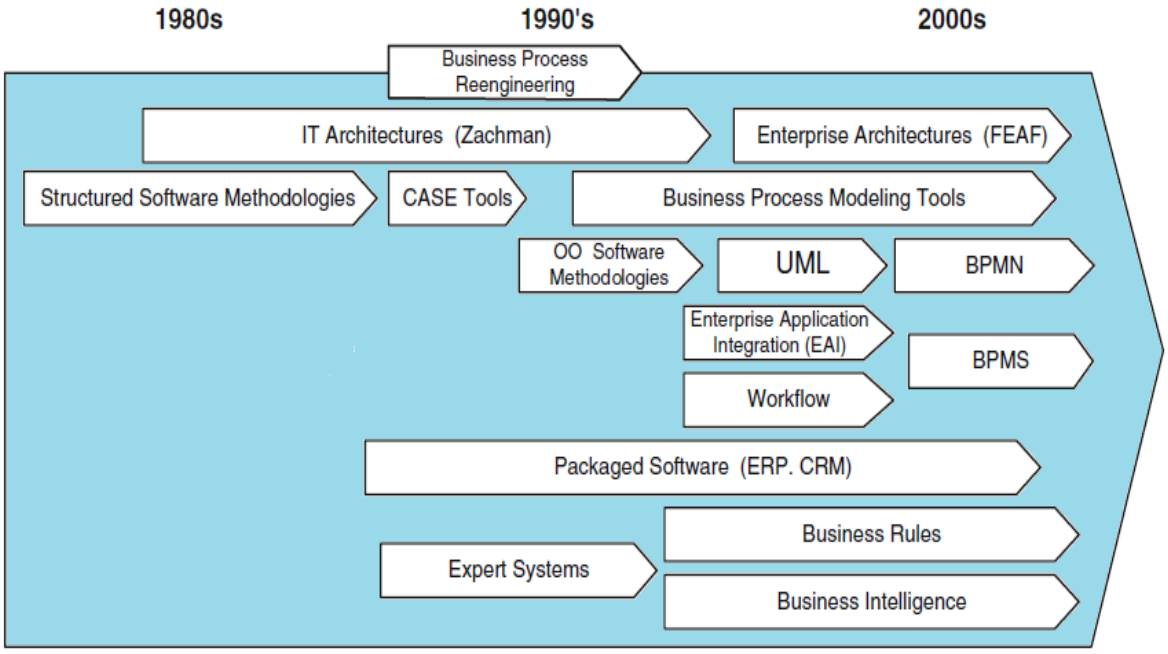

Figure 2.1.1: The development of BPM (Harmon, 2015)

Moreover, besides BPM's history, the primary elements that construct it are still debatable (Rosemann and Vom Brocke, 2015). In this respect, Rosemann and Vom Brocke (2015) suggested that BPM consists of six major components, namely strategic alignment, governance, methods, IT, people and culture. The authors have also explored the entire range of skills and competencies related to each component taken individually, and this extension has expanded the findings presented in the study of Lohmann and Zur Muehlen (2015). Nonetheless, the authors did not discuss the relationships between various components nor did they investigate how implementing change in a specific component might impact the other integral parts.

However, some authors tackled this relationship implicitly as Harmon (2015) did when he studied the development of BPM and showed how IT could play a significant role in changing the BPM structure and functions. Furthermore, Harmon (2015) asserted that the evolving technological development engendered a fast-paced expansion into the BPM functions and duties. Likewise, Kirchmer and Franz (2014) argued that the organizations who seek to sustain their competitive advantage will manage to adapt to continuous change. At the same time, Kirchmer and Franz (2014) advocated that the BPM, responsible for developing other parts of the firm through enhanced processes can be also developed in a similar manner. Consequently, they designed a framework that helped re-engineer the BPM with extensive consideration for the new technologies and methods. Furthermore, Kirchmer and Franz (2014) argued that the change in BPM should be conducted by the Chief Process Officer rendered as a newly emerging

role. According to the authors, the Chief Process Officer (CPO) should answer the business questions regarding what task would be assigned to what employee and how this task should be performed.

2.1.1 BPM roles and responsibilities

As it could be observed, the previous section drew extensive explanations of the BPM development and emphasised the need to restructure the re-engineered part of the business (Kirchmer and Franz, 2014). However, to be able to apply changes to the BPM's structure, it is important to understand in depth the functions and the roles responsible for every operation. Firstly, the emerging technologies and the growing importance allocated to the management of the processes in an organization called for the standardization of the functions in the BPM (Davis & Brabänder, 2007). Furthermore, a clear definition and delimitation of the BPM helped to better establish its main functions (Lederer Antonucci & Goeke, 2011). In this sense, Wolf and Harmon (2012) considered BPM to be an encompassing approach that scales the whole organization. Although Wolf and Harmon (2012) argued that the BPM functions are not within the limits of IT, Lederer Antonucci and Goeke (2011) found that the fundamental success factor for BPM is its partnership with the IT section of the organization.

Building upon the previous findings, many scholars attempted to explore the possible functions that BPM is responsible for in an organization in order to not only identify those functions, but also to distribute them among a set of roles that form the core of the discipline itself (Davis & Brabänder, 2007; Lederer Antonucci & Goeke, 2011; Wolf & Harmon, 2012; Rosemann and Vom Brocke, 2015; Müller, Schmiedel, Gorbacheva, & Vom Brocke, 2016). The most substantial studies that outlined the BPM's functions are the research papers of Paim, Mansur Caulliraux, and Cardoso (2008) and Lederer Antonucci and Goeke (2011). Considering the study of Lederer Antonucci and Goeke (2011), six tasks that construct the BPM's life-cycle have been identified as follows:

1- Planning processes and building strategies that administrate the operations
2- Analyse, model, and design the processes of the organization
3- Business process configuration and implementation
4- Execution and creation of processes
5- Monitoring and controlling the processes to get to the final step (feedback)
6- The Feedback helps to start the previous steps all over and leads to process amelioration

Ostensibly, the authors did not explain how the tasks should be distributed, and this urged other scholars to explore further the competencies required for each role within the BPM. Nevertheless, the set of roles and competencies required to perform BPM functions remain a matter of debate and differ from a business to another and from an organization to another (Müller, Schmiedel, Gorbacheva, & Vom Brocke, 2016; Lohmann and Zur Muehlen, 2015). However, the high number of positions and labels, and how the BPM responsibilities are divided among them is not as vital to the success of the BPM as it is to the excellent performance of the BPM functions (Rosemann and Vom Brocke, 2015). Hence, the best set of positions that

should ultimately form the Business Process Management discipline is one that can include all the six functions mentioned above.

In a nut shell, based on the literature related to what type of positions can be included in the BPM, one can say that the primary role is the one that links BPM with the top management (Lederer Antonucci & Goeke, 2011). Therefore, the authors asserted that achieving alliance and unanimity on new processes, conveying the BPM's vision about the best way to do business, controlling process performance and forming process policies and culture are the leading responsibilities of the principal role in BPM. The role itself has different labels in different organizations, as many studies have mentioned previously: some studies identify it as the Chief Process Officer (CPO), while others refer to it as the Business Process Director (BPD) or the Business Process Manager (Rosemann & Vom Brocke, 2015; Lohmann and Zur Muehlen, 2015; Lederer Antonucci & Goeke, 2011; and Eicker, Kochbeck, & Schuler, 2008).

The second important role in BPM is the support offered to the CPO by the structured process strategies, the plans drawn for the integration of new technologies and process standards, the synchronization between the BPM strategies and the main strategy of the organization and the unification of the process communication and notation (Lederer Antonucci & Goeke, 2011). The same authors stressed out in their survey that there are different job titles for the same position (2009) and identified the following existing job titles that various organizations frequently use: business architects, business improvement consultants, business process architect, etc., (Lederer Antonucci & Goeke, 2009).

However, the final set of responsibilities has been poorly divided between two positions in both Lohmann and Zur Muehlen (2015) study, Lederer Antonucci and Goeke's (2011) research. These studies did not make a clear distinction between the two different positions, namely business process consultant and business process analyst. Nevertheless, according to Lohmann and Zur Muehlen (2015), the business process consultant is responsible for process design, modelling, improvement, education, innovation, and out measurement. Other studies, including the study of Lohmann and Zur Muehlen (2015), showed the business process analyst has similar responsibilities. Apart from those four primary roles that are mainly identified in Lederer Antonucci and Goeke's study (2011), Lohman and Zur Muehlen (2015) identified as well other existing roles, such as business process owner.

2.1.2 The Business Process Analyst

The confusion in differentiating between Business Process Analyst and Business Process Consultant derives from the fact that both job titles refer to similar responsibilities (Lohmann & Zur Muehlen, 2015). Some of the most important similarities consist of building, analysing and designing processes, educating process stakeholders about new processes and gaining their consensus. However, the scholars are often considering the Business Process Consultant to be a management position with a strategic focus, while the Business Process Analyst is placed on a rather operational level (Rosemann & Vom Brocke, 2015).

At the same time, at the operational level, different organizations correlate the responsibilities of a Business Process Analyst with other job titles, for instance Business Analyst, IT Analyst or System Analyst (Lohmann & Zur Muehlen, 2015). Since the responsibilities performed are the same, despite the title differences, in this paper, the Business Process Analyst job title will be used interchangeably for all the other positions at the operational level. In addition to that, a

clear definition for the BPA role is lacking, since its functions and responsibilities are continuously changing (Sonteya & Seymour, 2012). However, a common definition agreed upon by many scholars is that BPA represents the link between IT and business people (Chakabuda, Seymour, & Van Der Merwe, 2014).

Therefore, the primary focus will be on the Business Process Analyst title since this position will be significantly impacted by the developments and upcoming changes applied to BPM in information technology and information systems (Daryl Nord & Horn Nord, 1997). Moreover, these changes will affect the way the Business Process Analyst is performing its duties mainly because his work is directly linked to the tools used at the operational level (Rosemann & Vom Brocke, 2015). In order to better understand how future developments in the IT and IS field will transform the Business Process Analyst role, it is important to present what are its current functions and how they are performed. In this sense, the main duties fall in three different categories: the first category encompasses analysing, designing and modelling processes, the second category refers to process documentation followed by implementation, control and performance measurements and finally, the last category includes process education and training and process innovation and improvement (Lohmann & Zur Muehlen, 2015; and Lederer Antonucci & Goeke, 2011).

The way in which the functions are performed is linked to certain sets of skills (Daryl Nord & Horn Nord, 1997). The first category of functions (analysing, designing, modelling and documentation) relies predominantly on technical and system skills like Computer Security, Computer Program Design, Data Flow Diagrams and Dialogue Design (Daryl Nord & Horn Nord, 1997, p. 23). The second category, namely implementation, control and performance measurement depends on business skills, for instance, Business Law, Finance and Marketing and managerial skills such as planning, creativity, controlling and delegating (Daryl Nord & Horn Nord, 1997, p. 24). The final category relies strongly on behavioural skills such as verbal and written communication in order to transmit important top-down information during the process education and training phases (Daryl Nord & Horn Nord, 1997, p. 24).

How the duties are performed depends on the organization, for example in modelling different businesses use different standards and notations. Similarly, in performance measurement, there are no generalized standards since every organization implements its key performance indicators. The reason why the BPA role consists of a wide variety of skills in both the IT and the business fields is that organizations consider it to be a moderator in the relationship between business people and IT people (Vashist, McKay, & Marshall, 2011). The authors explained the mediatory role by suggesting the activities of business analysis are boundary practices linked in return to business and IT practices. In addition to this, the definition of the knowledge worker offered by Parker et al., (2001) made it evident the BPA can be, without doubt, placed in this category as he is performing a highly skilled work that requires him to apply both analytical and theoretical knowledge.

Another aspect of the BPA role would be to support and collaborate with agile information systems (Gregorio, 2012). In order to improve and develop information systems, applying methods like analysis, process documentation and user stories are of vital importance (Gregorio, 2012). However, Gregorio (2012) argues that it is often difficult for developers and programmers to perform these tasks. In this respect, the BPA becomes a cornerstone in the development of agile information systems in view of its role encompassing crucial duties related to process documentation, user stories and analysis that will positively impact the success of the IS (Gregorio, 2012). Furthermore, the mediatory attribute of the BPA role

predisposes it to changes related to the IT or the Business field, especially when new technology or ISD are introduced (Vashist, McKay and Marshal, 2011). Consequently, adding a new information system development such as decision automation services may lead to significant changes in the characteristics of the BPA role (Taylor & Purchase, 2016).

2.2 Work Design and the nature of work

As mentioned previously, BPM is responsible among others for offering the best structure for business roles and processes in any organization (Rahimi et al., 2016; and Earl, 1994). For instance, when introducing a new method or technology, BPM needs to address the changes required for the business processes and the design of the roles affected, in order to sustain the competitive advantage of the organization (Dumas et al., 2013). Furthermore, the automation and technological advancement in BPM tools brought more attention to the BPM design along with its structure and goes beyond the role of BPM as an actor responsible for work design and workflow (Kirchmer, & Franz, 2014).

Although many studies have examined different theoretical frameworks for work design and role structure, no studies have offered an explanation of the impact of the new ISD methods or technologies on the work design and role structure of the BPM itself (Harmon, 2015; and Weske, 2012, PP. 335-369). Despite the lack of a theoretical framework of the BPM work design and role structure, studies such as Harmon (2015) shows how BPM roles and duties are undertaking a continuous change due to new methods and technologies. Therefore, it is important to understand the existing theoretical frameworks of the work design in order to be able to build a framework that is suitable for the work of BPM and that can examine the role of the BPA as a knowledge worker.

2.2.1 Existing work design models

Since the work design theory is not able to cope up with the fast-paced technological developments, a new framework for work design must be advanced to address them (Hackman & Oldham, 1976). Consequently, different approaches have been proposed to formulate a framework that can incorporate new methods and technologies into the job design of the organization (Huang, 2011; Morgeson and Humphrey, 2006; Parker et al., 2001; Hackman & Oldham, 1976; and Lawler & Hall, 1970). The model offered by Hackman and Oldham (1976) was the foundation for other models and expanded this framework to include the continuous changes taking place in the organizational field (Parker et al., 2001).

Hackman and Oldham (1976) focused on three different elements that formed the foundation of their model to examine what work design would be best suited for the enhancement of the employees' performance. In addition to this, the results achieved in Hackman and Oldham (1976) are based on a sample of a wide and heterogeneous variety of roles within different types of organizations. This sample increased the complexity of the proposed model and made results less relevant when it was applied to a certain role. Furthermore, neither the model nor the examined sample had differentiated between the different types and levels of work, for example, knowledge work (Parker et al., 2001). However, the components of Hackman and

Oldham's (1976) model have been used later on in different and more detailed work design models such as the model offered by Parker et al., (2001) or Morgeson and Humphrey (2006). One of the most useful constructs of Hackman and Oldham's (1976) model is that they identified a preliminary set of role dimensions such as skill variety, task identity, task significance and autonomy.

On the other hand, Parker et al., (2001), tried to offer a more specific work design model that could overcome the weaknesses of the two-factor theory established by Hackman and Oldham (1976). Moreover, Parker et al., (2001) analysed first the organizational structure, more specifically the work design which continuously undertook changes, for instance, the growth in the variety of roles and tasks. In addition to that, the authors asserted that the organizations and the businesses are witnessing rapid growth in the numbers of service workers. This increasingly spreading work segment urged scholars such as Janz, Colquitt, & Noe, (1997) to propose a precise definition for this work segment. Thus, Janz et al., (1997) considered 'knowledge workers' or the white collars as top-level staff with theoretical and analytical education that could be used to provide services or products. Parker et al., (2001) expanded their work design model to focus on the differences between 'white collars' and 'blue collars'. By doing so, Parker et al., (2011) made it clear how external and internal factors like new ISD methods or technologies may impact different aspects of work characteristics. In addition, Parker et al., (2001) extended the job characteristics to include both individual and group characteristics, an aspect that gave their model the ability to examine the new work segment, namely knowledge work.

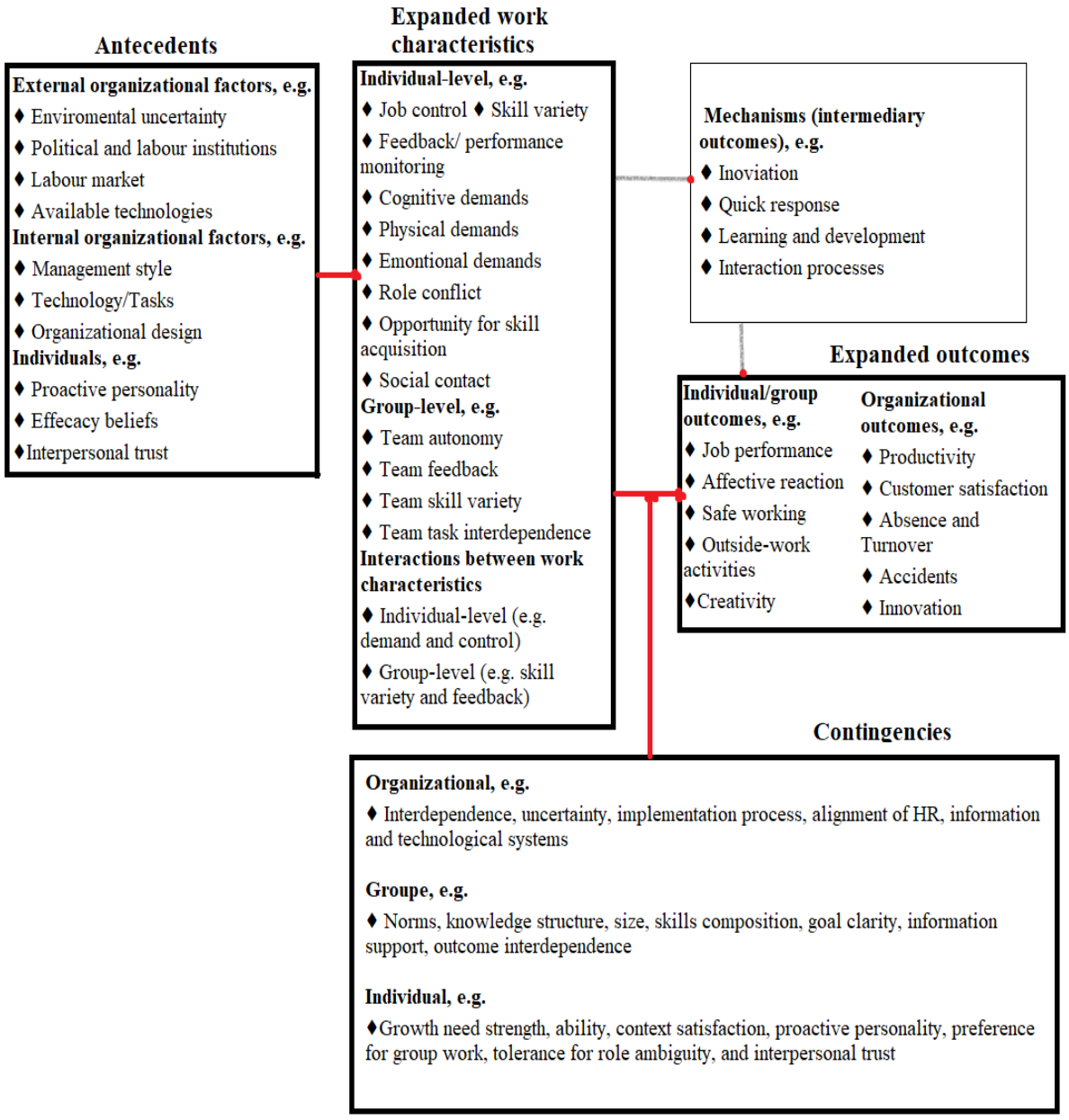

Figure 2.2.2: elaborated model of work design (Parker et al., 2001)

Although the study of Parker et al., (2001) offered a more robust and reliable model of work design, the model could neither cover all the job characteristics, nor could it predict the incremental development of IT and IS (Morgeson and Humphrey, 2006). The rapid change in work procedures and business codes and processes - due to the incorporation of new methods and technologies - created the need for the re-examination of the work design and the role characteristics (Morgeson and Humphrey, 2006). Consequently, Morgeson and Humphrey (2006) reviewed the previously conducted studies in the field of work design, categorized the role characteristics and finally, provided measurement instruments to analyse them. In addition to that, the authors managed to explain the work of Parker et al., (2001) concerning the growing segment of knowledge workers by differentiating between task and knowledge characteristics. Subsequently, this current research will adopt the idea related to the categorization of the role

characteristics from the study of Morgeson and Humphrey (2006), in connection with the examination of the research question.

