Business Processes The Way They Should Be: Tuning For Low Friction And Sustainability

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BUSINESS PROCESSES THE WAY THEY SHOULD BE: TUNING FOR LOW FRICTION AND SUSTAINABILITY

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Abstract

We propose an approach to find pain points in business processes, which may cause them to be ignored or be seen as a burden rather than a valuable orientation for everyday work. We evaluate four dimensions (Motivation, Understanding, Value, and Effort), using a customizable questionnaire that is answered by process participants. The output is a dashboard-like report that graphically depicts the health of those dimensions and allows for a drill down on its components. Concrete actions can be derived from the analysis of the report. The approach has been used in two distinct organizations, one of which – a medium-sized CMMI level 3 compliant IT company – is used here for illustration. Latent problems have been identified, paving the way for a tuning of the business process that will improve its long-term sustainability and the participants’ willingness to follow it.

Keywords: Business process evaluation, business process tuning, business process design, business process friction, business process sustainability, business process improvement.
1 Introduction

People should love processes. Processes should make everyday life simpler. Processes should make work easier and meaningful. Processes should encode best practices to free people from constantly reinventing the wheel so they can focus their energy, attention, and creativity on more complex matters. However, people don’t usually love processes. Most often they dislike them, or, at best, they tolerate them. A top-level executive we interviewed described this resistance to following processes by saying that “(...) some processes have a lot of friction. If you don’t keep pushing, they will eventually stop.” If a process stops when unattended, then it is not sustainable in the long-term. Somewhere along the way, the benefits we stated above have been lost.

Non-compliance with the established processes can have adverse impact on companies: output quality may become inconsistent, waste and rework may increase, and the company may fail audits by certification bodies, eventually becoming excluded from operating in certain markets. There are many reasons for the friction we see in processes: time may have rendered them excessively bureaucratic, convoluted, or outdated since they were originally created, or they may have been poorly designed from the start, as so often happens when companies are misguided by immature concepts of quality, or pursue certifications – such as ISO 9001 (ISO, 2008) or CMMI (Chrissis, Konrad and Shrum, 2011) – for the sake of the certificate alone and not for the improvements they are supposed to drive.

Nevertheless, the body of processes of a company, much like its portfolio of information system solutions, represents a considerable investment (of time, money, know-how, user training). Occasionally, we can drastically reengineer some very unsuitable processes (Hammer and Champy, 1993), but for the majority we need a more lightweight way to keep tuning them for lower friction and long-term sustainability. What we propose is an approach, that we have called MUVE, which taps into process participants to identify the issues requiring attention. Its theoretical model underpins a customizable questionnaire, whose results enable the creation of an executive report highlighting pain points of the process under analysis and provides suggestions for improvement. Our goal is to reclaim the advantages of processes and have the stakeholders willingly following them.

The rest of this paper is structured as follows: in the next section we state and justify our choice of research method. In section 3 we provide some background on process improvement and, in section 4, we introduce our model and explain how it builds on existing work. Its use in a real case is illustrated in section 5. A discussion follows, in section 6, just before we close with conclusions and future work.

2 Research Method

Our aim is to come up with a methodology for the evaluation and improvement of business processes. However, studying new or changed methodologies calls for interventions to test them in practitioner environments (i.e. to “go into the world and try them out” (Land, quoted in (Wood-Harper, 1989)). Furthermore, socio-technical contexts pose specific challenges to rigor and validity, given the multitude of variables at play, both known and unknown, over which the researcher has no control. When discussing this scenario, Baskerville and Wood-Harper (1996) state, “(...) action-research is one of the few valid research approaches that researchers can legitimately employ to study the effects of specific alterations in systems development methodologies. It is both rigorous and relevant.” Design science research would constitute another feasible approach, since it is suitable for designing a generic artifact or solution and testing it in practice (Hevner, March and Park, 2004), (Peffers, et al., 2007), (Bider, Johannesson and Perjons, 2012). However, since our interventions in the field were also aimed at solving concrete organizational issues, we considered they were more aligned with action-research’s dual goal of contributing to the body of knowledge and solving a problematic situation. According to Checkland and Holwell (1998) and to Lau (1999), it is important to have a clear theoretical frame of reference before starting the action-research cycles. This was achieved through a literature review,
summarized in the next section, and through the establishment of our first-cut model and approach. These were subsequently applied and refined in two real-world cases, one in an ISO 9001 certified not-for-profit institution, focused on research and development in science and technology, and another in a medium-sized CMMI level 3 compliant IT company. The latter is used in this paper as an illustration of our approach.

