Extending the Boundaries of Business Process Management: 
From Operational to Creative Business Processes

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Abstract. In very recent times, organisations are starting to shift their focus from highly standardised operational business processes (BPs) to other types of processes that cannot be easily replicated due to the knowledge, skills and creativity of people involved. The paper introduces the knowledge dimension of creative BPs and uses it to illustrate why the existing BP Management (BPM) and collaborative systems are not suitable to support these knowledge intensive processes. The paper argues that, in the case of creative BPs, process support needs to co-evolve with process execution itself through the accumulated experience.

Keywords. Business Process Management, Knowledge Management, Creative Processes

1. Introduction

In recent times, the field of Business Process Management (BPM) is becoming increasingly recognised as an established field of applied research and practice.”The BPM discipline employs methods, policies, metrics, management practice and software tools to discover, model, simulate, execute, analyse, optimize and govern ongoing adjustments to processes toward the goal of improving business agility and operational performance”[3].

While looking for new opportunities for competitive differentiation, organisations are now shifting their focus from transactional, operational BPs to other types of processes that cannot be easily replicated by the competitors. Their key ingredients are human knowledge, experience and creativity that cannot be standardised, prescribed and easily acquired. This in turn, creates the need to support these knowledge-intensive processes in a way that would not restrict and stifle human creativity.

However, this need is yet to be met by the commercial BPM systems, as they are still best suited to support highly structured, repetitive BPs. In fact, the control-flow oriented coordination paradigm remains the most dominant in both research and commercial world of BPM. Even when more flexibility is provided by, for example, adaptive and dynamic workflow systems, these systems still focus on transactional BPs at the operational level.

Furthermore, in order to determine if a particular BP should be supported by BPM technology, encouraged by vendors, users tend focus on process structure rather than its knowledge component. However, this approach fails, the moment one starts to look beyond operational BPs. For example, some processes may appear to be highly structured at the coarse level of granularity, in terms of their individual tasks and the control-flows between them. In some cases, most (if not all) of their tasks are also known in advance even their inputs and outputs. For example, in the case of a highly creative BP “Marketing a new product”, the same set of coarse-grained tasks is followed each time a new product is launched (benchmarking competitors, deciding pricing strategy, planning promotions, etc.). Other typical examples include design processes in different organizational environments (e.g. design of new product, design of a new program or course curriculum etc.). These processes are still classified as BPs as they contribute to business value creation. Their business value is directly related to knowledge and skills of process participants. In essence, these are knowledge intensive, creative BPs.

It is important to observe that creative BPs are often collaborative, by nature. Even though, they may appear as highly structured at the coarse level of granularity, at the finer level each individual task consists of a number of individual
and collaborative tasks that unfold, very often, unpredictably. However, they cannot be effectively supported by the existing collaborative systems.

The main objective of this paper is to investigate creative BPs from the knowledge perspective. Although there are many different types of BPs that are, or should be classified, as creative, we focus on processes that appear to be more-or-less structured at the coarse, but unstructured, at the finer level of granularity. They are different from the so-called emergent BP [7], such as long-term planning at the strategic level, or crisis-management processes, where even the high-level process structure is never known in advance.

The paper introduces the knowledge dimension and uses it to further distinguish creative from operational BPs. It then critically analyses the existing BPM and collaborative systems, currently used to support different aspects of BPs. Based on this analysis, the paper argues that, in the case of creative BPs, process support co-evolve with process execution itself through the accumulated experience. This finding has very important consequences for the traditional Information Systems (IS) development methodologies, such as System Development Life Cycle (SDLC). Thus, when developing a possible support for creative BPs, SDLC is no longer suitable, as the user requirements cannot be specified upfront. This, in turn, creates a case for a much better synergy of BPM, CSCW Computer Supported Collaborative Work (CSCW) and Knowledge Management (KM) fields.

2. The knowledge perspective of BPs

Creative BPs can be found in many different domains. Examples include design of a marketing strategy for a particular product, curriculum design for a new postgraduate program, collaborative software development and a process of collaborative problem solving. Case studies of these examples of creative BPs, conducted by the author in different organisational settings, have confirmed that, in order to understand their real business value of these processes, one needs to understand their knowledge dimension, rather than their structure.

