A Typology of Different Forms of Business Process Standardisation (BPS)

Kanika Goel(✉), Wasana Bandara, and Guy Gable

Queensland University of Technology, Brisbane, Australia
kanika.goel@hdr.qut.edu.au,
{w.bandara,g.gable}@qut.edu.au

Abstract. Organisations are increasingly adopting a process-centric view in order to compete and thrive. Business Process Standardisation (BPS) is a strategy for improved efficiency and effectiveness of business processes. BPS approaches are known to vary in practice, but are ill-understood. Through inductive content analysis of 18 published BPS case studies we identify three key decisions of the BPS approach: (i) Origin of standardisation (de facto or de jure), (ii) Optimisation of the master process (yes or no), and (iii) Choice of master process (internal exemplar, internal best-of-breed, or external exemplar) thus yielding twelve ($2 \times 2 \times 3$) alternative BPS types. This typology can serve as a useful tool for researchers investigating the BPS concept and may provide insight for practitioners when selecting an appropriate form of BPS. Further development, extension, and evaluation of the typology are suggested as future research.

Keywords: Typology · Business Process Standardisation · Case study
Inductive content analysis

1 Introduction

"Standardization is the activity of establishing and recording a limited set of solutions to actual or potential matching problems directed at benefits for the party or parties involved balancing their needs and intending and expecting that these solutions will be repeatedly or continuously used during a certain period by a substantial number of parties for whom they are mean" [1]. Business Process Standardisation (BPS) has been recognised as a key mechanism for achieving operational process optimisation, and is becoming integral to Business Process Management practice (BPM) [2]. BPS has been shown to positively impact business performance [3, 4], as evidenced in time, cost, and quality matrices [5]; it can also facilitate streamlining, automating, or outsourcing of business processes [6]. Globally, companies both private (e.g. [7]) and public (e.g. [8]) are making substantial investments in standardizing their business processes.

BPS can arise in different forms, which results from the different choices made in BPS design and execution. Understanding these underlying decision options and the different forms they result in, will assist in bringing more clarity to the concept of BPS and enable better BPS design, implementation, and decision-making. However, this aspect of business process standardisation has received limited attention. This study

M. Weske et al. (Eds.): BPM Forum 2018, LNBIP 329, pp. 179–193, 2018.
https://doi.org/10.1007/978-3-319-98651-7_11

asks 'What are the different forms of Business Process Standardisation?' and uses the literature to identify the prominent differentiating decisions in order to develop a typology for Business Process Standardisation. Typologies provide a useful framework to explain outcomes [1]; they aid analysis and provide a means for comparing and contrasting classes of a phenomenon (Gregor [2]). A typology of BPS can help unveil different forms of standardisation to determine which form is suitable in different contexts. First, we briefly discuss the concept of BPS; next, we present the research approach; this is followed by the findings, and then a related discussion.

2 Introductory Overview of Business Process Standardisation (BPS)

For business processes to be standardised, there must be a 'standard' to adopt. According to ISO [3]:

"Standards are documents, established by consensus and approved by a recognized body that provides, for common and repeated use, rules, guidelines or characteristics for activities or their results, aimed at the achievement of the optimum degree of order in a given context".

When establishing a process standard, a 'Master process' (a process that becomes the reference point) must be determined [4], and there are several ways in which to do this. Firstly, a master process may be derived internally by combining the better practices of the process variants. A process variant is "an observed or documented business process with a specific variation of at least one of the elements (inputs, outputs, enablers, guides and sequence of activities) for a defined part of the overall process" [5]. Another way a Master process can be developed is by adopting an internal end-to-end process in its entirety [6]. Finally, a Master process may be a reference point external to the organisation [7]. This concept of the 'Master process' is referred to variously as an 'Archetype process' (Muenstermann and Weitzel [4] or a 'prototype standard' (Muenstermann, Eckhardt [8], Stetten, Muenstermann [9]); all referring to a reference point that is derived internally or externally, against which all other process variants are to be standardised.

Muenstermann and Weitzel [4] suggest particular characteristics of a Master process that are essential for it to become a standard (see Table 4, p. 10 of their paper). They explain that the chosen master process must be 'well documented' and 'modularized' (which is the process of subdividing a process into meaningful sub-processes and steps), with 'specificities' clearly 'isolated'. Specificities refer to those steps that cannot be undertaken in the same way in all process instances. Such steps need to be sequestered and minimized in a good process standard [4]. At the time of its adoption, a Master process might also be improved (beyond selecting the best internally or externally existing end-to-end master process, or combining existing internal best practice modules), to reflect known best practices and thereby ensuring the standard is 'the best known execution process' [4, 10, 11]. Once this process has been devised, it is endorsed and becomes standardised, by unifying the variants of the process in line with the standard.

