

Business Process Improvement Activities: Differences in Organizational Size, Culture, and Resources

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Abstract. Although there are many business process improvement (BPI) methods, organizations are struggling to apply them effectively. We answer to the call to focus more on the organizational context in BPI projects. We use workarounds – deviations from the prescribed way of using an information system – as a specific angle to approach BPI. In five healthcare organizations of different contextual types, we study workarounds and make recommendations for process improvements. Based on this multiple-case study, we propose a set of contextual activities for each stage of a BPI project. Thereby, we shed light on the differences in tackling process improvements in organizations that differ in size, culture, and the availability of resources for BPI projects. We evaluate the completeness and expected adoption of the proposed contextual BPI activities by organizing two focus groups and conducting a survey.

Keywords: Business Process Improvement, Context-Awareness, Workarounds.

1 Introduction

Business Process Improvement (BPI) is on the agenda of many organizations since it is believed to have potential on many aspects, including increased stakeholder satisfaction and reduced process cost and time [1]. Many methods for process improvement exist, albeit under different titles: process reengineering, improvement, and process innovation [2]. Despite the availability of many methods, actually improving a business process is not an easy endeavor. A problem that may be at the heart of this is that many BPI projects follow a “cookbook approach” that does not adapt to organizational context. Vom Brocke et al. [3] join Benner and Tuschman [4] in claiming that the lack of *context-awareness* is the reason that many of such projects fail. A study by Denner et al. [5] shows that only one in three Business Process Management (BPM) methods takes organizational dimensions into account, which underlines this viewpoint. A number of methods do take account of size and cultural differences – specifically, whether or not the organizations are supportive of BPM – but this is yet a limited view on the range of contextual factors that may be relevant. Additionally, none of the methods provide guidelines for both ends of the spectrum within these factors: e.g. for small start-ups and large multinationals [5].

We attempt to answer the call of multiple scholars [2, 6, 7] for more focus on context-awareness in BPM research and methods. We do so by focusing specifically on how to adapt BPI methods to the organizational context of the projects in which they are applied. Through our own work on the development and application of a specific

BPI method, centered around “workarounds”, we had the opportunity to carry out five improvement projects. These projects have all taken place within the same domain, i.e. healthcare, which ensured that we could apply our improvement method in a very similar way across the cases. By identifying and addressing workarounds, we also gained an in-depth understanding of the processes in question and closely engaged with various stakeholders. At the same time, the organizational contexts of these projects differed to such an extent that we could study and identify relevant contextual factors. On the basis of the experiences we collected in these projects, we provide an answer to the following question: *depending on an organization’s context, which activities are essential in process improvement projects?* We identified the organizational contexts that are worthwhile to distinguish from each other and derived a set of essential improvement activities for each of these contexts. Throughout the paper, we will refer to these as *contextual BPI activities*.

The contribution of this work lies in our proposal of a list of contextual activities for each stage of an improvement project. These insights can help both researchers and practitioners to fine-tune their BPI method of choice. This may be beneficial to improve the success rate of the projects in which such a BPI method is applied. To ensure that our insights can indeed be transferred to and made specific for a wide range of BPI methods, we adopted the Stage-Activity framework by Kettinger et al. [8], which was recently extended by Gross et al. [32]. The framework identifies broadly recognizable stages in a BPI projects, as well as the typical activities that are carried out in these.

The structure of this paper is as follows. The next section contains an overview of the relevant literature. In Section 3, we describe our study’s methodology and present our proposed contextual BPI activities. In the evaluation section, Section 4, we reflect on the completeness of our proposal and investigate its expected adoption in practice. We end our paper with a discussion of the related work on contextual factors and improvement activities in the context of our study and present ideas for future work.

2 Theoretical Background

2.1 Context-Aware Business Process Management

Schilit and Theimer first coined the idea of context-awareness in relation to computing [9]. The concept was later adopted in the BPM area and used in the sense of modeling context-aware processes [e.g. 6, 10] and context-aware process mining [11]. Vom Brocke et al. [3] designated context-awareness as the first of ten principles of good BPM. We attempt to answer the call of multiple authors [2, 6, 7] for more focus on context-awareness in BPM research and methods. The organizational factors from the framework by Vom Brocke et al. [7] and the activity framework by Gross et al. [2] form the basis for our proposal. From the extant literature, Vom Brocke et al. derive a set of contextual factors relevant for BPM. They distinguish four dimensions: goals, processes, organizations, and environments. As we are especially interested in the differ-

ences in types of organizations, we focus on the organization dimension. The organization dimension includes the following factors: scope, industry, size, culture, and resources.

