

Standardization of Service Descriptions, Process Models and Forms in Public Administrations: Results from a Survey in Germany

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Abstract. Public administrations face a high need for service orientation, process efficiency as well as digitalization of documents. Thus, service descriptions, process models and forms are relevant artifacts of administrative procedures. Due to their interrelation, an integrated standardization regarding these information artifacts is promising. Our overall research objective is to analyze initiatives that aim at a standardization regarding service descriptions, process models and forms in German public administrations. This article provides a first step of ongoing research to reach this aim by investigating initiatives that deal with forms. It builds upon interviews with public managers of 15 IT standardization initiatives and describes these concerning criteria such as supported standardization features, targeted federal levels and number of application domains. Given the lack of standardization found in practice, this article raises the need for an instrument that enables the integrated standardization of service descriptions, process models and forms in public administrations.

Keywords: Standardization, Reference Model, Process, Form, Public Administration

1. Introduction

Public administrations are confronted with an increased demand for digitalization [1], process efficiency [2] and service quality [3]. Digitalization can be achieved by substituting paper-based documents and forms with electronic equivalents throughout administrative procedures. Business process management and process modeling have gained more relevance in public administrations in order to construct efficient sequences of activities and enable the (semi-)automatic processing of electronic documents. Transparent service descriptions for external stakeholders such as citizens and companies can lead to an increased service orientation due to higher user conven-

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ience. Hence, service descriptions, process models and forms are important information artifacts of administrative procedures [4].

A standardization of these information artifacts can lead to several benefits for public administrations, citizens and companies. Due to a harmonization of service descriptions and forms, a more uniform appearance of public administrations to citizens and companies can be achieved. A standardization of processes can result in higher efficiency if unnecessary activities are removed. Companies can benefit from accelerated data exchanges due to unified interfaces through standardized forms. Additionally, certainty in legal interpretation can be achieved in public administrations due to guidelines on the amount of requested information on forms and its processing.

In this article, standardization refers to the provision of reference models to public administrations. "Reference models are generic conceptual models that formalise recommended practices for a certain domain" [5, p. 595]. Hence, a reference model may represent a standardized artifact, i.e. recommend a design of the artifact. The reference model can be used in order to implement the artifact. Hence, we restrict standardization to the development and provision of reference models and do not focus on the implementation of the standardized artifacts.

An integrated standardization – i.e. a standardization of the three information artifacts of administrative procedures in a holistic manner - offers potential for synergies due to the interrelation of the artifacts. First, service descriptions contain information relevant for external stakeholders, e.g. the actions a citizen or company has to perform as well as the inputted and outputted forms. Hence, service descriptions provide valuable information for the standardization of processes and forms. Second, process models offer information on internal activities which includes details on data that is requested on forms in order to be able to deliver the services. Third, the order of processed information in process models may even suggest an order of fields on forms. Thus, process information is useful during the standardization of forms. Hence, in this context the term 'integrated' does not mean a necessarily simultaneous standardization of the different artifacts but refers to the usage of other artifacts' information in the standardization process. Moreover, higher consistency and convenience for public administrations are achieved if there is an integrated platform as single point of truth to assess reference models for the three information artifacts on administrative procedures.

By considering initiatives that primarily deal with forms as a first step in our ongoing research, the aim of this paper is to provide first insights on the following research question: *To what extent do initiatives exist that aim at an integrated standardization of service descriptions, process models and forms in German public administrations?* Initiatives cover short-term projects as well as durable institutions which may have just been started or well-established.

This article is structured as follows. Section 2 presents the research background. In section 3, the research design is described. Afterwards, the results are provided in section 4 and discussed in section 5. Finally, a conclusion is drawn and an outlook on future work is given in section 6.

2. Research Background

The standardization of services, processes and forms in public administrations has been considered in scientific literature. The concept of *shared service centers* (SSC) in public administrations [6–8] describes the consolidation of activities at an organization to deliver common services to an internal group of partners. The notion of SSC is relevant in the context of this article since a SSC requires a standardization of processes since each partner does not carry out processes individually but the execution of processes is bundled at a SSC. Additionally, a standardization of forms occurs since forms may be processed by standardized processes in the context of SSCs.

Besides, a standardization of forms is conducted when *interoperability* is established in public administrations [9–11] in order to enable the information exchange between IT systems. Using data exchange standards, electronic information can be transmitted automatically. As forms are views on data [12], a standardization of electronic forms is conducted by interoperability concepts and data exchange standards.

The concept of *reference models* has been studied in the context of public administrations mainly with the focus on reference process models [13–15]. Reference models are relevant for standardization since they may represent a standardized artifact, e.g. a standardized process. Hence, reference models provide valuable information for standardization purposes. For instance, a standardized process can be represented as reference process model. In order to share knowledge on reference process models, dedicated libraries [16, 17] exist which aim at a collaborative business process management among public administrations.

3. Research Design

In order to address the research question, an empirical study of the phenomenon of standardized service descriptions, process models and forms was performed. The overall research approach can be split into two steps: (1) The identification of standardization initiatives and (2) the in-depth evaluation of these initiatives.