3 Research Approach

This research adopted a multi-phased approach to build a typology of BPS. A detailed coding rule book (following [12]) was prepared, outlining how the data was to be captured, stored, updated, and analysed; this was strictly adhered to. Data was analysed primarily by one coder, and then followed by detailed coder-corroboration sessions with a second coder. In the case of any discrepancies or disagreements, the original data was revisited to jointly resolve the issue. Figure 1 demonstrates the approach followed.

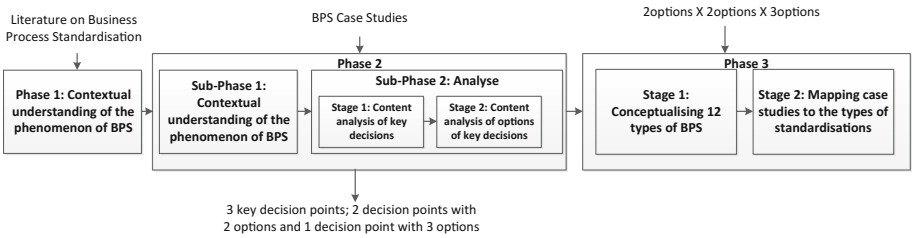

Fig. 1. Phases and stages involved in research approach

In Phase 1, we reviewed existing BPS literature to understand the key stages involved in the process of standardization (outcome presented in Sect. 2). Such provided a sound contextual understanding of what BPS is, including some early elicitations of choices organisations have (or decisions that organisations make) during design and implementation of BPS. Phase 2, consisted of two sub-phases. First, we sought for published BPS case studies to form this study's empirical base. Given that documented case studies provide vivid descriptive information, and with the goal of been able to use such case details of BPS as an empirical base for this study, Phase 2 embarked on a structured search and analysis of published BPS case studies, following the guidelines of Bandara et al. [13].

As current literature around BPS is scarce and disparate [14], we aimed to retrieved all BPS articles and then review them to extract case studies. A broad range of search strings[1] were employed, to locate full text, peer-reviewed journal and conference articles in English. Following search strategies of similar literature reviews [15], the databases JSTOR, IEEE, Emerald, ABI/Inform, Science Direct, ProQuest, and Gartner were used. The retrieved papers were quality and relevance checked, resulting in 38 papers about BPS, which increased to 44 papers with forward and backward searching. These papers were reviewed in detail to identify those that had case details providing a descriptive overview of the implementation of BPS. This resulted in 18 case studies and 22 cases (as some papers had more than one case study). These cases were then subject to content analysis to elicit the different decisions made (as explained directly or

[1] Some examples include: Process and standard* in abstract, title and keywords; "Business Process" AND standard* in abstract, title and keywords; Process AND standardization in in abstract, title and keywords; "Business Process" AND standardization in in abstract, title and keywords.

implied in the case studies) that characterized the diverse BPS efforts described in the cases. The analysis was inductive and involved two stages (Stage 1 and 2). In Stage 1 the aim was to distil key decisions undertaken by the organisations during their standardization initiative. In Stage 2, the content was revisited to synthesise various options for each of the decisions extracted in Stage 1[2]. The aim was to find distinct decisions that characterised the different BPS implementations, and to then delineate the patterns in which these decisions manifested. The outcome of this Phase was three decisions (see Sect. 4.1) and associated options (Fig. 1).

Phase 3 also had two stages. In Stage 1 we aimed to conceptualize the different forms of BPS by generating categories that simply combined the decisions options from Phase 2; which resulted in 2 * 2 * 3 = 12 potential forms of BPS. Next, we revisited the case studies to map them against each of the potential types. This resulted in instantiation of 8 of the conceptualised types of BPS. Though not supported by empirical evidence (i.e. case instantiations) the other 4 types are also explained and presented here using a hypothetical case for illustrative purposes. This was done, given these BPS types' logical relevance and also potential limitations of the current pool of cases selected for this analysis (i.e. only based on published BPS cases in academic outlets).

4 Study Findings

This section first introduces the resulting decisions that contribute to differentiating BPS implementations, explaining the potential options within each decision. Following this, different types of BPS are discussed (which are derived by the different combinations of these decisions options).

4.1 Key Decisions that Differentiate the Different Forms of Business Process Standardisations

Three key decisions that potentially explained the different forms of Business Process Standardisation were uncovered.