Gross et al. [2] built on the Stage-Activity framework by Kettinger et al. [8]. Kettinger et al. distinguished six stages in Business Process Reengineering projects: 1) envision, 2) initiate, 3) diagnose, 4) redesign, 5) reconstruct, and 6) evaluate. They proposed a set of activities to be executed during each stage. Gross et al. [32] extended this framework with several more contemporary activities. In this study, we highlight from Gross et al.'s BPI activities the essential ones for each stage, depending on the contextual factors of an organization.

2.2 Workarounds as a Source for Business Process Improvement

In BPM literature, workarounds are often discussed in the context of users of process modeling languages, such as BPMN, inventing alternative ways of modeling processes [12–15]. Studies in other research domains discuss workarounds enacted by end users of ISs in general, or specific types of ISs such as Health Information Systems (HISs). They are often described as a form of appropriation [20] and a response to blockages [16], rigid constraints [17], or a misalignment between design and practice [18]. Fortunately, there is a positive side to workarounds. By acknowledging them, instead of ignoring them, organizations can perform corrective actions and improve their work systems. Beerepoot and Van de Weerd acknowledged the potential of workarounds for BPI and developed an approach for identifying, analyzing and addressing workarounds in organizations, in order to achieve work system improvement [16]. We use their *Workaround Snapshot Approach* as a context for studying the role of organizational dimensions in improvement projects and to derive a set of contextual activities.

3 Methods

In this study, we investigate how process improvement is to be tackled within different organizational contexts. We followed a multiple-case study approach to identify contextual factors that influence the choice of activities in process improvement projects. The multiple-case study approach enabled us to investigate a contemporary phenomenon in its real-world context [17]. Furthermore, it allowed us to recognize general patterns in different settings [18] and to increase the external validity of our insights [17]. We assessed the completeness of these contextual factors and activities by engaging with two focus groups. Finally, we carried out a questionnaire to evaluate the adoption of the contextual activities in future process improvement projects.

3.1 Case Selection

We investigated five different organizations. Because the goal of our study is to replicate findings across cases [17], we chose our cases from one sector: healthcare. Focus-

ing on organizations in one sector made it easier to compare the cases, as several variables (industry, scope) remained constant. In the healthcare sector, optimal process support is particularly important since care processes transcend departments [19] and are less predictable than industrial processes [20]. **Table 1** presents an overview of the five case organizations we studied. All organizations use the same HIS, which is used for managing information related to patient records, patient logistics, and other administrative data. Although all organizations are from the same sector, they have several distinctive characteristics. For example, they differ with respect to the organization type, the department that was the focus of the case study, and number of beds (the most common measure of capacity in healthcare organizations [21]).

Table 1. Overview of case organizations and their characteristics

Case	Organization type	Department	Number of beds
A	General hospital	Orthopedics and surgery	313
B	District hospital	Urology and cardiology	435
C	District hospital	Urology and pulmonary	474
D	Specialized center	Rehabilitation	112
E	Specialized center	Rehabilitation	61

3.2 Data Collection

Data collection was performed by the first author of this paper and took place between April 2017 and March 2019. As presented in **Table 2**, data was collected via observations of caregivers, unstructured interviews with the observed caregivers, and semi-structured interviews with team leads, IT managers, and HIS experts. By using these multiple sources of data we enhanced the reliability of our analysis [18].

Table 2. Overview of data collection techniques and informants.

Type	Amount	Informants	Collection
Observations and unstructured interviews	16 (106 hours)	Caregivers: physicians, nurses, office secretaries, clinical secretary, physician assistant, team lead, therapists	Field notes
Semi-structured interviews	22 (24 hours)	Team leads, information architect, HIS experts, IT managers and coordinators, care administration employee	Recorded and transcribed

3.3 Data Analysis

We analyzed our data in several iterations. First, we conducted a *within-case analysis* of each of our case organizations. We reduced and made sense of the collected data by structuring our interview transcripts and field notes in 51 workaround snapshots. These snapshots capture a description of the workaround, the roles involved, a process model, an illustration of the impact on the existing process, the motivation of the user to enact

the workaround, and an advice on how to use the snapshot as a basis for BPI in the organization [16]. This advice was based on the interviews with caregivers and HIS experts. Furthermore, we extracted contextual information about each organization related to the size, culture and resources.