2.2.2 Work characteristics

As discussed above, it can be said that the work characteristics have been evolving in parallel with the technology and the organizational structure (Parker et al., 2001; and Morgeson & Humphrey, 2006). However, to build a set of characteristics that can be used in answering the research question, it is important to explore the current role characteristics that have been examined in several studies.

The table outlined below presents and explains the most important characteristics in the light of the current research with respect to the studies that have scrutinize it. In addition, numerical signs will be used to differentiate between knowledge characteristics, task characteristics and other types of characteristics. In doing so, *number one* will refer to knowledge characteristics and *number two* will denote task characteristics. Finally, the table is an adaptation of Morgeson and Humphrey's work (2006) where additional adjustments have been made to offer a more lucid explanation of the research themes.

Table 2.2.1: Work characteristics adopted from Morgeson & Humphrey (2006)

Characteristics	Definition	Adopted from
Task autonomy[2]	It is the ability to perform tasks with broader limits of freedom, independently. This characteristic is deemed to be the main pillar of any motivational work design.	Lawler & Hall (1970); Hackman & Oldham (1976); Kirchmer, & Franz (2014)
Task variety[2]	It refers to how many tasks a role contains, and how an employee occupying a certain position has to deliver the tasks. In the previous chapters, it has already been discussed how BPM can decide the task variety of each role.	Morgeson & Humphrey (2006); Huang (2011); Kirchmer, & Franz (2014)
Task significance[2]	This characteristic explains how indispensable a role is and how the tasks of this particular role impacts other roles, people and departments	Morgeson & Humphrey (2006); Kirchmer, & Franz (2014); Huang (2011)
Task identity[2]	When the role is able to perform complete tasks with defined results without the interference or participation of other roles, the identity of its tasks become stronger	Hackman & Oldham (1976); Morgeson & Humphrey (2006); Huang (2011)
Feedback from the work[2]	This characteristic examines the feedback quality offered by a certain role about the task performance and how direct and clear it is when it reaches the top-level management.	Hackman & Oldham (1976); Parker et al., (2001); Morgeson & Humphrey (2006);

Task complexity[1]	Refers to the difficulty of performing and delivering the tasks and how this decides the level of role complexity. This characteristic is considered to be an attractive factor for knowledge workers.	Morgeson & Humphrey (2006); Huang (2011); Kirchmer, & Franz (2014)
Information handling[1]	Simply put, it refers to the accumulated information and data that the role has to process through its tasks. This characteristic decides the cognitive level of the employee that occupies that particular role.	Morgeson & Humphrey (2006); Huang, (2011); Kirchmer, & Franz (2014)
Problem-solving[1]	This characteristic is crucial to any type of work, although the nature of the role strictly defines the level and the specific abilities required for problem-solving.	Hackman & Oldham (1976); Parker et al., (2001); Huang (2011);
Skill variety[1]	Hackman and Oldham considered this characteristic to be one of the cornerstones of their theory since it refers to the quantity and the quality of the skills required to perform a specific type of work.	Lawler & Hall (1970); Hackman & Oldham (1976); Parker et al., (2001)
Specialization[1]	Represents the opposite of skill variety and it shows how knowledgeable and skilled an employee can be when performing a specific task	Morgeson & Humphrey (2006); (Huang, 2011);
Role ambiguity[1]	It is usually the difficulty of understanding the tasks and their purpose or the lack of information that decides the level of ambiguity of a certain role	Fuller, Marler, & Hester, (2006); Huang (2011)

The table above encompassed only specific characteristics related to knowledge and tasks since the primary purpose of the research is to focus on the role of "the BPA" portrayed as a knowledge worker. Thus, the table disregards other characteristics, for example, social and context characteristics explored in studies like Morgeson and Humphrey (2006) and Parker et al., (2001). Another crucial component presented extensively in this chapter is the external antecedence factor and its relationship with the work characteristics found in Parker's et al. model (2001). The importance of this factor for the job characteristics derives from its relation to the new ISD methods and technologies. This affiliation is examined with consideration for the impact on the BPA's role features (Parker et al., 2011). Hence, the main goal is to investigate the concepts, the methods and the technologies of the new ISD, namely the decision automation services, as an external factor that demonstrate a substantial effect on the job characteristics of the BPA role (Taylor and Purchase, 2016; Taylor, 2013; and Parker et al., 2001).

2.3 Business Decision Management

Although Decision management is not a new term in the business field, it still does not have a clear structure in the organization (Taylor and Purchase, 2016). As a matter of fact, there is an ongoing debate about whether to consider BDM as a part of BPM or as a separate discipline

that supports BPM (Taylor, 2011). Harmon (2015) asserted that some of the traditional responsibilities of BPM that are related to process automation (modelling, analysing, documenting, etc.) are under continuous development (Harmon, 2015). This development is associated with the new methods and technologies that organizations are integrating into their business to boost the performance of tasks and responsibilities (Taylor & Purchase, 2016). Accordingly, one can argue that this incremental development would lead to changes in the roles and responsibilities of BPM (Huber, 2000). Based on this fact, Taylor and Purchase (2016) suggested that the development in how to handle operational decisions would lead to the separation of BDM as an emerging discipline and it will end up running alongside BPM.

Moreover, Taylor and Purchase (2016) considered decisions to be the backbone that holds organizations standing in the market and made business decision management crucial for organizations. Nevertheless, at different organizational levels decisions can be managed depending on their type into, for instance strategic, tactical or operational decisions (Schmidt and Wilhelm, 2000). Thus, different types of decisions require different types and levels of automation, for example, strategic decisions which depend mainly on analytics (Hodgkinson, and Starbuck, 2008). In addition, most of the organizations strive continuously to automate the operational decisions that are linked to the processes in order to optimize their performance (Taylor, 2011). Although businesses have been utilizing decision management systems for a considerable amount of time to elevate their performance, Taylor (2011) asserted that Business people and IT people are still on different sides. Simultaneously, he advocated that new methods should be applied so that decision management systems could be developed as an IS class.

In this respect, Taylor (2013) considered Business Decision Management (BDM) to be a development approach for Information Systems (IS) and specifically for Business Process Management (BPM) systems. He argued in the decision management manifesto (2013) that the (BDM) approach enhances the practices of (BPM), increase the agility of its systems and improve the overall profitability. In addition to that, Taylor and Purchase (2016) tackled mainly the operational decisions that were conducted in large numbers on a daily base to fulfil short terms goals. Consequently, Taylor and Purchase (2016) suggested that if BDM functioned in parallel to BPM, it would boost the performance of BPM. However, the relationship between the two concepts, BDM and BPM continues to be debated in the research field (Fish, 2012).

With this BDM definition, Taylor and Purchase (2016) brought the decisions into the centre of Information Systems Development (ISD). Consequently, decisions started to play a vital part in the Business architecture and promoted the concept of "Decisions First" in regard to the BRs automation methods. Correspondingly, defining statements regarding the role of decisions were put into motion as it follows: "*Decisions support business processes and help organizations respond to events, simplifying their expression and management. However, decisions are not subsumed either by processes or events*" (Taylor and Purchase, 2016, P. 28).

Accordingly, Taylor and Purchase (2016) did not only promote the concept of Decisions First but also separated decisions from the processes and events. Therefore, a new method of modelling and automating the workflow of the organization accompanied this concept namely, decision automation method. This new ISD method would impact the work of BPM, in particular, the performance of BPA, since this role is highly intertwined with the BP, BR, operational decisions and events (Taylor & Purchase, 2016; Morgeson & Humphrey, 2006).

Finally, the complex changes in the BPM methods and technologies foster the need to answer questions related to its structure and to how responsibilities should be assigned to each role

individually (Kirchmer, & Franz (2014). Some of the questions are strongly linked to the role of BPA since the concept of Decisions First promoted by Taylor and Purchase (2016) would demand core changes to the tasks of the BPA role.

2.3.1 Necessary abstractions

The complex use of terms like Business Process (BP), Business Rules (BR), and Operational Decisions (OD) promotes their ambiguity in the business field and makes it difficult to draw a line between the terms (Taylor and Purchase, 2016). Therefore, many researchers tackled the concepts in several studies to explore, explain and differentiate between the three terms in order to help business people to utilize them more efficiently (Business rules group, 2000 and 2003; Morgan, 2002; Bajec and Krisper, 2005;).

Firstly, the Business Rules (BR) can be considered the dynamo of the information system in any organization (Business Rules Group, 2000 & 2003). Although the definition is still broad, it had motivated many scholars such as Morgan (2002) to examine more closely the BR's, models, frameworks, architecture and characteristics in order to create a more explicit definition. Morgan (2002) argued in the third chapter of his book for the differentiation of the two concepts (business rules and business process) where he suggested that business rules answer mainly the what question while processes offer rather a response to the 'how' question of business. Furthermore, Morgan (2002) provided a set of characteristics that could increase the accuracy of business rules meaning, as follows:

- Atomic: which means that a business rule should be a statement that cannot be simplified without losing information.
- Unambiguous: where a particular business rule should have only one meaning or interpretation.
- Compact: the business rule should consist of one simple sentence.
- Consistent: meaning that business rules all together should provide a coherent and unified description.
- Compatible: this characteristic pinpoints to the use of a unified language in the whole organization; in this respect, business rules should make use of the same terms as those applied in the business model.

Moreover, researchers explored possible methods to better understand and utilize BRs in the business field. Bajec and Krisper (2005), for instance, suggested the use of Entity Relationship Model (ERM) for the modelling of BRs. The authors argued that the spread of BRs all over the organization's data and IS makes ERM an effective method for dealing with BRs. On the other hand, Taylor and Purchase (2016) argued that one of the best practices to model BRs is either decision trees or decision tables. Taylor and Purchase (2016) substantiated their claim by arguing that BRs are more connected with the decisions and represent ultimately the logic of decisions. Moreover, knowing that the ERM is not efficient when it comes to the continuously changing and increasingly complex BRs, the use of decision trees and tables as simple methods becomes justified (Bajec and Krisper, 2005; & Taylor and Purchase, 2016).

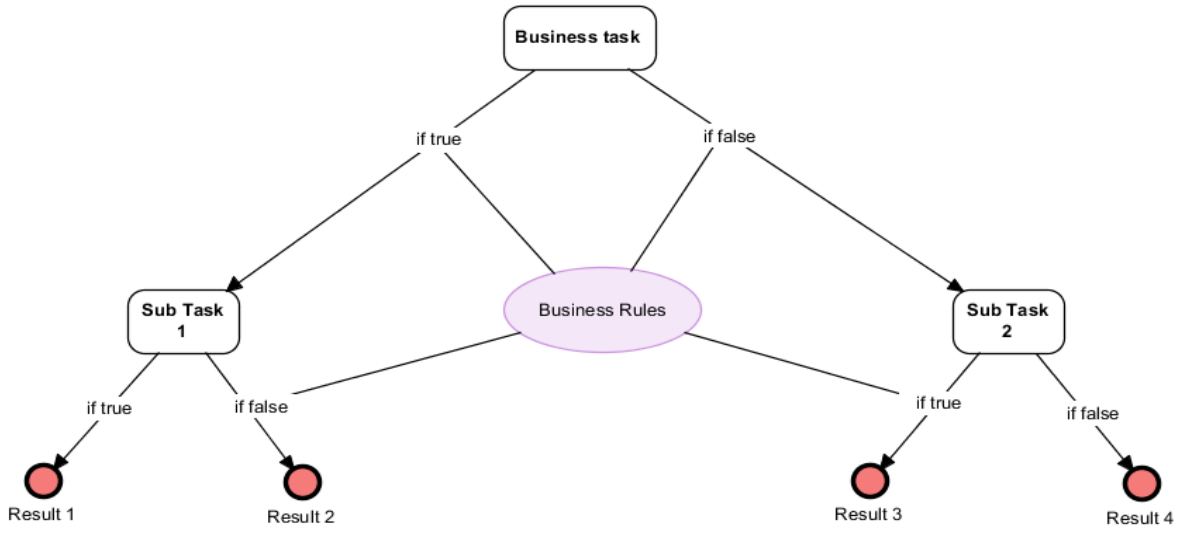

Figure 2.3.3: an example of decision trees (Taylor and Purchase, 2016, Pp. 298-330)

Finally, it is important to expand the other side of the coin as well, namely, the operational decisions since, as mentioned above, the business rules represent the logic of operational decisions (Taylor and Purchase, 2016). Further, the operational decisions are fundamental since they are present in large numbers in business (Taylor et al., 2016). Moreover, they can be an indicator for testing business processes before implementation and execution (Rozinat, Wynn, Van Der Aalst, Ter Hofstede, & Fidge, 2009). Consequently, automating operational decisions may result in synthesizing BPM and BDM (Taylor and Purchase, 2016). Hence, a way will be provided to manage operational decisions correctly and to optimize BPM's performance in decision handling (Taylor, 2013).

2.3.2 Business decisions automation

Automation in the business field is a broad term that covers all the aspects of a business and all types and levels of machine involvement in the business. However, decisions automation remains an ambiguous concept when it comes to the methods used and the way in which they differ from other automation methods (Taylor, 2013). With time, decisions automation experienced a variety of approaches, among others the customer-centric, the user-centric (Taylor, 2011) and the rule-centric approach (Morgan, 2002). Although the approaches aimed for the optimization of BPM, they suffered many problems related to system maintenance and flexibility (Taylor, 2011; & Taylor and Purchase, 2016). The business rules management systems, for example, represent an important aspect in the automation of the organizational workflow (Holmberg and Steen, 2011).

Nonetheless, spreading BRs at different levels of IS and its redundancy would make a change to difficult task (Cemus, Cerny, and Donahoo, 2015; & Wang, Indulska, and Sadiq, 2016). Moreover, Wang et al. (2016) asserted that automating and modelling BRs apart from BPs would contribute to fragmentation and iteration in the IS. In addition, Holmberg and Steen (2011) argued that process modelling is another essential approach in the information systems development (ISD).

Although most of the research literature revealed a strong relationship between modelling BRs and modelling BPs, it did not provide a solid association or a mediator between these two aspects of BPM (Business Rules Group, 2000; Morgan, 2002; Holmberg and Steen, 2011; & Wang et al., 2016). By contrast, most of the automating methods and approaches continued to tackle BRs and BPs separately, thus, increasing the complexity of the information systems which in turn will reflect on the performance of the BPM workers (Lohmann and Zur Muehlen, 2015; & Wang et al., 2016). Furthermore, Fish (2012) argued that although most of the business rules derived from the data and the database relations and business policies, some important rules continue to be conceived from highly complex business processes. The author suggested that when experts conducted these processes they followed the knowledge they had about the process. This liaison between business rules and business processes urged scholars to find an automation approach that could combine all these aspects together. In this respect, operational decisions represented the missing link that would improve steadily the BPM functions (Taylor and Purchase, 2016).

2.3.3 What is a decision-centric approach?

The previously discussed problems regarding the automation of BRs and BPs caused the IS positioned within organizations to suffer from cleavages (Wang et al., 2016). Wang et al., (2016) postulated that this fragmentation in the IS makes it difficult to introduce changes to the organization. Likewise, according to Wang et al., (2016) applying modifications to BPM functions and systems can become a daunting task. Moreover, Cemus, Cerny, and Donahoo (2015) argued that Business Rules (BR) represent the main link that can connect all the information systems in the organization since they derive from the organizational knowledge and the policies implemented all over IS. Comparatively, Holmberg and Steen (2011) suggested that the success of companies that are striving to conduct a service-oriented business depends on BRs and BPs. Subsequently, modelling and automating those components will result in lowering costs and increasing agility, adding efficiency and building up the effectiveness and the accuracy of the IS (Morgan, 2002; Holmberg and Steen, 2011; Fish, 2012; Cemus et al., 2015; Wang et al., 2016; & Taylor and Purchase, 2016). However, the traditional methods of modelling are fraught with problems. To give an illustration, Cemus et al., (2015) asserted that the BRs automation in accordance with different levels of ISs will engender issues like rules duplication and inconsistency in rules location.

According to the current state of BRs and BPs automation methods, Taylor and Purchase (2016) postulated that modelling the decisions first will solve the problem of inconsistency and redundancy in BRs. They also argued that modelling the decisions first will help both, simplifying the BPs and the data modelling. In addition, Taylor and Purchase (2016) asserted that organizations originate BRs from their business knowledge, policies, regulations and the business environment. The authors suggested as well that modelling operational decisions requirements will depend equally on the business knowledge and the policies of the organization, both externally and internally. Hence, the requirement model for operational decisions can be considered a consistent source of BRs (Taylor and Purchase, 2016).

Furthermore, the concept of “Decisions First” interconnected the BPs modelling and the automation to the BRs by treating every decision nod in the decisions requirement model as a major task in the business process model (Taylor and Purchase, 2016). Decision Management Solutions (2017) confirmed as well that modelling and automating BPs with high consideration for ‘decisions first’ will increase the agility and simplicity of the processes. Moreover, since

the data and the information are the foundation of any decision, modelling the requirement of operational decisions will ultimately decide the data model (Taylor and Purchase, 2016).