3 Background

Process improvement has been studied for long, both by the management and by the software engineering communities. A report by the Software Engineering Institute (SEI) (Fowler and Rifkin, 1990) provides guidance on how to set-up a group responsible for software process improvement (SPI). It discusses formal SEI assessments, which can be time-consuming and expensive. It also gives guidance on how to deal with the many factors that lead to process improvement failure, such as resistance. According to Rifkin (2002), resistant participants should not be ignored or pushed aside because they are directly involved in the process and may be able to identify flaws in the improvement plan that are not obvious from an outside perspective. In that sense, it becomes important to understand why they are not willing to adopt a process.

Several factors identified in the literature are well known for influencing the motivation for process improvement adoption. Niazi, Wilson and Zowghi (2006) identified a list of critical success factors for process improvement through an empirical study that looks at conditions that help overcoming resistance to process change. Some examples are: top-management support, training, awareness, allocation of resources, and experienced staff. Baddoo and Hall (2003) identified common De-Motivators for SPI initiatives. Some examples are: lack of feedback, lack of evidence of benefits, workload, time pressure or constraints, lack of overall support, imposition, and cumbersome processes. Although the motivation and de-motivation factors previously mentioned are related with SPI, some can also be found in work motivation studies outside the software engineering area. Morris (2009) lists ‘perks’ like: autonomy, seeing the end result, sense of achievement, team support, interesting and meaningful work, leadership support and respect, leadership recognition and reward. He also lists ‘irks’ such as: abusive supervision, unclear expectations, time and work pressures, inadequate materials and equipment, lack of commitment and interest of co-workers, and bureaucracy.

Another condition that motivates the adoption of work procedures is the balance between the effort required of the process participants and the value they perceive from their engagement. Pfeffer (1996) states that “People will work more effectively to the extent they receive some benefit from doing so”. Failing to balance the effort with value may lead participants to stop collaborating (if that’s an option), degrade the quality of their contribution, or assign a low priority to the tasks. Costa and Cunha (2008, 2010) developed an approach to evaluate the value-effort balance in business model networks, to ensure key participants remain engaged in a sustainable manner.

The A³ framework, by Bider, et al. (2012), assesses the introduction and adoption of IT systems, based on the premise that certain conditions must be satisfied to achieve success. It then proposes adjustments to ease that process. A³ is supported on a questionnaire, to be answered by end users of the IT system. It measures adoption parameters, two of which are the Cognitive and Motivation parameters. The former evaluates three types of users’ understanding – the purpose of the system (Why), in which situations they should interact with the system (When), and how to use the system (How) – and the latter evaluates if the users are intrinsically willing to use the system (e.g. would they use it if it was not mandatory?). Although A³ is oriented towards the adoption of IT systems, its underlying theories of acceptance and change management also fit process adoption analysis. A³ does not, however, directly evaluate the organizational learning about the implemented processes. Participants may learn how to perform the activities in a process but will need easy access to information that can continuously guide them in their work. Stoll (2010) describes the importance of knowledge sharing as a complement to training, referring to the need of documentation being accessible and pedagogically oriented to guide the employees.
4 The MUVE Approach

Our proposal for process evaluation and improvement includes four dimensions: Motivation, defined as the willingness of participants to follow the process; Understanding, defined as the level of comprehension of the participants about the process; Value, defined as the benefits perceived by participants when following a process; and Effort, defined as the demands perceived by participants when following a process. Figure 1 illustrates how the work of various authors mentioned in the background section contributed to this model.

**Figure 1.** MUVE approach - Background contributions

Each of the four dimensions is further detailed into more specific factors that influence process adoption, promoting its sustainability, as shown in Figure 2.