In our *across-case analysis*, we compared our workaround snapshots with the activity framework of Gross et al. [2]. Furthermore, we analyzed for each case organization the corresponding contextual factors from the framework by Vom Brocke et al. [7]. As the scope and industry of our cases were all equal – intra-organizational and healthcare sector – we focused on the differing contextual factors in size, culture, and resources. Finally, for each type of context, we prioritized the most important activity for change. **Figure 1** illustrates the methodological framework of our case study by showing how our within-case analysis and across-case analysis are connected. The result of our case analysis was a matrix containing activities for BPI linked to contextual factors.

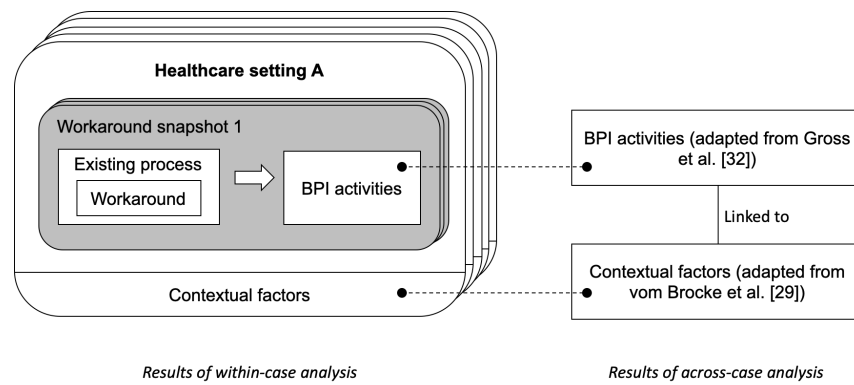


Fig. 1. Methodological framework

3.4 Evaluation

We evaluated the case study results through two focus groups and a questionnaire. The participants in these evaluations were all employees of the company that implemented the HISs in the five case organizations. In addition to their current role as HIS consultant or developer, most of the participants also had an extensive background in the healthcare industry (e.g. as nurse or IT manager in a hospital). **Table 3** provides an overview of the participants involved in the evaluation.

The goal of the *focus groups* was to test the *completeness* of the found BPI activities and their linked contextual factors. We organized two focus groups of six and two participants; HIS experts with extensive experience in healthcare organizations. We presented our BPI activities and contextual factors to the participants and asked them to evaluate these. We encouraged them to propose different contextual factors or activities if they did not fully agree.

The goal of the *questionnaire* was to discover whether possible end users intended to follow our proposed prioritization of BPI activities in their role as process change agents in new encounters. We developed a questionnaire based on Moody's method

evaluation model [22] to evaluate our proposed set of activities on ease of use, usefulness, and intent to use. The questionnaire was administered to three HIS consultants. We first explained our proposal of factors and activities in detail and then let them answer the questions.

Table 3. Evaluation participants (BC, FC, TC = Business, Functional, Technical Consultant).

Evaluation part	Occupation	Previous occupation(s)	Years in healthcare
Focus group 1	Manager Business Improvement	IC nurse & head of IT (in hospital)	33
Focus group 1	Senior BC	IT developer (in hospital)	15
Focus group 1	Business Developer	Account manager	9
Focus group 1	Team Lead TCs	Senior TC	7
Focus group 1	Account Manager	N.a.	4
Focus group 1	CISO & Service Delivery Manager	N.a.	4
Focus group 2	Team Lead FCs	Senior FC	12
Focus group 2	Product Owner & Senior FC	N.a.	3
Questionnaire	Team Lead BCs and Senior BC	Nurse & Senior IT Advisor (in hospital)	29
Questionnaire	Senior BC	Nurse & Manager IT (in hospital)	30
Questionnaire	Junior BC	N.a.	1

4 Contextual BPI Activities

Based on our interviews and observations with HIS users and experts in five organizations that differ in context (illustrated in **Table 4**), we derived a set of contextual BPI activities and discuss these in detail in the following sections.