As a starting point, this paper adopts the basic concepts of explicit and tacit knowledge. Explicit knowledge can be written down or drawn and easily described to other people, who share the same context. Consequently, it can be organised, distributed and managed by technology. Good examples of explicit knowledge are various organisational policies and procedures used to prescribe how things „should be done“.

On the other hand, tacit knowledge are things known by people that cannot be easily documented such as the know-how, understanding mental models and insights of an individual or disciplines [1]. Very often, tacit knowledge is very difficult to communicate but could be externalised to some degree through problem solving and “working things out”. Externalisation of tacit knowledge in an organization results in development of organisational practices.

In reality, all business processes combine, to some extent, both procedures and practices (i.e. the explicit and experiential knowledge). Figure 1 depicts the theoretical framework that can be used to describe the knowledge dimension of different types of business processes. This is an extension of the framework that was originally introduced by [7].

![Figure 1. Knowledge dimensions of BPs](image)

As illustrated by the above figure, in the case of highly repetitive, operational BPs their procedural component is much more prominent. Among other things, the procedural component defines the process structure i.e. individual tasks and their order. In fact, in order to design BPM solutions, technology developers do rely on standardisation and predictability of organisational procedures, often expressed as business rules. This is the main reason why the existing solutions still remain the most suitable for the operational business processes. In the
case of operational BPs, the main emphasis is placed on speed, quantity (no. of transactions) and control via standardised procedures.

On the other hand, in the case of creative BPs their the practice component of is much more prominent. Here, people develop new experiential knowledge while participating in collaborative creative tasks and problem solving activities. The explicit knowledge comes in the form of policies that are used to define rights and responsibilities of participants rather than prescribe process structure. “Consider an international bank – everyone would agree that the teller should not get creative with bank drafts. Tellers have very strict procedures (and systems) for handling money directly. On the other hand, try applying a rigorous procedural approach to those developing new trading instruments or those managing the bank’s largest corporate customers. They would rebel if everything they did fit within rigid computerised procedures developed beforehand” [8].

Case-handling BP also combine procedures and practices. Here, the experiential knowledge consists of various practices people develop while handling non-standard cases of customer-facing BPs. These BPs are out of the scope of this paper.

The introduced knowledge dimension can be used to further analyse different characteristics of creative BPs and distinguish them even more from operational BPs. Thus, in the case of an operational BP, almost all its aspects can be considered as the explicit knowledge. This includes a process models, its coordination aspect (including the order and timing of individual tasks), organisational policies and procedures governing the execution of individual tasks as well as models of completed instances. This is why it is possible do predefine process models and automate process coordination. While some BPM systems still require all possible exception handling procedures to be prescribed, in recent times organisations are starting to recognise the value of experiential knowledge developed through exception handling. For example, Stein and Zwas [10] argue that the core competencies of an organisation are derived from the episodic knowledge (contextually situated decisions and their outcomes) rather than semantic knowledge that is widely available in organisation.

On the other hand, creative BPs involve components that are predominantly experiential rather than explicit knowledge. For example, coordination among fine-grained tasks is completely human driven and cannot be predefined. Thus, participants decide when and how to proceed. Although this knowledge cannot be ever entirely captured, some aspects could be documented, preserved and reused to promote organisational learning. However, current research from the KM field confirms that a widespread approach to document and store organisational best practices more often than not fails [5].

3. The existing process support systems

This section offers a critical analysis of two popular types of process support systems. The main objective is to illustrate why they cannot be used to support creative BPs.

3.1. The existing BPM systems

The existing BPM systems are designed to support a BP lifecycle of as follows:

- Modelling and verification: Most, if not all, of the existing BPM systems provide support for BP modelling. They also provide various levels of support for structural and temporal verification of BP models. In essence, BPM systems require the whole model to be predefined and stored in the model repository before it can be used. It is important to observe that BP models are typically designed by BP analysts rather than end-users (people who actually perform these processes). This practice raises some important issues related to domain (experiential) knowledge held by end-users rather than analysts. For example, practice confirms that the so called “shadow” BPs often occur as the result of over-prescriptive but inefficient models (for an example see [4]. At the same time, the existence of operational procedures, used to prescribe process execution, makes BP modelling possible for non-domain experts (e.g. workflow analysts).

