Evaluation of a Classification System for Best Practices

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Abstract

The practical problem addressed in this paper is that it can be problematic to find appropriate best practices (BPs) in a large collection of BPs, covering many different domains, within an organizational database. Our goal was to propose a classification system of BP documentation to facilitate effective use and retrieval of BPs documents in such a large collection of BPs, independent of any domains. We have designed such a domain independent classification system and evaluated it with practitioners and academic experts. We found that all the BP characteristics and labeled values in the proposed classification system were recognized and applied by practitioners as well as academic experts. However, it turned out that some of the characteristics were particularly useful. These characteristics were: implementation area, level of formalization, completeness of description, Balanced Scorecard perspectives, and management process.

1. Introduction

Nonaka and Takeuchi [1] emphasized the importance of maintaining organizational knowledge by converting tacit forms of knowledge into explicit forms and presenting a model to formalize employees’ thoughts. Currently, many international organizations still face difficulties related to the means of presenting and organizing knowledge documentation in order to facilitate find-ability, usability, share-ability and lifecycle management [2]. Hence, having a system that enables practitioners to easily find appropriate knowledge, should minimize the ambiguity when searching for appropriate knowledge. This will also link practitioners with the knowledge content, and facilitate retrieval and selection of knowledge.

In this paper, the focus is on organizational knowledge in the form of best practices (BPs), which we view as taking advantage from previous practices and experiences to define feasible ways to conduct activities and solve a problem.

For the last two decades, facilitating search for BPs has been a popular topic for researchers and practitioners [3]. The practical problem addressed in this paper is that it can be problematic to find appropriate BPs in a large collection of BPs, covering many different domains, within an organizational database.

The goal of this paper is to propose and evaluate a classification system of BP documentation to facilitate effective retrieval of BPs documents. The system is intended for organizations that are interested in indexing, storing and retrieving large quantities of BPs of different domains. Therefore, the scope of this paper is domain independent classification of BPs documents.

The classification system will support users to find appropriate BP and navigate BP description very easily. The classification system can also save employees time and effort to read BP documents because of the clear structure of organizing knowledge content. Moreover, having a standard classification system will enhance the quality of a large collection of BP documents in other ways as well. First, this standard classification system will present a holistic view of the organization since it can be applied on different BPs in different departments. Second, the system can minimize the difficulties of relating BPs to each other, since the characteristics and values of the classification system can be used for that. Third, the classification system will play an important role for BP provisioning in organizations when keeping the description of BP categorized, for lines of compliance purposes.

Researchers suggested that BP systems should be pertinent to an organization’s core business [4, 5]. Furthermore, several studies, including, [2, 6, 7, 8] focus on suggesting a system to classify BPs. These studies confirmed that the positive impact of such classification systems is geared toward organizing and retrieving of knowledge. However, these studies do not quite lend themselves to the capturing and harnessing of essential elements of BP on a domain independent level. This limitation is addressed by the classification system presented in this paper.

The rest of the paper is organized as follows section 2 presents research methodology and section 3 deals with the designed tentative artifact. Section 4 presents the refinements of the artifact, while section 5
addresses artifact evaluation. Then, findings follow in section 6 before the conclusion, which is section 7.

2. Research methodology

The research methodology used in this study is design science. Hevner et al. [9] rooted design science in engineering disciplines where a researcher aims at creating a novel artifact for solving practical problems. Furthermore, an artifact needs to be a generic solution to be qualified as a design science solution [10]. This means that the artifact needs to solve the problem in many different organizations. Design science is characterized by the design of artifacts that can be methods, models, constructs, frameworks, prototypes or information technology (IT) systems. In this paper, the artifact is a classification system of BPs.

Hevner et al. [9] highlighted the importance of evaluating a designed artifact, that is, evaluating the artifact’s ability to solve a practical problem. This is a challenging issue, since an artifact has to be applied and evaluated to determine if the artifact has solved the problem at hand.

The main evaluation strategies in design science are ex ante and ex post evaluation strategies [11]. Ex ante evaluation indicates that the artifact is evaluated without being used in an organization, while ex post evaluation, requires the artifact to be applied in an organization. An ex ante evaluation often uses interviews, where users provide feedback on the artifact. In the research presented in this paper, an ex ante evaluation has been carried out. The focus of the evaluation was how the artifact is effective in facilitating retrieval of BPs.