Table 4. Overview of case organizations and their characteristics

Case	Size	Culture	Resources
A	Medium	Flat	Average
B	Large	Hierarchical	Many
C	Large	Hierarchical	Many
D	Small	Flat	Few
E	Small	Flat	Few

4.1 Envision

What was evident from our observations and interviews is that the identification of workarounds and the development of snapshots needs to be preceded by a set of preparation activities. For all types of organizations, it is essential to identify the process stakeholders and boundaries. What distinguishes the different contexts is the culture

factor, specifically in terms of hierarchy. For hierarchical settings, it appeared to be especially important to establish management commitment and adhere to their vision. In case C, not all managers were sufficiently included in the pre-stages of the project. As a result, the improvement project was discontinued. On the other hand, in non-hierarchical settings such as case A, D and E, it appeared much more important to evaluate the existing culture when starting a BPI project. In such organizations, although change procedures are often undocumented, there are implicit procedures in place. When these procedures are not adhered to, resistance from staff can be expected. **Table 5** presents the contextual BPI activities for the first stage.

Table 5. Contextual BPI activities in the Envision stage.

Dominant Factor	Values	Activities
Culture	Hierarchical	Establish and adhere to management commitment and vision
	Flat	Evaluate existing culture and implicit procedures
	All	Identify process stakeholders and identify process boundaries

4.2 Initiate

The findings presented in the envision stage highlight the importance of gaining commitment from staff – either through establishing commitment from management or through adhering to implicit procedures. In the initiation stage, gaining commitment from all those involved only becomes more important. If the staff is not committed, the diagnosis stage will be unsuccessful. Different types of organizations can be distinguished in this stage by their size. In large organizations we experienced the importance of defining ownership: during our research in case B, we discovered that another group within the organization felt they were assigned the task of improving the process in question. This could have been prevented by establishing ownership in the initiation stage of the improvement project. In smaller organizations it is less likely that two groups are working on the same task without them knowing about each other. In such organizations, it has turned out to be much more important to inform stakeholders of the initiation of the improvement project, giving them a chance to express their interest in the project and their willingness to contribute. Furthermore, in these organizations it is much more manageable to include the larger part of the stakeholders involved than in larger organizations. **Table 6** shows the contextual activities related to this stage.

Table 6. Contextual BPI activities in the Initiate stage.

Dominant Factor	Values	Activities
Size	Large	Define ownership
	Small	Inform stakeholders
	All	Gain staff commitment

4.3 Diagnose

In the diagnosis stage, we again use size to distinguish different contexts, as presented in **Table 7**. Larger organizations allow for comparison of processes and workarounds over different departments within the same organization. A team lead described a specific workaround used in the urology department in case C, and recalled the use of a similar workaround in the cardiology department. Such settings allow for benchmarking comparable processes in different departments of the same organization. In smaller organizations such as medical rehabilitation centers, there are seldom similar processes to compare with. What is more common in such organizations is to organize discussion meetings with similar organizations that encounter the same obstacles. A solution found by one can sometimes be directly implemented by another. For example, medical rehabilitation center D used an open source tool developed for autistic children to create daily schedules for rehabilitants with neurological damage. In medical rehabilitation center E, they used Microsoft Word to make such schedules. One of the recommended actions captured in the snapshot was for organization E to use the same tool as it was much more efficient. What appears to be important for all types of organizations is to obtain quantitative data on processes using techniques such as process mining. Diagnosis is currently most often done qualitatively, using a small sample. Analysis of a larger data set would allow for a more complete diagnosis of inefficient processes.

Table 7. Contextual BPI activities in the Diagnose stage.

Dominant Factor	Values	Activities
Size	Large	Benchmark process from within company
	Small	Benchmark process from competitors
	All	Obtain quantitative process data, e.g. via process mining

4.4 Redesign

During the redesign stage, we found that it is important for all organizations to estimate the required resources and organizational change needed. Only when this is done, it can be decided whether to move forward with the redesign. Not making a thorough estimation of the required resources and organizational change can endanger the continuity of the improvement process and can result in the loss of staff commitment. High-resource organizations making a significant investment in process improvement will also need to develop an elaborate improvement plan on top of this estimation in order to make the most of their investment. Organizations with a smaller budget will benefit from utilizing their stakeholders' knowledge of the process in coming up with improvement ideas in order to save resources. Moreover, having the stakeholders contribute improvement ideas often raises their engagement with the improvement project. **Table 8** shows the contextual activities related to this stage.

Table 8. Contextual BPI activities in the Redesign stage.

