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# Understanding The Adoption Of BPM Governance In Brazilian Public Sector

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## **UNDERSTANDING THE ADOPTION OF BPM GOVERNANCE IN BRAZILIAN PUBLIC SECTOR**

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### **Abstract**

*BPM governance is a key factor to ensure the successful deployment of BPM across an organization. BPM governance emphasizes not only the accountability and control of BPM initiatives, but also provides the mechanisms to ensure that BPM delivers desirable results. Despite growing research identifying the importance of BPM governance, there has been limited number of empirical studies investigating this issue. In this paper, we adopt existing BPM governance elements presented in the literature to investigate how these elements are embraced by public organizations. We conducted case studies with four public organizations in Brazil. All organizations are involved in BPM initiatives with varying levels of maturity. The results suggest that strong sponsorship, suitable BPM training and availability of internal staff with BPM expertise are key success factors for these initiatives. To provide a richer understanding on the factors that affect the performance of BPM initiatives, we conducted a system dynamic analysis of how barriers and facilitators interact with each other and create patterns of dysfunctional systemic behaviors, which may slowdown the success of the BPM initiative. The generated system archetypes can enhance the understanding of current situation and direct future actions.*

*Keywords: Business Process Management, BPM Governance, Public Sector, Case Study.*

## 1 Introduction

Business Process Management (BPM) discipline has received significant attention in the last decade. The introduction of BPM philosophy in organizational environment promotes increased agility, efficiency and innovation in operation (Korhonen, 2007; Becker et al., 2012). It promises to define high-performing processes that demonstrate strategic strengths, such as the ability to better respond to rapid changes and the possibility to standardize operational best practices across the organization (Recker et al., 2011). These benefits are obtained via the execution of BPM lifecycle, which encompasses the phases of process identification, modeling, automation and continuous improvement (Khan, 2004). To have a truly successful adoption of BPM, organizations must execute a systematic planning that includes the definition of specific roles and responsibilities, the description of policies and methodologies, and the selection of process-oriented software tools. This “definition layer” of BPM can be referred to as BPM governance. It aims at providing principles to support BPM initiatives by addressing ownership and control of process across organizational units and bridging the gap between business goals and BPM efforts (Bandara et al., 2007).

According to (Jeston and Nellis, 2008; Ravesteyn and Batenburg, 2010; Rosemann and van Brocke, 2010), establishing BPM governance is considered a critical success factor for BPM initiatives. The relevance of a well-defined strategy for BPM governance is intensified in the context of public organizations. This occurs due to specific characteristics of these institutions that hamper BPM adoption, such as periodic change of government leaders, low flexibility and innovation, and stiffness of a hierarchical structure that is based on a vertical approach. A limited number of studies have empirically explored the adoption of BPM by the public sector (Santana et al., 2011; Jayaganesh and Shanks, 2009; Gullede and Sommer, 2002). Additionally, low attention has been paid to the usage, evolution, implications and overall success of BPM initiatives (Becker et al., 2012).

Motivated by the previous scenario, this research investigates how BPM governance practices are adopted by organizations from Brazilian public sector. As the broad goal of this research project, we aim to develop a methodological guide for BPM governance within the public sector, supporting organizations to increase transparency, efficiency, accountability and innovation of their processes. In this paper, we report on findings from case studies carried out in four Brazilian public organizations. Based on a set of BPM governance elements proposed in the literature, we analyze how the organizations are conducting projects to introduce BPM in their structure and operations. Given that, we address the following research questions in this study: (RQ1) *How the BPM governance elements are adopted by the Brazilian public organizations?* (RQ2) *What are the barriers and facilitators encountered in the BPM initiatives?* (RQ3) *How the barriers and facilitators interact with each other?*

The rest of the paper is organized as follows. Section 2 provides a brief background in BPM Governance. Section 3 outlines the case study method and introduces the participating organizations. Section 4 presents the results of the case studies. Section 5 discusses the findings of the case studies. In addition, this section presents a system dynamic analysis of barriers and facilitators faced by one of the studied organizations. This approach treats barriers and facilitators as factors that can interact with each other and create patterns of dysfunctional systemic behaviors, which may slowdown the success of the BPM initiative. Finally, Section 6 summarizes the main contributions of the study and provides an outlook on future research.