**Figure 2.** MUVE dimensions detailed
For Motivation, we extended Bider et al. (2012)’s contributions to account for the adoption of the process as well as of the system. We see these as independent, in the sense that the participants may be motivated towards one but not the other. For instance, people may be inclined to follow the process, but consider its supporting system to be an obstacle. Additionally, Bider et al. (2012) only provided the kick-off question “Would you use the system if nobody in the management demands that you use it?” so we included several other motivation enablers and barriers consolidated from Niazi, Wilson and Zowghi (2006), Baddoo and Hall (2003), and Morris (2009), as seen in Table 1. The presence of these factors in the process under evaluation is systematically checked in our approach.

<table>
<thead>
<tr>
<th>De-Motivation factor</th>
<th>Description</th>
<th>Adapted from</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time pressure or constraints</td>
<td>Participants are unable to fully adhere to the process due to their busy schedule.</td>
<td>1, 2, 3</td>
</tr>
<tr>
<td>Lack of resources</td>
<td>Participants don’t have enough resources (staff, information, budget or tools) to follow the process adequately.</td>
<td>1, 2, 3</td>
</tr>
<tr>
<td>Lack of evidence of benefits</td>
<td>Participants are not aware or were not provided evidences of the benefits of the process.</td>
<td>1, 2</td>
</tr>
<tr>
<td>Lack of support in process activities</td>
<td>Participants feel unsupported (either by their leaders or co-workers) while performing the tasks required.</td>
<td>1, 2, 3</td>
</tr>
<tr>
<td>Lack of technical support in the system</td>
<td>Participants feel unsupported (technically) while using the system.</td>
<td>1, 2, 3</td>
</tr>
<tr>
<td>Irrelevant objectives and deliverables</td>
<td>Participants don’t see the process and deliverables relevant for the real needs and question its meaningfulness.</td>
<td>2, 3</td>
</tr>
<tr>
<td>Low priority process</td>
<td>Participants assign other tasks higher priorities thus do not fully adhere to the process.</td>
<td>2</td>
</tr>
<tr>
<td>Lack of training about the process</td>
<td>Participants don’t have enough autonomy in process tasks and require adequate training.</td>
<td>1, 2, 3</td>
</tr>
<tr>
<td>Lack of training about the system</td>
<td>Participants don’t have enough autonomy using the system and require adequate training.</td>
<td>1, 2, 3</td>
</tr>
<tr>
<td>Workload</td>
<td>Participants find the process workload too heavy</td>
<td>2, 3</td>
</tr>
<tr>
<td>Cumbersome process</td>
<td>Participants find the process too bureaucratic.</td>
<td>2, 3</td>
</tr>
<tr>
<td>Lack of feedback about the deliverables</td>
<td>Participants do not receive feedback about their work and are not aware of their contributions to the final purpose.</td>
<td>2, 3</td>
</tr>
<tr>
<td>Management imposition</td>
<td>Participants feel uncomfortable with the imposition of the process with no regard for their opinion.</td>
<td>2, 3</td>
</tr>
<tr>
<td>Fire fighting culture</td>
<td>Participants always have urgent issues to deal with.</td>
<td>2</td>
</tr>
<tr>
<td>Lack of senior management commitment</td>
<td>Participants don’t see their managers understanding the process or committed to it and follow their example.</td>
<td>1, 2, 3</td>
</tr>
<tr>
<td>No experienced staff support</td>
<td>Participants need a group of experts facilitating the process, to which they can ask questions or request for help.</td>
<td>1, 2, 3</td>
</tr>
<tr>
<td>No defined methodology</td>
<td>Participants are not aware of defined procedures that can guide them on how to follow the process.</td>
<td>1</td>
</tr>
<tr>
<td>Inadequate system</td>
<td>Participants find the supporting system inadequate for the process activities.</td>
<td>1, 3</td>
</tr>
<tr>
<td>No recognition or reward</td>
<td>Participants feel that there is no reward scheme or no recognition for those who adhere to the process.</td>
<td>1, 3</td>
</tr>
<tr>
<td>Distrust</td>
<td>Participants have no confidence in the system or co-workers thus avoid following the process.</td>
<td>3</td>
</tr>
<tr>
<td>Unclear expectations and responsibility</td>
<td>Participants are not clear about their responsibility or other’s expectations about their work.</td>
<td>3</td>
</tr>
<tr>
<td>Social Behaviour</td>
<td>Participants choose not to adhere to the process because they observe that co-workers don’t do it.</td>
<td>3</td>
</tr>
</tbody>
</table>