Dominant Factor	Values	Activities
Resources	Many	Develop detailed improvement plan
	Few	Collect improvement ideas from stakeholders
	All	Estimate required resources and organizational change needed

4.5 Reconstruct

In **Table 9**, we present the contextual activities related to the reconstruct stage. We noticed in our case organizations the many consequences process changes can have on other processes. In smaller organizations, these consequences can be easily overseen. However, in larger organizations, the potential impact of changes on other processes need to be analyzed in order to prevent harmful consequences. We also experienced a certain ‘change fatigue’ in these larger organizations. Participants were frequently confronted with new change programs, receiving many communications on what was happening and what they needed to change in their work practices. In smaller organizations, stakeholders constantly reminded the interviewer that they wanted to be involved in any process changes. We therefore recommend smaller organizations to emphasize the communication of any information related to the improvement project, whereas we recommend larger organizations to hold back on heavy communication. For both types we see the importance of integrating process changes into existing processes. If not, keeping up with process changes will become unmanageable for process stakeholders.

Table 9. Contextual BPI activities in the Reconstruct stage.

Dominant Factor	Values	Activities
Size	Large	Analyze potential impact for other processes
	Small	Communicate process changes
	All	Integrate process

4.6 Evaluate

Building on the previous stage, we again make the distinction between in size, as described in **Table 10**. As larger organizations often have other improvement programs running, we suggest they should look for opportunities to link individual process improvement activities to existing programs. Doing so will hopefully decrease the change fatigue that participants are experiencing in these organizations. As mentioned in the previous stage, we found that participants in smaller organizations would like to be more involved and would like to hear about any outcomes of process changes. We therefore recommend smaller organizations to emphasize the communication of these outcomes to stakeholders. The importance of monitoring the changing environment and processes applies for all types of organizations. Processes and workarounds are always in flux and need to be monitored over time.

Table 10. Contextual BPI activities in the Evaluate stage.

Dominant Factor	Values	Activities
Size	Large	Link to continuous improvement programs
	Small	Report key process change outcomes
	All	Monitor environment for future needs to change

5 Evaluation

To evaluate the completeness of the contextual activities and the expected adoption of our proposal in practice, we organized two focus groups and distributed a questionnaire among potential end users of the method.

5.1 Completeness of the Contextual Factors

During one of the focus groups, an interesting discussion on the organizational factors of healthcare organizations arose. One of the critical notes was that, in the future, the amount of beds in hospitals would not be a valuable indicator of size, since healthcare is moving more and more towards home care. Looking at revenue and number of employees would give a more realistic view of the size of these organizations.

Another proposal made in the focus group was to add the contextual factor of maturity. Some organizations are more mature than others in such terms as procedures in place to address problems and the knowledge present to bring HIS projects to an end successfully. It was mentioned that in more mature organizations, it would be possible to focus more on quality and external factors such as patient satisfaction. In contrast, more immature organizations need to focus on solving problems and getting their processes in order in the first place. However, it was also mentioned in the focus group that it would be difficult to categorize organizations into a scale of maturity and the organizations themselves might be inclined to make misjudgments as to how they fare on the ladder. Moreover, many examples were given of small organizations that are in some aspects very mature and big organizations being surprisingly immature on some levels. This shows that it would be difficult to define simplified profiles, such as big, mature organizations and small, immature organizations. Doing so, we would exclude many organizations. The other three factors – size, culture and resources – are often interdependent. Most big organizations are hierarchical and have more resources than the more flat and smaller organizations, with some exceptions. In **Table 11** we summarize the focus group’s evaluation of the proposed context factors.

Table 11. Summary of the evaluation of contextual factors.

Opposed	Confirmed	Proposed additions
Operationalization of size: number of beds	Culture: flat or hierarchical	Operationalization of size: revenue and number of employees
	Resources: many or few	Maturity: mature or immature

5.2 Completeness of the Contextual Activities

Focusing on the activities of the method, some possibly missing ones were noted. First, the importance of the activities ‘realize need for change’ in the envision stage and ‘outline key measurement variables’ in the improvement stage were stressed by the focus group participants. This would apply for all types of organizations. The key measurement variables would then need to be evaluated in the evaluate stage. Such an activity is not included in the list of [2], although the activity ‘evaluate process performance’ comes close. Another activity considered important for all types of organizations in the evaluate stage is also not in the list of activities, namely ‘solicit feedback’. This activity is listed in the improvement stage, but is considered even more important in the evaluate stage according to the participants.