Decision 1 (D1) Origin of Standardisation: This decision relates to the nature of standardisation, which results from the different triggers causing the organisation to undergo BPS. Kwon [16] discusses two possible options for the origin of standardisation: de facto and de jure. He explains: "De Facto standardisation emerges spontaneously and informally, whereas de jure standardisation is usually issued from administrative procedures and enforced by authorities that have some regulatory power" [16]. Therefore, the de jure origin of standardisation is formalised and specifies

[2] For instance, incorporation of best practices is a decision to be taken by the organisation during standardization, and was distilled from literature as an outcome of Stage 1; whereas, the options of the decision (yes or no), were extracted and synthesised in Stage 2.

how things need to be done. A formal project is mandated and then initiated by upper management. In contrast, de facto standardisation emerges organically, led by employees as a means to try to improve their day-to-day practice.

Decision 2 (D2) Optimisation of Master Process: This decision relates to the inclusion of best practices in the Master process, when formulating the standard in the process of standardisation (refer to Sect. 2 for an overview of BPS). The literature conveys how the integration of best practices depends on organisational goals of standardisation: only when an organisation wishes to have the processes standardised against an improved version of the Master process are best practices are integrated; otherwise, the organisation may choose not to.

Decision 3 (D3) Type of Master Process: When standardising a process, a Master process is sought first, before the process is standardised (see Sect. 2 for further details). This dimension relates to the type of Master process chosen. The literature clearly outlines two possible forms of internally-derived Master processes and one external type. The first internal type uses a reference process that is chosen from within the organisation [17, 18]. This internal Master process can then be a complete end-to-end single process chosen from within the organisation [6] or an amalgamation of modules (best-of-breed) of internal variants of the process [4]. The analysis (see below) confirmed that there may be an external Master process, against which the organisation wishes to standardise its processes. For example, given the large volume of best process practices that has been captured through decades of research forming reference process models in different domains [19] and more recently been available through structured process model repositories [e.g. 20], organizations can refer to these when considering external input to form the Master process for their BPS efforts.

4.2 Different Forms of Business Process Standardisation

Of the three decisions introduced above, D1 and D2 have two options each, and D3 has three options. And when looking at the combinations this can result in; $2 \times 2 \times 3$—it points to twelve potential types of Business Process Standardisation, as presented in Table 1. Of these twelve types, eight were instantiated by the literature and four (Type 6, 8, 11 and 12) were not. Column 1 of Table 1 populates the different forms of BPS (referred to as BPS 'Types') in accordance with the decisions and the options for them uncovered in the literature. Columns 2, 3, and 4 list the three decisions and the options within, as evidenced in literature (as explained in Sect. 4.1). Column 5 lists the total number of cases in which the type of standardisation was evidenced. Column 6 lists the references where the types of standardisation were uncovered. When the reference had more than one case study, then the reference has been suffixed with a case number (i.e. Case 1, Case 2, and so on) to reflect the corresponding cases described in the same paper. These results were carefully checked and reviewed by two coders for quality assurance.

Table 1. Types of Business Process Standardisation (BPS)

	D1	D2	D3				
Type	**Origin**	**Optimise**	**Type of Master Process**			**No of Cases**	**Cases**
			Internal Exemplar	Internal best-of-breed	External exemplar		
1	De jure	Yes	X			8	(Agnar, Harry, & Mariano, 2004; Kwon, 2008; Manrodt & Vitasek, 2004; Muenstermann et al., 2009; Müenstermann et al., 2010; Rahimi et al., 2016, Case 3; Rosenkranz et al., 2010, Case 2; Schafermeyer et al., 2010, Case 1)
2				X		2	(Muenstermann, Moederer, & Weitzel, 2010; Müenstermann & Weitzel, 2008)
3					X	1	(Wessel, Ribbers, & Vries, 2006)
4		No	X			3	(Afflerbach et al., 2016; Rosenkranz et al., 2010, Case 3; Stetten et al., 2008)
5				X		3	(Kettenbohrer, Beimborn, & Klop-penburg, 2013a, 2013b; Rahimi, Møller, & Hvam, 2016, Case 2)
6					X	NA	
7	De facto	Yes	X			1	(Roubert, Beuzelin-ollivier, Hof-mann-amtenbrink, Hofmann, & Hool, 2016)
8				X		NA	
9					X	1	(Kauffman & Tsai, 2010)
10		No	X			2	(Rahimi et al., 2016, Case 1; Schafermeyer et al., 2010, Case 2)
11				X		NA	
12					X	NA	