We adopted the process of Peffers et al. [12] for design science. The process includes the following activities:

1. Identify problems and motivation, which in this paper is related to the difficulties within an organization to find appropriate BPs in a large number of BPs covering many domains. The solution is an artifact in the form of a BP classification system.

2. Define objectives of a solution, which in this paper is defined as necessary requirements on the artifact, specifying how the artifact solves the business problem. These requirements will guide the design of the artifact and form a basis for evaluation. The requirements in this paper are that the artifact (1) should be easy to apply when annotating the BPs within an organization, (2) should be applied to all types of BPs, and (3) should be domain independent. The requirements also include whether the artifact can facilitate access of BPs, that is high BP (4) recall and (5) precision.

3. Design and develop, which in our research include the development of a tentative and final artifact. We first developed a tentative artifact, described in [13]. The tentative artifact, that is a BP classification system, was based on an in-depth literature survey resulting in the use of 26 reference articles. We identified 7 characteristics with possible values for each characteristic, formed the BP classification system. However, we did not present other characteristics that occurred in the reference articles. The final artifact, presented in this paper, tackles this issue and designs a BP classification system with all relevant characteristics and values that can manage and support a classification system.

4. Demonstration, which requires the use of the artifact in a real-life case to prove its feasibility. We applied the final artifact to organizations.

5. Evaluation, which assesses how well the artifact solves the practical problem while taking into account the requirements. We evaluated the final artifact with practitioners and experts to assess the requirements on the artifact. We asked them for their suggestions, feedback and contributions.

6. Communication, which requires communication of the study carried out to and by both researchers and organization’s experts in a scientific published paper such as this.

3. The tentative artifact: the BPs classification system

In this section, we describe the developed artifact, which is a BP classification system that consists of a set of BP characteristics, and possible labeled values for each characteristic. To design the BP classification system, we first conduct a literature study [13]. The researchers adopted five steps to conduct literature review as described by Creswell [14]. These steps are:

1) Identifying keywords. The keywords were best practice, knowledge management, best practice framework, best practice system, and best practice model in all combinations.

2) Locating sources of relevant literature. The review process involved selecting databases with e-resources that included international conferences and journals related to knowledge management. The e-resources selected were Association for Information Systems Electronic Library (AISeL), ACM Digital Library, ScienceDirect (Elsevier), Wiley, SpringerLink, Emerald and IEEE Xplore.

3) Critically evaluate the literature. In this step, articles in the e-resources with relevant titles and keywords were evaluated based on the presence of a
BP system, BP framework, BP model within the abstract. In order to collect relevant articles, the articles should answer the search question: does the paper present a framework, model or system for BPs and does it provide aspects that are relevant for such a framework, model or system? This resulted in 102 articles.

4) Organizing the literature. In order to select the most relevant articles, we reviewed the content of the articles to identify BP characteristics, assess the usefulness of existing studies, and explore an opportunity for improving past BP systems/frameworks/models in order to introduce an opportunity for building a new classification system. The result of the literature review was 26 reference articles.

5) Writing a literature review. From the 26 reference articles, we selected general characteristics for the classification system of BP. These BP characteristics and their possible annotated values designed the tentative artifact i.e. classification system. The characteristics of the BP system were 1) degree of cooperation 2) organizational level, 3) scope, 4) completeness of description, 5) degree of quantification, 6) implementation areas, 7) level of formalization. The characteristics were defined as well as their possible values, as described in Table.1.

Table. 1 Synthesized classification system (adopted from [13])