In the first step, primary data was gathered through a cross-sectional survey in order to identify standardization initiatives in German public administrations. We developed a questionnaire with a fixed set of open questions. Since we aim at a description of the status quo regarding the phenomenon, the addressees were selected as a representative cross section of federal and state administrations. Each addressee – employed in an IT management position – was questioned to describe the initiatives towards standardization of services, processes and forms in the corresponding organization. Additionally to the primary data gathered through questionnaires, we conducted a literature review [18] in order to discover the landscape of standardization initiatives as presented in German public meetings, conferences and congresses. The sampling of data resulted in a set of 40 potentially relevant initiatives with focus on standardization of service descriptions, process models or forms.

In the second step, additional secondary data was obtained through the projects' web sites and publications. Complementary primary data was collected by interview-

ing public administration employees engaged in the 40 initiatives. Upon interviewees’ request for preparation, we sent the scheme for analysis that should allow us to describe the status of standardized services, processes and forms in German public administrations. Finally, we were able to conduct a total of 40 structured in-depth interviews in person or per telephone, with duration between 15 and 45 minutes per interview. The results of the interviews were used to complement the information on the initiatives obtained during the first step. After the analysis of the interviews, we considered several potential initiatives as not relevant. Eventually, we identified 30 relevant initiatives in German public administration towards the standardization of services, processes and forms. As a first step of our ongoing research, this paper focuses on 15 initiatives which integrate the standardization of forms into their scope.

Using the data from the two steps described above, the 15 initiatives were evaluated using the criteria presented in table 1. Whereas the first seven criteria are generally applicable, the following seven criteria are artifact-specific for forms. The criteria have been derived in the course of a workshop series with domain experts, method experts, practitioners from the private and public sector and researchers.

Table 1. Criteria for Evaluating the Standardization Initiatives

Criterion	Rationale
1. Artifact	As described above, service descriptions (S), process models (P) and forms (F) are important artifacts of administrative procedures.
2. Classification Scheme	A classification scheme is important in order to pre-structure existing elements which are standardized and identify common segments. Additionally, it supports the detection of suitable standardized service descriptions, process models and forms for a specific case.
3. Structural Standardization	This criterion covers the actual standardization of the artifacts’ structures.
4. Organizational Standardization	This criterion indicates whether the initiative aims at a standardization of the procedures to develop, maintain and apply the standardized artifacts.
5. Technical Standardization	In order to enable machines to further process the standardized artifacts, a standardized technical specification of the information artifacts is required.
6. Federal Level	This criterion is important since an initiative is more comprehensive the more federal levels it covers.
7. Number of Application Domains	This criterion affects the extent of initiatives since initiatives with more application areas (e.g. “Environment” and “Education”) are usable in more scenarios.
8. Fields	Fields are used on forms to enter the requested information, e.g. the street or postcode. They have metadata such as their labelling and datatype. A standardization of fields enables their reuse on different forms and harmonizes their occurrences.
9. Groups of Fields	Similarly to fields, the standardization of groups of fields is useful since fields are normally grouped to logical entities. For instance, the group ‘address’ consists of the atomic fields ‘street’, ‘street number’, ‘postcode’ and ‘city’.
10. Entire Forms	The standardization of forms as entire entities is relevant since it affects their metadata such as the name and their contents, i.e. the fields and groups of fields.

Criterion	Rationale
11. Editorial Processes	The definition of a process of editing is useful in order to incorporate all stakeholders in the standardization process according to their interests as well as roles and ensure the appropriate creation, maintenance and application of the standardized artifacts.
12. Quality Criteria	The provision of a set of quality criteria is relevant since they should be considered during the creation and maintenance process and aim at a correct, consistent and complete creation of information.
13. Dependency Rules	Dependency rules are useful to describe relationships between form elements. For instance, a form should ensure that a starting date is always scheduled before an end date when a citizen completes a form.
14. Layout	A standardization of layout characteristics is useful since it affects the positions of the forms' elements, i.e. their order.

4. Results

This section presents the first results of the study. Table 2 contains the results regarding supported standardization features. Each of the investigated initiatives deals with forms but may support more than one standardization feature. The rows contain figures for each possible combination of services, processes and forms that at least covers forms. The last row presents aggregated figures for all form-related initiatives.

In general, there are 15 initiatives which deal with forms. There are few initiatives which integrate forms with services and processes for standardization purposes. Seven initiatives focus on more than one artifact. On the contrary, eight initiatives consider forms individually. One initiative aims at a standardization of all three artifacts of administrative procedures.

Table 2. Supported Standardization Features (Criteria 2 to 5)

Artifact	Classification Scheme	Structural Standardization	Organizational Standardization	Technical Standardization	Total
S, P, F	1	0	0	0	1
S, F	0	1	0	1	2
P, F	2	3	3	1	4
F	1	3	1	4	8
Total	4	7	4	6	15

Considering the supported standardization features, the results reveal that a classification scheme and organizational standardization are delivered by the fewest number of initiatives. In general, two initiatives provide three or more standardization features (figure is not given in the table). They deal with forms and processes and one of them covers all four standardization features. On the contrary, the initiative supporting all three artifacts of administrative procedures only provides a classification scheme.