To sum up, Taylor and Purchase (2016) considered that centralizing decisions when developing the information systems is a necessary solution to link BRs to BPs in a way that guarantees consistency in BRs. Accordingly, the authors proclaimed that modelling BPs and BRs in accordance to the decisions requirements model will mitigate rules conflict, process complexity and many other problems. They also advocated that a decisions requirements model could enhance the data model by describing the required data from business sources and knowledge sources. With this approach in mind, the authors emphasized the importance of BDM as an emerging aspect in the management of the organization, thus creating a conflict with the role of the BPM in traditional organizations. Moreover, according to the authors, the conflict derives from the following business question: how responsibilities will be shared between employees and who will perform what task (Morgeson and Humphrey, 2006). Furthermore, this new approach related to IS improvement has implications not only for the systems but also for the people working with the system since it requires changing the way in which BPM duties are performed (Huber, 2000; & Parker et al., 2001). In addition, the IS development approach proposed by Taylor and Purchase (2016) to automate operational decisions led to the intersection of a large number of functions from different organizational entities. This intersection is clearly visible between data modelling, BRs and BPs modelling, and finally, between modelling and automating operational decisions (Taylor and Purchase, 2016). As a consequence, when a new ISD approach is introduced, the organizations will experience changes in the work design (Hackman and Oldham, 1976; Huber, 2000; Parker et al., 2001; Morgeson and Humphrey, 2006; & Decision Management Solutions, 2017).

2.4 The Blueprint of the concepts

The evident change and broadness of specialization in BPM roles and responsibilities is based primarily on the integration of new ISs methods and technologies into the work of BPM discipline (Harmon, 2015; and Rosemann, & Vom Brocke, 2015). The growing importance and interdependency of BPM with the organizational structure and the technological development created a need for the analysis and restructuring of the BPM roles (Kirchmer & Franz, 2014). However, examining the impact of the new ISD technologies and methods on the work design of BPM should be done prior to the restructuring process so that the new methods and technologies can also be integrated (Hackman & Oldham, 1976; Huber, 2000; Parker et al., 2001; and Morgeson & Humphrey, 2006).

Accordingly, the new concept of Decisions First developed by Taylor and Purchase (2016) brought forth further standardization and modelling methods to the BDM as a vital component of the BPM discipline. This new ISD changed the way in which many tasks are performed and assigned responsibilities such as analysing, modelling and improving processes to the BPM. Moreover, most of these tasks are related to the work of the BPA, which brings into discussion the question of how these new ISD methods and standards will change BPA's characteristics (Hackman & Oldham, 1976, Morgeson & Humphrey, 2006). In addition, the existing work design frameworks, for instance in Hackman and Oldham (1976) or Parker et al., (2001), that were the foundation for this research are too broad and did not specify what type of work they examined. Therefore, this current research combines different work characteristics used in most of the frameworks mentioned above that are related to knowledge and role characteristics

(Morgeson & Humphrey, 2006). The proposed framework aims to examine the impact of a new concept, namely process automation with a decision-centric approach, on the work characteristics of BPA (Morgeson & Humphrey, 2006; Lohmann & Zur Muehlen, 2015; and Taylor & Purchase, 2016).

On the other hand, the role of the BPA in BPM discipline has a range of tasks (e.g. modelling and analysing processes, documentation and implementation) that requires a BPA employee to have a variety of skills in order to deliver results (Lederer Antonucci & Goeke, 2011). In addition to that, the work characteristics play a significant role in identifying the right employee with the required set of skills that will be able to perform the tasks of the BPA role (Lohmann & Zur Muehlen, 2015). Hence, a change in the tools and methods that the BPA role is using could impact its work characteristics as well, for instance in terms of task complexity the new methods might increase or decrease the complexity (Huber, 2000; and Parker et al., 2001).

In the light of the above, it can be said that the choice of work design characteristics in this framework is strongly correlated with the definition of the BPA role provided in different studies, for example, Lohmann and Zur Muehlen (2015), Lederer Antonucci and Goeke's study (2011) or Gregorio (2012). Generally, the definitions provided in those studies are consistent with the definition of knowledge workers offered by the studies of Parker et al., (2001) and Huang (2011). This will help examine the impact of decision automation with a decision-centric approach on the work characteristics of BPA more precisely and offer more relevant results (Taylor & Purchase, 2016; and Morgeson & Humphrey, 2006).

According to Hackman and Oldham (1976), the work characteristics are potent incentives that can boost the performance of the employees. For instance, adding a new tool that could enhance the autonomy of a role would ultimately increase the satisfaction of the employee who occupies this position and his motivation (Morgeson & Humphrey, 2006). Similarly, Parker et al., (2001) asserted that levelling-up the complexity of a role is likely to motivate the employee since it makes the work more challenging. However, no existing framework had the necessary tools to examine how the integration of a new ISD method or technology may impact the work characteristics of knowledge workers' roles in an organization, for instance, the roles of the BPM.

In order to be able to analyse what impact the introduction of decision-centric automation methods would have on the work of BPA, a set of work design characteristics were adopted from three previous frameworks (Hackman & Oldham, 1976; Parker et al., 2001; Morgeson & Humphrey, 2006). The characteristics were divided into two different categories as follows:

Knowledge Characteristics like job complexity, information processing, problem-solving skills, skill variety, specialization and position ambiguity.

Role Characteristics such as autonomy, task variety, task significance, task identity and eventually feedback from the role.

Finally, the previous characteristics together with the concept of decision automation will be used in analysing the empirical data. The following chapter will explain in detail how this research study will utilize the theoretical concepts outlined above and what methodological and analytical tools will be used to answer the research question.

3 The Research Methodology

This thesis aims ultimately to offer a clear explanation of the impact of DAS, as a new ISD method, on the work characteristics of BPM, more specifically the role of BPA. Accordingly, the research will aggregate data, both primary and secondary, then analyse these data using different methods that are compatible with the ethics of IS research. Another reason behind conducting this research is enhancing the scientific evidence related to the research subject, hence adding building blocks to the IS body of knowledge (Recker, 2013). Consequently, this chapter will go through the methods used to harvest and analyse the data, the strategy of the research, the literature used, the selection of participants and the context selection. However, it will start with the context selection that explains the choice of a specific domain for collecting the primary data.

3.1 The research strategy

The continuous development of IS, methods and technologies, impose endless changes on the work design of the organization, especially the roles of IS employees (Billings et al., 1977; Huber, 2000; and Parker et al., 2001). In order to sustain their competitive advantage and cope up with changing technologies, organizations need to understand the impact of these technologies and make the required modifications (Billings et al., 1977). The study expects that introducing decision automation services as a new ISD will affect the job characteristics of the roles associated with this development, especially the BPA role. In addition to that, the research forecasts that knowing the impact of DAS will help to apply the right changes to the BPM.

The first stage in conducting this research was to accumulate and analyse the available literature on Decision automation, the BPA role and the work characteristics. This step was considered to be the main success factor for research in general, since knowing and understanding the available literature is essential to achieving valuable results (Webster & Watson, 2002; Randolph, 2009). Furthermore, according to the research context, the qualitative method was set to be the main methodological approach of the study. This method choice is justified by the textual nature of the primary data that has been collected. Moreover, the fact that the research is aiming to explore in depth the interaction of DAS and BPA role characteristics also enforced the preference for a qualitative method (Recker, 2013, p 88). In addition to that, it is logical to consider the research as an interpretive investigation since this is in line with the characteristics of the qualitative approach defined by Recker (2013, p 89) and Gummesson's study (2003). The ways people understand and interact with their work environment and tools are subjective and differ from a person to another (Orlikowski & Baroudi, 1991). Therefore, listening to the opinions of the experts in order to explain what impacts DAS may have on the role of BPA via interviews will offer richer and more valuable data compared to the insights that the numerical data could provide. The disadvantage of the quantitative method derives also from the limitations of its precise measurements which does not prove to be beneficial for an exploratory study (Recker, 2013, p. 66).

As a consequence, this research will follow a qualitative method throughout the study, it would be interpretive in nature and will follow an exploratory approach instead of focusing on providing an explanatory dimension. This means that the researcher will not only depend on

the provided literature but will also try to explore and provide new insights through the expert interviews that could add new perspectives to the existing knowledge related to the topic (Gummesson, 2003).

3.2 The research context

It is beneficial for the reader to have a general idea of the context in which the study has been conducted before delving into the used literature or the secondary data. Initially, the study targeted Swedish governmental agencies (e.g. Försäkringskassan, CSN, Skattverket, etc.) with the aim of designing a case study. The reason behind targeting this sector was related to the vibrant work context of these agencies in terms of the operational decisions and automated processes that they contain. A more important reason was that the Swedish government is transforming into a fully functioning E-government. Consequently, the Swedish governmental entities could have been a fertile environment for decision automation and BPM. However, the confidentiality of information and the intensity of work have contributed negatively to the realization of these research plans and constituted a strong discouragement for the entities to become part of the study. Therefore, the research went on to collect data from another domain that consists of companies specialized in offering decision automation solutions and businesses that are actively involved in BDM and BP automation. This change made the use of a case study design difficult to realize. Therefore, due to access and data limitations, the research will be using a different tool, namely interviews. Furthermore, since the targeted companies represent different work environments and cultures, the data collected would offer broader and more meaningful insights on the subject.

3.3 Secondary data collection

The continuous advancements in the body of knowledge in the academia depended mainly on the collective learning and the incremental understanding of subjects under research (Boote, & Beile, 2005). The authors associated the research success to the added value brought to the body of knowledge in the academia and to the comprehension of the available literature on the topic under research. Hence, the literature used in research represented the base for the choice of the study topic and secondly, it tried to present the data in a transparent way in order to offer satisfying answers to the research problem (Randolph, 2009). The importance of secondary data or what is known as academic literature derived from the fact that it works as a road map and helps the researcher to achieve its study target (Recker, 2013, p. 39). Therefore, in this section, a description will be offered in order to understand how the literature used in this paper has been chosen and how it has ultimately helped to design the theoretical framework and to identify the necessary concepts.

To set a clear research question that can quickly point to the target of the study is the most important and daunting task of any research (Recker, 2013, p. 25; and Kvale, 1996). Therefore, after the study has established the research question, it was clear what theoretical data was necessary for the choice of the research concepts. The research question pointed out to three theoretical themes, namely BDM, BPM and work design which later on has been narrowed down to more specific terms like decision automation, the BPA role and its work characteristics. The secondary data collection process was carried out in three steps as follows:

The first step was to explore the available literature in previous courses such as BDM course, Sustainability and Innovation course and other relevant courses (INFN50 2018; INFN40, 2017; INFN25, 2017; and INFN01, 2018). The literature found in these courses established the base for the next step and set the red thread for the search process since it consisted of articles that covered thoroughly two of the main concepts.

The second step was to use internet-based literature, mainly articles accumulated through search queries on reliable websites such as google scholar, LUB search, and other associated web pages. The search queries consisted of expressions referring to the main building blocks of the research question. Some of these expressions are business decision management, business process management, work design, decision automation, business process analyst, work characteristics and several other related expressions.

The third step was to find the hyperlinked literature. This step was a dispirited process since it required detailed analysis of every targeted article to identify the relevant information and to find out on what study they are based, in this way tracking back the main study used. For instance, when the work design framework offered by Parker et al., (2001) has been analysed, it was visible that it was strongly linked to the study of Hackman and Oldham (1976).

The total number of studies accumulated on the research themes exceeded 115 and varied between articles, books, chapters and white papers. The vast bloc of the literature was related to BDM and BPM, while fewer articles where found about concepts like work design. Most of the BDM articles focused on the emergence of decision automation as the main concept of BPM and on prioritizing decision points in modelling processes (e.g. Taylor, 2013; Taylor and Purchase, 2016; Fish, 2012; Holmberg & Steen, 2011 etc.). On the other hand, BPM articles focused on the evolution of the discipline and on the use of technology as a component that enhances performance (e.g. Harmon, 2015; Müller, Schmiedel, Gorbacheva, & Vom Brocke, 2016; Lohmann and Zur Muehlen, 2015; Wolf & Harmon, 2012 etc.). Finally, the articles assembled about the topic of work design showed a tendency to explore the work characteristics as motives for work performance and work satisfaction (e.g. Hackman & Oldham (1976); Parker et al., (2001); Morgeson & Humphrey (2006); Huang, 2011 etc.). Finally, the study found one relevant article that examined the impact of new technology on the work characteristics (Billings et al., 1977). This study did not specify what type of work is targeted and nor did it consider the opinion of the targeted workers since it depended only on structured interviews (Whiting, 2008)

On the other hand, no study has been found that could explain what happens to the characteristics of the BPA role when DAS is introduced to the BPA work as a new ISD method. These findings validated the importance of the research question posed in this paper and strengthened its role in filling this gap in the literature by examining data collected from the business domain.

3.4 Primary data collection

The empirical data known also as primary data represent the main source of scientific evidence required to answer the research question (Bhattacherjee, 2012, Pp. 35-65). The limited number of participants contributed to the choice of the interpretive method, best suited for textual analysis (Bhattacherjee, 2012, p. 35). Moreover, the interviews, as an interpretive method to

collect the required data represented the best approach, since a direct interaction with the participants will offer valuable, detailed insights (Kvale, 2006). Accordingly, since the opinions of the experts participating in the study are important, flexibility in the interview questions was required in order to offer more space for the interviewees to express themselves (Fontana & Frey, 2000). Therefore, a semi-structured interview was designed with a set of open questions keeping at the same time, in mind the target of the question (Whiting, 2008). In this sense, the interview has been outlined in accordance with Whiting's (2008) guidelines. The author pointed out four groups of guidelines as follows:

- First group related to the structure of the questions, where Whiting (2008) argued that following a semi-structured interview will bring attention to the biases that may appear. In addition to that, this type of interviews helped to keep the researcher equidistant in relation to the data collected. Finally, semi-structured interviews offered a red line for the research methods.
- The second group referred to the characteristics of the interview, how they are decided, where and what should be the maximum length. Furthermore, Whiting (2008) argued that the interview is usually prepared around a set of already fixed questions with the possibility for sub-questions to emerge from the context.
- The importance of the third group derived from its relation to the interviewee. Whiting (2008) asserted that it is crucial to the success of the interview to provide the interviewee with some explanations. For instance, the goal of the interview, an introduction to the topic, confidentiality and handling of personal data, the freedom assurance in answering the questions and other important explanations.
- Finally, the fourth group deal with different investigation techniques that help in achieving more data and exploring the thoughts and opinions of the participants. Those techniques are: a) silent, b) echo, c) verbal agreement, d) the "tell me more" phrase, e) long questions, f) leading, g) baiting.

In addition to the previous guidelines offered by Whiting (2008), it is useful to take into consideration the study of Schultze and Avital (2011) since they tackle different types of interviews that are compatible with different types of IS research. In addition to that, this paper is seeking to answer the question 'what?' with explanations of how and why. Consequently, the nature of the research question makes the appreciative interview, proposed by Schultze and Avital (2011), the best interview type for collecting the required data. Moreover, the appreciative interviews could be a way to avoid the pitfalls of other methods of interviewing like the method suggested by Myers and Newman (2007) and to gain more profound insights into the perspectives and experiences of the participants.

Finally, when conducting the interviews, several points from the study of Myers and Newman (2007) have been adopted to ensure expanded, reliable, and high-quality data. For instance, top-level management participants where targeted for the interviews to guarantee a reasonable level of entry in the organization and its experiences. At the same time, participants who are directly associated with the research subject or working with it were also targeted in order to avoid the elite bias (Myers & Newman, 2007). Additionally, one crucial point from Myers and Newman (2007) was to give the participants space to choose the interview date and time to avoid time pitfall. Other aspects were also considered, such as avoiding to interfere or to help constructing knowledge about the topic during the interview, unless the participant asks for additional explanations.

3.5 Informant selection

Another vital point to the success of the research study is the group of participants (Schultze & Avital, 2011). When the interviews are used as a method for data collection, the quality of the data depends predominantly on the participants' involvement in the research topic (Whiting, 2008). Consequently, the daunting process of selecting the right participants and succeeding to book an interview with them, started at the early stages of the research. This process has been carried out in different directions as follows.

The first stage was to identify and list organizations, companies, associations and communities that are strongly involved in the themes of the research topic. However, the themes of the research go in two different but connected directions, namely BDM and BPM in IT and work characteristics in work design and organizational structure (Hackman & Oldham, 1976; Huber, 2000; and Taylor & Purchase, 2016). Hence, the primary focus was on participants from the fields of BDM and BPM. The study aimed to interview participants with managerial roles, since the management level is usually involved in the work design or the organizational structure processes.

To achieve the previously mentioned goals, a global list of 20 organizations, two communities, 5 webpages specialized in BDM and BPM have been identified. Initially, the researcher started contacting the organizations via the contact form offered on their webpages. This step resulted with one single answer out of 17 forms that have been filled, from the Decision Management Solutions organization, which were available only via E-mail. The second step was to contact participants via Linkedin search queries: six participants have been contacted, three of them answered and only one finished the interview since the others two quit in the process. The third step was to approach online communities associated with BDM and BPM, for example DMCommunity and Open Rules that provided 25 E-mails of various specialists. Accordingly, there was one positive reply from the E-mails, who later suggested another specialist in the technical field of BPM and decision automation. Finally, the available contact information of the IT and BPM department were collected from the list of the organizations by contacting the information centres at "*info@org.com*". Consequently, another 61 experts were contacted, providing 23 responses out of which only one answer was positive.

The Following table shows the positive feedback received, the dates of the interviews, the organizations that participated and the method used to conduct the interview.

Table 3.5.1: The interviews participants

Some insights of the interviews and the organizations				
Organization	**Attempt**	**Representative**	**Date**	**Method**
D.M. Solutions	Contact form	JP	04/24/18	E-mail
Goldman Sachs	LinkedIn	PGS	04/26/18	Hangout google
Camunda BPM	E-mail	NC	05/11/18	Skype
Trisotech	DMcommunity	DG	06/07/18	GoToMeeting app
RedHat	Recommendation	ER	07/11/18	GoToMeeting app

3.6 Instructions for the interview

After designing the interview and the form of the questions, to obtain the desired data together with the participants' stories, a set of instructions has been established (Appendix 1). Moreover, to acquire a constructive interview, instructions have been used to help participants understand the study goals and their rights during the interview. In this respect, instructions were designed in accordance to Whiting (2008), and Myers and Newman (2007). By definition, the instructions are:

1- A brief introduction to the topic that would help participants to prepare their answers.
2- Important information related to the ethics of interviewing such as the rights of the participants during the interview.
3- The interview questions divided into three sections, namely introductory, main themes' questions and commentary question.

Finally, the quality of the interview instructions and guidelines played an important role in making the participants open and share their experiences and stories.

3.7 Data Analysis Procedures

Data analysis were the procedures that led to the assembling of the puzzle pieces hidden in the collected data to help answer the research question (Recker, 2013, Pp. 92-98). The research followed three stages of data analysis and those stages are:

- Analyse and connect the important ideas from the available literature in order to build the concepts and the theoretical background of the study.
- Complement and support the theoretical background with trusted white papers and articles published by reliable organizations (e.g. Decision Management Solutions or IBM).
- Finally, the last and most important stage, where the empirical data needs to be analysed rigorously and carefully in order to examine the concepts from the previous stages.

However, since the primary data represented raw material, it undertook two steps of analysis before it became ready to be used. The steps were:

1- Transcribing the interviews

All the interviews have been conducted in English despite the diversity of participants which made the transcription process go faster and smoother. Additionally, since one of the interviews have been conducted via E-mail and the questions were answered in a written form, only four interviews were left to transcribe.

Both the reliability of the results and the quality of the research depend strongly on the quality of interviews transcription (Poland, 1995). Therefore, the interviews have been transcribed carefully and the transcriptions have been also sent to the participants for their approval and consensus on what has been transcribed. Furthermore, the missed words caused by the poor quality of the recording in some interviews have been corrected in consultation with the

participants. Finally, the written transcription excluded sounds such as laughter, mumbling or break words like "*Hummm*".