## 2 BPM Governance

According to (Kirchmer, 2009), BPM governance is a set of guidelines and processes focused on organizing all BPM activities and initiatives that are conducted by an organization. In a previous research we presented a synthesis of BPM governance elements found in literature (Santana et al., 2011). This list of elements was adopted in order to guide our current research and is described as follows.

- **Objectives** – intentions and goals established by the organization with respect to BPM initiatives.
- **Organizational structure** – arrangement of the institution to support BPM practices operation.
- **Roles and responsibilities** – functions and duties focused on the execution of BPM initiatives.
- **Activities** – tasks and routines associated with roles involved in BPM initiatives.
- **Infrastructure** – technical and non-technical basis required for accomplishing BPM practices, including physical structure, software tools, staff and other resources used in BPM initiatives.
- **Methodological standards** – theoretical models, techniques, notations, reference models and standardized descriptions of activities.
- **Decision-making process** – criteria and decision limits for prioritizing and setting goals.
- **Control and evaluation** – indicators, metrics and additional forms of monitoring BPM initiatives.

Governance is necessary for the success of business processes, contributing to business success. In public organizations, governance is increasingly seemed as a key element to strengthen transparency, integrity and accountability in order to reinforce public confidence in government activities.

### 3 Research Method

This study strives to understand how BPM governance is adopted by Brazilian public organizations. Given the exploratory nature of the research questions, we adopted a case study method (Yin, 2008). We used a non probabilistic and purposeful approach to select the organizations (Merriam, 2009).

#### 3.1 Overview of Organizations

In this section, we present a description of the four participating organizations together with a brief status of their BPM initiatives.

- **Organization A** – information technology State agency that develops information management systems, portals and web pages meeting the interests of government institutions. Efforts to introduce BPM started in 2008 with a new direction board, which sponsored the creation of a BPM unit. This unit aims to improve business processes for public organizations in Pernambuco, Brazil.
- **Organization B** – State public institution responsible for resolving civil and criminal cases. Discussions about the adoption of BPM began in 2009 together with the exigency by the National Justice Council to deploy the electronic workflow of judicial processes. Later, as a result from the organizational strategic planning, training of managers on BPM and standardization of routines were defined as additional objectives to be pursued.
- **Organization C** – responsible for auditing the accounts of the State and municipalities. The adoption of BPM practices started in the beginning of 2012. The new management board intends to establish a Business Process Management Office (BPMO) within its structure. Previously, process modeling activities were conducted, but these efforts were not considered as a BPM initiative.
- **Organization D** – this organization is responsible for the public administration of Recife, capital of Pernambuco State, with a population of 1.5 million people. The establishment of business process modeling and improvement activities started in 2006 with the conduction of several pilot projects. In July 2010, a formal BPM initiative was initiated.

#### 3.2 Research steps

Initially, we performed a literature review to identify core BPM governance elements, as presented in Section 2. These constructs were described in a glossary and acted as a group of categories to classify empirical data obtained. This procedure followed coding guidelines proposed by (Merriam, 2009).

To collect qualitative data, we developed a semi-structured interview protocol that included demographic questions, inquiries regarding BPM governance elements as well as inquiries about barriers and facilitators that affect the success of BPM initiatives. The same interview protocol was used in all interviews. Interviewees were public servants responsible for promoting and/or executing

BPM projects. In summary, five professionals from the four institutions were interviewed. These professionals played one or more of the following roles: process analyst, BPM team leader, BPM sponsor, BPM client. The interviews were registered using a digital voice recorder. Obtained data was transcribed and extracted with Weft QDA software. Data analysis phase mapped textual excerpts from interviews to a set of categories representing BPM governance elements.

Following the interviews, we organized two focus groups with interviewees and other representatives of studied organizations. The first focus group aimed to validate data collected from the interviews and exchange experience on BPM governance among the four organizations. After the focus group, we shared a document describing the integrated results of the case studies with the organizations. A second focus group was conducted with the purpose of the institutions presenting the evolution of their BPM initiatives and share best practices. The dialogues of the focus groups were recorded and further examined. Additionally, we examined the power point slides that the organizations presented during the focus group as evidence source for our data analysis.