- Execution of BP instances: BPM systems that do support both modelling and execution phases, clearly separate design of BP models from execution of BP instances. Thus, during the execution (run-time) phase, an event (e.g. customer submits an application) is used to activate a new instance of an existing BP model that has been previously stored in the process repository. A coordination mechanism (such as for example workflow engine) is then used to
automatically schedule individual tasks and make them available to the right participants at the right point of time (based on their roles in the process) along with the resources required to complete these tasks.

- **Monitoring and modification**: BPM systems that support execution of pre-defined BP models, typically provide a set of monitoring tools that support, to some extent, management of business process performance. Thus, participants with the right privileges can monitor execution of current instances (e.g. its current tasks, resources used etc.) as well as make some process-related predictions, based on the current values of various parameters (e.g. this instance will take 2 more days to complete).

The existing BPM systems still offer very limited support for exception handling, in the case when the running instance departs from the pre-defined model. Recall that the exception handling procedures help employees build process-related experiential knowledge, even in the case of very routine, highly repetitive operational business processes. However, even the most popular BPM systems such as workflows, are still very inflexible when it comes to possible exception handling due to the fact that their coordination mechanism uses a pre-defined BP model. New developments in the area of rule-based and policy-based models of BPs are likely to offer more flexibility. However, so far, they remain focused on BP structure.

- **Analysis of the accumulated process-related experience**: The existing BPM solutions still offer very limited support for the analysis of the accumulated process-related experience. Possible approaches include process mining of the completed BP instances.

The above analysis makes it clear that the existing BPM systems (e.g. workflows) remain highly suitable for operational processes that can be predefined and that are, by nature, repetitive and well structured. For example, suppose that one is interested to use the previously described BPM system to support a creative BP called “Marketing a new product”. As already pointed out, in terms of its high-level (coarse-grained) structure, this process is very simple. If this particular process is to be executed by workflow technology, these high-level tasks would be executed one after another. Obviously, this would not add any value to process participants. At the same time any attempt to pre-specify the model at finer level of granularity would be equally ineffective. Similarly, process monitoring would not offer anything new to participants apart from the information that a particular task is currently active. Most importantly, a strict linear execution of process tasks would be very inflexible. In creative BPs participants often move forward and backwards through the process, returning to previous tasks and moving forward in an iterative fashion. Even more, in some instances, it is even very difficult for the participants to determine the exact “high-level task” they are currently in [11]. Process modelling and execution are highly intertwined.

The above analysis confirms that the widely used model of BP lifecycle, does not apply to creative BPs.

### 3.2. Collaborative systems

Collaborative systems are typically categorised on the basis of the space/time dimension into applications that support same/different time and same/different place collaboration. Examples include Groupware, CSCW and GDSS systems. In this paper we use a generic term collaborative systems.

When these systems are analysed from the process perspective, it is possible to observe that most of them are designed to support what is, in fact, a high-level problem solving process. Typically, they provide tools for information gathering (e.g. electronic brainstorming), information organisation, analysis of different alternatives (e.g. alternative analyser, stakeholder analyser etc.), selection and evaluation of possible solutions (actions), as well as tools for collaborative writing and report generation. In essence, these are high-level problem solving tasks, independent from the context of a particular problem that needs to be solved. Consequently, these systems can be effectively used in many different problem-solving scenarios. Therefore, the concept of a “task” is very different than in creative BPs as previously discussed.

Collaborative problem solving sessions are prepared and guided by an experienced facilitator, usually in collaboration with the group leader and other participants. During the preparation phase, facilitator creates a session agenda that is in fact, a high-level model of a collaborative problem solving process. Even though the high-level model may be the same for different sessions, the actual execution of high-level tasks will be different in each session.
Thus, the same tools will be used in different ways and in different contexts.

While participants have domain knowledge that facilitator may or may not have, facilitator’s experience and skills are considered crucial for coordination of individual collaborative efforts. Therefore, from the process perspective it is possible to observe that during the actual execution of a collaborative process, the facilitator is in fact in charge of coordination of different tasks. Thus, the coordination component is human-driven.

Even though collaborative systems typically log data generated during collaborative sessions, the purpose of this form of “process log” is very different from process logs in typical BPM systems. Here, session logs are used to support the reflection phase of the problem solving process, describe the action plan in more details or serve as “organisational memory” used to provide continuity between different sessions.