<table>
<thead>
<tr>
<th>BP characteristics</th>
<th>Values</th>
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<tbody>
<tr>
<td>Scope means the area or extension that the BP focuses on</td>
<td>Global Enterprises means that the BP focuses on issues related to a multinational organization.</td>
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<tr>
<td></td>
<td>Local Enterprises means that the BP focuses on issues related to a national, regional or local organization.</td>
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<tr>
<td></td>
<td>Department of Enterprise means the BP focuses on issues related to specific work related tasks within a department.</td>
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<tr>
<td>Organizational level means the level in an organization that the BP focuses on</td>
<td>Strategy means that the BP focuses on more overarching strategic long-term goals, such as which markets, products and customers to focus on.</td>
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<tr>
<td></td>
<td>Tactical means that the BP focuses on tactical short-term goals, that is, goals related to resource allocation.</td>
</tr>
<tr>
<td></td>
<td>Operational means that the BP focuses on a particular operational routine or business process.</td>
</tr>
<tr>
<td>Implementation area means the area where the BPs is aimed to be applied in</td>
<td>Management Area means that the application area of the BP is geared to upper-management and organizational leadership and governance.</td>
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<tr>
<td></td>
<td>Business Area means that the application area of the BP includes some kind of business processes, but not processes related management, leadership and governance.</td>
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<tr>
<td></td>
<td>Technical Area means that application area of the BP is technical.</td>
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<tr>
<td>Level of Formalization means the level of</td>
<td>Formal means that the BP has the form of a formalized procedure which needs to be followed in detail and which, therefore, might</td>
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<td>be embedded in IT implementation of BPs, such as Enterprise Resource Planning or Business Process Management Systems.</td>
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<td></td>
<td>Semi-formal means that the BP has the form of directing functional considerations, i.e. guidelines and business rules, for example, via established organizational procedures or expressed in official documents that are sometimes checked.</td>
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<td></td>
<td>Informal means that the BP has the form of soft, informal suggestions.</td>
</tr>
<tr>
<td>Completeness of Description means that the BP description either contains necessary context for using the BP or not</td>
<td>Complete with Context means that the description of the BP contains the context (that is, when to apply, where to apply, who applies it, and how to apply), which makes it possible for the user to apply the BP without being familiar with the context.</td>
</tr>
<tr>
<td></td>
<td>Basic Parts means that the description of the BP only contains basic parts, such as how to apply it, which requires that the user of the BP must be familiar with the context in order to know how to apply it.</td>
</tr>
<tr>
<td>Degree of Quantification means the type of measures assigned to the BP</td>
<td>Qualitative Measures means that interpretive, soft measures are assigned to practices.</td>
</tr>
<tr>
<td></td>
<td>Quantitative Measures means that numerical, hard, values are assigned to practices.</td>
</tr>
<tr>
<td></td>
<td>Mixed Measures means that both soft and hard measures are assigned to practices.</td>
</tr>
<tr>
<td>Degree of Cooperation means the BP focuses on either increase competitive edge or increase collaboration</td>
<td>Competitive means that the BP focuses on making a practice, a product, or a service more competitive.</td>
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<tr>
<td></td>
<td>Collaborative means that the BP focuses on collaborative knowledge sharing for creativity and ingenuity/innovativeness.</td>
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</tbody>
</table>

Then, we initially evaluated the classification system of BPs by applying the classification system to a collection of 20 BP descriptions from IT, manufacturing, and public organization. The study, presented in [15], presented the synthesized classification system to students of knowledge management at master’s level at the Department of Computer and System Sciences at Stockholm University. This study resulted in verifying that all characteristics and values identified in the literature study could be used when classifying BPs. The study also resulted, after comments from the students applying the classification system, in adding one value regarding the Scope of characteristics of BPs. This value was named departmental enterprise, which was defined as focusing on specific work-related tasks within a department.

This paper is an extension of the previous studies presented in this section, that is, the studies presented in [13] and [15]. In these studies, we included only the BP characteristics that occurred in all of the 26 reference articles. However, in this study we also include relevant characteristics that occurred in at least one article. A BP characteristic was deemed relevant if it fulfilled any inclusion criteria and was not excluded by any exclusion criteria, as presented and discussed in the following section.
4. Artifact refinement

In this section, we refine the tentative artifact and develop the final artifact. This final artifact is not presented in [13]. In order to enhance the quality and completeness of the tentative artifact, we went back to our 26 reference articles to select general features for the classification system, which correspond to the fifth step of Creswell [14], that is, writing a literature review. We decided to identify another inclusion and exclusion criteria to guide our selection of BP characteristics, see Table 2.

Table 2. Inclusion and exclusion criteria.