2- Coding the transcription

In order to organize and structure the collected data, the study used two stages of coding on the transcript of the interviews. Coding has been identified by Recker (2013, p. 92) as the process that transforms each part of the text into a code and that, at the same time, refers to a relevant concept. Firstly, the study started to identify the main concepts and associate them with a set of codes called primary codes. The concepts identified were coded as follows: Decision Automation Services referred to as DAS-DC, Business Process Analyst abbreviated as CBPA, and finally the Work Characteristics referred to as WDA. The second step in the coding process was to simplify the concepts even more, and since the purpose was to understand the impact of DAS on work characteristics, the work characteristics have been divided as well. The work characteristics were divided into Role Characteristics abbreviated as RC and Knowledge Characteristics referred to as KC. Finally, the constructs of Role and Knowledge characteristics were also coded to facilitate their identification in the transcript of the interviews. To sum up, the tables below explain the coding system used in the study:

Table 3.7.2: The main concepts codes

<table>
<tr><td rowspan="2">Business process analyst (chapter 2.1). Coded as CBPA</td><td rowspan="2">Decision Automation Services (chapter 2.3). Coded as DAS-DC</td><td rowspan="2">Work characteristics (chapter 2.2). Coded as WDA</td><td>Role characteristics (chapter 2.2). Coded as RC</td></tr>
<tr><td>Knowledge Characteristics (chapter 2.2). Coded as KC</td></tr>
</table>

Table 3.7.3: The Codes for second level constructs

Knowledge Characteristics (KC)		**Role Characteristics (RC)**	
Job complexity	Coded as **(JC)**	Task autonomy	Coded as **(TA)**
Information processing	Coded as **(IP)**	Task variety	Coded as **(TV)**
Problem solving	Coded as **(PSL)**	Task significance	Coded as **(TS)**
Skill variety	Coded as **(SV)**	Task identity	Coded as **(TI)**
Specialization	Coded as **(SP)**	Feedback from job	Coded as **(FFJ)**
Role ambiguity	Coded as **(RA)**		

3.8 The Quality and the Ethics of the Research

The interpretive nature of the research makes the measurement of its quality more complex than it is the case for a quantitative positivist approach (Bhattacherjee, 2012). Another obstacle in evaluating the quality of the paper would be the difficulty to use statistical generalizability in interpretive research since the sample does not speak for the entire community of study (Recker, 2013). However, two relevant measures were taken into consideration in the study to ensure good quality research, and the measures are:

- ***Research Validity***

According to Recker (2013, pp. 70-73), validity represents consistency between the data collected and the research constructs. The author discussed different types of validity that can be used in different contexts such as face validity, content validity and construct validity (Recker, 2013). In this research paper, the transcript was accompanied by clear explanations of the coding procedures in order to obtain content validity. In addition, the interview guide and the instructions have been also provided to show the data collected aimed to answer the interview questions based on the research constructs.

- ***Research Reliability***

Every research study might include biases and subjective observations (Recker, 2013, P. 69). Therefore, Recker (2013) argued that the ability to mitigate and reduce subjectivity and biases in research would increase its value and reliability. However, performing reliability tests on qualitative data was considered hard and incompatible with this type of research since the collected data are textual and interpretive in nature (Bhattacherjee, 2012). Hence, another quality test was performed to ensure the quality of the research, namely 'dependency of the findings' (Recker, 2013, p. 94). Dependency means that for each finding and data used in the empirical analysis, a direct reference from the interviews was given. Thus, the referencing guarantees a logical reasoning between the research findings and the data extracted from the interview.

- ***Ethics***

Most of the scholars specialized in research methods and design strongly emphasized how important it is to follow a set of ethics when qualitative research is conducted (Bhattacherjee, 2012; and Recker, 2013). Having a set of ethics becomes vital when the research design is based on a qualitative method, for instance interviews, since during this phase the researcher will interact directly with the participants. The current research paper followed and included ethics in the interview structure to ensure that the participants are well informed about their rights. The ethics that have been discussed with the participants are mentioned below as follows:

1- Anonymity and confidentiality (the study ensured the protection of identity and personal data for all the interviewees).
2- Harmlessness and Voluntary participation, meant that all the participants have been informed about their right to participate freely and to stop whenever they want without further repercussions.
3- Disclosure (the researcher offered preliminary explanations, for example he made an introduction to the research topic and the interview questions prior to the interview).
4- Data analysis and findings (the interviewees were informed about the further use and analysis of data in the research study).

Finally, other ethic related principles such as referencing and appropriate use of language were considered (Recker, 2013, p. 146).

4 Findings

In the current chapter a presentation of the main organizations involved in the study and the results achieved from the information they offered will be revealed. The description of the organizations is collected both from their websites and from the explanations provided by the participants. When the chapter will outline the empirical data, a reference will be made to clarify what sections from the interviews have been used. The reference would be provided in two parts, one referring to the appendix of the transcripts and the second would be the number of the chapter mentioned in the transcript.

4.1 Involved organizations

The empirical data are considered the cornerstone of any research seeking to provide valuable and useful insights. Therefore, it is important to describe the sources of the data and the involvement of the participants in the topic under study. In this research, five participants have been interviewed representing five different organizations as described below:

1- *Decision Management Solutions*: is an organization specialized in consultancy work related to BPM and BDM with a focus on decision automation with decision-centric approach (Decision management solutions, 2017). Its CEO, James Taylor is a notorious scholar specialized in BDM and the writer of Real World Decision modelling with DMN as the main theoretical sources of this study. The interview was conducted with the VP of the company (Appendix 2:2).
2- *Goldman Sachs*: since this organization is well known world-wide as a veteran in the banking industry, their work consists of an enormous amount of operational decisions and transactions (Goldman Sachs, 2018). Thus, they have been involved in the field of decision automation and management in the early stages of the discipline's establishment. Furthermore, it is the only organization that has a decision analyst position that the researcher had the chance to interview (Appendix 3:2).
3- *Camunda BPM*: is one of the leading companies in the field of process automation and decision automation with focus on the standards of DMN and BPMN (Camunda, 2018). In addition to that, the company is involved in the theoretical field and is making important contributions to the academia through their publications, for instance, the book called "Real-life BPMN". The researcher was able to interview one of their senior consultants in the field of BPM (Appendix 4:9).
4- *Trisotech*: is one of the leading organizations in digital enterprise transformation (Trisotech, 2018). The company offers easy-to-use software for enterprises to help them analyse and model their work (Trisotech, 2018). This study was able to interview the CEO of the organization who has a solid experience in the fields of BPM and BDM (Appendix 5:4)
5- *Redhat*: is one of the leading organizations in open source solutions and has long term experience in the field of workflow automation and BDM (Redhat, 2018). In addition to that, the organization is one of the active members in the decision management community "DMcomunity" (Redhat, 2018). The interview was performed with the decision manager that has a vast experience in the technical aspects of decision management (Appendix 6:8).

4.2 Analysis of the findings

The analysis will be carried out to showcase the results identified in the interview transcript. A detailed and concrete exploration of the points of view obtained from the participants will be presented in regard to the main research concepts: the BPA role, DAS and the work characteristics. The full transcript of the interviews can be found in the appendix (they are numbered from 2 to 6).

4.2.1 The Definition of the Business Process Analyst Role

Since the research provided a variety of definitions, it can be argued that there is still a lot of confusion in the business field surrounding the BPA role and its responsibilities. For instance, some of the interviewees requested an explanation of what the researchers have said about the BPA role, in order for them to be able to offer a definition that can apply to the subject of the study: "*what a company define as a business process analyst can change quite a bit depending on the size of the company, depending on what they are aiming to achieve as well. Are you able to define this role?*" (Appendix 4:1).

In addition to that, the empirical data approved the confusion since different definitions were received from different experts. For instance, some experts perceived it as a Business analyst (BA), whereas others did not:

"*A business process analyst to me is a traditional BA, a traditional business analyst, with its skills set in interviews, analysis work, logical thinking and working with the business to understand what the problem is but he does have a specific focus or appreciation for the process context as well*" (Appendix 3:4).

"*I make a distinction between a business process analyst and analysing a business. So, those are two different scopes, but the business process analyst for me is really concentrated on capturing, analysing and improving how things get done in an organization*" (Appendix 5:6).

The current study suggested that the introduction of decision automation services will have direct effects on the work of the BPA. This hypothesis has been supported by many participants when answering the questions and revealed the involvement of the BPA in decision automation. In addition to that, some participants advocated that a new role will emerge to support the BPA and not that the BPA role will change to integrate the new automation approach. However, the idea of having a new emerging role rather than changing the role of the BPA to integrate the new approach has been proved to be erroneous and was not galvanized by the participants when answering the rest of the interview questions. Hence, they offered further support to the hypothesis presented in the current study:

"*Understanding an open standard like DMN is the primary change; without understanding that knowledge of DMN you basically are nowhere*" (Appendix 4:43).

"*I think the main skill is understanding the standard and the language, it is a new language, especially the expression language will be new for him*" (Appendix 6:36).

"*In some organizations, a dedicated decision modeller role with distinct skills will evolve and collaborate with the BPA*" (Appendix 2:8).

4.2.2 Decision automation versus Process automation

This study advocated that decision automation should be part of the BPM and more specifically, of the BPA role, thus changing how this role function. Consequently, decision automation would be contained in process automation –the main task of the BPA– a fact that has been approved by most of the interviewees. In addition to that, the research suggested that integrating DAS into BPM will enhance its capabilities and expand its influence over the organization.

All participants agreed with the statement that says process automation contains decision automation and it is even broader than this. Two examples in this sense came from the CEO of Trisotech and the BPM of Camunda:

"[…] *Process automation is about processing activities so sequencing and orchestrating a series of activities where decision automation, the act of deciding, is one activity. So, within the process you may have one activity that is deciding on something and then that decision will itself be automated*" (Appendix 5:8).

"*Process automation is higher level so, process can stand –considering any given company– for the core part of what they do[...]*" (Appendix 4:15).

"*The decision logic of the process model is precisely captured by decision modelling, a separate, yet linked model. Integrating process and decision models provides an even more powerful and capable toolset for business analysts and business process analysts*" (Appendix 2:6).

4.2.3 Decision automation services & Role Characteristics

The work design framework that this study adopted from various models is divided into two levels of questions throughout the interview. The first level examined the Role Characteristics (RC), while the second one examined the Knowledge Characteristics (KC). The purpose was to understand what changes DAS will bring upon those characteristics and how it will change them. When the participants answered the introductory questions, they leaned toward separating decision automation and incorporating its responsibilities with a new role, namely decision analyst. However, when the participants started answering the main theme questions, the answers leaned more towards admitting the changes in the BPA role because of the introduction of a new approach. To start with RC the interviews showed a variety of opinions regarding the impact of decision automation services on each RC.

In what concerns the Task Autonomy (TA), the study reveals that offering the BPA more tools to handle processes and the decisions embedded in them, will enhance the role autonomy and decision-making space of the BPA. This assumption has been supported through interviews since most of the participants agreed on two points: firstly they confirmed that DAS will add a new method to the toolkit of the BPA:

"*If you give a business process analyst an extra tool to also be able to define the decisions and the rules that apply in a process, you are definitely adding to the different methods and the different options that the business process analyst has.*" (Appendix 3:10).

"*That, usually requires to work with another person or another group of persons, usually developers, side by side in order to deliver the process automation. So giving him the freedom*

or the autonomy to do everything by himself by using a standard, higher-level language, is something that will increase his ability to use different methods" (Appendix 6:16).

However, not all participants agreed with the second idea that decision automation services will enhance the decision-making space of the BPA. By contrary, some considered that:

"*It will open and broaden the participation of the process analyst in a different space. In particular, a good approach to decision modelling will help the relationship with the business people and the IT people, in providing a better cleared way of how decision is achieved, what are the requirements for making that decision and the decision logic that is used to achieve it.*" (Appendix 5:12).

"*In my understanding of the business process analyst role, I don't think he was the one making decisions at all, right! He was responsible to understand the processes in the company and talk to the people that were actually executing those processes and making those decisions to model those decisions.*" (Appendix 6:18).

Furthermore, Taylor and Purchase (2016) asserted that if a decision automation approach is applied, it will simplify the process automation. Accordingly, it can be argued that this will fragment the task of the BPA into many detailed tasks and will even add more tasks to his role. This suggestion was found to be compatible with what the participants have said through the interviews:

"[…] *I think in the end it would add more because it opens up more opportunities to define a bigger picture. So, if you are just a process analyst and your only concern is the sequence of events, different roles and the different authorization for those roles, which is kind of a smaller picture of your business problem, then, when you also add the rules that govern that process to it I think it adds more work to the BPA [...]*" (Appendix 3:14)

-"[…] *I guess it will definitely add more responsibilities to an analyst, namely because up until now the analysts drive documentation and the documentation does not run, the documentation is not going to follow a runtime it does not get deployed anywhere, but if you give this automation idea to the analysts, you give them a lot more responsibilities.*" (Appendix 4:21)

In addition to that, when the BPA will have the tools to separate decisions from processes, model them and understand their requirements, he will better understand the business owners and the IT people. Subsequently, the BPA will link those two sides and impact their relation positively which will enrich, in turn, the role significance since it provides a more understandable language for both the business people and the IT sector as described below:

"*Well, the business process analyst is a key player in bridging the divide between business and IT* […]. *Now with the capability of decision modelling it adds more tools in their toolset to better grasp the requirements of business [...]*" (Appendix 5:18).

"*If you use decision automation it means a code with open standard that both the developer and the analyst can look at, it runs, so it is executable, and they can both talk or use it as a common language [...]*" (Appendix 4:23).

Similarly, the decision automation approach will allow the BPA to start with the business side by doing documentation and it will finish with IT, performing modelling and through the use of a standard language such as FEEL. The tools provided through a decision automation

approach will, therefore, allow the BPA to deliver end-to-end tasks that can be measured and evaluated by the top management as explained below:

"*Yes, because decision modelling separates the decision logic from the process, and decisions are linked explicitly to business objectives. This helps ensure that complete outcomes are achieved, i.e. the business object is defined and measured [...]*" (Appendix 2:14).

"*Absolutely, I think that is one of the biggest advantages of the standardization of decision management, and the realization of DMN standard is to enable the business process analyst to work on the modelling of the process automation* […]" (Appendix 6:24).

Finally, since decision automation will allow the BPA to do end-to-end tasks that would mean the feedback information that the top management will get from this role will be more accurate and precise. Many participants agreed with this assumption and supported it, since the information will come directly from the BPA to the top management without the need to pass it first to a developer or to a business owner.

"[…] *it provides a much more precise capture of the requirements and therefore, leads to more precise feedback from business to correct the things that are not correct or for IT who have very specific questions in the details of the automation of the logic.*" (Appendix 5:24).

"*Absolutely. Because decision modelling is linked explicitly to business objectives and the outcomes are measured, the BPA can clearly measure and define the benefits delivered. This provides a clear basis for feedback.*" (Appendix 2:16).

"[…] *but it also puts more transparency in the holistic intern view of the solution and I think that is the major benefit for every organization because with every hand over to different people with different skill sets it sums up lots of information and it also sums up the component of rework*" (Appendix 3:22).

Nonetheless, there was one participant who asserted that the quality of the feedback information is connected directly to the organization and its management, whether they were applying automation or not:

"[…] *I think it actually depends on the company, not on whether they use automation services or not. Because I see companies who use decision automation but uses them very ad-hoc, so it doesn't necessarily give anyone a better understanding* […]" (Appendix 4:31).

The second part of the BPA work characteristics refers to the knowledge characteristics (KC). Consequently, adding a decision-centric approach in terms of new added knowledge, to the BPA role as a knowledge worker should have some implications on the KC of the role. The last five questions of the interview tried to observe the views of the participants on this matter.

4.2.4 Decision automation services & Knowledge Characteristics

The research has explained through the theoretical framework that knowledge characteristics are related to the understanding of the role and its tasks, for instance, the role ambiguity, the task complexity and skill variety. Adding a new technology or ISD method can have both a positive or negative impact on these characteristics. By looking at the collected data, one can

argue that adding a new decision-centric approach to decision automation would urge the BPA to fulfil more knowledge requirements.

Firstly, there was a general agreement among the participants that DAS will decrease the complexity of the tasks performed by the BPA and the need for more complex problem-solving skills. Nevertheless, the study assumed the BPA already has the required skills regarding problem-solving (PSL). However, when looking at the data, only one of the participants supported this assumption as explained below:

"*Decision modelling simplifies the complexity of tasks. Decision modelling provides BPAs with an industry standard technique for separating the business decision logic from the business process. This serves to greatly reduce the complexity of business process models and facilitate their readability.*" (Appendix 2:18).

"*I think they would still solve the problem but, I think they now have methods and tools to mobilize and truly define the problem and that is a big difference* […]" (Appendix 4:41).

"*An effective BPA must already have complex problem-solving skills. Decision modelling improves communication and collaboration with stakeholders, IT, analytics teams, providing a much more effective presentation of the BPA's work* […]" (Appendix 2:20).

Yet, there were other participants who suggested that DAS will simplify the work in general, but will complicate the BPA role. They depended mainly on the fact that the BPA will solve more problems, a responsibility that the developer or the business owner used to perform:

"*I think in a sense there are slightly more complex tasks on his hands. Before he would probably just write a few sentences in his native language and then someone else would be implementing or automating those decisions. With this "DMN and automation standards" what will happen is he will have to implement basically the decision. Of course, the work can still be complex but the idea here is that you have control end to end.*" (Appendix 6:32).

Moreover, this study postulated that DAS, with its methods and standards, will require the business process analyst to handle more information, for instance the decision requirements. This assumption found agreement among most of the participants, aspect that can be controversial when connected with the information regarding task complexity mentioned above:

"*Yeah, I expect so, because as I already said, the additional information that the analyst will need is understanding the DMN notation and the second thing is they cannot have ambiguity, it's not possible anymore […]. […] they would actually need to add for every bit of information, every default value. All of that needs to be precise.*" (Appendix 4:35).

In the theory section a strong focus was placed on the BPA competencies and skills. Accordingly, the integration of new ISD methods or technologies into the work of BPA would bring forth the need for new skills that would allow him to deal with the new ISD. Although most of the participants agreed with this suggestion, there was one participant that suggested the integration of this new approach will result into an emerging role that will assist the BPA, as mentioned above:

"*They need at least two skills: one skill is to be able to capture and analyse the decision requirements and this is by looking at what information and what knowledge is required to*

achieve the decision […]. *The other skill required is going to be about capturing decision logic, how the actual decision is achieved. This is taken by specifying what the question is* […]" (Appendix 5:32).

It is also expected that DAS will impact similarly the specialization area of the BPA. This was noticeable in most of the interviews where the participants suggested the BPA will involve in different aspects of the work as follows:

"[…] *BPAs have an opportunity to lead and influence the transformation of the organization into a more analytically driven organization.*" (Appendix 2:24).

"Yes! It introduces in a formal way the whole decision modelling and decision automation aspects, which was not necessarily present before or was left to a separate group." (Appendix 5:34).