The results concerning the practical application at different federal levels are displayed in table 3. The initiatives may support more than one level. The results reveal an almost equal distribution on the three federal levels. Besides these levels, the initia-

tives are used in other institutions. In total, eight initiatives address all federal levels, two of them are additionally applied in other organizations (figures are not given in the table). Four out of those eight initiatives deal only with forms, two consider forms and processes and further two forms and services.

Table 4 provides results for the criterion “Number of Application Domains”. Four initiatives are dedicated to one specific domain and three initiatives are generic approaches applicable to a wide range of areas. Each of these generic approaches aims at standardizing only forms individually, or the combination of forms and processes or forms and services, respectively.

Table 3. Federal Level (Criterion 6)

Artifact	Fed. Gov- ernment	Fed. States	Local Au- thorities	Other Institu- tions	None / No Indication	Total
S, P, F	0	0	0	0	1	1
S, F	2	2	2	0	0	2
P, F	2	3	4	2	0	4
F	6	5	5	1	1	8
Total	10	10	11	3	2	15

Table 4. Number of Application Domains (Criterion 7)

Artifact	1	4	>8	No Indication	Total
S, P, F	0	0	0	1	1
S, F	0	0	1	1	2
P, F	2	0	1	1	4
F	2	1	1	4	8
Total	4	1	3	7	15

Table 5 provides insights on the initiatives’ comprehensiveness with regard to the artifact-specific criteria for forms. Whereas two-thirds of the initiatives support a standardization of entire forms, layout and editorial processes are barely considered. The highest quantity of supported standardization aspects is five out of seven (figure is not given in the table). Three of the initiatives with more than three aspects of standardization cover processes and forms while two initiatives deal with forms indi-
vidually.

Table 5. Comprehensiveness of Standardization (Criteria 8 to 14)

	S, P, F	S, F	P, F	F	Total
Entire Forms	0	2	4	4	10
Groups of Fields	0	0	3	4	7
Fields	0	1	3	4	8
Editorial Processes	0	0	0	1	1
Quality Criteria	0	0	1	2	3
Dependency Rules	0	0	4	2	6
Layout	0	0	1	0	1
No Indication	1	0	0	1	2
Total	1	2	4	8	15

5. Discussion

Our findings suggest that initiatives that aim at an integrated standardization of service descriptions, process models and forms in German public administrations exist to a limited extent, although its existence is of crucial importance.

At first, the integration of the three artifacts of administrative procedures as well as corresponding standardization features is insufficiently present in practice. As table 2 reveals, there is one initiative that aims at an integration of services, processes and forms, but it has limited standardization features. Similarly, there is only one initiative covering all standardization features and supports two information artifacts of administrative procedures. Secondly, an integrative initiative for all information artifacts which supports all federal levels and a wide range of application domains is missing. Several initiatives address all federal levels (cf. table 3) or target multiple application areas (cf. table 4). However, the combination of all federal levels and multiple application areas with service descriptions, process models and forms is missing. Thirdly, even the extent regarding the artifact-specific standardization aspects of forms is limited (cf. table 5). There is not a single initiative that addresses all aspects of comprehensiveness. Additionally, two standardization aspects – editorial processes and layout – are only provided by one initiative.

In summary, we are able to identify an existing gap in standardization initiatives of service descriptions, process models and forms in German public administrations. Hence, there is a need for an instrument that enables the integrated standardization and covers the criteria presented in table 1.

6. Conclusion and Outlook

This study develops an understanding regarding the current extent of existence of initiatives that aim at an integrated standardization of service descriptions, process models and forms in German public administrations. The findings reveal that an integrated initiative does not exist.

Since this article presents ongoing research, it is especially subject to limitations and potential for further research. The main focus of our upcoming activities is to integrate the remaining 15 initiatives which do not cover forms into the scope of investigation. Although this will not yield an integrated approach, their analysis will provide insights on the integration of services and processes and the comprehensiveness regarding each of these artifacts individually. For this purpose, the set of criteria is to be extended, especially for services and processes. Moreover, we recognize the focus on German public administration initiatives as limitation which may be expanded to other countries in the future.

Despite these limitations, we still believe that our findings are already of value for both theory and practice. Implications for theory include the recognized gap of a detailed approach of the integrated standardization of service descriptions, process models and forms as well as guidelines for its operationalization and application in practice. Researchers have the methods such as business process modeling and the con-

cepts of reference models as well as the domain knowledge to design such an approach. Additionally, the set of criteria to describe standardization initiatives is a contribution itself. Implications for practice include the integrated view on standardization and the existing potentials for integration given the current heterogeneity of initiatives. As described above, the development and implementation of an integrated standardization approach can yield significant synergies such as process efficiency, certainty in legal interpretation, customer convenience and facilitated data exchange.

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