<table>
<thead>
<tr>
<th>Inclusion criteria</th>
<th>Exclusion criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elements and features that are focused on representing, saving and indexing BP. This can facilitate reusability and retrieval of BPs.</td>
<td>Elements and features that are specified on a particular organizational sector.</td>
</tr>
<tr>
<td>Elements and features that are focusing on presenting generic parts of BP that can be applied to all types of practices and not just a particular type.</td>
<td>Elements and features that are focused on infrastructure requirement.</td>
</tr>
<tr>
<td>Elements and features that are focused on organizing, managing and classifying a large number of BPs. This can facilitate the ability for practitioners to quickly find appropriate and relevant BPs.</td>
<td>Elements and features that are focused on technical support to classify BP.</td>
</tr>
<tr>
<td>Elements and features that are focused on improving the retrieval performance of BPs. This can provide a positive integration between the objective of each practice and the classification system.</td>
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</table>

We reviewed the 26 reference articles in order to identify BP characteristics. The identified characteristics were also labeled with possible values from the articles. Within the following we presented the BP characteristics and possible values:

A. Process area means the process area that the BP focuses on supporting. We found the following values for process area characteristics (including articles in which the values were found):

1. **Internal Process** means that the BP focuses on supporting processes related to human resource, finance and accounting, and manufacturing [16, 17, 18, 19].
2. **External Inbound Process** means that the BP focuses on supporting processes related to supply chain management and logistic [3, 20].
3. **External Outbound Process** means that the BP focuses on supporting processes related to marketing, customer services, and sales [6, 7, 8].

B. **Balanced Scorecard (BSC) Perspective** means the BSC perspective the BP focuses on. We found the following values for BSC perspective characteristics (including articles in which the values were found):

1. **Learning and Growth Perspective** means that the BP focuses on supporting infrastructure for long-term learning, growth and improvement [8, 21, 22].
2. **Internal Business Processes Perspective** means that the BP focuses on supporting efficiency of business processes of an organization [6, 19, 21, 23].
3. **Customer Perspective** means that the BP focuses on fulfilling the customer satisfactions and needs, i.e. focuses on the value proposition [7, 21, 24, 25].
4. **Financial Perspective** means that BP focuses on increasing revenue and reducing cost and risks [21, 22].

C. **Management Process** means the management process that the BP focuses on supporting. We found the following values for management process characteristics (including articles in which the values were found): The names of the management processes 1-9 below have been also inspired by Hamel and Breen [26]:

1. **Authorization Process** means that the BP focuses on supporting the management process where the actors authorized to carry out an activity are specified [6, 17, 22].
2. **Information Distribution Process** means that the BP focuses on supporting the management process where information needed to carry out activities are distributed to the actors allocated to these activities [3, 20, 23, 27].
3. **Resource Allocation Process** means that the BP focuses on supporting the management process where actors and other resources are allocated to work activities [23, 28, 29].
4. **Accountability Allocation Process** means that the BP focuses on supporting the management process where actors accountable for an activity are specified [30, 31].
5. **Planning Process** means that the BP focuses on supporting the management process where the activities/tasks are planned and ordered [20, 30, 31, 32].
6. **Monitoring Process** means that the BP focuses on supporting the management process where execution of the process is monitored for problems and deviations from the plan [23, 24].
7. **Controlling Process** means that the BP focuses on supporting the management process where actions are taken to address execution problems and plan deviations [3, 7, 23].
8. **Evaluation Process** means that the BP focuses on supporting the management process where process performance and the quality of results are evaluated [18, 20, 29].
9. **Rewarding Process** means that the BP focuses on supporting the management process where rewards
are distributed based on excellence in performance [29, 33].

10. Development Process means that the BP focuses on supporting the management process where artifacts, such as IT systems, methods, devices, etc. are developed [6, 8, 30].

11. Maintenance Process means that the BP focuses on supporting the management process where artifacts, such as IT systems, methods, devices, etc. are maintained [21, 23, 24].

12. Education Process means that the BP focuses on supporting the management process where employees and business partners are educated [7, 18, 29, 32].

The final artifact is presented in Table 3.