Type 1: De jure standardisation, with an internal exemplar Master process and optimisation of Master process

This type of standardisation is suitable to organisations where standardisation is a result of formal authority and procedures to achieve consistency in processes, and where standardisation efforts are related to continuous improvement. Organisations working towards such standardisation would have multiple variants of the process to be standardised and are committed to process improvement. This is why an internal exemplar Master process is sought and then optimised with best practices for the BPS initiative. For example, in the case study outlined by Muenstermann, Eckhardt [8] the organisation 'VISION' launched a project to standardise its recruitment process across all autonomous divisions working under the umbrella of the company. VISION pre-selected the recruiting process of the headquarters as the Master process and then enhanced it, using the insights gained from three large competing organisations regarding strengths and weaknesses of the process. This helped VISION to standardise their processes against an industry-identified best practice process, assisting the organisation in achieving the specific goals it was committed to. Eight cases were instantiated as Type 1; in other words, this is quite a popular form of standardisation employed by organisations. Our analysis suggests that this type of standardisation is suitable for organisations with mature processes (from which a Master process can be chosen), and a goal of standardising against an improved version of the Master process.

Type 2: De Jure standardisation, with a best-of-breed internal Master process and optimisation of Master process

This type of standardisation is suitable for organisations where the BPS initiative is a result of a lack of consistency in the processes; these organisations are aiming for continuous improvement. Organisations undertaking this form of BPS document all the variants as a part of the formal procedures and merge best practice modules of variants of the same process to obtain a Master process.

The best-of-breed internal process is further improved by integration of industry best practices, enabling the processes to be standardised against a best practice process that was derived by amalgamating a range of internal best practices and the enhancing it with external best practice. In the case study outlined by Muenstermann and Weitzel [4], a multinational firm 'Dream' (real name kept anonymous by authors) launched a program for BPS with a desire to reduce costs and work on continuous improvement. The organisation had a number of process variants and used Type 2 standardisation to achieve their goals. This type of standardisation hence works best in organisations with mature processes, and with multiple variants. The objective to implement standardisation is consistency and process improvement. Two cases instantiated this form of standardisation.

Type 3: De Jure standardisation, with an exemplar external Master process and optimisation of Master process

This type of standardisation is suitable for organisations where standardisation is formally introduced due to observed inconsistency in processes, with a desire to standardise against an external best practice process, and a goal of continuous improvement. Type 3 particularly relates to organisations that do not have competent processes or are in industries in which there is a need to abide by external standards (such as IT, law etc.). In their paper, Wessel, Ribbers [21] discuss a standardisation initiative across a financial

firm with over 50 divisions around the world. The firm had integrated an information system, 'PeopleSoft', to standardise their business processes. This helped the firm to ensure that the data privacy and protection regulations were followed in the same way across all the divisions. Further, there was a focus on continuous improvement to ensure that the Human Resource policies are best practices, enabling the organisation to perform better. This type was instantiated by one case study.

Type 4: De Jure standardisation, with an internal exemplar Master process and no optimisation of Master process

This type of standardisation is suitable for organisations that want to standardise their processes, where the process standardisation efforts are not related to any continuous improvement, and the aim is mere consistency of processes based on existing/current internal practices. This form of BPS is common with the rise of globalisation as the desire and need for greater consistency in services/operations grows. These organisations require a dedicated project to standardise the processes; this involves committing certain resources to achieve the target outcome of overall consistency. Formal official procedures need to be followed and final approval for the standard needs to be obtained. A responsible person needs to be appointed for the BPS initiative [22]. Once a formal procedure for standardisation has been initiated, a decision to choose the Master process needs to be made: internal or external. Organisations with mature internal processes may choose to have an entire internal (e.g. a headquarters' process) as the Master process, in this type. So this one internal process becomes the point of reference, which is then used to standardise the other processes.

This type of standardisation was evident in the Stetten, Muenstermann [9] case study of 'Future' (name of the case has been anonymised in the paper). 'Future' has three autonomous divisions, each responsible for their own results. In the past, different information systems were being used for the same goal: recruitment of candidates. 'Future' wanted the recruitment process to become consistent across all divisions, so it launched a standardisation project (De Jure) in 2004. The aim was to have maximum internal and external transparency, with no commitment to process improvement. Since the processes at 'Future' were mature, the headquarters process was chosen as the Master against which to measure for the standardisation process. This type of standardisation has been instantiated by three case studies from the pool of cases analysed.