The participants also mentioned that – apart from the distinction in which activities to perform depending on context, which they mostly agreed on – a distinction can be made in how to perform certain activities. For example, when performing the activity ‘analyze existing process’ during the diagnosis stage, the way the data is collected differs depending on the type of organization. In a small medical rehabilitation center with only two secretaries at the front desk, the means of data collection and communication of process changes would differ considerably from a big hospital with sixty to seventy secretaries at multiple front desks.

What was evident both from our experience in looking at workarounds in the five cases and from the participants’ experience in other healthcare organizations, many users of HISs experience a significant level of change fatigue. Especially caregivers in bigger organizations have participated in several reorganizations and process improvement programs. It is therefore important to prioritize process changes; to not only gain their commitment but also to retain their commitment, by soliciting feedback when necessary and by feeding back the results they helped achieve. In **Table 12** we summarize the focus group’s evaluation of the contextual BPI activities.

Table 12. Summary of the evaluation of activities.

Opposed	Confirmed	Proposed additions
None	All	Realize need for change (stage: envision)
		Outline key measurement variables (stage: redesign)
		Evaluate process performance (stage: evaluate)
		Solicit feedback (stage: evaluate)

5.3 Expected Adoption of Our Proposal in Practice

The questionnaire on ease of use, usefulness and intent to use of our proposed set of contextual BPI activities was completed by two senior business consultants (one of whom was also the team lead of the business consultancy team) and one junior business consultant. We scored the answers from 1 to 5 (e.g. for statement #1: strongly disagree = 1 and strongly agree = 5). Note that the scores on the negatively worded statements #4, #7, and #9 need to be inversed for a correct interpretation.

Our proposal is considered easy to understand and use (average of statements #1 through #4 = 3.75), although for those spending little time in the concerning organizations it may be difficult to apply in practice. Moreover, it is considered useful (statements #5 through #8 = 3.75 on average), but does not necessarily make it easier to perform BPI projects than other methods. The intention to use the ideas we proposed is high (statements #7 and #8 = 4.0 on average). The full results are depicted in **Table 13**.

Table 13. Results from the questionnaire on ease of use, usefulness and intent to use.

#	Statement	Strongly disagree (1)	Dis-agree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
1	In general, the method seems to be well-applicable.	0	0	0	3	0
2	It seems easy to learn the method.	0	0	0	2	1
3	I find the stages and activities of the method clear and easy to understand.	0	0	0	3	0
4	I am not confident I can apply the method in practice.	0	1	1	0	1
5	I believe that this method can improve the work practices of HIS users.	0	0	1	1	1
6	This method makes it easier for me to tackle improvement projects in healthcare organizations.	0	0	2	1	0
7	I find other improvement methods more useful than this method.	0	1	2	0	0
8	In general, I find this method useful	0	0	0	2	1
9	I would definitely not use this method to improve the use of HISs in healthcare organizations.	1	2	0	0	0
10	I intend to use this method in future projects.	0	0	1	2	0

6 Discussion

In this study, we proposed that the essential BPI activities differ for organizations of varying size, culture, and resources. For each stage in a BPI project, we pointed out the dominant factor to distinguish organizations and suggested the corresponding contextual activities. In the following, we discuss related work on contextual factors and BPI activities and their relation to our study.

In four of the six stages of BPI projects, we found size to be the dominant factor in determining BPI activities for an organization. The importance of organizational size has been noted in several other studies. For example, a large firm size appeared to be the largest contributor to Total Quality Management success after industry type [23]. Similarly, Shah and Ward [24] studied the role of organizational context in lean manufacturing and concluded that plant size was the largest influencer in the likelihood of implementing lean practices. In IT innovation studies, organizational size also has been

considered an important predictor of IT innovation adoption [25]. Our study complements these findings by suggesting that size is also an important factor in another way, namely in distinguishing which activities should be carried out during BPI projects.