Table 3 BP classification system (i.e., final artifact)

<table>
<thead>
<tr>
<th>BP characteristics</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scope</td>
<td>Global Enterprises, Local Enterprises, Department of Enterprise</td>
</tr>
<tr>
<td>Organizational Level</td>
<td>Strategy, Tactical, Operational</td>
</tr>
<tr>
<td>Implementation area</td>
<td>Management Area, Business Area, Technical Area</td>
</tr>
<tr>
<td>Level of Formalization</td>
<td>Formal, Semi-formal, Informal</td>
</tr>
<tr>
<td>Completeness of Description</td>
<td>Complete with Context, Basic Parts</td>
</tr>
<tr>
<td>Degree of Quantification</td>
<td>Qualitative Measures, Quantitative Measures, Mixed Measures</td>
</tr>
<tr>
<td>Degree of Cooperation</td>
<td>Competitive, Collaborative</td>
</tr>
<tr>
<td>BSC Perspective</td>
<td>Learning and Growth, Internal Business Processes, Customer perspective, Financial perspective</td>
</tr>
<tr>
<td>Process area</td>
<td>Internal process, External inbound process, External outbound process.</td>
</tr>
</tbody>
</table>

5. Design of artifact evaluations

In order to evaluate the final artifact, we conducted interviews with academic experts and practitioners in the area of BP. Hence, we applied purposive sampling methods, which allowed us to get the best information through focusing on some selected attributes for the prospective interviewee. These attributes are:

1. The interviewee should be either an academic expert or a practitioner from business or IT domains. He/she should be interested in knowledge management.

2. The interviewee should have at least two years work experience in the same organization with involvement in different projects.

For each of the interviews, we presented the practical problem that the artifact aimed to address and the goal of the artifact. Then, we presented the artifact that consists of BP characteristics and possible values accompanied with a full description of each feature. The interviewees needed to assess the following requirements of the artifact: easy to annotate, applicable to any BP and domain independent as well as whether the artifact facilitates high BP recall and precision. The interviewees were asked to assess each value’s level of importance for the three former presented requirements by using a Likert scale with values represented in Yes, Maybe, and No. After the assessment of the BP classification system, we asked the interviewees 11 semi-structured questions about the system. The questions were related to their overall opinion of the system, to evaluate, in their opinion, benefits and drawbacks, and to their suggestions for addition or removal of some of the characteristics. Furthermore, the interviewees needed to address questions about whether or not the artifact addressed the practical problem and fulfilled its stated requirements (i.e., if it is easy to annotate, applicable to any BP, and domain independent). The interviewees were also asked whether it could facilitate high BP recall and precision.

The results of the assessment and feedback from practitioners and academic experts are presented below:

- **Interview 1:** We carried out an interview with a practitioner in a global IT organization. He is a technical manager in the area of information systems (IS), and knowledge management (KM). This interviewee has also been responsible for applying BPs in the knowledge base in a large organization in Sweden. After introducing the artifact, he affirmed (i.e., answered “Yes”) the requirements on the following values: department of enterprise, complete with context, semi-formal, internal process, and information distribution process. He also did not affirm (i.e., answered “No”) the following values: basic parts, collaborative, financial perspectives and education process.

- **Interview 2:** With an academic expert in IS and a lecturer in KM for graduate and undergraduate
students. She had some practical experience in designing BPs for a global organization. After introducing the artifact and artifact’s requirements, she affirmed the following values: strategy, quantitative measures, accountability allocation process, planning process, controlling process, and evaluation process. She supported the need for the classification system and her response for the assessment ranged between yes, maybe and no regarding our requirements for each value.

. **Interview 3:** We interviewed an academic expert in IS. He affirmed the following values: strategy, tactical, operational, management area, business area, technical area, formal, semi-formal, informal, qualitative measures, quantitative measures, and mixed measures. He did not affirm the following values: internal process, external inbound process, and external outbound process. He positively answered “Yes” for having the management process and affirmed these requirements: easy to annotate and domain independent. Also, regarding management process he suggests “Maybe” for all values related to applicability to any BP.

. **Interview 4:** The fourth interview was carried out with a practitioner in a global IT organization. He is a project manager and his tasks are related to KM. He affirmed the following values: monitoring process and evaluation process. All other values were ranging between Yes, Maybe and No without any value that he did not affirm totally regarding all three requirements by the expert.