Type 5: De Jure standardisation, with a best-of-breed internal Master process and no optimisation of Master Process

This type of standardisation is applicable to organisations that have a relatively greater number of process variants and hence want to standardise the process, where the desire is consistency of processes across the organisation, without any goal for continuous improvement. When compared to Type 4, the difference here is that the organisation is likely to have a number of process variants, and modules of such variants are merged to obtain the Master process to be used for standardisation. This type of standardisation was reflected in the case of Lufthansa Technik (LHT) in Germany [23] where the goal was to standardise the process that provides quality assessment of suppliers and supplier-related products. There were several working variants of the same process, with modules that were considered best practice internally

by the organisation. Such pockets/modules were extracted and then amalgamated to retrieve the Master process, which was then used for standardisation. This type of standardisation has been instantiated by three case studies from the pool of cases analysed.

Type 6: De Jure standardisation, with an external Master process and no optimisation of Master process

This type of standardisation was not instantiated by any case study. However, we believe this type of standardisation can exist. An organisation may formally launch a standardisation initiative and choose to use an external standard as the Master process, without any need to optimise it. For example, University A may wish to standardise its student enrolment process. They may feel that their own current processes (or any variants) are not competent, but on the other hand, have confidence in the student enrolment process of University B because of immense positive feedback (or other evidence). In such a case (assuming that University A has access to University B's, process details, either in the public domain or through a structured review), University A may launch a dedicated standardisation project to standardise its student enrolment process, using University B's method as the Master process. Since University A is satisfied with the execution of the student enrolment process of University B, it may decide not to enhance it with integration of best practices. Hence, this type is suitable for organisations that desire consistency of operations, but do not consider their own internal processes sufficient to be used for a standardisation initiative, but may want to standardise their processes against a best-known external process.

Type 7: De Facto standardisation, with an exemplar internal Master process and optimisation of Master process

This type of standardisation is suitable for organisations where standard processes are required for efficiency and people are encouraged to keep their practices as uniform as possible across the organisation. Further, this type of firm would have competent mature processes, leading them to use an internal Master process and commit to improvements that will lead to the optimisation of a Master process. Standardisation in such firms assists people to do their tasks well, which is why observed practices start to become a standard. This type of standardisation was somewhat evident in the case study by Roubert, Beuzelin-ollivier [24], where a firm working in nanotechnology realised its need for a standard process related to nanoparticle experimentation. The current set of guidelines the company used to conduct experiments became the Master process. This was further enhanced by collating information from external protocols followed for tasks related to nanoparticles. Mutual consensus was gained on the integration of such best practices. This assisted in developing standard practices with nanoparticles across the firm. One case instantiated this type of standardisation.

Type 8: De Facto standardisation, with a best-of-breed internal Master process and optimisation of Master process

This type of standardisation was not instantiated by case studies; however, we believe it could happen. When the employees in an organisation experience confusion and they are over-worked, they may initiate the need for consistency. They may decide to standardise the processes (de facto) using the observed practices. Since many variants of the process may exist, causing inconsistency, the organisation may use best

practices from variants to form an internal Master process and then refine it further with other industry best practices, to achieve the best possible outcome. For example, University A may have many variants of the student recruitment process across faculties, causing inconsistency in data stored. As a result, the employees may attempt to standardise the process by selecting different parts (or modules) of the recruitment process from variants to form a new Master process. The Master process may be further optimised by integrating practices from recommended best practice student recruitment processes by the national education board. However, this form may not be widely evident: for it to be effective and successful, the employees need to have a deep desire for continuous improvement and an understanding of process management.

Type 9: De Facto standardisation, with an exemplar external Master process and optimisation of Master process

This type of standardisation is suitable for organisations that cannot function efficiently without having standard practices, but in which no standardisation is mandated. In these cases, the staff themselves initiate the standardisation process, as they see it as helping them to do their job better (which is also why De facto standardisation happens). This form exists in industries where there is fierce competition, creating a need to maintain standard practices across the entire industry—examples include IT, law, and medicine.

This type of business process standardisation was evident in the case study outlined by Kauffman and Tsai [7] in which an IT firm adopted de facto standardisation to ensure the technology sold to the consumers is of consistent quality. The employees considered standardisation necessary: without it, the customer may not be happy. For example, software vendors need to have standardised practices to launch enterprise software solutions, so the employees started looking for ways to do this. An industry-wide-practiced standard was chosen, which was subject to continuous refinement. Adopting such a standard assisted the IT firm to maintain consistent practices across the firm and also compare their performance across the industry. Only one case was instantiated for this type of standardisation.