Finally, we performed a system dynamics analysis of facilitators and barriers that affect the success of the BPM initiative conducted by Organization D. The selection of Organization D is due to the fact that their BPM initiative has the highest maturity level among the studied organizations. Therefore, their BPM initiative provides a richer set of data for investigation. This analysis was based on system thinking theories and methods of Peter Senge and colleagues (Senge, 2006); (Senge et al., 1994). System dynamics approach enabled us to discuss how the individual factors found in the studied context interact with each other and establish patterns of dysfunctional systemic behaviors, which may affect the success of BPM Initiative.

## 4 Findings

In this section we present the results from the case studies. We discuss how the BPM initiatives conducted by the four organizations embrace the BPM governance elements described in Section 2.

### 4.1 Objectives

We observed that Organizations A and B share the goal of fostering the main BPM concepts and practices. Organizations B and C consider the establishment of a BPMO as a key objective, since this structure supports the conduction of BPM projects. Implementing the electronic workflow of judicial processes is also an objective for both institutions, automating relevant workflow routines and enabling process monitoring. This was reinforced by Organization C: *“The president wants to implement electronic processes from here to 2013”*. Organizations C and D have the common goal of formalizing process owner role, which is currently performed in an ad-hoc fashion. The relevance of performance indicators is perceived by Organizations B and D, which strive to improve control by defining process management indicators. The execution of the BPM lifecycle is also an objective shared by all organizations. By implementing this approach, they intend to establish a continuous improvement cycle that enables process standardization and increasing efficiency.

### 4.2 Organizational structure

Organizations A, B and D created an organizational structure to manage BPM projects. In Organization A, the Business Processes Unit is responsible for supporting BPM initiatives within State public institutions. In its turn, Organization B has two structures dedicated to internal BPM initiatives. The Business Process Management Unit is primarily an operational division. It focuses on executing BPM activities such as process modeling, design and automation. It also supports the selection and deployment of BPM-oriented software tools. While the Coordination of Planning and Strategic Management Unit is associated with the high direction. It guides the definition of the organizational strategic planning and monitors BPM initiatives. Organization C lacks a formal structure to govern BPM within the institution, but efforts towards the definition of a BPMO have already started.

### **4.3 Roles and responsibilities**

Most BPM roles identified during the interviews are informally established. The BPM sponsor role is considered by all organizations. With respect to this role, the interviewee in Organization A stressed that *“This is something we emphasize; the organizations should have a strong and active sponsor”*. The process owner role was mentioned by Organizations A, B and D. According to interviewees, the sponsor aims at supporting and promoting BPM activities within the institution. In its turn, the process owner is responsible for a specific process and monitors its progress during execution. The role of the process analyst was evidenced in Organizations B and C. It accounts for process modeling, design, documentation and automation. Organizations A and B highlighted the existence of a process coordinator, who is an IT professional providing technical support to the implementation of process-oriented systems. Organizations A, B and C also describe the role of the BPM project manager, whose function is to coordinate and report the evolution of the BPM projects. This role is responsible for the relationship between the customer and the supplier, while providing support for projects infrastructure problems. Additionally, some organizations assign more than one role for the same employee. In organization C, the process owner can also accumulate the function of process analyst.

### **4.4 Activities**

All organizations are involved with training activities. Their aim is to introduce BPM concepts by providing public servants with lectures and workshops. In regards to BPM lifecycle, the activities of process analysis, modeling and design are conducted by all Organizations. In particular, Organizations A, B and D already automated some processes using BPMS (Business Process Management Suite). The provision of an appropriate IT infrastructure (e.g. computer networks, data servers) is an activity common to Organizations A and D. The monitoring of suppliers and external consultants and the acquisition of process-oriented systems are duties of Organization A. Since this organization assists public institutions in BPM initiatives, they also act as external consultants and training facilitators.