. **Interview 5:** With an academic expert in IT management. He affirmed the following values: learning and growth, internal business processes, customer perspective, financial perspective, resource allocation process, accountability allocation process, planning process, monitoring process, controlling process, evaluation process, rewarding process, education process. He did not affirm the following values: global enterprises, local enterprises, informal, and qualitative measures.

. **Interview 6:** With an academic as well as practitioner expert in KM. His research interest focused on KM, institutionalization processes and cross-cultural management. He also worked as Training Department Manager for a global manufacturing organization where he had developed a growing interest for KM issues. According to him, most of the values were ranging between fully affirmed and maybe while he stresses the importance of having the perspective of BSC within the artifact. However, he did not affirm the global enterprise since it depends on language issues and culture.

. **Interview 7:** With an academic expert in IS and a lecturer of KM for more than five years. She affirmed the following values: operational, formal, semi-formal, complete with context, quantitative measures, financial perspective, authorized process, accountability allocation process and maintenance process. She did not affirm these values: strategy, tactical, informal, and learning and growth. She supported having the BSC perspective and management process.

. **Interview 8:** We carried out an interview with an academic expert. He had also experience from senior leadership and practice management positions across a broad spectrum of corporate and consulting organizations. He was experienced in strategic management, KM, organizational document and archives management. He affirmed the requirements for all values. He argued that his 25 years of experience made it easy to assent and affirm all the values while a regular practitioner may not have affirmed them.

. **Interview 9:** With a practitioner in Enterprise Information Management in a global organization. He is responsible for improving the way people communicate, directly or through IT by using BPs of business process management. He also plans a progressive alignment of information management related practices depending on clients’ key objectives and indicators. He affirmed the majority of the artifact values and characteristics since he saw it as a facet classification system that will be useful in business process BPs and management of them.

6. Findings

In this section, we present and discuss our findings from the evaluation of the artifact.

First, we present the interviewees’ assessment on each value of the characteristics of the artifact from each requirement’s perspective. In Table 4, the result of this assessment can be found. In the third column we present how many experts answered “Yes” for all possible values of each characteristic out of the following formula: (the total possible values of each characteristic * 9 experts). To clarify this, scope has 3 values and we multiplied these values by 9 since we conducted 9 interviewees with experts so the result is 27 times. The fourth column represented “Maybe” answers from experts out of the same former formula.

<table>
<thead>
<tr>
<th>Table.4 Assessment result for each requirement</th>
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<tbody>
<tr>
<td>BP characteristics</td>
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<tr>
<td>Scope</td>
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<tr>
<td>Organizational Level</td>
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<td></td>
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<tr>
<td>Implementation</td>
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</tbody>
</table>
Some of the characteristics are easier to annotate than others, such as the “Management process” have 85 answered “Yes” out of 108 times. Moreover, “BSC perspectives” affirmed, that is received the answer “Yes”, 23 out of 36 times, “Implementation area” affirmed 18 out of 27, “Level of formalization” and “Organizational level” affirmed 20 out of 27 and 19 out of 27 respectively. However, the assessment shows that “Process area” was not easy to annotate (affirmed only 10 out of 27). The reason for this could be that process area depends on the management perspectives of the user so a regular practitioner may find it difficult to annotate BP regarding supporting processes human resource, logistics or sales. Also, “Completeness of description” was not easy to annotate since it only confirmed 10 out of 18. The reason for this could be due to the difficulty and time consuming nature of annotating the value of “complete with context”. Hence, Interviewee 2 stressed the importance of this value. However, she argued that it is hard to apply for each BP regarding unspecified content of description that may contain when, who, where, and how to apply BP. Attention should be paid regarding how and what should be annotated.