Type 10: De Facto standardisation, with an exemplar internal Master process and no optimisation of Master process

This type is suitable for organisations that have mature (processes with intricate details), yet inconsistent processes, but desire more consistency to fulfil the tasks with reduced time, energy, and costs. This type was evident in case study 1 described by Schafermeyer, Grgecic [25] about the German telecommunication provider (TCSP) that started using a software as a part of its client order process, and then went on to adopt this as a standard. Following this, an in-house software was developed to achieve the desired standardisation of the client order process. Since the aim was solely to have a consistent client order process across all the locations of the organisation, the Master process (the internally designed Master process that was embedded in the system) was not optimised. One case was instantiated for this type of standardisation.

Type 11: De Facto standardisation, with a best-of breed internal Master process and no optimisation of Master process

This type of standardisation was not instantiated by any case study, though we believe it can exist. It is suitable for organisations where consistency in processes is

crucial and there are multiple variants of the same process in the organisation. There is no goal of continuous improvement. For example, University A may have variants of student recruitment process across faculties, resulting in inconsistencies in data stored, which then, in turn, may cause bad decision making. Therefore, to make things easier for the staff, the staff members may decide to work together to understand the different variants; once variants have been determined, the best practices may be combined to form the Master process. The recruitment process may then be standardised against that Master process. Since the goal is consistency and (not to have an optimal recruitment process), the Master process is not optimised further.

Type 12: De Facto standardisation, with an exemplar external Master process and no optimisation of Master process

This final type of standardisation was not instantiated by the case studies, either, but, again, we believe it may happen. For example, the employees of University A may be tired of managing the different ways they process the payroll. Some employees may ask for signatures of the concerned, for instance, while others may not, resulting in confusion and inconsistency in the data fed into the systems. As a result, the employees may internally discuss and initiate standardisation of the payroll process. In order to do this, they may adopt the guidelines of the payroll process of some other university, which they believe to have better operations than the one in their own organisation; using that information, they work to standardise the process at University A.

5 Discussion

The aim of this paper was to review the existing literature around Business Process Standardisation (BPS) in an attempt to build a preliminary BPS typology. Analysis of content revealed three decisions (D1, D2, and D3). An organisation seeking the benefits of BPS needs to first decide whether to lead standardisation (de jure). Or, standardisation may also occur organically, as different parts of the organisation become aware what is working well and what not (de facto). Next, there are three options for deciding the Master process (internal exemplar, best-of-breed internal, external exemplar). Finally, an organisation may decide optimising the Master process by taking into account best (industry) practices. A total of twelve types of BPS were conceptualised, considering the options for the three decisions. Eight types were instantiated by the case studies. However, we do believe that the other types could also exist and have provided hypothetical scenarios (based on University A) to illustrate these alternative types. Of all types, Type 1 (De Jure standardisation, with an exemplar internal Master process and integration of best practices) was found to be the most popular. BPS initiatives involve considerable time, money, and resources, which is why companies may launch a formal project to standardise a process. Moreover, a best-known internal process may be chosen (as it comes with advantages, such as having access to the process details and the fact that the process parts been formed within the same context), and then may be refined with best (industry) practices. Considering these aspects, it is not surprising to find Type 1 to be the most common.

With growing significance of BPM and increasing globalisation, the concept of BPS is also gaining prominence [14]. Greater numbers of organisations are adopting

BPS as a mechanism to achieve consistency in operations and obtain the benefits of reduced time and costs, while improving service quality. While traditionally the objective was to standardise against the best practice process, with a goal of process improvement, today there are organisations that desire mere consistency of processes, driven by the need to provide consistent customer service. The objective is to have uniform, rather than best practice processes functioning within the organisation. This is why in some cases the Master process is not subject to improvement through integration of best practices (Type 1, 2, 3, 7, 8, and 9). Another reason for not optimising the Master process can be the organisation having competent and mature processes, which is why further improvement is not sought. Further, a specific type of Master process, best-of-breed internal, has emerged. This is particularly true for organisations that are large and have multiple variants of the same process. In such cases, the organisation may consider having sections of the variants amalgamated together to obtain the best practice internal process, against which the variants are then standardised (Type 2, 5, 8 and 11). Further, organisations that are new, with incompetent processes, may also choose to have standard processes. In such cases, an external Master process is found suitable to be adopted (Type 3, 6, 9 and 12). Adopting an external Master process is also evidenced as applicable to organisations where there is a need to maintain consistency with industry-wide practices. For example, a banking organisation has to follow certain rules and regulations practiced across the industry in order to sustain its place in the market. Furthermore, on understanding the options of D2, we believe another option is possible which is combining an external standard with internal practices to form a best-of-breed Master process, which is not entirely internal. For instance, a university while standardising their recruiting process may use activities of an external best practice process and amalgamate it with the activities of the internal process to arrive at the best-of-breed Master process. However, the literature does not instantiate such option.