### **4.5 Infrastructure**

Concerning the use of software tools to handle BPM activities, all organizations adopt Bizagi Modeler during process modeling phase. To automate process models, Organizations A and D employ the BPMS Agiles, while Organization B executes these models in a beta version of the electronic workflow of judicial processes. Oracle BPA Suite was acquired in Organizations A and B. In the former, this tool is employed for designing systems integration. While in Organization B, the Oracle BPA Suite was obtained as part of a large acquisition. However, since no training courses were given to the BPM team, the system is not currently in use. In particular, Organizations C and D reported the use of software tools providing centralized knowledge repositories, while project management tools were identified in Organization C. The BPM teams are quite small considering the size of the institutions. In Organization A, a team of three people is responsible for promoting and coordinating BPM projects. Organization B has a team with six public servants and one external consultant. In Organization C, the BPM team has five public servants and one trainee. Finally, in Organization D, five public servants and six external consultants are involved with the BPM initiative.

### **4.6 Methodological standards**

Organizations A and B developed internal guides that include best practices and schemes of business flows. The BPM methodology used by Organization D was externally defined by a consulting company. BPM CBoK and GesPública are the conceptual basis of the methodology defined in Organization A. GesPública is a Brazilian public initiative that proposes guidelines for public management based on BPM concepts (GesPública, 2012). BPMN is the modeling notation adopted by all institutions. PMBoK is employed to manage BPM projects in Organizations B and C. Additional conceptual references are adopted by Organization C, such as BSC and PDCA cycle: *“the flow of the*

*process modeling phase is based on the PDCA cycle*". Besides the previous references, the notion of value chain was evidenced in Organizations B and C, although not explicitly mapped.

#### **4.7 Decision-making process**

Organization A prioritizes BPM projects according to the demand from external public institutions. Organization B defined a decision-making process for process monitoring. This procedure starts by identifying issues during process modeling, which are then prioritized. Indicators associated with these factors are established and support the follow-up of bottlenecks during process execution. In order to prioritize the processes that will be modeled and automated, Organization D takes into account the level of process complexity. Processes that are easier to represent receive a higher priority. This is the same criterion employed in Organization C, which also considers aspects such as difficulty of automation, degree of association with the organizational value chain, relevance for citizens, and number of process instances. In exceptional cases, Organizations C and D prioritize critical processes independently of their complexity.

#### **4.8 Control and evaluation**

The BPM teams from all organizations have periodic internal meetings. Monthly meetings are carried out in Organization A, although no formal control and evaluation criteria are defined. Organization B monitors the BPM initiative via periodic meetings with top management. In order to improve process monitoring, this institution is currently extracting indicators from databases. Additionally, it considers measures defined by the National Justice Council to assess the evolution of the BPM initiative. Project management practices and BSC-based indicators are used as monitoring instruments in Organization C. Finally, Organization D has weekly meetings to control their BPM projects.

### **5 Discussion**

In this section, we discuss how BPM governance elements are adopted by the studied organizations. We also provide a system dynamics analysis of barriers and facilitators involved in the BPM initiative of Organization D.

#### **5.1 How BPM governance elements are adopted by Public Organizations**

The adoption of BPM principles requires cultural changes within organizations (Puah and Tang, 2000) and this is particularly critical in public sector environment due to its bureaucratic structure (Bigdeli et al., 2012). Therefore, promoting BPM philosophy is considered a key goal to be achieved by the organizations. Another goal stressed during the interviews is the creation of a BPMO, which is one of the main characteristics of process-oriented organizations (Kohlbacher, 2009). The BPMO fosters the implementation of major roles for BPM and supports all activities of BPM lifecycle. Studied organizations strive to formally define this structure to support the coordination of BPM initiatives and also face their discontinuity due to change of government leaders. Finally, most organizations aim to define process performance indicators. These form the basis of process controlling, which promotes the efficiency principle pursued by the public sector and is also a starting point for continuous process improvement (Niehaves and Henser, 2011). Besides, some institutions also intend to determine indicators for BPM initiatives, which may pave the way for effective BPM governance.

Three organizations have established a unit centered on BPM. The structures created partially comprise the responsibilities of a proper BPMO, such as defining methodologies and standards for BPM, and selecting software tools to support the execution of BPM lifecycle. The absence of an appropriate structure for BPM reflects the low maturity of BPM initiatives in studied organizations. This low maturity is also reflected on the structure of roles and responsibilities: functions identified are not formally defined. This also results from the fact that in order to define new functions and roles

in the Brazilian public sector it is necessary to change legislation. Differently from traditional BPM functions mapped during the interviews such as process sponsor, process owner and process analyst, the role of process administrator was reported by some organizations. This role is similar to an IT coordinator, enabling an appropriate implementation of processes and acting in conjunction with the process owner. Finally, the process project manager was perceived as someone who drives the BPM initiative, evaluates and reports its evolution for sponsors.