Table 1. List of motivation enablers and barriers in the context of process adoption
The Understanding dimension of Figure 2 is based on the cognitive parameters presented by Bider, et al. (2012), but also extended to process adoption while originally it was concerned with systems. It consists of: Strategic Understanding (Why), which assesses if the participants know the purpose of the process, its inputs and outputs; Tactical Understanding (When), which assesses if the participants know when to intervene in the process and any of its activities; and Operational Understanding (How), which assesses if the participants know how to execute the activities of the processes, making use of its inputs and supporting information system. We have included two additional sub-dimensions in the Understanding dimension, based on Stoll (2010): Access, which refers to the accessibility the participants have to the supporting information system and to the documentation that describes the process; and Documentation quality, which reflects how clear, comprehensive, and useful is the documentation that describes the process. Finally, the Value and Effort dimensions from Figure 2 are based on Costa and Cunha (2008, 2010). They are independent, but more meaningful when analyzed from the perspective of how balanced they are. The former collects the perceptions of the participants regarding the return they get from executing the process. A distinction is made between gains for the individual and gains for the organization. For each, we try to assess if a problem lies in the process itself or in the supporting IT system. The latter collects the effort required for the process as a whole and breakdown by each activity. This enables a fine-grained analysis of the more friction-prone steps.

The MUVE model is operationalized using a questionnaire to be answered anonymously by the participants in the process. The analysis of the answers lets us create a management report describing its pain points and suggestions to overcome them. To create this questionnaire we had to reconcile some tensions. On one hand, we wanted a lightweight instrument that would not drive off busy respondents and whose results practitioners could easily and timely treat for multiple processes. This was an argument against using open-ended questions and subsequent content analysis with tools like NVivo. On the other hand, we wanted the instrument to provide process-specific insights, which was an argument against using the same set of questions regardless of the process. Our solution entails a template-questionnaire, mostly made of closed questions, that is customized for each process under evaluation, as shown in Figure 3.

![Figure 3. Operationalization process of the MUVE approach](image)

The customization of the template-questionnaire is kept simple, with fill-in-the-blanks (e.g. names of inputs) and duplication of questions (e.g. for each activity, or for each input). For example, instead of having one generic question about the effort required by (all) the activities, this is enquired for each activity, referred by name, enabling a more accurate pinpointing of issues. See Table 2 for some example questions. Items in square brackets are replaced by actual names of process elements.
Since we are mainly evaluating the participant’s attitudes towards the process under analysis, we opted to collect answers (except for the de-motivator factors) using a 4-point scale excluding the neutral option (Ghiglione and Matalon, 1993), as shown in the right column. In this case, the target respondents have a direct involvement in the process, so we assume that they have an opinion about all the questions. The small scale reduces the alternative options, making it easier for respondents to answer. A larger scale (e.g. 7 or 9-point) would provide better discrimination, but at the expense of burdening the respondents with the difficulty of choosing between similar levels (e.g. 5 and 6). In addition to the closed questions, we also added an optional free text field that respondents can use for comments or suggestions.
5 The MUVE in Action – an Illustration

Here we will illustrate MUVE’s outcomes, namely excerpts of the management report that we generate and samples of issues that we have found. We evaluated a concrete process of a medium-sized CMMI level 3 compliant IT company. Around 200 people potentially execute this process. We have selected 43 to answer our questionnaire and 21 accepted. The main output of MUVE is the dashboard in Figure 4. It represents the aggregate results for each of the four top-level dimensions.