Table.5 shows the result of the total assessment since we calculate the result of each requirement (i.e. presented earlier in Table 4) to show the total “Yes”, “Maybe”, and “No”. In regard to the requirement “Easy to annotate”, the assessment varies between affirming (answer “Yes”) or not affirming (answer “No”) this requirement. The assessment showed that the artifact in general is “Easy to annotate” (236 Yes out of 342, 64 Maybe out of 342, and 42 No out of 342). Five of the experts had a long range of experience of KM management consulting and currently academic in the KM domain. Therefore, they did not have a problem with assessing that the characteristics and their values were easy to annotate. However, other practitioners may not find it easy to annotate based on the low assessment, i.e. 42. Therefore, the classification system should allow changes and updates to happen over time. However, this might prevent having a clear structure to follow since the system gives a user a specified category and rules to follow to annotate and fill out. Regarding the requirement “Applicability to any BP”, the most interviewees assessed that the requirement was fulfilled for the “BSC perspectives” and “Implementation area” since the assessment showed that it was affirmed 24 out of 36 and 17 out of 27 respectively. On the other hand, “Degree of cooperation” (affirmed 6 out of 18) and “Process area” (affirmed 10 out of 27) were assessed not to be fulfilled by a majority of the interviewees. This is due to the values of these characteristics, which are collaborative, external inbound process, and external outbound process. However, when we asked experts at the end of the interview on whether the BP classification system can be applicable to any BP, they affirmed positively. As one expert (i.e. interviewee: 8) said “yes, I do because of the comprehensive nature of your subcategories”. This shows that the classification system is generic in its nature and can cover many domains within an organization. Hence, organizations may adapt and customize the system according to their core business process.

For the third requirement, i.e. “Domain independent”, the assessment showed that a majority of the interviewees assessed that the requirement was fulfilled for the following characteristics: “Management process” (affirmed 80 out of 108), “Completeness of description” (affirmed 14 out of 18), and “BSC perspectives” (affirmed 25 out of 36), and “Level of formalization” (affirmed 20 out of 27). However, the affirmed values for “Degree of cooperation”, “Degree of quantification” and “Process area” were 8 out of 18, 13 out of 27 and 13 out of 27 respectively. Regarding this requirement, one of the experts (i.e. interviewee: 8) stated: “I looked through many of the criteria and based on my previous experience in a number of industries, felt quite comfortable with the domain independent applicability.” Also, in total, three experts affirmed that the BP classification system is domain independent and claimed that it scopes around business process and management of business process of best practices.
The assessment shows that some characteristics are mostly affirmed for all three requirements. These characteristics are: “Implementation area”, “Level of formalization”, “Completeness of description”, “BSC perspectives”, and “Management process”. For instance, the experts affirmed the usefulness of having BSC perspectives and one expert (i.e. interviewee: 7) stated that “many organizations now use two additional supplemental sections to make the BSC a sextant, not a quadrant: that is, ethics perspective and diversity perspectives.” However, the characteristic “Process area” was the lowest affirmed characteristic for all three requirements.

Table 6 shows the result of this assessment since we calculate the result of each characteristic (i.e. presented earlier in Table 4) to show the total “Yes” and “Maybe”. Hence, the second column represents the total affirmed “Yes” within the three requirements for each characteristic out of the result of the former formula * 3 (i.e. the number 3 stand for three requirements). The third column represents “Maybe” answered within the same previous overall total.

At the end of each interview we asked interviewees regarding two other requirements, requirements four and five. The fourth requirement is whether the system can facilitate high BP recall, which means that the system can successfully retrieve all possible BP in a single search hit. The fifth requirement is whether the system can facilitate high BP precision, which means that the system can retrieve BPs that very are relevant in a single search hit.

The experts (i.e. all interviewees) affirmed that the artifact could also facilitate high BP recall and precision if the artifact is applied correctly. It leads to successfully retrieving BP documents. This is because the artifact covered, labeled and tagged all the essential components on BP characteristics and values. Then, the relevant BP documents will appear to a user with a simple search hit in databases. Therefore, the artifact provides an organization with controlled vocabulary that may enhance the local search within the organization as the system provides some type of semantic search terms for retrieval. However, the artifact is very comprehensive, covers all relevant values, and includes all possible characteristics to facilitate sorting BPs in knowledge bases.