All organizations currently focus on training to increase understanding of BPM concepts. However, it is worth noting that only the BPM teams are directly receiving BPM training. Activities related to the execution of the BPM lifecycle were also reported by interviewees. While Organization C focuses on process modeling phase, Organizations A, B and D also implemented their processes in workflow systems. In particular, Organization D analyzes the results of monitoring phase to refine process models. The software infrastructure supporting these activities is basically composed by process modeling and automation tools. A possible explanation for the predominant adoption of Bizagi Modeler among organizations is its free offer for download. This is relevant, since emergent BPM initiatives in the Brazilian public sector may not have a high budget due to the uncertainty of their results for senior government. Also, the use of knowledge repositories for BPM initiatives can be viewed as a strategy for process reuse. This may reduce modeling efforts of process analysts, while providing benefits such as process flexibility and variability management (Derguech and Bhiri, 2010).

The definition of methodologies to guide BPM activities was observed in all organizations. These methodologies establish business flows, techniques and/or best practices to accomplish and standardize BPM lifecycle execution (Aitken et al., 2010). Their usage also increases the maturity of BPM initiatives (Bucher and Winter, 2010). For decision-making support, the most common criterion was the complexity level of processes. This may result from the fact that easier processes are less costly and risky to model and implement, while providing faster results. With respect to control and evaluation of BPM efforts, most organizations conduct periodic monitoring meetings.

In addition to the governance elements presented in Section 4, we also investigated the barriers and facilitators involved in the BPM initiatives. These aspects were individually mentioned during interviews and lately clarified in focus groups sessions with the four institutions. The major challenge organizations face for the evolution of their initiatives is to internally promote a process-orientation culture. In particular, they need to increase awareness of the benefits, conceptual and technical basis of BPM among employees. Another issue claimed by all organizations is the lack of human resources with BPM expertise, which is a fundamental capability for organizations to succeed in BPM (Kohlbacher, 2009). To overcome this obstacle, most of them have external consultants or trainees as part of their BPM teams. However, this represents a potential risk, since these personnel are not permanent. Defining a knowledge transfer strategy is therefore essential. Also in human resources context, institutions complained about the reduced size of the BPM team and the lack of personnel with abilities to act as process owners. Additionally, the complexity associated with the integration of BPMS, the discontinuity of BPM initiatives due to government changes, and the BPM team also performing software maintenance tasks were found as barriers in some organizations.

Senior management sponsorship and proper BPM training were evidenced as main facilitators for BPM initiatives progress. While BPM sponsors act in the executive level to internally evidence the strategic role of BPM, training programs cover an organization-wide BPM methodology and prepare employees to use BPM technology (Scheer and Brabänder, 2010). Additional aspects cited by the organizations are having a good technical infrastructure (e.g. software tools, supporting communication facilities) and the positive synergy among units participating in the BPM initiatives. In the next section we provide an in-depth analysis of barriers and facilitators faced by Organization D.



## 5.2 A System Dynamics Analysis of Facilitators and Barriers in Organization D

In order to deeply investigate the barriers and facilitators faced by participating organizations and understand how these are related to each other, we performed a system dynamics analysis (Senge, 2006), (Senge et al, 1994). It establishes a causal relation network among factors extracted from Organization D, which is the richest and most mature initiative among the investigated cases. This method aims to identify potential leverage points and patterns of causal cycles that contribute to organization’s success along time. It also evidences other points that limit its success or may lead failure. Some of these patterns are known structures called by Senge (2006) “system archetypes”.

We started by deeply scrutinizing the facilitators and barriers declared by Organization D. A detailed set with 38 factors was obtained. After several meetings with participants in this institution, we obtained a prioritized list with 15 factors. This was represented as a causal matrix, which establishes relationships between these factors (Figure 1). Each line in the matrix represents a variable, which is analyzed to identify if it influences other variables listed in the columns. While crossing lines with columns, a code ‘d’ or ‘i’ was inserted. It indicates that the variable in the line causes the one in the column in a directly (‘d’) or inversely (‘i’) proportional form. The values ‘3’ and ‘1’ are suggested standard weights related to the intensity of causal relations. Cells with no code state that no relation was remarked. Given their knowledge about the business and the BPM initiative, participants in Organization D were responsible to indicate the relations and weights among the prioritized factors.