When it comes to possible support for creative BPs, collaborative systems can only be used to support some aspects of these processes. First of all, a model of problem solving process supported by collaborative systems is considered to be at much higher level of granularity than the one used by creative BPs. Also this model does not always follow the same problem-solving “pattern”. Furthermore, even though creative BPs do involve human-driven coordination as collaborative problem-solving processes, this coordination requires the experiential domain knowledge and cannot be easily delegated to an external facilitator.

At the same time, creative BPs could have tasks that involve some aspects of collaborative problem solving (e.g. analysis of different alternatives). In this case, the existing collaborative systems could be used to provide such support, but only within a particular high-level task. However, it is also important to acknowledge the fact that not all problem-solving tasks are collaborative by nature and may require different type of decision support (e.g. data analysis, simulation and forecasting tools).

Finally, creative BPs involve both collaborative and individual tasks that need to be coordinated to facilitate knowledge transfer and sharing. This, in turn, also creates the need for seamless integration of different tools across different tasks by end-users rather than process specialists.

In summary, the previous analysis of typical BPM and collaborative systems confirms that none of them is entirely suitable to support creative BPs. The following section illustrates that in addition to the coordination and collaboration aspects of BPs any possible support need to take into account the knowledge aspect.

4. Supporting creative BPs

As already stated, almost all aspects of creative BPs are, in fact, experiential knowledge. Coordination and collaboration patterns emerge as people progress though the process. Fine-grained BP models emerge during process execution and are intertwined with process instances. These high-level models indicate different phases of process execution that could be used to, for example, determine different skill sets required for each coarse-grained task.

Looking from the process perspective, it is possible to observe that the main objective of process support shifts from coordination and scheduling of tasks to situated-decision making by individuals as well as groups. In this process, selection of the most appropriate tools for each fine-grained task needs to be left to domain experts. This means that selection of tools, their combination and possible use also become experiential knowledge as people learn from the experience which tool to use and how and when to use it. Consequently, it is possible to conclude that process support co-evolve with the process itself. This process of co-evolution ensures that tools are not prescribed and then used to restrict participants in the process. From the process perspective, this opens yet another challenge of ad-hoc, seamless integration of different tools that needs to be user-driven.

The fact that creative BPs involve predominantly experiential knowledge means that it is necessary to consider the associated knowledge management processes – creation, sharing, transfer and application of the acquired experiential knowledge. These knowledge processes need to be the main focus of BPM in the context of creative BPs. In other words, BPM should be guided by these knowledge processes rather than BP Lifecycle. But, at the same time it is important to take into account lessons learnt in the KM field, where researchers and practitioners have dealt with the problem of documenting, reusing and transferring of best practices (experiential knowledge) for the past two decades. Here, the latest KM research confirms that the wide-spread approach to use technology to capture, codify, store and then transfer (send)
this knowledge to a user is very likely to fail [5]. The fundamental problem here is in the underlying, mechanistic information-processing model called the Technology-Push Model of KM [6]. This widely used model assumes that technology is best used to “push the right knowledge to the right people at the right point of time”. However, as Newell et al. [9] pointed out, these KM systems obscure and deny the socially constructed nature of knowledge.

The above analysis confirms the relevance of the emerging “Strategy-pull model of KM” as proposed by [6]. Essentially, “this model embodies organisational processes that seek synergistic combination of data and information-processing capacity of information technologies and the creative and innovative capacity of human beings” (pg. 15). In the case of creative BPs, knowledge and action are integrated through the processes of sense making, decision making and reflection. “This is why the codification process for the richest tacit knowledge in an organisation is generally limited to locating someone with knowledge, point seeker to him/her and encourage them to interact”[2]. In the case of creative BPs this means that any possible support need to include various knowledge management strategies to identify and nurture self-organised communities of practice to facilitate sharing and reuse of experiential knowledge via human interaction. Only in this way, BPM can leverage organisational knowledge to create better business value [4].

5. Conclusions and future work

Research described in this paper confirms that in order to understand creative BPs and how they differ from other types of BPs, it is necessary to analyse their knowledge dimension. These BPs involve predominantly experiential rather than explicit knowledge. This paper argues that, in the case of creative BPs, any process support needs to co-evolve with process execution itself and therefore can be also considered as experiential knowledge, acquired though reflection-in-action. Our future work in this area includes further investigation of possible synergy between creative BPs and the “Strategy pull model of KM”[6], via more exploratory case studies in different domains and organisational settings. This research is expected to create new frameworks and tools to support organisations to better support and leverage their creative BPs.

6. References