Procedure model for the conceptual planning and implementation of electronic process handling in the city of Düsseldorf

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1. Procedure model

Procedure models aim for a consistent description of the development and usage phases of information systems in business and administration. They thus also form the basis for the systematic realisation of electronic process handling of company-related services in public administrations (G2B e-services). Here the term 'process model' describes a shared-work process with the involvement of several roles and persons and their combination of methods. Regular application areas for process models are to be found in soft-ware engineering (Beck, 1999). Approaches for domain-specific process models relating to sub-areas of the Services Directive can be found in Breitenstrom & Fromm (2009). The phase focus relevant from the customer's perspective regarding the technical realisation of the electronic process handling of G2B e-services (EU Services Directive, 2006, Art. 8) is to be specified and validated in application cases; papers like this have not been published up to now.

The phase division in process models aims to break a complex overall task down in individual sub-tasks that are easier to manage. This procedure aims to facilitate an efficient planning, control and monitoring of the respective phase results and crossovers. The differentiation between the individual phases is also the requirement for the determination of the temporal and logical sequence of the individual activities. The more complex a project, the more important it is to introduce control sections and set times at which the progress, the results and the insights are assessed. The realisation of the electronic process handling of G2B e-services in the context of the Directive represents one such complexity for the domain area of public administration. An analysis of the literature shows that to date there is no process model for the electronic process handling of G2B e-services. A total of 58 process models were analysed in this regard (appendix).

Figure 1 gives an overview of the procedure model developed as part of the research work. It incorporates four phases, each with corresponding sub-activities. The proposed model is the result of an iterative development process based on the analysis of 58 process models, literature and practice reports. Against the background of the specifications for the effective provision of administration services, the concepts of an integrated product and process modelling in the procedure model gain particular importance. The implementation of the requirements regarding electronic process handling is done with regard to the project organisation and the time, activity and resource planning according to the generally accepted rules of project management with consistent documentation. Depending on the boundary parameters and individual project goals, both the sequence of sub-activities can vary and sub-steps may not be necessary at all. The phase organisation can either be structured strictly successively, or also show several phase activities to be carried out in parallel.