Finally, the introduction of new methods or approaches to the work of an organization usually comes with an intention to make things clearer and easier to understand. In addition to that, the first section from the data analysis reported the confusion surrounding the BPA role definition. Consequently, the primary perception of DAS was that it will result in less ambiguity in the BPA role. However, the participants of the interviews did not have one common stance regarding the impact of decision automation on the ambiguity of the BPA role.

"*I think it would make it more difficult and that is kind of inherited with the additional complexity that a business process analyst would have to deal with, if he is also involved in a decision context* […]" (Appendix 3:36).

"*I believe it is the opposite, I think it will make it simpler for them to understand those situations, that before were complex for them to capture or model* […]" (Appendix 5:38)

"*Decision modelling will make it easier for the BPA to understand because the graphical decision model reduces process complexity and facilitates their readability*" (Appendix 2:26).

5 Discussion

The way organizations do their business and design their work is changing continuously, in parallel with the incremental development of the IS and the IT (Huber, 2000; & Parker, et al., 2001). Although BPM is considered to be the administrator of these changes in the organization, it can be argued that introducing new ISD approaches may require redesigning the work of BPM itself (Krichmer & Franz, 2014). Consequently, this study examined the effect that the introduction of new ISD to the BPM had on its work design, more specifically, the impact of DAS on work characteristics of the BPA role.

5.1 The role of the BPA

Harmon (2015) showcased how BPM developed over time and changed its functionality and roles in accordance with the development of IS methods and tools. At the same time, the role of BPA undertook several changes that impacted its own definition and responsibilities (Sonteya & Seymour, 2012). Sonteya and Seymour (2012) suggested that the rather new role is responsible for aiding the business process overall and for leading the organizational changes. The empirical data did not supported the arguments provided by Sonteya and Seymour (2012) and considered the BPA role similar to a BA, but with a small difference, as the BPA role focuses more on process analysis and documentation. In addition to that, most of the participants leaned towards considering the BPA more involved in the business side than in the technical side. Furthermore, the empirical data showed that the introduction of DAS will position the BPA in the centre, between the business side and the IT or technical side. Finally, an appropriate definition of the BPA role found in the empirical data makes it compatible with the findings of scholars like Chakabuda et al., (2014). This definition considered the BPA as a role that bridges the gap between the business and its requirements, on one side and the IT and its capabilities, on the other and leads ultimately to organizational transformation in technology.

5.2 Decision automation services and work characteristics

Although scholars like Taylor and Purchase (2016) leaned toward separating BDM from BPM, the empirical data revealed a blazing debate on this matter. The findings assisted the idea that decision modelling and automation as the spine of the BDM is a lower level function than process automation and can, therefore be considered a part of it. These preliminary findings formed the base for the research question and contested a possible separation between the two concepts. On the other hand, the findings suggested that BDM has always been a concern for business people and that the question asking how to manage decisions is not entirely new. This finding goes in line with Taylor (2013), since the author asserted that BDM is not new to the business field and that the concept of prioritizing decisions in automation is in fact, the new approach in the IS development

Accordingly, the findings discussed previously and their relation to the literature allowed the research to go further. The research study assumed that introducing DAS will impact the work of the BPA since the role is strongly associated with process automation. The findings consist

of two segments: one is related to the impact of DAS on the Role Characteristics, and the other relates to the impact on Knowledge characteristics.

5.2.1 Impact of Decision Automation Services on Role Characteristics

The research examined five role characteristics that have been discussed as part of the work characteristics of a knowledge worker in both Huang (2011) and Parker et al., (2001). Accordingly, the findings approved that the tools of DAS will allow the BPA to broaden its perspective on the business requirements. This gave the role the ability to involve more in the decision-making process related to how the business should be carried out. Although Taylor and Purchase (2016) approached it partially when they discussed the value of BDM, this aspect has not been addressed explicitly in the literature. In addition to that, the tools of DAS will help the BPA to require less help from the developers on the IT side, thus having more autonomy in doing his job. Subsequently, decreasing the developer involvement in the BPA work will result in additional tasks attributed to the BPA, more specifically, on the technical side as the empirical data showed in the Findings Chapter. The decision management manifesto written by Taylor (2013) recognized the additional IT tasks the will be moved into the responsibilities of BDM. However, the study did not address openly the role that will perform those tasks. As a result, this study argued that the BPA will play a significant role in transforming the IS into a more decision-centric system through the utilization of DAS approaches.

Furthermore, the findings indicate that DAS will magnify the impact of the BPA on the roles that are associated with it such as developers. This impact will be obvious in bringing the IT and business people to one common ground since the tools of decision automation will allow him to communicate with both sides more clearly. Most of the literature on the role of the BPA consider it to be a link between IT and business and the introduction of DAS helped the BPA to bring the IT and the business closer (Chakabuda et al., 2014). Moreover, the empirical data stated that DAS enhanced the BPA task identity by giving this role the ability to deliver end-to-end tasks. The importance of this statement stems from the fact that the discussed literature claimed the tasks a BPA must be complemented by the work of developers on the IT side (Gregorio, 2012). The study also found that the consequences of being able to deliver start to end tasks will help the management to get more clear information from the BPA about performance and effectiveness. Hackman and Oldham (1976) argued that the ability to deliver complete products will enhance the understanding of the activities, thus offering a clear image on the performance at the top management.

5.2.2 Impact of Decision Automation Services on Knowledge Characteristics

It has been discussed in the literature that the role of BPA is considered to be a knowledge role according to the definition of knowledge workers offered by (Huang, 2011). Therefore, it was more crucial for the research to examine the impact of DAS on the knowledge characteristics. Firstly, Taylor and Purchase (2016) assumed that the use of decision automation approaches will decrease the complexity of processes thus, making the work of the BPA easier. The empirical data was not in line with this assumption. The study found that introducing DAS into the organization will have two effects regarding the complexity of work. On one hand, it will simplify the work of the organization and make it easier to understand the processes and the decisions. On the other hand, to achieve this simplicity, the BPA role will have to deal with more complex tasks. Secondly, the BPA will be required to offer a more holistic image of the

business and decision as discussed before. Accordingly, the empirical data revealed that to do so, the BPA will have to deal with a bigger amount of information in his work. Morgeson and Humphrey (2006) argued that adding more information for the role to process will increase its complexity. This argument linked the amount of information processed in a role to its complexity and allow the study to support the idea that the BPA tasks will be more complex. However, the data collected was not in favour of increasing the BPA problem-solving skills when adding decision automation services. Sonteya and Seymour (2012) argued that the BPA portfolio should already consist of high-level problem-solving skills, which means that DAS have no effect on this characteristic.

Moreover, the empirical data strongly emphasised that introducing DAS will require the BPA to add more skills related to this approach. This point was justified with the fact that operational decisions are a component of the process according to the participants, thus they are the responsibility of BPA. In comparison, the literature suggested that developing IS with the decision automation approach will result in an emerging role that is concerned only with decisions (Lohmann & Zur Muehlen, 2015). Another key finding to discuss is how decision automation services may affect the specialization area of BPA. The data collected showed that this new ISD approach will stretch the specialization circle of the BPA more towards the IT field. Chakabuda et al., (2014) asserted that the fast-paced development in IS will require the BPA to get more involved in different aspects of the work. Contrary to expectations, the final knowledge characteristic showed a blazing debate on whether DAS will help clarifying the role of BPA or add to its ambiguity. However, the extracted data leans more towards the suggestion that DAS will ease the understanding of how this role function. This aligns with what Taylor and Purchase (2016) asserted in their book, namely that the decision automation approach will simplify the work and make it clearer.

6 Conclusion and implications

The research paper set out to explore the possible effects that occur in the BPA role when DAS is introduced into the BPM work. The available literature was explored in relation to the main concepts and led to the construction of a new theoretical framework that helped later on to collect the necessary data. The empirical data were collected through a semi-structured interview based on the newly formulated theoretical framework. Finally, the data has been analysed using the theoretical framework in order to answer the following research question:

What impacts, if any, Decisions Automation Services have on the Work Characteristics of the Business Process Analyst role?

6.1 Research implications and future directions

To answer the research question, operational decisions were considered to be a primary component of the business processes and have often associated their management and automation phases with the BPM responsibilities (Fish, 2012; & Harmon, 2015). In this sense, BDM as a key component of the BPM was considered responsible for the operational decisions (Taylor and Purchase, 2016). However, both the empirical and theoretical data questioned whether BDM should be separated from BPM or not. According to the observed data this inquiry was associated with increased development in decision automation approaches and methods. Furthermore, the findings from the empirical and the theoretical data resulted into a more comprehensible BPA definition. According to the definition, the BPA role translates the business requirements and strategies into processes and decisions and communicates them as models and documentation to the developers on the IT side.

Furthermore, starting with the idea that decisions are the first-class citizens in the IS, modelling and automating them has been a major concern in the literature (Taylor and Purchase, 2016). This led consequently to the promotion of decision and process automation with a decision-centric approach. In this respect, the empirical data identified several positive effects caused by the introduction of DAS with a decision-centric approach to the BPA work (Taylor and Purchase, 2016). The results identified in the work characteristics supported the necessity to correlate the BPM and BDM. Moreover, studies like Lohman and Zur Muehlen (2015) set forth a competencies portfolio for the BPA role in order to help organizations and employees to understand the position requirements. The findings discussed in the previous chapter supported these endeavours and explored ultimately the impact of DAS on characteristics like skill and task variety, specialization and complexity.

The paper has also successfully demonstrated that the automation of operational decisions through a decision-centric approach has a series of benefits for organizations. In this respect, the empirical data showed that DAS helped to reduce the ambiguity of the BPA work related to processes and decisions. Simultaneously, DAS allows the BPA to enhance his task identity by providing end-to-end tasks. The study also identified other changes, for instance, a more direct channel of feedback from the BPA to the top management and a centralized BPA position in relation to IT and business people. This result will allow organizations as well to build a more

comprehensive portfolio for the BPA depending on the complete tasks that the role can deliver with DAS.

Although the results indicate a growing involvement of DAS in the work design of BPM, this has not been examined in large-scale organizations, for example in the banking industry or at the level of governmental entities. Therefore, this area can be further explored, especially in regard to the impact of decision automation on the overall work design of BPM and BDM. Apart from that, since the work design is strongly associated with the implementation of change in the IS and IT segments (Parker et al., 2001) expanding the current study from work characteristics to include the impact of antecedents such as DAS on work outcomes would offer more insights about the future IS trends. Finally, further studies can be conducted in relation to the impact of decision automation on the IT and analytics work in order to be able to provide an overview and to produce better generalizations regarding future developments.

Appendix 1: The interview guide and instructions

Introduction to the research themes

All the activities, objectives, strategies, and processes of an organization are strongly dependent on and deeply correlated to how decisions are taken. In reverse, decisions are categorized in different groups namely, strategic, tactical, and operational decisions. At the same time, technology and information systems are becoming a determinant factor for the survival of different organizations as they started to use technology to ease their workload and optimise the decision-making processes. This use of technology can take different forms, for instance by introducing new practices such as the automation of the business processes or the optimization of data analysis.

Furthermore, the use of new technologies obliges the organizations to adjust their structure to fit these technologies and systems. The change in the organizational structure is strongly driven by technology, hence, information technology (IT) and information systems (IS) end up having a deep impact on the organizational structure. One important part of the organizational change is the work design or position design. In this respect, companies change constantly their demands for employees in terms of social and practical skills depending on how their activities are designed and what task will be assigned to whom.

Besides, Business decision management (BDM) and its systems represent a new technological approach which was created specifically to deal with the operational decisions. Since this approach has been introduced to the business field, not many studies have been conducted on the relationship between BDM and its impact on the organizational structure. Moreover, questions like what changes decisions automation services impose on the organization in terms of its work design remain particularly unanswered.

In order to fill this gap, this research is aiming to understand how decision automation services will impose changes on the job characteristics of the Business Process Analyst position since this role is directly connected to decision automation services. The job characteristics that this research is aiming to test are the following:

Role characteristics	Knowledge characteristics
1- Task autonomy 2- Task variety 3- Task significance 4- Task identity 5- Feedback from job	1- Job complexity 2- Information processing 3- Problem solving 4- Skill variety 5- Specialization 6- Role ambiguity

Important information for the interviewee

Only one interviewer will conduct the interview with one interviewee at the time and the interview will be held in English. Using Skype is preferable, nevertheless, the interviewee may decide what method is fitting his/her circumstances.

A set of already prepared questions will be provided to the interviewee to answer. These questions are structure in a way that draw a red line for the research objectives which means that the interview type is semi-structured. Also, the answers of the participant may require us to ask complementary questions in order to have an in depth understanding of the subject. In addition to that, the interview will not exceed the time limits of 40 minutes.

Finally, in order to follow the common research ethics that are agreed upon in academia the participant has a set of rights regarding the interview as following:

1- The participant will receive a copy of the interview's transcription after the interview
2- The identity of every participant in the interview will be protected in this research. The participant will not be identifiable in any report regarding this research for any reader.
3- The data collected from the participants through the interview will be transcribed, coded and analysed. Finally, the results derived from the analysis is meant to be used in the scientific community.
4- Information and explanations of the research and its objectives will be sent to the participants before the interview take place. Hence, the participant will have an understanding that allow him/her to decide if he/she will participate or not in the research.
5- the participation in this interview is voluntary, therefore, the interviewee has the right to withdraw from the interview or stop it at any time without further implications.

The interview questions

Introductory questions:

1- Can you describe shortly what your current position is and the company you are working with?
2- Based on your experience, what is the role of a business process analyst?
3- Can you explain shortly how decision automation service is different from process automation?

The research themes:

1- Do you think introducing decision automation services will increase or decrease the ability of a business process analyst to use different methods in his/her work and more space to make decisions and how is that?

2- In your opinion, how decision automation services will affect the work performed by business process analyst would it add more tasks or remove some and why?

3- What impact the role of business process analyst has on other positions in the organization and how this impact will develop when decision automation services are introduced?

4- Do you think that introducing decision automation services will help the business process analyst to provide complete outcomes, for instance doing some tasks from the beginning to the end how is that?

5- Will decision automation services allow the business process analyst to better understand his tasks and help the management to get more precise feedback about his tasks performance and effectiveness and why is that?

6- How do you think decision automation services will affect the complexity of the tasks and the amount of information a business process analyst work with every day and why?

7- Do you think adding decision automation services will require a business process analyst to have more complex problem-solving skills and why?

8- What skills business process analyst needs to acquire when introducing decision automation services and why?

9- Do you think introducing decision automation services will broaden the area of specialization of a business process analyst and how is that?

10- Would decision automation services make it more difficult for a business process analyst to understand the additional tasks and why?

Closing question:

1- Do you have any final notes/ comments on the subject or related to the structure of the interview/ questions?

Appendix 2: First interview transcript

NO.	PER	Conversation	Factor
1	FZ	Can you describe shortly your current position is and the company you are working with?	--
2	JT	VP Decision Management Solutions, consulting with large, multinational companies, improving operational efficiency and customer lifetime value.	--
3	FZ	Based on your experience, what is the role of a business process analyst?	--
4	JT	Lead process improvement to streamline process flow, reduce waste and increase effectiveness.	CBPA
5	FZ	Can you explain shortly how decision automation service is different from process automation?	--
6	JT	Decision automation enhances and expands process automation. Process automation has been limited by decisions embedded in the process. For many years, business and process analysts had to model decision logic directly in business process models in an attempt to fully define process branching logic. This made process models complex and hard to change. A combination of process modelling with BPMN and decision modelling with DMN simplifies business processes by eliminating and replacing entire sections of the process model with a decision model. The decision logic of the process model is precisely captured by decision modelling a separate yet linked model. Integrating process and decision models provide an even more powerful and capable toolset for business analysts and business process analysts, enabling four key benefits: • Reduced business process complexity • Increased business process agility and Straight Thru Processing • Simplifies and clarifies the use of business rules and advanced analytics/AI.	DAS-DC
7	FZ	Do you think introducing decision automation services will increase or decrease the ability of a business process analyst to use different methods in his/her work and more space to make decisions and how is that?	--
8	JT	Decision automation requires that the business process analyst (BPA) learn the decision modelling approach and the DMN notation. In some organizations, a dedicated decision modeller role with distinct skills will evolve and collaborate with the BPA.	(DAS-DC) TA

		Because decision modelling describes the business decision making, decision modelling will enable the BPA to more fully engage with the business owners and subject matter experts, improving the BPAs ability to describe, define and implement useful services, well understood by their business partners that improve business performance.	
9	FZ	In your opinion, how decision automation services will affect the work performed by business process analyst would it add more tasks or remove some and why?	--
10	JT	As in #1 above, Decision automation requires that the business process analyst (BPA) learn the decision modelling approach and the DMN notation. BPAs will no longer have to try to describe decision making using a business process model and notation, which is not well suited to decisions. Describing decisions using process often takes pages of text or cumbersome branching logic in a process model. This is eliminated with decision modelling. Overall, decision modelling will improve requirements gathering and reduce the amount of time required to gather the requirements. There are seven steps in a high-level process discovery effort using process and decision modelling: • Develop a high-level process model. This high-level model and other discussions will help identify the critical decisions. • Identify decisions that support operational, compliance, and risk management objectives and that support these processes. • Develop decision models that show how to deliver the needed responses within these processes. In turn, these responses suggest process elements in an iterative development cycle. • A data model is necessary for executable decisions and processes. Develop a data model to provide specificity to process data elements and decision inputs/outputs. • The narrative of each decision allows for the refinement of the decision models, showing how multiple logic elements or conditions are combined. • Detailed decision logic can be specified to manipulate incoming data from input data sources or other decisions and produce the required outputs. • Use the assignment of values to attributes by decisions to prescribe downstream process components, activity order and role responsibility, paths through the process, data and events.	(DAS-DC) TV