The interviewees were asked to express their overall opinion of the artifact. They indicated that the artifact represented a good foundation for classifying BPs and the values are very sufficient (stated by interviewees: 1, 2, 3, 5, 6 and 7). Another expert (i.e. interviewee: 9) suggested that the artifact is presenting various facets of the BP since it covers sufficiently all possible characteristics of BPs as he stated “It is very good to see the order aspect and the facets of the BP classification. It can be used as a checklist when cited the existing stack of BP. Its really useful”. Hence, one expert (i.e. interviewee: 8) regarded the classification system as ontology or taxonomy system and stated that “The taxonomy is bifurcated or trifurcated and its broken down into numerous values”. The use of BP characteristics and values permit the easy implementation of the system into particular check off boxes or drop down lists. The experts think that applying the artifact successfully can facilitate work and management tasks to have unified control in large organizations (stated by interviewees: 1, 4 and 9). It leads organizations to customize their work process and control how the resources are used. This unified work practice will lead to limit individual from doing other work practices or new practices that might not be successfully achieved. Also, it facilitates employees’ work by sharing BPs that can facilitate understanding between employees in a large organization. Moreover, it enhances communication with customers as one expert (i.e. interviewee: 4) stated: “customers will know what to expect from you and how to expect it”.

Based on the evaluation of the artifact, the experts stated some benefits for applying the artifact in an organization. First, it helps the organization to be maintained and organizes its core knowledge represented in BPs (stated by interviewees: 4, 5 and 8). Second, the artifact stresses the importance of employees values like learning and growth, and education processes (stated by interviewees: 1, 2 and 7). This is highlighted in the system and it’s always in the concerns of the employees. Third, the artifact is a holistic view of classification systems and it seems to cover all components and characteristics of BPs (stated by interviewees: 2, 5, 6, 7, 8 and 9). Fourth, the artifact presents a base to count on since it includes lists and possible values to select from (stated by interviewees: 3, 4, 6, 8 and 9). It helps organizations to uniquely structure its BPs rather than counting on employees for their own description and keywords. Therefore, it will be easier to classify and retrieve BPs in large databases. Finally, the artifact stresses the upper level management issues regarding applying and
implementing BPs within an organization (stated by interviewees: 3 and 9).

The experts provide some concerns regarding the drawbacks of the artifact, which includes the complexity to implement it since it requires time (stated by interviewees: 1 and 4). Three interviewees suggested deleting some characteristics like degree of cooperation and completeness of description (interviewees: 1, 2 and 5). Furthermore, two experts (i.e. interviewees: 2 and 7) suggested adding an education model that will definitely be required by target audience in which numerous examples are proposed to the end user to help them to understand the application of the classification system. Also, implementing the artifact requires human factors and it is the weakest link of the artifact since it takes time and effort. Another expert (i.e. interviewee: 3) suggested having a better overall structure for the artifact would make it easier to follow the logic and follow the system. Therefore, one expert suggests adding another top level over the 10 general BP characteristics that can give an overall map for the system (interviewee: 3). Another expert (i.e. interviewee: 9) suggested one BP characteristic that is lifecycle management facets and the possible value could be written, verified, applied, updated, outdated and efficient.

7. Conclusion

The main contribution of this paper is a classification system for BP documentation and an evaluation of the system. The classification system can effectively facilitate retrieval of BPs in an organizational knowledge base independent of any domain.

This system can be regarded as a standard holistic and generic classification system for BP documentation. It can provide a sufficient foundation and a base for an organization to store and classify BPs in order to facilitate retrieval of knowledge. This is because it supports tagging and labeling of the component and the use of keywords to bring the relevant materials.

The classification system has been evaluated by practitioners and academic experts. To summarize the result of the evaluation, the practitioners and academic experts answered affirmatively regarding the usefulness of the artifact. Indeed, all the BP characteristics and labeled values are recognized and applied by practitioners and academic experts. However, it turned out that some of the characteristics were particularly useful. These characteristics are: implementation area, level of formalization, completeness of description, BSC perspectives and management process.

The limitations of the study include that it is domain independent and does not present domain specific characteristics. Such characteristics can be useful in order to retrieve an appropriate BP. To use the classification system in certain domains, you need to customize it for the domain.

We suggested for future work to apply the artifact in different domains, such as the manufacturing industry or IT sector. This can enhance the feasibility and the accuracy of the domain independent characteristics and values of the classification systems. This application can also be used to identify and include domain specific characteristics. The classification system could, therefore, in the future, include both domain independent and domain specific characteristics and values. For example, when used in a certain domain, such as IT, the domain independent as well as the IT domain dependent characteristics can be used to classify the BPs.

8. References