#	VARIABLES	BPM team motivation	Support from top management	Speed of BPM team learning	Financial resources	Compliance with payment schedule	Culture of departmentalization	BPM roles and responsibilities definition	Concurrence with non-BPM activities	Maturity level in BPM	Proper operation of BAM tool	Availability of adequate IT infrastructure	Leaders with process manager characteristics	Priority of systems integration	BPM team turnover	Implementation delay of modeled processes	SUM of weights for being CAUSE	SUM of weights for being EFFECT
1	BPM team motivation		d3	d3				d1		d3			d1		i1		12	25
2	Support from top management	d3		d1	d3	d3	i1	d3	i3	d3	d1	d3	d3	d3		i1	31	8
3	Speed of BPM team learning	d3	d1				i1	d1		d3	d3		d3		i1	i1	17	15
4	Financial resources	d3	d1			d3	i1	d1	d1	d1	d3				i1	i1	16	4
5	Compliance with payment schedule	d1								d1					i3	i1	6	8
6	Culture of departmentalization					i1				i3			i3				7	13
7	BPM roles and responsibilities definition	d1		d1					i1	d3			d3			i1	10	14
8	Concurrence with non-BPM activities	i3		i3		i1		i1		i3	i1	i1	i3	i1	d1	d1	19	8
9	Maturity level in BPM	d3	d1	d3	d1		i3	d3	i1		d1	d1	d3		i1	i3	24	31
10	Proper operation of BAM tool	d1	d1				i1			d1			d1				5	12
11	Availability of adequate IT infrastructure	d1		d3						d1	d3						8	8
12	Leaders with process manager characteristics	d1								d3	d1							
13	Priority of systems integration	d1							i1	d1							3	14
14	BPM team turnover	i1		i1					d1	i3	i1		i1			d1	9	8
15	Implementation delay of modeled processes	i3	i1				d3	i1		i3							11	11

Figure 1. Causal Relationship Matrix.

The variables (facilitators and barriers) in the resultant matrix were reordered by values in the correspondent columns ‘Sum weight of causes’ and ‘Sum weight of effects’. Table 1 lists the variables ordered by what can be considered as their systemic power. This is useful to identify potential leverage factors to the performance of the BPM initiative. BPM teams can use this result to define aspects requiring further investment and improvement. The factors labeled with (\*) should be preceded by “lack of”, as reported by interviewees in Organization D. We also removed this information from the matrix displayed in Figure 1 to enable an easier analysis. The last column in Table 1 relates the facilitator or barrier to the BPM governance elements, when this is applicable.

We subsequently analyzed the observed causal relationships to identify systems archetypes (Senge, 2006) for the BPM initiative in Organization D. Systems archetypes are known patterns of related causal loops that may explain or predict the behavior of a system. In this case, we identified a structure that characterizes a system archetype known as **Growth and underinvestment** (Figure 2). It represents typical situations where the performance of a system grows for a certain period, and then it halts or decreases due to lack of investment in factors that could improve its performance.

#	Variable	Facilitator or Barrier	Sum Weight of Causes	Sum Weight of Effects	Related BPM Governance Element
1	Support from top management	F	31	8	Roles and responsibilities
2	Maturity level in BPM(*)	B	24	31	-
3	Concurrence with non-BPM activities	B	19	8	Activities
4	Speed of BPM team learning	F	17	15	-
5	Financial resources	F	16	4	-
6	BPM team motivation	F	12	25	-
7	Leaders with process manager profile(*)	B	12	21	-
8	Implementation delay of modeled processes	B	11	11	-
9	BPM roles and responsibilities definition(*)	B	10	14	Roles and responsibilities
10	BPM team turnover	B	9	8	-
11	Availability of adequate IT infrastructure(*)	B	8	8	Infrastructure
12	Culture of departmentalization	B	7	13	-
13	Compliance with payment schedule	F	6	8	-
14	Proper operation of BAM tool(*)	B	5	12	Infrastructure
15	Priority of systems integration(*)	B	3	4	-

Table 1. Variables (facilitators and barriers) ordered by their systemic power.