Further, the origin of standardisation may differ for organisations. Standardisation may be a result of a formal project initialised by the authorities in an organisations resulting in a dedicated team or resources (de jure), or may not be formal in nature (de facto) and emerge organically; led by employees as a means to try to improve their day-to-day practices. De jure standardisation seems to be more common (nine cases instantiated this), which is understandable, as considerable resources are spent in such initiatives. However, employees have started recognising the need for having standardised processes that can aid them in reduced rework, time, cost, resources, and efforts, and are more and more often encouraged to engage in continuous improvement through standardised practices. This is why de facto standardisation has started gaining significance, especially in industries where it is difficult to function without standard practices, such as the medical industry.

Three decisions revealed in the literature assisted us in understanding the different types of standardisation that may take place. Options within a decision can influence the state of other decisions. For instance, de jure BPS is more likely to proceed with optimisation (if not immediately, at least as a follow-up phase) because optimisation efforts are more likely to be supported/resourced by management in de jure than in de facto contexts. This also brings forth the plausibility of shifting from one type of standardisation to another, as BPS itself is a continuous effort, which is reviewed and

repeated on a periodic basis (i.e. companies may update their standard process and then unify the variants with the standard process). In such instances, the organisation may have initially conducted one type of BPS, but in the next iteration they may move to the next. For example, the success of de facto BPS can lead to de jure BPS. Or a company may deploy Type 4 (De Jure standardisation, with exemplar internal Master process and no optimisation of Master process) first, but in the next iteration may choose to switch to Type 1 (De Jure standardisation, with exemplar internal Master process and optimisation of Master process) to further enhance the Master process against which the variants are eventually standardised. An understanding of these different types of standardisation, as revealed in this paper, is significant: it brings further clarity to the concept of BPS. These different types assisted in building a preliminary typology for BPS, as discussed in this paper, and provided a framework to explain different outcomes [1]. According to Gregor [2], typologies help in understanding similar yet different forms of a phenomenon, in this case BPS, enabling better understanding. This understanding can serve as a useful tool for researchers investigating the BPS concept and also provides insights for practitioners to select the appropriate form of BPS, for their specific purposes and circumstances.

We acknowledge the limitations inherent in the research approach and analysis here. Our search outcomes could have potential limitations, as each and every article related to BPS may not have been retrieved. It is recognized that 22 cases were used to build this typology, and there may be other published BPM cases that were not retrieved. Further, even though two coders were involved in the coding process, it is possible that some relevant information may not have been coded. However, this was minimised by conducting multiple rounds of coding and having continuous corroboration sessions. This qualitative research was built on content analysis assisting in forming themes, which may at times appear to be subjective and lacking transparency in how the relevant themes were developed, but we have tried to address this by providing an overview of the data analysis. We also do not claim that the BPS decisions presented here that formed the dimensions characterizing BPS are the only ones - they were, however, the ones derived from the extracted cases. We suggest future researchers could validate and further build upon this preliminary typology of BPS. Given the BPS choices depend on context, researchers may conduct BPS case studies to further understand the organisational requirements and contexts related to each BPS type. Diverse organisational impacts based on the type of BPS need to be explored. Conducting further empirical work to validate the typology, research on the different success factors and impacts from these different BPS types, and how they may differ in their designs and implementations would be beneficial to progress the outcomes presented in this paper.

6 Conclusion

In this paper we used 22 BPS cases to understand the different forms of Business Process Standardisation (BPS). Content analysis revealed three decisions: (D1) origin of standardisation, (D2) Optimisation of Master process, and (D3) Type of Master process. D1 and D2 were evidenced to have two options and D3 had three options; the

combination, resulting in twelve different types of BPS. Of these twelve types, eight were instantiated by the cases and the others were explained using hypothetical cases. The three decisions assisted in developing a preliminary typology for BPS. The typology presented herein provides a good understanding of the concept of BPS, and can provide a solid foundation for future researchers to unravel other potential types and further insights of BPS. The typology also has practical significance as it enables organisations to select the right type, given their organisational requirements. Future researchers are encouraged to build this typology and accumulate knowledge in a systematic manner, enlightening both professional and academic practice.