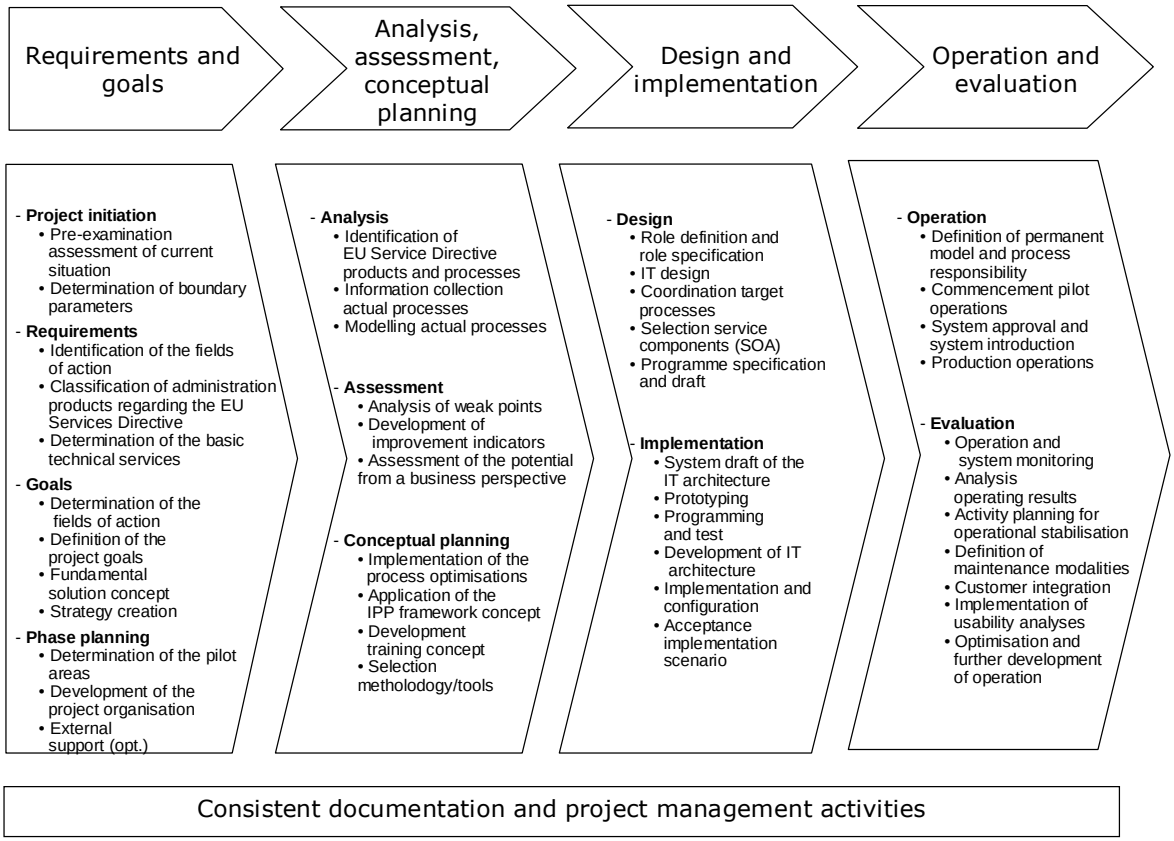

Figure 1: Procedure model for electronic process handling

The sub-activities of Phase 3 'Design and Implementation' represent the change from the conceptual planning to the DP-based process parts and activities that, as the results of the analysis and assessment phase, are to be done in future (partially) automatically as the project objective. In accordance with the setting of priorities made, the following designs are focused on Phase 3 (see also Hogrebe et al., 2010). Selection and implementation of service-based components also gains a special importance as the replacement of manual work steps with reusable component-based services offers a whole range of optimisation and synergy potentials. The working time freed up by a SOA service can thus be used, for example, to intensify consulting services for citizens and companies. The implementation covers the sub-steps via the prototyping to the technical acceptance.

2. Portal component

The IT technology structures and components described lay the basis for the design and implementation of the portal component. Based on functionally enhanced online forms that include new functionalities, such as sending, storage or a signature component in line with the results of the requirements analysis, the data are brought into a data structure for the integration in the specialist procedures connected and transmitted in encrypted form, taking into account data security and data protection guidelines. The secure return transport of the services (e.g. confirmation of the business registration) can be done via a standard e-mail client without any hardware or software using a central encryption and identification certificate. With its integration layer, the concept makes it possible to ensure other forms too in this prototypical way (if necessary, connected with different specialist procedures in the offices) and a secured electronic communication with the service provider bi-directionally. An

online pay function was also integrated. The core process was implemented as a prototype after programming and test phase and the acceptance of the specific implementation scenario. The production operations are also subject to a constant evaluation to stabilise and further develop operations.

Figure 2 outlines an example (from top left to bottom right) of the connection of a form service offered in the portal for a service provider; on the one hand, to a back-end PC of an employee in a municipal business registration centre and on the other as a transmission file to a chamber of industry and commerce that uses the data for the tasks there. With successful registration or log-in in the portal, an encrypted communication with the authority is made possible for the administration customer and metadata for the application forms are provided. The form content is enriched with SOA services and made available to the specialist procedure at the respective official workplace. Through the selected generic approach via the integration layer, it is possible to accept all formats for the import and export of data and also to forward these. In the application case, XML data are exchanged with the chamber of industry and commerce. This standard should be included in the domain of the XML data exchange formats for public organisations (XÖV, or XML in public administrations). The data communication with the tax offices is served via an EDIFACT interface (Peters, 2008). All modifications are controlled via the integration layer. This thus ensures that changes only have to be made in this layer and not in all connected (sub-) systems.

In the application case, missing electronic services (here: the 'localTaxOfficeDetermine') were already identified during the modelling of the process. Up to now, this represented a media break in the process sequence of the business registration as the address of the workplace in larger towns and cities can theoretically be assigned to five possible tax offices. In the application case, the tax office responsible was determined by searching manually in street directories, online services or other services before the introduction of technology. The determination can now be done by a SOA service automatically and also be used in other administration processes of the players with the spectrum of public sector tasks. It should be taken into account that also other specialist authorities exchange information with tax offices with different responsibilities as part of the carrying out of processes and there too the responsible tax office is still regularly determined manually. The SOA service determines the tax office by polling an existing street table with assigned tax offices. The address of the workplace can be found on the form or in the basic data of the service provider entered during registration. The SOA service can also be called up independently of the business registration process by the employees of an authority via a separate web site specially created for this purpose and thus be used in a large number of other specialist processes of the players with public sector tasks in Europe.

The integrative approach of specialist and technical modelling also systematises the identification of SOA service candidates and indicates opportunities in prototype form of implementing administration services in future through optimised administration processes in e-government offerings. The city of Düsseldorf was presented with a prize for this innovative approach as one of the top five projects in the category 'Performance Improvement in Public Service Delivery' of the 2009 European Public Sector Award (www.epsa2009.eu/).