The virtuous reinforcement causal loops delimited by the rectangle (1) on the left-side of Figure 2 may be seen as a dynamic structure that initially leveraged the performance of the BPM initiative in Organization D. It is formed basically by a set of variables that were considered as facilitators in the context studied. Although the central variable **Realizations of the BPM initiative** is not present in the causal relationship matrix illustrated in Figure 1, it was inferred from the context. It represents the efforts carried out and the positive results already obtained by this initiative.

The balancing loops delimited by rectangle (2), right-side up of Figure 2 is formed mainly by variables that were pointed out as barriers. It tends to slow down and break the performance of the virtuous loop delimited by (1). Starting from the variable **Realizations of the BPM initiative**, it causes the **Concurrence with non-BPM activities**, as people involved continued to accumulate other responsibilities besides the BPM activities. That, in its turn, generates a lack of **BPM roles and responsibilities definition** in the BPM initiative. This later variable contributes to slow down **Maturity level in BPM** and **Leaders with process manager profile** variables. Finally, fewer **Leaders with process manager profile** reinforces the **Departmentalized culture** in the organization, resulting in less **Realizations of the BPM initiative**, closing this balancing loop.

The rectangle (3) delimited in Figure 2 represents the **Underinvestment** structure of the archetype proposed. It means that the **Concurrence with non-BPM activities** leads to the **Perception of necessity to establish permanent BPM services**. This later variable promotes **Establishing a BPM Office**, which, in its turn, shall foster **BPM roles and responsibilities definition** and **Maturity level in BPM**. This shall invert the slow down effect of balancing loops in (2), consequently contributing to

the sustenance of the initial performance growth. We must highlight that, although the variables **Perception of necessity to establish permanent services in support to BPM** and **Establishing a BPM Office** are not present in causal relationship matrix in Figure 1, they are actions already in course in Organization D. However these actions were related as being on its initial steps, which means here that their presence in the archetype is a significant risk to the performance of BPM initiative in organization D, since concrete results may not be promptly available. We shall also remark that there may be other investments that were not mentioned by participants of Organization D and that can leverage the performance of this BPM initiative. For instance, actions of continuing education in BPM should contribute to more **Leaders with process management profile**.