Each bar in Figure 4 corresponds to the answers of one respondent to the questions for that dimension. Its size is calculated by summing the weights associated with each answer, which range from 1 (low) to 4 (high). The full scope of the charts is, thus, from all questions answered ‘low’ to all questions answered ‘high’. For Motivation, Understanding, and Value, the way the bar colours are assigned is: Green, when the size is within 2/3 of the scope and the upper boundary (means a high level of the presence of the condition under evaluation and ‘no concern’); Yellow, when the size is within 1/3 and 2/3 of the scope (means an alerting low level of the presence of the condition under evaluation and ‘warning, check reported issues’); Red, when the size is within the lower boundary and 1/3 of the scope (means a critically low level of the presence of the condition under evaluation and ‘alert, urgent attention required’). For the Effort dimension the colours mean the opposite, since a high level of effort is not desirable (e.g. when the sum of weights of the answers is within 2/3 of the scope and the upper boundary the bar will be red indicating a critical alert for the amount of effort perceived by respondents). For Motivation and Understanding, the bars are sorted from low to high to provide an immediate visual perception of the general health of the dimension and of the magnitude of the three ranges. For the Effort and Value, the representation is slightly different. Since these are more meaningful when compared to each other the bars are not sorted, in order to have the actual responses from the same participants side by side. We can see from Figure 4 that, in the case of our IT company, there is a global balance between Effort and Value, with no reds in the former and some greens in the latter. We can drill-down on the four top-level dimensions for further detail, using the hierarchy introduced in figure 2. The representation of each sub-dimension follows the same rationale and visual format as that of figure 4. Space constraints prevent us from including the whole management report in this paper, but figure 5 shows an example of drilling down on the Understanding dimension.

Figure 4. MUVE Dimensions- aggregate results
From the results depicted in figure 5 we can conclude that a comfortable majority of process participants understands the ‘why’ and ‘when’ of the process (mostly green bars). But not so many know ‘how’ to execute their activities in the process (only about half green bars). One possible cause may be documentation quality and accessibility. The results show that 43% of the respondents never tried to access the process documentation (notice the missing bars in ‘Documentation Quality’) and the remaining 57% say that the documentation could be more clear, detailed, and useful. There is plenty of margin for reducing the friction in this process by concentrating on the documentation and its access.

In the full management report, it also becomes clear that the participants acknowledge the Value of the process being evaluated, from both the organizational and individual perspectives, but the same cannot be said about the supporting IT system, whose value for the organization is rated higher than the value for the participant that must use it. This is a potential friction point that may be eliminated by enquiring and addressing the specifics of this dissatisfaction. Another barrier to smooth process adoption was identified from the most frequently selected de-motivation factors. Close to 60% of the respondents stated that they weren’t able to rigorously follow the process because they had to attend to other tasks of higher priority. Many respondents also stated that they were constantly burdened with urgent matters and had little time to spare with this process.

Besides the information on the charts, our management report also discloses the value-effort balance for each of the process activities. It also provides information about the actual use participants make of the process inputs. Figure 6 illustrates how this information is presented.

Figure 5. Drill-down on the Understanding dimension

Figure 6. Analysis of use of inputs and Value-Effort balance per activity

Figure 6 shows the original diagram explaining the flow of the process that we have evaluated. For confidentiality reasons, actual names were replaced with letters for inputs and outputs and with numbers for activities. MUVE is process-representation agnostic, so we use the organization’s own representation to add our information about the actual use made of the inputs and the value-effort balance for the various activities. Supposedly, all process inputs should be relevant and used, but our findings show otherwise. Only input c (in green) is actually consistently used in the appropriate
activities to generate the process outputs. The inputs in yellow are actually only used by 66% or less of the respondents. This reality suggests that some inputs (which can, in turn, be outputs from an upstream process) may no longer be relevant, leading to simplifications. Generally speaking, the activities have balanced effort and value, although there is some potential for improvement. Activity 5 seems to generally hold on a fragile balance and activity 4 has some specific red bars for effort whose respective perceived value is not green. One specific issue in activity 2 shows high effort for very low perceived value. The causes for these issues can be immediately analysed in case of an atomic task, or MUVE can be applied recursively if that task is a complete sub-process per se.