The second contextual factor we studied was culture. As Schmiedel, vom Brocke and Recker [26] state: “bluntly put, BPM initiatives often fail for cultural reasons”. Culture has been argued to be an important factor in BPM. BPM is often more successful when cultural values are high [27]. Moreover, the success of BPM methodologies depends on the culture of an organization. Thiemich and Puhlmann [28] for example, argued that an organization open for change benefits from the use of agile methodologies, while a continuity-valuing organization might benefit more from using traditional methods [7]. The difference in suitable management styles in organizations varying in culture has also been noted by Donaldson [29]. The latter also mentioned that size and culture are linked in this respect. Bureaucracy and hierarchy are often more suitable in bigger organizations than in smaller ones. Our results confirm all these insights: we found the hierarchical culture of an organization an important factor in determining the pivotal activities in BPI projects.

The third contextual factor that we looked into was resources. This factor has received less attention in BPM studies than size and culture, but our study suggests that it is nonetheless an important aspect to consider in BPI projects. In the context of open process innovation, Niehaves [30] studied the role of personnel resource scarcity. He found that BPM outcomes are affected by personnel scarcity as it decreases customer involvement. Several authors have mentioned the importance of stakeholder involvement for improving processes, also in the context of workarounds. Wheeler et al. [31], for instance, state: “in the case of workarounds, organizations could capitalize on the mindfulness of employees by encouraging employees to share their workarounds in order to improve task design”. It is believed that insights from users can guide system design [32, 33] and decrease resistance towards the system [34, 35]. In other words, even though previous studies have touched on this topic, our study puts the resources factor firmly on the map as an important contextual factor.

In the evaluation of our proposal, another contextual factor was raised: maturity. In the BPM literature, several studies have distinguished the difference between mature and immature organizations. For example, Reijers et al. [36] argued that “BPM projects are performed in a more systematic manner in larger and more mature organizations”. Similarly, according to Burlton [37], “the more mature the organization is with regard to BPM, the more sophisticated their process governance framework and their commitment to it”. Ravesteyn and Jansen [38] went a step further and proposed a situational BPMS implementation method that uses an organization’s maturity level to configure the activities that should be executed. In our study’s evaluation it was mentioned that immature organizations need focus on improving existing processes – called *exploitation* [39] – while more mature organizations can move beyond their existing processes and focus on *exploration*. However, we recognize that most current organizations focus on exploitation and are not yet ready to move towards exploration [2]. Additionally, we found that it was difficult to assess the healthcare organizations of our study as either mature or immature. BPM maturity models such as the one by Rosemann [40] might be of help to operationalize the contextual factor maturity.

Until now, we discussed the different contextual factors separately. However, the factors size, culture, and resources are tightly linked. Most larger organizations have a hierarchical structure and more resources than the smaller and flatter organizations, with some exceptions. This finding of interdependency of contextual factors supports statements by several others [7, 24, 41, 42].

Our study does have limitations. The data collection was performed by one researcher only. However, we did collect data in multiple ways and have performed different methods of evaluation (including a quantitative survey) in order to make sure subjective views did not cloud the findings too much. Moreover, we proposed contextual BPI activities based on an intensive case study of five organizations, all of which in the healthcare sector, which provided a meaningful set for comparison. The small number of cases and the sole industry makes generalization difficult. Therefore, we extensively evaluated the proposed activities, leading to a number of clues for where our proposal might fall short in generalizability. Future studies may reveal whether our proposal would be applicable in other industries.

7 Conclusion and Future Work

In this study, we attempted to identify which activities are essential in improvement projects depending on organizational size, culture, and resources. We used a multiple-case study approach to discover how improvement is to be tackled in organizations of different contexts. We focused specifically on organizations in the healthcare sector, although findings may be generalizable to other sectors as well. We proposed a set of contextual activities for each stage of process improvement projects and evaluated our proposal on multiple levels. The evaluation revealed several points of departure for further refining our proposal. (1) In addition to size, culture, and resources, the maturity of an organization may be an important factor in tackling improvement projects. (2) The contextual factors size and maturity need to be further operationalized. For example, in the future, distinguishing healthcare organizations using number of beds will become irrelevant, as most of the care will be brought to the home. (3) In addition to defining the essential activities for each organizational context, we might also make a distinction in the way an activity is performed. (4) The stakeholders in improvement projects may experience a high level of change fatigue, which will need to be taken into account when tackling improvement projects in organizations.

In general, our proposal for the identification of contextual factors is considered relatively useful and easy to understand, although it may not be easy to apply for all. The intention to use the ideas is high among the three participants we involved in the questionnaire. Future work may look into the role of an organization's maturity in identifying contextual improvement activities. It may also focus on evaluating our proposal for sectors other than healthcare.

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