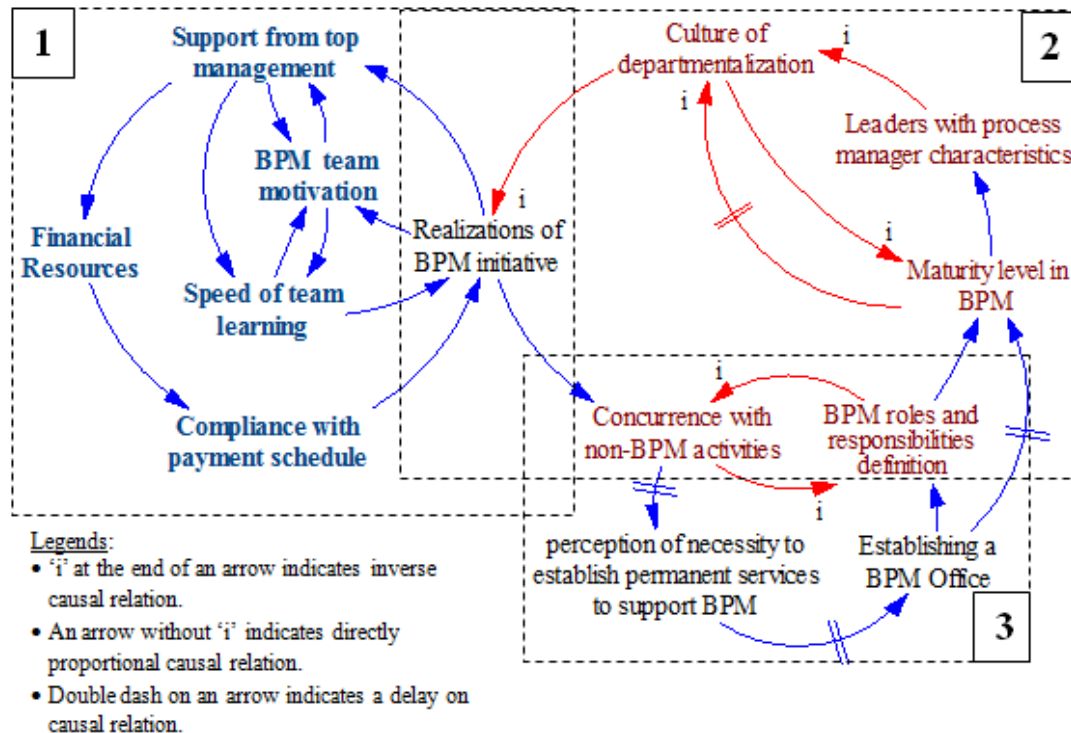


Figure 2. Growth and Underinvestment Archetype for BPM initiative in Organization D.

Finally, when we look at the last column of Table 1 relating facilitators and barriers to the governance elements that guided this research we found that the governance elements "roles and responsibilities", "infrastructure" and "activities" are highlighted in the context studied. The elements "activities" and "roles and responsibilities" also play an important role in the archetype identified as they are related to variables **Concurrence with non-BPM activities**, **BPM roles and responsibilities definition** and **support from top management**.

## 6 Conclusion

This paper presents two key contributions to the understanding on how BPM governance is conducted by public organizations. We performed case studies with four Brazilian public organizations to investigate how BPM governance elements are treated by their BPM initiatives. In addition, we presented a system dynamic analysis of barriers and facilitators faced by one of the studied organizations. This analysis of system archetypes may contribute to a better understanding of causal variables and how their interaction impacts the performance of a BPM initiative. We believe that the results from the system dynamic analysis contribute to an in-depth diagnosis of current challenges and key factors that shall increase the success of BPM initiatives.

Based on our findings, we can conclude that a key barrier faced by organizations is to increase BPM awareness and promote a process-orientation culture. In addition, the lack of personnel with BPM expertise who can act as process owners can be a major threat for public sector BPM initiatives. Brazilian public sector hires servants approved by official exams. This means that professionals may not have desirable BPM skills and expertise. To overcome this barrier, organizations hire external consultants. This strategy can be a short-term palliative, but organizations must perform the necessary knowledge transfer to internal staff. A key facilitator for the BPM initiatives is the strong sponsorship by current government leaders. However, this support can be quite fragile since future elections can change managerial priorities. All organizations aim to strength their BPM units to guarantee the evolution of their initiatives organization wide. In summary, our conclusion regarding the current stage of BPM initiatives carried out by the four organizations is that even though they do not adopt a formal BPM governance model, most governance elements were identified.

Similar empirical studies were found in literature. Jayaganesh and Shanks (2009) synthesized a framework for BPM governance and reported two case studies that explored the influence of national culture on BPM governance in India. While Doebeli and colleagues (2011) proposed a BPM governance model that addresses BPM decision-making, along with roles and responsibilities in an Australian governmental corporation. Similarly to our research, both studies employed a qualitative approach, but these were applied in BPM initiatives with higher maturity levels. The originality of our study is the investigation of how BPM governance elements are embraced by public organizations. Given the low maturity levels of the BPM initiatives of the studied organizations, the challenges and fragility of their BPM initiatives are even greater. To foster their performance, we proposed a system dynamics analysis to understand how barriers and facilitators are interrelated. From this analysis, organizations shall better plan their upcoming actions.

Despite our efforts to avoid inappropriate conclusions, there is a possibility that the study interpretation may have resulted in some inaccuracy. We addressed validity and reliability of our results from the perspective proposed by Merriam (2009). We tried to maximize consistency by validating our synthesis with participants during the focus groups. To increase credibility, we used triangulation by having data collected using two data collection methods: interviews and focus groups. To enhance transferability, we tried to provide a rich description of the organization's context and characteristics of their BPM initiatives. As future research, we plan to conduct longitudinal case studies with participating organizations to capture the evolution of their BPM governance. In addition, we aim to perform system dynamics diagnosis with other organizations. The comparison of the archetypes produced shall delineate more general insights to leverage the performance of BPM initiatives in public organizations.

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