11	FZ	What impact the role of business process analyst has on other positions in the organization and how this impact will develop when decision automation services are introduced?	--
12	JT	Decision modelling is a simple yet powerful approach and technique that is well understood by business owners and subject matter experts. BPAs have a tremendous opportunity in leading business process transformation with decision modelling. Decision modelling clearly identifies opportunities for business rules, makes it easy for subject matter experts to buy-in and participate in rule maintenance, identifies opportunities for advanced analytics and AI, creating smarter processes that directly improve business measures.	(DAS-DC) TS
13	FZ	Do you think that introducing decision automation services will help the business process analyst to provide complete outcomes, for instance by doing some tasks from the beginning to the end how is that?	--
14	JT	Yes, because decision modelling separates the decision logic from the process, and decisions are linked explicitly to business objectives. This helps ensure that complete outcomes are achieved, i.e. the business object is defined and measured. Decision modelling also provides a continuous improvement loop, the decision outcomes are measured, and improved over time.	(DAS-DC) TI
15	FZ	Will decision automation services allow the business process analyst to understand his tasks better and help the management to get more precise feedback about his tasks performance and effectiveness and why is that?	--
16	JT	Absolutely. Because decision modelling is linked explicitly to business objectives and outcomes are measured, the BPA can clearly measure and define the benefits delivered. This provides a clear basis for feedback. Additionally, modelling decisions as peers of processes make it much easier for the BPA's supervisor, and the executive management, to understand the process, the decisions the drive business performance and the resulting outcomes.	(DAS-DC) FFJ
17	FZ	How do you think decision automation services will affect the complexity of the tasks and the amount of information a business process analyst work with every day and why?	--
18	JT	Decision modelling simplifies the complexity of tasks. Decision modelling provides BPAs with an industry standard technique for separating the business decision logic from the business process. This serves to greatly reduce the complexity of business process models and facilitate their readability.	(DAS-DC) JC/IP
19	FZ	Do you think adding decision automation services will require a business process analyst to have more complex problem-solving skills and why?	--
20	JT	An effective BPA already must have complex problem-solving skills. Decision modelling improves communication and	(DAS-DC)

		collaboration with stakeholders, IT, analytics teams, providing a much more effective presentation of the BPA's work. This will help the BPA communicate the value of process transformation and their value-add.	PSL
21	FZ	What skills business process analyst needs to acquire when introducing decision automation services and why?	--
22	JT	BPA needs to learn the decision modelling approach and the Decision Model and Notation (DMN) standard. It is not enough to just learn DMN. It is a relatively simple notation but does not impart the key elements of the decision modelling approach. There are different decision modelling approaches, and it is critical to the success of the project to select the appropriate approach for the project goals. Decision modelling approaches: The Decisions First approach defined by Decision Management Solutions models the complete decision making (not limited to a specific tool) and does not capture implementation details such as business rules or decision tables in decision models as this results in duplication—there would be one version in the model and another in the implementation environment. Instead, Decisions are linked to Implementation Components representing the business rules, decision tables or decision trees in a business rules management system. Because the relationship between Decisions and Implementation Components is many: many, reuse of logic between Decisions is supported. The Decisions First approach is based on the DMN industry standard. Some BPM vendors support execution in the decision model using the DMN FEEL expression language. While this approach may be sufficient for simple implementations, it uses the BPMN model to orchestrate and manage the elements of decision-making. This imposes unnecessary sequence on decision-making, increasing the complexity and reducing the reusability of decisions in the organization. Some modelling tool vendors use the DMN standard but aim to build a complete, executable model. This quickly increases the complexity of the models, making them harder for business users and BPAs to manage. Either 100% of the complexity of the solution must be embedded and maintained in these models, further increasing their complexity, or the generated logic must be edited/extended outside the model resulting in duplication and out of sync models. Neither is recommended. TDM (The Decision Model) is a proprietary decision modelling approach that is not recommended because it is both highly rules-	(DAS-DC) SV

		centric, being very focused on decision logic, and because it is a more complex, proprietary representation.	
23	FZ	Do you think introducing decision automation services will broaden the area of specialization of a business process analyst and how is that?	--
24	JT	Yes, the BPA's role should broaden because the competitive pressure on companies to become analytically driven continues to increase, and decision modelling identifies the opportunities for analytics. BPAs have an opportunity to lead and influence the transformation of the organization into a more analytically driven organization.	(DAS-DC) SP
25	FZ	Would decision automation services make it more difficult for a business process analyst to understand the additional tasks and why?	--
26	JT	Decision modelling will make it easier for the BPA to understand because the graphical decision model reduces process complexity and facilitates their readability. The decision model clearly defines automation boundaries, what data is needed, where business rules and analytics make business sense and links to the business measures that drive operational improvements and improved business performance.	(DAS-DC) RA
27	FZ	Do you have any final notes/ comments on the subject or related to the structure of the interview/ questions?	--
28	JT	Decision modelling has broad and deep applicability outside of business process analysis. While it will continue to have a positive impact on process modelling, it will also have an impact on analytics, job design, dashboard design, system/UI design and much more.	DAS-DC/ WDA

Appendix 3: Second interview transcript

NO.	PER	Conversation	Factor
1	FZ	Ok! Let's start then! Here is the interview…. And, yes, we can start with the first question. Like… if you can describe shortly your current position in the company and about your work in it	--
2	PGS	Yes, I 'm a process decision consultant that is business and decisions, currently located in the Netherlands, and the nature of my job is actually kind of the typical business analyst but with a specific focus on process and decision management.	--
3	FZ	And based on your experience, what is the role of business process analyst?	--
4	PGS	A business process analyst to me is a traditional BA, a traditional business analyst, with its skills set in interviews and analysis work and logical thinking and working with the business to understand what the problem is. But, he does have a specific focus or appreciation for the process context as well, and that, let us say on a wider view of the organization not just at the single problem they are trying to fix for the business which a traditional BA would do. You go problem by problem, but the business process analyst has a wider view also in the end towards the process, what is actually you are trying to achieve. So, I think that is one major component. The other one is when you have an appreciation for the process you also kind of open the whole discussion around lean and six-sigma, so I would also add that to the skill set of a business process analyst. A really strong perspective on how things should work and what is the most efficient way is of handling a certain object in the organization be it up front with kind of ordering raw materials if you take a traditional company or be it finance where you are managing accounts table all of these different objects travel through a number…. A sequence of events and if you are a business process analyst you have that intranet view plus you have that, what is the most effective way, how we can calculate what the most effective way is and that's kind of whole lean and six-sigma, so I will add that to the definition of BPA a business process analyst.	CBPA
5	FZ	Yes, Ok! So the third question, can you explain shortly how decision automation services are different from process automation?	--
6	PGS	Process automation linked to that what I am just saying in tails everything all the automation all the software all the technologies that are out there on the market that can help you manage a sequence of events with different people and roles that are involved in the process and ultimately reach a certain end state. So again that is "input-transform-output". Decision automation or the decision perspective is more of that of a declarative context where you define a square and within the square, certain things can happen and that is governed by the rules or the decisions surrounded, but within it, all the different events can happen as a sequence versus declaring. Declaring is the rule perspective, and the sequence is the processing angle. These	DAS-DC

		different components have very different views in the way they approach a particular problem.	
7	FZ	Great, thank you, and now the main body of the interview which contains questions about the business process analyst. The first question is: do you think introducing decision automation services will increase or decrease the ability of business process analyst to use different methods in his/her work and more space for making decisions and how is that?	--
8	PGS	Can you help me with that question defining additional methods, Because I am not sure what direction you want to go with when you say it adds methods?	--
9	FZ	For example, using new ways of automating a process through technology or programming abilities maybe!	--
10	PGS	In that case, I would say that it would definitely open up new opportunities for a business process analyst to be able to do that. You obviously, depending on the different technologies, the different undelaying technologies that … but if we look at the low code or no coding platforms where a lot of the software are built by clicking and dragging with kind of user-friendly interfaces. There is a number of different tools out there that would enable a business process analyst not only to just describe the process and define a little form where some users add some information and then send to another person, but if you were to have a decision component in that as well, you can add the different rules that almost always exist around a particular process. Sometimes is governed by an internal policy, sometimes by the law of the land, different regulations, but a process without rules I don't think that is desirable because everything is allowed, and everyone can do everything. So, if you give a business process analyst an extra tool to also be able to define the decisions and the rules that apply in a process, you are definitely adding to the different methods and the different options that the business process analyst has.	(DAS-DC) TA
11	FZ	So, you think that business automation will increase the space for making decisions for the business process analyst. Will he be freer to do more decisions?	--
12	PGS	Yeah, and my answer was more in the context of change management, with that I mean your standard internal consultant in a way that tries to fix a business problem. So, in a way you are changing the organization. In that context, if you give the extra tool of decision automation to the business process analyst BPA he will have more tools in his toolkit to be able to change the organization as quickly and as efficient as possible.	(DAS-DC) TA
13	FZ	FZ: Ok, and then the second question is; in your opinion how, decision automation services will affect the work performed by business process analyst, would it add more tasks or remove some of it and why?	--

14	PGS	I think in the end it would add more because it opens up more opportunities to define a bigger picture. So, if you are just a process analyst and your only concern is the sequence of events and different roles and the different authorization for those roles that is kind of a smaller picture of your business problem then when you also add the rules that govern that process to it. So, I think it adds more work to the BPA, he is going to be busier because he now has to deal with all the analysis around and actually what are the rules and the most effective way to implement some of those rules and decisions that govern this process and where they actually sit in the process. In the end, he will end up with a more holistic picture of his problem because it's a combination of the process and the different people involved in it plus all the rules that govern these actors and processes and he ends up with a better view of how he should work.	(DAS-DC) TV
15	FZ	OK then, we move to the next one, what impact the role of business process analyst has on other positions in the organization and how this impact will develop when decision automation services are introduced to his work?	--
16	PGS	In the answer to this question I would zoom in on the automation part of it, kind of more the technical side of things. What I have seen in the organization that I work for that when it comes to the automation part it, a lot of that is the IT responsibility. You have a developer that implement, build, and test and even design, the design steps are not done by a traditional BA, if we were to add the tool of decision automation to a business process analyst he is definitely able to take over some of that design work from your traditional developer because he can paint a complete picture of how the business process should work and he can, again depending on the different tools that you use in the market, the business process analyst really can come down into an implementation level detail with the specification of what so far needs to be built to solve the problem. So he has an impact on the IT, to answer your question he has an impact on the technical world but I also think that the impact goes to the business side because a traditional BA would maybe through interviews enlist some information, but it is very specific to his certain problem or his context, but a process analyst draws a bigger picture because he is also involved in the process but now adding decisions to processes as well now you are adding even more to the interviews that a business process analyst needs to conduct and the information he needs to obtain from the business side to analyse the problem and to find the potential solution. So, I think towards both ends of that spectrum from technical to the business he is adding work to himself but also impacting the traditional roles that people had on either side.	(DAS-DC) TS
17	FZ	Ok! The fourth question, do you think that introducing decision automation services would help the business process analyst to provide complete outcomes for instance doing some tasks from the beginning to the end and how is that?	
18	PGS	absolutely, and I would again refer to a particular context that I have worked in, wherein an organization there was a traditional business	(DAS-DC)

		analyst team that would sit kind of behind your typical business users who were filling away different business applications. So as soon as some senior manager in that business says I have a problem that needs to be fixed the BA would go to work, try to fix the problem or try to define the problem and then hand it over to a technical expert. That would sit behind him who would then go about the back end of that application to fix the particular problem. Obviously, that are two handovers, and the transparency for that senior business manager was completely gone because he hands it over first to the BA business analyst and then to some technical person, and after some six months later something came back over the fence and you were supposed to accept that. In this organization when we add the business process analyst and later on even the decision analyst, and we merge those two skill sets the new BPA including the decision component was able to travel that journey with the business from start to finish. So, from problem definition or the initiation of a project around a particular business problem all the way to test the solution in the end. That was because in the process and decision, work through different methods and approaches that are out there such as the low code/no code platforms that are out there. A lot of the skills could be transferred to the business side and some of it was less technical as well so in a sense people with no programming expertise really could take on that job and could interpret the problem and find the right solution to it. So I would say that very much this allows and especially with some of the approaches that are out there now proclaimed by some of the industry experts, process management and decision management really will help the BPA to deal with the problem start to finish.	TI
19	FZ	Ok! The fifth question is, will decision automation service allow business process analyst to better understand his tasks and help the management to get more precise feedback about his tasks' performance and effectiveness and why is that?	--
20	PGS	That depends a lot on the organization. I think if you have a clear definition of a BPA so let's say you have an organization where someone is hired as a BPA, and he has a very clear role description. He or she should very much be able to define how effective you can perform in this role given the constraints that the organization define for them. Yeah, again depending on the organization some BPAs might be happy with that because this is their job description and that is what they work with. Your eager BPA might say, well actually if you give me the authority to do X, Y and Z as well reach the decision management side of the work or the rules side of the work I will be able to be more effective. But as far as I can see not every organization has a very eager group of BPAs that kind of see the opportunity in adding to their skill set and taking on additional responsibilities to be able to provide a better service ultimately or to provide high-quality product when it comes to changing an	(DAS-DC) FFJ

		organization.	
21	FZ	Ok! Question number six, how do you think decision automation service will affect the complexity of the tasks and the amount of information a business process analyst work with every day and why?	--
22	PGS	I would say it would definitely make life a bit more complicated for the BPA especially if you, on a high level conceptually consider the three components; Process, decisions or rules, and data. These are major themes in every project, and usually, if you have a traditional BAs they would just be consigned with either the process side or just only the data side and only to some extent right? So, they only analyse some level of detail about what they need or what they require and the rest of the detail to be able to write the software will be done by the technical stakeholders. So, given that if you merge the process angle and the decision angle in one profile, in a better process analyst profile, he or she would be able to do with all of these components. To be able to see that the problem is solved start to finish. So, it makes it more complicated, but it also puts more transparency in the holistic intern view of the solution, and I think that is the major benefit for every organization because with every hand over to different people with different skill sets, it sums lots of information and also sums component of rework. If I give a developer something in an Excel sheet, he would look at it and then question who the author was. so, as soon as he finds out that it was just a business person who is the author he will probably already have a perspective of this is not ideal work it's not high-quality work, this is some business person that does not understand my complex world I probably need to reanalyse this. So, there is a lot of work there is a lot of information, a lot of these handovers. If you have a single person that deals with all this complexity holistically, and that makes his life more difficult yes that is true, but, hopefully, in the end, you have higher quality product plus it's faster because you have less rework.	(DAS-DC) JC/IP
23	FZ	Great! The seventh question: Do you think adding decision automation services will require a business process analyst to have more complex problem-solving skills and why?	--
24	PGS	PGS: absolutely, I definitely think that a business process analyst should have problem-solving skills and also should have strong logical and almost mathematical way of looking at things. That kind of perspective or that kind of attitude is often found in technical people. So, that also needs to be matched with the traditionally found on a normal BPA, a more creative and critical thinker that can work with business stakeholders to be able to define the problem, isolate where the problem sits and then define the solutions and obviously then further analysing and further adding on to that information to be able to reach a level of detail where a technical person can implement it. So, it is very much a length mix profile and that makes it at the same time quite unique, because you need to be rather technical and rather logical thinking and rather mathematical and good with problem-solving but, you also need to have the creativity and the critical thinking process to work with the business stakeholders that	(DAS-DC) PSL

		says I need X, Y, and Z but, when you analyse this question further, they actually only need "C". So, having that skill coupled with a technical skill that is the uniqueness of the strong file but at the same time the key factor to make it work.	
25	FZ	OK! Number eight is, what skills business process analyst needs to acquire when introducing decision automation services and why?	--
26	PGS	I almost answer that question already so, when it comes to skills I would definitely say programming skills and I am not going into the discussion of what languages are better than the others! It also gives a further appreciation for the technical components and you might not be a rock star programmer, but it would definitely help you in the communication with the actual programmers as well. So, I am not saying you need to be hardcode programmer, but you definitely need to have these skills on some level that you can read it, and you feel comfortable in that space, and you can work with any developer. You don't have to have preferences for languages, but at least you understand the concepts. And then on the other hand, you need some soft skills right! Some creativity, some critical thinking, some empathy to work with different business stakeholders. Then in the middle sits kind of logical thinking the combining of different angles and the combining of different arguments and solutions to be able to analyse and further add on to information to be able to do the communication to the technical side of the work. Yeah, and that preaching is a mix of different profiles.	(DAS-DC) SV
27	FZ	Which mean more skills you mean? More skills than the normal business process analyst?	SV
28	PGS	Exactly, yeah!	SV
29	FZ	OK! Number nine, do you think introducing decision automation services will broaden the area of specialization of business process analyst and how is that?	--
30	PGS	Again, just to clarify the question, when you say broadening of the specialization what does that entail?	--
31	FZ	it means, does he involve in other aspects of the work, for example, we know that business process analyst is limited to this, this and this, does introduce decision automation services will increase this circle of specialization in the organization, to be more specialized in other things?	--
32	PGS	I think it would! For a start, I think if you have a focus or you have the additional skill of process management and decision management you can even add on data management in the sense of UML and appreciating different EDA processes and the whole data component traditionally seen in BI. These are already kind of specialization within the BA field. If you would interview a traditional BA who has been working 25 to 30 years, he probably worked part of his career with a strong focus on process. The only thing he would think of is process or even has a mix of just being a traditional BA that would work at BI solutions, that would mean he would work with data a lot,	(DAS-DC) SP

		and he would work traditionally with EDA processes and focus on master data management or this kind of things. So, I think all these three are already specialization in themselves. I think the decisions/ rules specialization is less known and it new, hence, why we are doing this research right!! Because it's kind of a new concept. So, within the organization what I have seen when we implemented the decisions management, you do see that there is a smaller group evolves with the specialization in rules/decisions management which at the same time kind of open new opportunities for these people as well, but I am hesitating to say, and I don't think I agree with kind of silo specialization. These are all kind of interwoven constantly, and it depends on the organization how they define where each one sits and what each responsibility is, but I ideally you would have BAs that have appreciation may be, not a deep skill but at least appreciation for all three; process, decisions, and data, and can work cross them in order to be flexible and adaptive to the different contexts that they find themselves in, if they find themselves in a project that is heavily data management or heavy on the data side, at least they have the skill and the ability to function as a BA in a process, but if they find themselves in rule implementation when it comes to implementing new regulations for banks, for example, they need to be comfortable with implementing rules as well and that would probably entail decisions as well because especially we are going to do automation of decisions you need to be able to understand what you are going to run these rules on right! So, automatically you end up in a data management context. So, it is a specialization, but I would not silo them too much.	
33	FZ	OK! The last question is, would decision automation services make it more difficult for business process analyst to understand the additional tasks and why?	--
34	PGS	What do you mean exactly with traditional tasks? Are you referring to the traditional tasks of a business analyst?	--
35	FZ	The additional tasks of business process analyst, when introducing decision automation service, would that make it more difficult for him to understand what his tasks are?	--
36	PGS	That is a good one, So, referring back to a previous answer from my side, I definitely said it would add additional tasks, but now the question is would it make it more difficult to understand these tasks. I think it would make it more difficult and that is kind of inherited with the additional complexity that a business process analyst would have to deal with if he is also involved in a decision context, but that also natural in a context where you… if we park this particular context, any context when you pick up an additional skill or an additional perspective that means you are now jumping into a whole new world with a whole other numbers of complexities that you have to deal with. So, it would make it more difficult, yes!	(DAS-DC) RA