References

1. Doty, D.H., Glick, W.H.: Typologies as a unique form of theory building: toward improved understanding and modeling. Academy of Management. Acad. Manage. Rev. **19**(2), 230 (1994)
2. Gregor, S.: The nature of theory in information systems. MIS Q., 611–642 (2006)
3. ISO, Standardization and related activities — General vocabulary, I.O.f. Standardization), Editor (1996)
4. Muenstermann, B., Weitzel, T.: What is process standardization? In: International Conference on Information Resources Management (CONFIRM) (2008)
5. Zellner, P., Laumann, M., Appelfeller, W.: Towards managing business process variants within organizations – an action research study. In: 2015 48th Hawaii International Conference on System Sciences (HICSS) (2015)
6. Muenstermann, B., Moederer, P., Weitzel, T.: Setting up and managing business process standardization: Insights from a case study with a multinational e-commerce firm. In: 43rd Hawaii International Conference on System Sciences (2010)
7. Kauffman, R.J., Tsai, J.Y.: With or without you: the countervailing forces and effects of process standardization. Electron. Commer. Res. Appl. **9**(4), 305–322 (2010)
8. Muenstermann, B., Eckhardt, A., Weitzel, T.: The performance impact of business process standardization. Bus. Process Manage. J. **16**(1), 29–56 (2010)
9. Stetten, A.V., et al.: Towards an understanding of the business value of business process standardization - a case study approach. In: Americas Conference on Information Systems (2008)
10. de Vries, H.J.: Best practice in company standardization. Int. J. IT Stand. Stand. Res. **4**(1), 62–85 (2006)
11. Ungan, M.C.: Standardization through process documentation. Bus. Process Manage. J. **12**(2), 135–148 (2006)
12. Saldana, J.: The Coding Manual for Qualitative Researchers. SAGE (2012)
13. Bandara, W., et al.: Achieving rigor in literature reviews: insights from qualitative data analysis and tool-support. Commun. Assoc. Inf. Syst. **34**(8), 154–204 (2015)
14. Muenstermann, B.: State of the art of BPS research. In: Business Process Standardization: A Multi-Methodological Analysis of Drivers and Consequences, pp. 29–118. IGI Global, Hershey (2015)
15. Romero, H.L., et al.: Factors that determine the extent of business process standardization and the subsequent effect on business performance. Bus. Inf. Syst. Eng. **57**(4), 261–270 (2015)

16. Kwon, S.-W.: Does the standardization process matter? A study of cost effectiveness in hospital drug formularies. Manage. Sci. **54**(6), 1065–1079 (2008)
17. Afflerbach, P., Bolsinger, M., Röglinger, M.: An economic decision model for determining the appropriate level of business process standardization. Bus. Res. **9**(2), 335–375 (2016)
18. Muenstermann, B., Eckhardt, A., Weitzel, T.: Join the standard forces - examining the combined impact of process and data standards on business process performance. In: 42nd Hawaii International Conference on System Sciences, HICSS 2009 (2009)
19. Fettke, P., Loos, P.: Classification of reference models: a methodology and its application. Inf. Syst. e-Business Manage. **1**(1), 35–53 (2003)
20. La Rosa, M., et al.: APROMORE: an advanced process model repository. Expert Syst. Appl. **38**(6), 7029–7040 (2011)
21. van Wessel, R., Ribbers, P., de Vries, H.: Effects of IS standardization on business process performance: a case in HR IS company standardization. In: Proceedings of the 39th Annual Hawaii International Conference on System Sciences (HICSS 2006) (2006)
22. Rosenkranz, C., Seidel, S., Mendling, J., Schaefermeyer, M., Recker, J.: Towards a framework for business process standardization. In: Rinderle-Ma, S., Sadiq, S., Leymann, F. (eds.) BPM 2009. LNBIP, vol. 43, pp. 53–63. Springer, Heidelberg (2010). https://doi.org/10.1007/978-3-642-12186-9_6
23. Kettenbohrer, J., Beimborn, D., Kloppenburg, M.: Developing a procedure model for business process standardization. In: International Conference on Information Systems, Milan (2013)
24. Roubert, F., et al.: "Nanostandardization" in action: implementing standardization processes in a multidisciplinary nanoparticle-based research and development project. Nanoethics **10**(1), 41–62 (2016)
25. Schafermeyer, M., Grgecic, D., Rosenkranz, C.: Factors influencing business process standardization: a multiple case study. In: 2010 43rd Hawaii International Conference on System Sciences (HICSS) (2010)