6 Discussion

Although only one case was presented, for illustration purposes, this section reflects on what we have learned so far from the use of MUVE in two organizations representing different industries and in two distinct business processes. In both cases the managers considered the results useful. Both cases revealed pain points already known by the organizations, such as issues with the documentation or the supporting IT system, but also revealed barriers that the managers were not aware of, namely in Operational Understanding of the process. Both organizations provided valuable feedback.

Organization 1 shared MUVE’s management report with the respondents, to provide a common picture and encourage suggestions for improvements. It also expressed interest in a way to identify profiles among them, to better target specific actions to the pain points identified by each group. To this end, they suggested forfeiting anonymity in the questionnaire. This organization also became interested in applying MUVE to a high-level process, composed of many sub-processes. They will start by assessing the top-level process, to reveal which sub-processes (tasks) require more immediate attention, based on their value-effort balance (see Figure 6). Then, they will recursively apply the approach to each of those.

Organization 2 considered that MUVE could be a valuable tool in showing its ISO 9001 auditors the required evidence of process improvement initiatives. The quality manager suggested applying the approach to identify pain points, addressing them, and then applying the approach again to compare results. We believe this avenue can be explored, but care should be taken to account for the fact that socio-technical contexts are not linear or deterministic. An example is the Hawthorne effect, which suggests that changes in participants' behaviour during the course of a study may be "related only to the special social situation and social treatment they received" (French, 1950, 1953). One of the invited respondents of this organization informed the research team that he was only involved in a few activities in the process; therefore he wouldn’t know how to answer the whole questionnaire. In such cases, the assumption that every respondent will have an opinion about every question is not true. This suggests the neutral answer should be available in every question related to activities and inputs.

Our own experience in these two cases revealed an additional benefit of MUVE: testing the clarity of process documentation and its consistency with how the processes are, de facto, executed. In the customization of our questionnaires we came across cases in which the process documentation was not clear or did not provide enough detail (e.g. about the purpose of all inputs). When testing our questionnaires with process experts before deploying them, we also found out that there were differences between their practice and the official process documentation that we had used. This side-effect of the customization of MUVE’s questionnaires for specific processes can be systematically leveraged, by assigning the task to someone whose only knowledge about the process comes from its documentation and then having the resulting questionnaire checked by experts in the process to find issues.

Generally, MUVE was considered simple to use. In the first organization it was applied by one of the authors, who was not an expert in the process under evaluation, using only the available documentation as information source. In the second organization it was applied by one of its members, after a brief explanation about the approach.
7 Conclusions and Future Work

The problem of ensuring the “social sustainability” of business processes, as opposed to a mere interest in their functional goals, seems to be largely unexplored. Our literature review returned scarce results, especially when looking for systematic approaches to address the issue. So, we have proposed an approach, called MUVE, that looks for causes of friction that may lead to a process being ignored or generally be seen as a burden rather than valuable orientation and support for everyday work. The participants are involved in unearthing the process pain points that afflict them, so that a revision that they’ll willingly follow can be reached. MUVE can be mastered in a matter of hours. It can be applied recursively, starting from a high-level process and moving down to its tasks (sub-processes) that show cause for concern. So far, it was applied in two distinct organizations, which provided positive feedback and revealed intentions to use it again in the future. In both cases, it confirmed existing suspicions about latent problems and rooted unknown new issues. Future work will focus on the following avenues: (1) exploring the use of aliases by the respondents (known only to them). This will enable us to analyse the longitudinal evolution of the answers of specific aliases without sacrificing the anonymity of the users, which, in turn could compromise the sincerity of the answers and hinder the identification of process issues. We appreciate this suggestion, made by one of the reviewers; (2) exploring ways to associate a dollar amount to value and effort in MUVE, to find out the financial impact and justify investment decisions to improve identified issues; and (3) assessing the relevance of including motivation factors related with social responsibility and its emotional implications. Seidel et al. (2010) identified the importance of this factor, since people are increasingly aware of the need to contribute to environmental and social sustainable practices. Naturally, we plan to test MUVE in new contexts. A third organization – from the telecommunications sector – has already shown interest this type of evaluation.

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