Appendix 4: Third interview transcript

NO.	PER	Conversation	Factor
1	NC	Now before we start, can you define to me what do you see as the role as a business process analyst? So, just I am clear about it, in my work I do a lot of tribble contact with the customers, usage staff, a lot of architectural view and training. Also, what a company define as a business process analyst can change quite a bit depending on the size of the company, depending on what they are aiming to achieve as well. Are you able to define this role?	CBPA
2	FZ	Exactly! So, the point is that the business process analyst or many companies call it business analyst is a really broad term, and it depends on the companies. But, we tried to narrow down the subject to business process analyst, identified by the role that is responsible for process simplification, process automation, and process modelling, and this involves dealing with rules and decision points. So, the person who is responsible for those roles in the company is a business process analyst that is what I thought about as the base of my interview questions.	--
3	NC	I think that is OK, it is good to describe what we are talking about, because those can often be different people or different roles, but I totally understand that is the role you describe. Supper! Do you want to get started then?	CBPA
4	FZ	Of course, we can start, and the interview is just ten questions and the introductory questions first which a bit is common. We can start with the introductory questions if you like?	--
5	NC	Sure, go for it!	--
6	FZ	Yes, the first question is, can you describe shortly what your current position is and the company you are working with?	--
7	NC	Sure thing, so, are you recording it or shall I….	--
8	FZ	I am recording it in order to transcribe afterwards.	--
9	NC	That is awesome, OK, my name is (XXX) I am an international consultant at Camunda, international consultant means that I will go around the world basically helping people to build processes, build decision models, and automate their processes and decisions. Camunda itself is an open source software company which specialized in automation engine that implements an open standard, that is clearly the open standard of business process and modelling notation, decision modelling and notation, and also CMN management and notations.	--
10	FZ	Ok, the second question is, based on your experience what is the role of business process analyst from your perspective?	--
11	NC	It changes quite a lot when we talk about process analyst is who his main goal is to be able to turn what really are ad-hoc or the verily not existent procedures of how work is completed into predictable and feasible patterns that are defined. A process analyst can also be someone who gathers requirement from customers. It can actually be	CBPA

		very broad, but based on my experience, a business process analyst is someone who is not necessarily technical, who very often have come from a background of creating documents to describe processes and is quite analytical.	
12	FZ	OK, the third question is can you explain shortly how decision automation services are different from process automation?	--
13	NC	So, the difference between process automation and decision automation?	--
14	FZ	Yes!	--
15	NC	Yeah sure, so, process automation is higher level so, process can stand –considering any given company– for the core part of what they do. So, if a company's main goal is to be able to, let's say deliver shoes or something, their main process will be the process of those shoes and the delivery of those shoes, that is what a company does and that usually is not going to change very quickly and that is the key point. A process in a company is core, it is often designed and implemented and change in that way is not very frequently and it would usually twist the basic idea. Decisions are very different decisions are usually very small core of a process and also very often changed frequently which is very important. A decision and model certainly could be changed daily, weekly and also very importantly they should be able to be changed with certain parameters that make it save to do so, changing a process usually have a bigger impact.	DAS-DC
16	FZ	Great! Now we move to the main body of the interview, the first question, do you think introducing decision automation services will increase or decrease the ability of business process analyst to use different methods in his/her work?	--
17	NC	So, from my own experiences is definitely they help. The main reason is that if you don't use decision automation or certainly if you don't plan to describe decisions in an automatable way, what you actually have is a text document that an analyst will give to a developer and have that developer code of, verily write it in a coded logic that is going to again comment those decisions. So, where is the problem, the problem is business and IT alignment. The idea is that if I as an analyst was to describe these decisions in a way in which I could directly execute them I get to skip the ambiguity of having to give these to a developer who might end up maybe making a mistake, maybe what the analyst wrote is not what they intended, but they seem to like it afterwards. So, you see, those who are able to visualize text and maintain these rules without needing to necessarily talk to a developer every time you change and that is where the main time-save that affect and also in changing.	(DAS-DC) TA
18	FZ	And would you think that these will increase the space of decision making for the business process analyst?	--
19	NC	it would mean that they would be able to have faster turnaround. So, it would mean that if an analyst has decided on a bunch of rules they can do some really cool stuff, they can actually change their job in a very interesting way. I have good examples of that, one of them is	(DAS-DC) TA

		that we have been using packages which is analysts count the rules, they talk to a developer, they go to the system, and eventually they would look at the results of what happened to those rules and then try to make changes to the decision tables they conducted. Now, they can still do that, but now the difference is with instruments like Camunda which is an automated system, you can version those, that is the first thing, and by versioning I don't mean replace a version which I can do this, as an analyst let's say, you have a set of rules, I can create two set of rules and do A/B testing analysing the system. So, if you are an analyst and you are not sure which rule you think will get the best result you can actually end up deciding to deploy both of them at the same time…… as the process continue I will choose one or the other, depending, and then actually I can use all that data generated to look back on that made changes. Plus, this is a completely different role, but it can't be existing, unless you are using decision automation.	
20	FZ	Great, the second question, in your opinion how decision automation services will affect the work performed by the business process analyst, would it add more tasks or remove some and why do you think that?	--
21	NC	I guess it will definitely add more responsibilities to an analyst, namely because up until now analyst drive documentation and the documentation does not run, the documentation is not going to follow a run time it does not get deployed anywhere, but if you give this automation idea to analyst you give them a lot more responsibilities. Which mean they are responsible for their rules working because they design it. It's not like they designed specification that is been dealt in the company, the exact thing they have designed is running. So, it means that they are going to be responsible for being far more accurate than they ever have been before and I find that to be a big stick that is very different, because analysts tend to expect mistakes being made or logical black holes or whatever to be cause in development by that time. If you ever worked on a project that has developed workflow pattern you would probably be aware that a document get created to describe by the analyst, it get to the developer, the developer then find out the document needs additional information and send it backward to the analyst, but the reality is that if you have decision automation properly implemented the analyst can get that whole phase and he is going to get from design to execution and if you are doing that you cannot rely on developers to catch your mistakes or fix it and very sure you are doing it. So, they fix it and after that they spend far more time insuring that what they have actually done works correctly in one time rather than in design time.	(DAS-DC) TV
22	FZ	Great! The third question, usually what the impact of a business process analyst on other roles in the organization is and how this impact will change when introducing decision automation services?	--
23	NC	I would say that the biggest relationship that would have changed would be the relationship between analyst and developers, namely	(DAS-DC)

		because let us say that I have written a deployment of my rules and my automation and now I am interested in getting some kind of reporting based on that like how the rules are doing, what is going on with them, I will usually need to go to raw data and then trying to generate some king of code, that actually involve speaking to the developer to find out how exactly to implement it. If you use decision automation, what you than have is the ability for a much closer relationship to a running instant, if I have a running decision table there are two people responsible for it, there is usually a developer that take care of run time and there is an analyst who cares about the results and cares about whether everything is working from a logical perspective correctly, and that relationship become a lot closer because now they are both looking at the same entity and they actually need to make sure that this is acting the way they expect. Because you don't have this block on the analyst where he won't be only looking at code and just not knowing what is going on. If you use decision automation it means a code with open standard that both the developer and the analyst can look at, it runs, so it is executable, and they can both talk or using it as a common language because it is both executable and it also documented. So, it is sort of crosses over types of people, the technical and the non-technical. So that would be the main I would say impact, towards other team, it's that now BPA team with specific developers have a common language they can now discuss this team decisions with and changes.	TS
24	FZ	Do you think these decision automation services would bring those two sides closer to each other and strengthen the relationships between them?	--
25	NC	Absolutely. In fact, I've seen it many times. So, I would say absolutely, that changes everything. It changes the relationship between developers in a very big way.	(DAS-DC) TS
26	FZ	Ok, then we move to the forth question. Do you think that introducing decision automation services will help the business process analyst to provide complete outcomes, for instance to complete some tasks from the beginning to the end and how is that?	--
27	NC	Can you give me an example?	--
28	FZ	For example, let's say traditionally a business process analyst will do the modelling and someone else will do the hard coding. However, when introducing decision automation services, we know that the natural language or FEEL or what Camunda use is very understandable for business process analyst and for the IT people. So, would that allow him to do a complete task from the beginning to the end without needing someone else to complete this task?	--
29	NC	Well the truth is not really. Mainly because as great as it is for a business analyst to be able to create these executable things they are still missing some really key components that they cannot do without other help and the main will be texting. So, a business analyst does not have the required tools and the required knowledge to be able to	(DAS-DC) TI

		cooperatively text complex decisions. They require uni-texting and they require a certain amount of automated texting and a certain amount of continuous integration that really is in the zone of a developer. So, I think the analyst will get further than usual like if the analyst will go from document to execution but realistically they cannot do all by themselves. It is usually not possible. Or it is possible, but it is usually a very bad idea because what end up happening is that they are playing with something they don't fully understand usually. If you put an analyst, if you took the authority out of a developer's backpack into these essential zones where they are deploying things that run with hard code they are not going to know all the things that the developers tend to learn about codes and things like texting, things like maintaining versions of your changes in a repository, things like rolling back changes to old ones and things like migration. So, I would say that while it is technically possible it's really never done. An analyst can still only get to a certain point, they really can't do everything on their own.	
30	FZ	Ok, then we move the fifth question. Will the decision automation services allow the business process analyst to better understand his tasks and help management to get more precise feedback about his tasks, performance and effectiveness?	--
31	NC	That is a good question, I think it actually depends on the company not on whether they use automation services or not. Because I see companies, who use decision automation but uses them very ad-hoc, in a very crazy way, so it doesn't necessarily give anyone a better understanding if the structure doesn't exist to propagate understanding. I'll give you an example: so, let's imagine that we have designed a DMN table in a big group and we deploy it somewhere as like we normally do, and it's there running ok? Now let's imagine that we want to make somebody notices in runtime let's say an end user notices that we are getting really weird results that we don't really expect. So, the very precise point in which, the way you structure your company could actually really ruin it, because if this person spots a problem under low feedback channels for these changes to be made and if you basically end up with the old style, analyst saying I designed my process, I deployed it, my job is done. But realistically if you're probably implementing decision automation it does not stop when you deployed it. Once you deployed it you must define the roles differently and you must be able to say, well I am going to create very specific feedback channels by which if somebody said I want to make a change to the table because I have a really good idea of how to optimize it or there is some weird mistake in there. Unless they know how to go to that problem is going to stay there forever. So, I would say that the combination of good management and decision automation together would definitely help people to understand their tasks better and to be able to be far more performing then what they	(DAS-DC) FFJ

		do, but unfortunately decision automation on its own does not necessarily help that	
32	FZ	OK, number six now, how do you think decision automation services will affect the complexity of the tasks and the amount of information that a business process analyst deal with every day and why?	--
33	NC	OK, that would be…, the complexity of the tasks I would say quite a lot more complicated because first of all I don't know if you ever seen, actually there are a lot of functional complication in software and in every single one of them you will see some kind of a way in which an analyst has described a process or rule without knowing that there are an open standard available for these descriptions. So, usually analysts, their main goal is trying to get across to the reader Ok that's their main goal or what they are trying to achieve, and to do that they generally come up with their own weird ad-hoc visual description however that look, it might be an excel sheet, it might be a complicated diagram, but either way their goal is the reader of this sheet to understand what is going on. Now, why are these things more complicated with decision automation because now they have two focus, now they have this table full of rules not like my little own ad-hoc system for them… and must use a specific standard which means I must learn this standard and I must know it ok, this is the first thing, they can no longer have any sort of autonomy when it comes to describing the rules. that incorporate that they actually no longer have this primary goal of being understood ok, that was the primary goal in the past when your business being hard-coded by a developer, but, now your primary goal is it should work when it runs which is really different. So, what you are doing is you are telling the analyst now your job is harder now because your goal is now two goals, those documents you wrote in the past where you were able to explain what is going on are not good enough. They need to explain what is going on and they need to be incredibly accurate about how they actually run. Therefore, I would say this would make the job far more complex. Besides, it would make it easier the long run because you are basically shortening the cycle here because this cycle still happens where somebody write the rules somebody codes them, the rules doesn't work as they expected then we go back to the start again where we actually need to change the rules right? We are basically closing this circle, what I am saying is we are going to keep this circle with the analyst. So, it feels like more work for the analyst and they need to learn a lot more, but the truth is they actually does exactly what they used to do, just sooner. So, rather than getting these errors or getting these problems to solve after a developer look at it you get these problems much sooner and just need to deal with them quicker.	(DAS-DC) JC
34	FZ	And do you think that will affect the same, the information a business process analyst deal with? Would it increase the amount of the information?	--
35	NC	Yeah, I expect so, because as I already said the additional information that analyst will need is understanding the DMN notation. The second	(DAS-DC) IP

		thing is they cannot have the ambiguity it's not possible anymore. Also, I have to say that as somebody who has seen a lot of applications as I said ambiguity is common thing I see analysts do when they are not sure so if they are not sure exactly how something can work or they don't care, they have not implemented it so, they just make it ambiguous. Now, the truth is they cannot do that anymore, they would actually need to add for every bit of information, every default value, all of that needs to be precise. So, yeah, I would say they will need a lot more information because they must deal with ambiguity vacuum.	
36	FZ	OK then, we move to question number seven.	--
37	NC	Yeah!	--
38	FZ	Do you think adding decision automation services will require business process analyst to have more complex problem-solving skills and why?	--
39	NC	Yeah! Also, it depends on the person, but, I think it would definitely help because if we recall the point I made before, if you are sitting there with your decision table and you are actually able to run it, locally let's say so then you can use the DMN simulator that Camunda has online somewhere. So basically, it allows you to upload a DMN table and then it has set of various values you can enter before it runs and then see of things connect correctly. Now this is very cool because now you have a tool which you don't need to wait for a developer to tell you if you forgotten something you can literally try to solve those problem beforehand. So, actually I would say that the addition of tooling made available to analysts who use automation give them the ability to actually solve their problems. I would say that they got already very good problem-solving skills, but I think that they don't have the tooling to be able to utilize them properly at the early stages of design unless they use automation.	(DAS-DC) PSL
40	FZ	So, you think the tool will replace the need for their skills and it will help more in solving the problems that will face the business process analyst.	--
41	NC	Yeah exactly! I think they would still solve the problem but, I think they now have methods and tools to mobilize and truly define the problem and that is a big different. Analysts if they design a rule table their best tool is just to stare at it and try to imagine all the possible combinations, right? And that is all that they can do because they cannot run this. So, by making it automatable what they have done, they give themselves the ability to try things and try to solve them and build upon previous things there with that tooling. So, I would think it's the tool that would help them how to utilize their problem-solving skills.	(DAS-DC) PSL

42	FZ	Ok, then we move to number eight which is connected to number seven. Since it is a new tool in the market or in the business "the decision automation services" what skills business process analyst needs to acquire when introducing decision automation services do you think and why?	--
43	NC	So, I mention it already, but obviously understanding an open standard like DMN is the primary change without understanding that knowledge of DMN you basically are nowhere. Now another thing emerges that there is actual side effect of learning DMN just like let's say, when I say learning DMN I basically mean just learning to understand the open standard, knowing how this language FEEL work, understanding the hit policies and understanding rules rows and columns, that is the first step. The reality is that asking me to learn that you are telling me to learn about common patterns of solving problems ok! So, there is lots of different ways that you can use DMN to solve a problem and lots of people who already done that right! So, a really common work would be, I want to create a score that is able to tell me whether this customer deserve the VIP treatment, OK. Let's create a table that is going to have all the reasons why we might consider him to be active and also all the reasons why we might not consider him to be active. Now, unless you realize that this is a really common pattern and for that we need to write a specific kind of DMN table that return a collect sum it means to have integer outcome and it's going to sum the result of everything and this is a pattern this is a very common way to solve a very common use case. So, as well as having to know the DMN standard you also need to learn the patterns and the solutions that have existed since DMN have existed because so many people use DMN for modelling the rules. The challenges are something you are trying to model is already been created and the problem is already being solved and you need to know that you should look very deep into these patterns and these algorithms to be able to do that.	(DAS-DC) SV
44	FZ	OK, great, now number nine, do you think introducing decision automation services will broaden the area of specialization of business process analyst and how is that?	--
45	NC	Would it broaden the area of specialization! Maybe! I don't know to be honest, I mean you have I admit this is actually very hard for me to guess because I would say that there is no process analyst specialized in job rules because rules are a granular thing usually part of a bigger system I would say that the analyst still need to understand the complexity of the whole system or the very least a high granularity in terms of decisions before being able to specialize in it. So, I think I don't know the answer for that.	(DAS-DC) SP
46	FZ	But, to put it differently, if a company which chose using the tools of decision automation will bring in a business process analyst, then they will ask for his specialization would that be involving only process	--

		specialization, or will they ask for more involvement in decision understanding and making or maybe IT specialization. So, that what I meant by the question would that require the business process analyst to involve in different aspects of the work else than process modelling and documentation.	
47	NC	I don't think so, I don't know for sure but, just from my won guts feelings, I think an analyst don't need to specialize in one specific way of doing things. Now obviously with automation you have to be specialized in open standard so that your things actually run. So, I would say that very unlikely to be a specialization. In the future I would say that the opposite, I think that every business process analyst should be expected to know the standard by where you are supposed to model rules rather than having them specialized in either or, they should know both I would say, and I think everything that comes along with automation and process analysis. I am trying to imagine somebody how is specialized in just DMN for instance because you lost contact when you do that, but it's not because… imagine that someone is writing a specification and they are writing at the process and at a certain point of the specification Oh!! This needs the rules engine I will just throw this to my colleague how does rules engine. That is not likely to happen, it's more likely that they will stay at the high level they used to, but they will learn more about the notations that they are already working with. I do not think they will specialize in either processes or DMN, I think they should all know both.	(DAS-DC) SP
48	FZ	OK, number ten now, would decision automation services make it more difficult for a business process analyst to understand his traditional tasks and why?	--
49	NC	Actually, it depends on the analyst, I would say that considerably fifty percent of analysts at work have some technical background therefore DMN would be quite easy I imagine. I would say, I have worked with analysts who find having to take their responsibility of building something that is automated can often be quite hard for them in the sense that they don't necessarily want the responsibility of building something that will actually run at code because it is too technical, they won't understand it. Let's say for instance, they deploy a DMN table and they leave out an apostrophe or a comma let's say and therefore the DMN table won't work when they try to deploy it. Now if you are a developer or you have any sort of history of technical experience, you will know that, oh! I will take a look at that error you will be able to read what is going on maybe some kind of error outcome you will be able to read it understand it and change its model. Now if you are non-technical the moment you get an error historically	(DAS-DC) RA

		it is the moment where you stop and ask someone else for help because it is out of your limits. So, I would say that the one thing that will make it very difficult and frustrating for analysts is if they are not properly trained in understanding the nuances of having to deploy something that require very specific impact and it may drive errors if you don't do it according to the standards. So, that's, I would say that is probably why it might be more complex in the long run.	
50	FZ	Perfect! Then we can say that we are done with the main questions, the last question is just for you. Do you have any final notes or comments on the subject or on the structure of the interview or the questions?	--
51	NC	I do not have any comments, it all make perfect sense to me, and I am happy for that.	--
52	FZ	That is really great! End of record	--