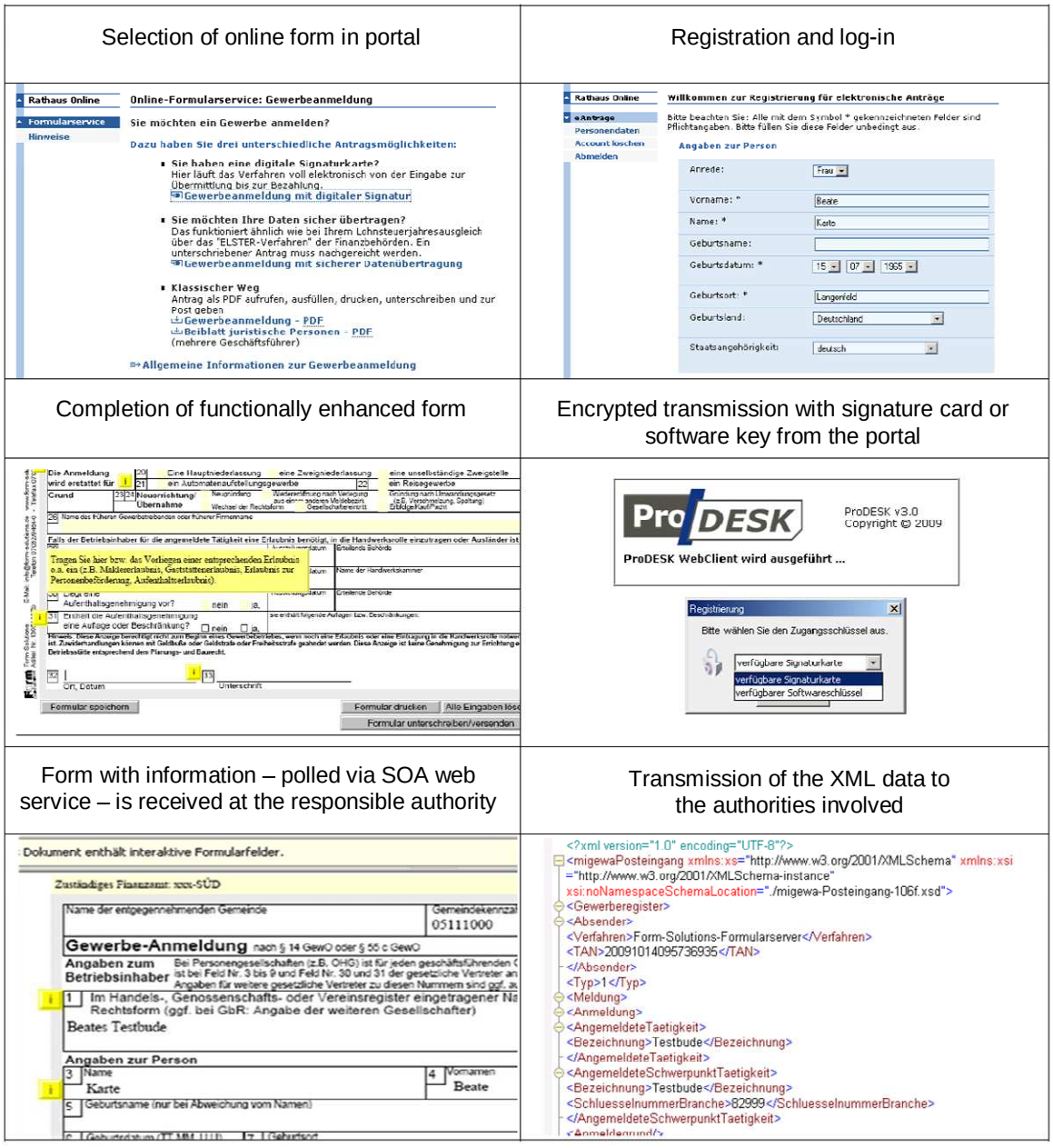

Figure 2: Connection of portal component, SOA service and back-end

3. Benefits for companies and administration

The core benefits for companies are [a] higher flexibility to access administrative services (including from afar), [b] complete transacting online (including information, registration, filing of form, permission and e-payment), [c] a faster administrative decision upon the permission than before, [d] pooling services from a company perspective and [e] reduction of bureaucratic burdens. Moreover, there are also benefits for the employees of the administration getting all data directly into the administrative procedures without writing

them manually. Those benefits are effective components for a metropolitan centre for innovative company support and for the relocation of jobs. At least, the improvement of local government services for companies strengthens the European and local economic region.

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Appendix:
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