Appendix 5: Fourth interview transcript

NO.	PER	Conversation	Factor
1	FZ	Start recording OK! Shall we start with the introductory questions?	--
2	DG	Sure, go ahead, you lead I follow!	--
3	FZ	OK, can you describe shortly what your current position is and the company you are working in?	--
4	DG	I am the CEO and CTO of "Trisotech". Trisotech is a software vendor that produces software for visualizing, improving, transforming, and innovating in your business. I am also, the chair of the business process model and notation model interchange working group at OMG. I am a member of the BPMN team at OMG, member of the CMMN team and the DMN team and. I am also a co-chair of the BPM in healthcare, and I am also a co-chair of the model interchange special interest group at OMG.	--
5	FZ	OK, great! According to your experience, could you tell us what the role of business process analyst is?	--
6	DG	My view of a business process analyst is someone that captures, analyses, and improves how things get done in an organization. So, I see the business analyst focus on how things get done. I make a distinction between a business process analyst and analyzing a business. So, those are two different scopes, but the business process analyst for me is really concentrated on capturing, analyzing and improving how things get done in an organization.	CBPA
7	FZ	OK, and can you explain to us shortly how decision automation services are different from process automation?	--
8	DG	It is totally different; process automation is about processing activities so, sequencing and orchestrating a series of activities, where decision automation, the act of deciding is one activity. So, within the process, you may have one activity that is deciding on something, and then that decision will itself be automated so, that is one activity within the process. Where we have seen a lot of confusion is that a lot of people were trying to model the act of deciding using process language like BPMN or other languages by describing different branching of the logic that represents an error. Really, what should be done in the process, there should be one decision point a moment in time when the decision is made, and that decision itself is defined using a model of the decision and some automation of it.	DAS-DC
9	FZ	Great! Now comes the main theme of the research. The first question, do you think introducing decision automation services will increase or decrease the ability of a business process analyst to use different methods in his/her work and more space to make decisions and how is that?	--
10	DG	In this particular case, I would say it is decision modelling that becomes the new method to be used by the process analyst. So,	(DAS-DC)

		process analysts are traditionally using different techniques for doing an analysis of the process, and one technique is decision modelling, and that was even introduced in the business analyst body of knowledge version three on the capability or the technique of decision modelling. So, with decision modelling comes a different set of tools, skills and also standards like DMN the decision model and notation as a new standard for doing decision modelling and that also lead to decision automation.	TA
11	FZ	would that give more space or autonomy to the business process analyst in his work	--
12	DG	Yes, I believe it will open and broaden the participation of process analyst in different space. In particular, a good approach to decision modelling will help the relationship with the business people and the IT people in providing a better-cleared way of how the decision is achieved, what are the requirements for making that decision, and the decision logic that is used to achieve it.	(DAS-DC) TA
13	FZ	Great! The second question, in your opinion, how decision automation services will affect the work performed by the business process analyst would it add more tasks or remove some and why?	--
14	DG	Well, it will displace tasks I think, in the sense that process analyst always has to look at how things are done and how decisions are achieved within the orchestration of the work. So, rather than just looking at it as a process view, we are bringing another perspective which is, the decision view and how to model and analyze and extract the requirement of a decision. So, I think it will provide a better tool for interaction with business people to the business process analyst.	(DAS-DC) TV
15	FZ	So, it's like exchanging, but not adding more tasks.	--
16	DG	Yeah, let's say that in a way it's just a transition of new methods that are already within the range of the process analyst.	(DAS-DC) TV
17	FZ	OK, the third question, what impact the role of business process analyst has on other positions in the organization and how this impact will develop when introducing decision automation services?	--
18	DG	Well, the business process analyst is a key player in bridging the divide between business and IT, their role is to take a different perspective of how things get done rather than having just a functional role they have a cross-functional work at the organization and the process. So it brings them a lot of value to get to really understand the requirement of business and translate these requirements into an orchestration of activities. Now with the capability of decision modelling, it adds more tools in their toolset to better grasp the requirements of business and particularly when it comes to decision points within the orchestration.	(DAS-DC) TS
19	FZ	OK! The fourth question, do you think that introducing decision automation services will help the business process analyst to provide complete outcomes, for instance by doing some tasks from the beginning to the end and how is that?	--

20	DG	Yeah, I think it will. I think it's a key element for helping the process analyst to do end to end job of orchestrating processes. The challenge with describing how things should get done using any of the modelling languages that are there for processes is to tackle those decision points for those points in time where there is a decision have to be made and properly capture this information. I think it will open the door for them to be more efficient and effective in that role.	(DAS-DC) TI
21	FZ	do you mean that they will be having more access, for example, if they have a background of business, will they have more access to the IT side where they can do more tasks there or complete their tasks which have started in the business side?	--
22	DG	I think it will help them in their discussion with IT because decision modelling is a very simple but rigorous way of looking at decision requirement and that is the way IT treat those decision points locally on the flow of activities. So, they will increase their relationship with IT as well.	(DAS-DC) TI
23	FZ	OK, the number five, will decision automation services allow the business process analyst to better understand his tasks and help the management to get more precise feedback about his tasks, performance, and effectiveness and why is that?	--
24	DG	Decision modelling if it is done in a rigorous way and applied some good methods and start using a standard such as DMN decision model and notation allow one to in a strict way decompose decision and its requirements and its information requirements and knowledge requirements as well as the different knowledge sources that influence the decision. Once that full decision requirements are established the business process analyst can also define the logic under which the decision is made by precise it means specifying the different rules that apply to achieve that decision. So, it provides much more precise capture of the requirements and therefore, leads to more precise feedback from business to correct the things that are not correct or for IT who have very specific questions in the details of the automation of the logic.	(DAS-DC) FFJ
25	FZ	OK, question number six, how do you think decision automation services will affect the complexity of the tasks, and the amount of information business process analyst work with every day and why?	--
26	DG	I think it will simplify the tasks of the business process analyst because prior to the introduction of the notion of decision modelling, process analyst tends to try to capture in a process language all the business decision points. Now by using decision modelling, they are able to simplify their business process work, and the decision aspect is also simplified by providing techniques and approach to elicit the requirements and specify the logic. So, I think it will simplify their tasks although it does require learning of new skills and techniques such as decision modelling, requirement elicitation for decisions and decision logic capture in their work.	(DAS-DC) JC
27	FZ	And would that increase the amount of information a business process analyst deal with every day, although it simplifies the work?	--

28	DG	I think it will increase by side effect, in the sense that by using a more precise approach to dealing with how things get done and how decisions are achieved. It will bring them more questions to ask the business people and the IT people and therefore, leads to more information to manage.	(DAS-DC) IP
29	FZ	OK, question number seven, do you think adding decision automation services will require a business process analyst to have more complex problem-solving skills and why?	--
30	DG	I don't think it is going to be more complex, again, it is having a different set of skills which is decision modelling but, decision modelling with the introduction of the standard DMN is quite simplified, it brings decision modelling to a level that is I would say equivalent in complexity to process modelling. So, therefore, I don't see that is more complex problem-solving skills, it is adding a different set of problem-solving skills to the business process analyst toolbox.	(DAS-DC) PSL
31	FZ	OK! Great, question number eight now, what skills business process analyst needs to acquire when introducing decision automation services and why?	--
32	DG	They need at least two skills; one skill is to be able to capture and analyze the decision requirements and this is by looking at what information and what knowledge is required to achieve the decision. When this is done, it generates a graph of the requirements that lead from decision to sub-decision to sub-decision all the way to the information requirement then the knowledge requirements. The other skill required is going to be about capturing decision logic, how the actual decision is achieved, this is taken by specifying what the question is, so a decision activity always leads to a question to the answer of a question. While looking at the decision point as a question, what are the possible answers then we can look at all different rules that are involved in achieving that decision and these rules can be captured in different techniques they are again either in a decision table or other different techniques to deal with. With the introduction of DMN, there is the soft skill of learning the decision model and notation as well which is a specific way of achieving those two skills.	(DAS-DC) SV
33	FZ	OK! Question number nine, do you think introducing decision automation services will broaden the area of specialization of a business process analyst and how is that?	--
34	DG	Yes! It introduces in a formal way the whole decision modelling and decision automation aspects which was not necessarily present before or was left to a separate group.	(DAS-DC) SP
35	FZ	Would that mean that the business process analyst will have more access to different spaces of work in the organization more than before because of introducing decision automation services?	--
36	DG	I believe so, because depending on the organization, in bigger organizations they tend to specialize different sub-groups of process analyst with a specialty. So, you may have a sub-group of specialities that will be specialized around decision modelling and decision	(DAS-DC) SP

		automation.	
37	FZ	OK! The last question in the main body of the interview, would decision automation services make it more difficult for a business process analyst to understand the additional tasks and why?	--
38	DG	I believe it is the opposite. I think it will make it simpler for them to understand those situations that before were complex for them to capture or model. Now by the separation of concern wherein the process we look at only the orchestration of the activities and then when we get into a problem in this orchestration of activities of a decision point, we have a separation of concern, and then we look at the decision itself at the decision requirement and its logic. So, I think it will simplify the tasks rather than complex it.	(DAS-DC) RA
39	FZ	OK! We can consider now the main body is done, the last question is yours, do you have any final notes or comments on the subject or related to the structure of the interview or the questions?	--
40	DG	Final comment, I would say that the whole motion of introducing decision modelling into the toolbox of the business process analyst is critical to the future. It is a way of simplifying the business process model in general. It is also a way of introducing more rigor and better technique and methods for capturing decisions. When you use a standard such as DMN BPMN, I think this provides a business process analyst with a very strong toolbox to help support the capture analysis and potential improvement in both processes and decision-making.	DAS-DC/ CBPA
41	FZ	Great! Now we can say that we are done with the interview and I can stop the record.	--

Appendix 6: Fifth interview transcript

NO.	PER	Conversation	Factor
1	FZ	Start the recording! Yes, and I think I send the interview to you before, so I don't know if you are familiar with the topic or not but let's give it a shot.	--
2	ER	OK,	--
3	FZ	OK, so, we start with the introductory questions?	--
4	ER	So, you want to ask introductory questions?	--
5	FZ	Yeah, it is three parts; introductory question, theme questions, and then the last question is commentary for you. So, we are going to start with the introductory questions.	--
6	ER	OK!	--
7	FZ	The first question is, can you describe shortly your current position, what is your current position and the company you are working with?	--
8	ER	OK, so, I work for Redhat and more specifically, I work in the 'Red Hat Decision Manager' product team. My current… well, I have two jobs, on one side I am the product architect, so I basically define, understand and try to guide the development of the product in the right direction. On the other hand, I am the development manager for the team so, I do the usual management tasks like coordinating the team and delivering the products.	--
9	FZ	The second question, based on your experience, what is the role of business process analyst?	--
10	ER	My understanding is, that this change from a company to company so, I don't think like there is a general definition that works everywhere, but my understanding is that business process analyst is responsible for identifying business processes within the enterprise environment, within the company to model them to basically operationalize them, sometimes via software sometimes via documentation. So, that is the role that I see in general.	CBPA
11	FZ	OK, and can you explain shortly how decision automation services are different from process automation?	--
12	ER	I see them as complementary to each other. While the process automation deals with the automation of the flow of –you know– tasks that the company needs to perform, the decision automation basically deals with automating operational decisions that the company make every day. On my presentations I usually emphasize something that is very clear –you know– for a lot of people, not so much for others that there are three different types for decisions; the strategic one, the tactical one, and the operational one, where the operational decisions are those thousands of decisions that the company takes and makes every day to the business and those are the ones we are targeting in the automation, not the strategic one not the tactical one, it is really the operational one. Processes deal with those decisions all the time, so if I really want to achieve process	DAS-DC

		automation I need decision automation there as well	
13	FZ	OK, now we move to the main body of the interview, the first question is, do you think introducing decision automation services will increase or decrease the ability of business process analyst to use different methods in his work and more space to make decisions and how is that?	--
14	ER	First thing I need clarification because in the question you talk about the future like if this decision automation will increase… we had decision automation for a long time as well as process automation what we lacked before was standardization. So, I just need to understand what your point here? You are talking about decision automation in general or you are talking about specifically DMN as a standard for decision automation?	--
15	FZ	I am talking exactly about using a decision-centric approach which is like for example the tool of DMN.	--
16	ER	OK, so if I think the use of a standard approach will increase or decrease the ability to use different methods I think it will increase the ability for business process analyst to deliver process automation. I think this completes the feature in deals with the automation at the same level, at the same language level that the business process analyst understands so he will be able to do more in less time. Just to contrast to the question I asked you is that we had decision automation for a long time and we were able to automate processes with decision management but, those decisions typically used proprietary lower level languages that business process analysts were not able to implement by themselves or to model by themselves. That usually required to work with another person or another group of persons usually developers' side by side in order to deliver the process automation. So, giving him the freedom or the autonomy to do everything by himself using a standard higher-level language is something that will increase his ability to use different methods.	(DAS-DC) TA
17	FZ	And would that give him more space to make decisions in regard to his work like autonomy?	--
18	ER	In my understanding of the business process analyst role, I don't think he was the one making decisions at all right! He was responsible to understand the processes in the company and talk to the people that were actually executing those processes and making those decisions into model those decisions. So, that might be slightly different from your definition of a business process analyst for instance but, that is my understanding. He has more autonomy to model the decision automation but, in any case, he was not the one making those decisions.	(DAS-DC) TA
19	FZ	Ok, the second question, in your opinion how decision automation services will affect the work performed by business process analyst, would it add more tasks or remove some and why?	--
20	ER	This is related to the first one. I think in a sense it will add more tasks for him but, at the same time, he will get more autonomy. Before, as an issue he has to work with a more technical group of people,	(DAS-DC) TV

		developers usually, to model decisions in order to automate the processes and now he is able to… he wants to do it all by himself, so it's an additional task on his task list.	
21	FZ	Ok, the third question, what impact the role of business process analyst has on other positions in the organization and how this impact will develop when decision automation services are introduced?	--
22	ER	I think the impact he has is first to formalize the processes and the decision making that are being done within the company. Lots of times users they are so used to work that they make those hundreds or thousands of decisions daily and they do not realize they are doing this or they follow a process and they do not realize it is a process or what the process is. So, I think the impact he makes is to formalize and to really highlight how these processes work and later on how these processes can be optimized. The introduction of decision services and the automation of decision services again enables him to bring clarity to what decisions are being made and by doing that and modelling those decisions it brings consistency and accuracy to decisions that are being made. So, no more two people in the same department that are making the same decision but, having different outcomes, they will understand now what the process is and what the decision is supposed to be and then you now start to have a proper consistency between them.	(DAS-DC) TS
23	FZ	OK, do you think that introducing decision automation services will help the business process analyst to provide complete outcomes, for instance doing some tasks from the beginning to the end and how is that?	--
24	ER	Absolutely, I think that is one of the biggest advantages of the standardization of decision management, and the realization of DMN standard is to enable the business process analyst to work on the modelling of the process automation. As I mention, before you needed the developer to do this, now the business process analyst can do it at the same level and document the process at the same level in terms of languages, he does not need to go down to technical languages to achieve that.	(DAS-DC) TI
25	FZ	The fifth question will decision automation services allow the business process analyst to better understand his tasks and help the management to get more precise feedback about these tasks' performance and effectiveness and why is that?	--
26	ER	I am not sure about the first part… better understand his tasks I am not really sure about this. The second part for sure is helping management to get more precise feedback that is exactly what this task is, DMN and the decision management standards allow you to document your decisions at the same level that you document your processes and gives you end to end understanding of what is going on. This is especially helpful for the management in the par actor level of the company that have to deal with practical decisions, how do I detect problems in my process change and how do I optimize it to solve these problems. This is clarity, this is visibility that was not	(DAS-DC) FFJ

		there before.	
27	FZ	But, you are not sure that it could help the business process analyst to better understand his tasks by introducing those tools?	--
28	ER	What do you mean by understand his tasks?	--
29	FZ	I mean by introducing tools such as DMN or the FEEL language or modelling requirements of decisions, could that make it easier for the business process analyst to go through his tasks and do his work much easier than before or it would stay a lot complex?	--
30	ER	I do think it make the job easier because it places a framework in place, it shows a framework that he can use also the tools that he can use in order to do his job. He does not need to implement anything, he does not need to try to come up with solutions for something that is already there. More importantly, business process analysts rarely are single person in doing, we talk about business process analyst mapping processes that go across departments and they have specific knowledge as well so, cooperating between different business process analysts will become easier with that.	(DAS-DC) FFJ
31	FZ	OK, question number six, how do you think decision automation services will affect the complexity of the tasks and the amount of information a business process analyst work with every day and why?	--
32	ER	I think in a sense there is slightly more complex task on his hands, before he would probably just write a few sentences in his native language and then someone else would be implementing or automating those decisions. With this "DMN and automation standards" what will happen is he will have to implement basically the decision, of course the work can still be complex but the idea here is that you have control end to end. So, it is a bit more complex tasks and it requires a bit more work from the business process analyst.	(DAS-DC) JC/IP
33	FZ	Great, do you think adding decision automation services will require business process analyst to have a more complex problem-solving skill and why?	--
34	ER	we can say in the same sense that… you know, the previous question talks about the job of modelling the process being slightly more complex, yes it will be more complex, but my understanding is that business process analyst already has the type of skills necessary for this, beginning able to abstract a problem and see a solution, that is part of his job description probably. So, I see that he already has this type of skills, he was just not able to use these skills end to end.	(DAS-DC) PSL
35	FZ	OK, what skills business process analyst needs to acquire when introducing decision automation services and why?	--
36	ER	I think the main skill is understanding the standard and the language, it is a new language, especially the expression language it will be new for him. So, that is the kind of skill and training he has to get, but the fundamental part is understanding the logic of the business and understanding how you can abstract those decisions and processes he would already have. So, it is mostly about learning the new language.	(DAS-DC) SV

37	FZ	You mean he will have more hard skills because he already has the soft skills regarding extracting decisions and processes?	SV
38	ER	Correct!	SV
39	FZ	Number eight, what skills do you think…. I think I read this question. OK, number nine, do you think introducing decision automation services will broaden the area of specialization of business process analyst and how is that?	--
40	ER	Yeah, I think he will have a larger space where he can act, again decision management is a fundamental part of business process automation, but it is not embedded in that, it is not only used in that, it can be used stand-alone even if you are not dealing with processes. So, as long as he understands this new skill of how to model decisions and how to automate them, this can be applied to a wide variety of cases that are not all connected to regular business process analyst job.	(DAS-DC) SP
41	FZ	Which mean that the business process analyst will still be a business process analyst who is doing documentation and other tasks and he will broaden his specialization towards decision management like understanding the standards of decision management and the tools used there, so, that means his specialization area will be wider?	--
42	ER	Yes! Also, we have to understand here that the DMN standard is really a sibling to the standards that we have in the business process area both the BPMN business processes and CMMN. So, DMN is really a sibling standard so, as he moves his skill set and as he develops his skills on decision automation and decision management, he is really reaching over a larger deal of the market that will broaden his skill set.	(DAS-DC) SP
43	FZ	OK, and would decision automation services make it more difficult for a business process analyst to understand those new additional tasks and why?	--
44	ER	It is more difficult in a sense again that it is a new language… it is a similar language at the same level, but it is a new language. So, in that sense it is more difficult, but at the same time I believe it is ability so, having the autonomy to model these processes and decisions and to provide simulation environments, to provide tools for process analysis and optimization that this user can use by himself and try it out and optimize and improve their own models. I think all of this at the end of the day will make him be more complete professional in this role.	(DAS-DC) RA
45	FZ	Then we can say that the main body of the interview is finished, the last question is for you if you have any final notes or comments on the subject or related to the structure of the interview or the questions.	--
46	ER	Not really any specific comments, the only one is as I mentioned, we need to be careful when talking about decision management and decision services just because the new verbal idea of what we have that is new is a standard from the area. There has been introduction and practice by different companies for a long time now, so it really	DAS-DC

		was more technical decisions and cooperation between IT and a business process analyst, and now with the standard it simplifies, and it allows the business process analyst to work end to end. So, this differentiation I think is important and it is important to identify this in the questions as well.	
47	FZ	Good, now we will stop the recording.	--

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