

# Performance Measurement for E-Government Scenarios: A Reference Process Model Based Approach

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## INTRODUCTION

Due to the fact that Public Administrations (PAs) are under an increased pressure of being efficient and effective, in recent years the field of E-Government has gained importance. Successful E-Government solutions however not only focus on the usage of modern information and communication technology but also take into account the possibility for the need of a reorganization of administrative processes [1]. In this context, reference models constitute a well-proven approach to restructure administrative processes and to support the customization and implementation of corresponding IT-solutions. In case PAs base their E-Government solutions on reference models these models can furthermore be helpful in the context of establishing a performance measurement.

Thus reference models can on the one hand be located at the design and optimization level of the Business Process Management framework shown in figure 1. On the other hand they can as well be helpful on the controlling level as they may already contain basic key performance indicators (KPIs). Last but not least the implementation and customization of corresponding information technology (IT) solutions which are located on the execution level can be facilitated.

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## RAFEG

RAFEG deals with a case scenario in the domain of Plan Approval Procedures (PAPs) within the traffic environment. With the official approval of a plan as output of a PAP the area where traffic facilities are to be located is determined [3]. At the same time public decisions

necessary due to other laws are substituted by the official approval [4].

In the past four main steps which are shown in figure 2 have been conducted in order to develop the RAFEG reference process model.

At first the legal prescriptions for the PAPs have been analyzed and in a second step been modelled using Event-driven Process Chains. Thus so called “generic” models have been created. These have in the third step been used as a basis for the investigation of the as-is processes in several federal states of Germany. Taking into account the as-is processes, in the fourth step a reference process model has been constructed.

This reference process model can be used as binding element between the different levels of the Business Process Management framework shown in figure 1 and as such be the basis for a holistic performance measurement concept for PAs. The strategy level is strongly interwoven with a PA’s goals. These goals may be linked to the functions of the reference process model. By doing so the execution of the functions may on the one hand be steered by the corresponding goal. On the other hand an existing reference process model may be extended by a certain function in order to ensure the fulfilment of a special goal.

The reference process model itself is used on the design and optimization level in order to define the processes to be executed. It has at first to be adapted to the special requirements of the applying PA. After having executed the underlying processes results from the controlling level may help to further optimize the processes. Here again the reference process model can be helpful in setting up performance measurement scenarios. The KPIs defined on the strategy level may be linked with so called operational performance indicators (OPIs) which deal with what can indeed be measured when executing a certain function. These OPIs may already be included in the reference process model so that not only the process structure is predefined. The controlling level is thus supported by the reference process model as well.

Last but not least the execution level may be provided by the reference process model as it can be used to develop and customize IT-solutions to support the underlying processes. This last point is of special importance in the context of e-government.

In the next step of RAFEG a prototype will be developed, that supports the process execution for the case scenario of PAPs. At the same time the initial approach for a reference model based performance measure-

Figure 1. Business process management [2]

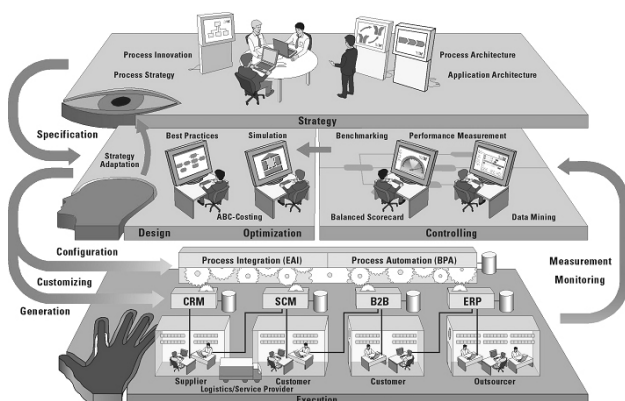


Figure 2. RAFEG – project proceeding [5]

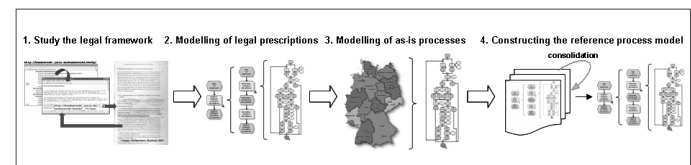
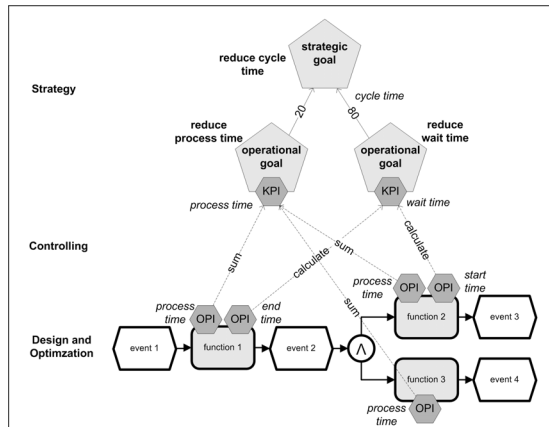


Figure 3. Performance measurement



ment concept which is presented in the next section will be further refined.

### A REFERENCE PROCESS MODEL BASED APPROACH FOR PERFORMANCE MEASUREMENT

In contrast to the more efficient designing of administrative processes, the performance measurement of these processes is an almost untouched research area. Figure 3 gives an overview on how goals of PAs may be linked with the functions of the reference process model on the one hand and with KPIs that enable a measurement of the fulfillment of the goals on the other hand.

Each PA has strategic goals. These goals are however too comprehensive to be directly connected to the reference process functions. Thus they have in a second step to be broken down to one or more operational goals. In this way goals can be linked with one another. Moreover an operational goal may support several strategic goals which will become obvious as well. A prioritisation of operational goals as far as their relevance for the fulfillment of the strategic goals is concerned or an estimation which operational goal has more potentials to be achieved has the chance to further improve the management of the relevant processes.

In order to enable a performance measurement of the administrative processes for each operational goal at least one KPI needs to be defined. The use of established KPI catalogues will support the procedure of choosing and assigning the KPIs to the goals. Other concepts like the Balanced Scorecard [6] may as well be helpful.

Having these requisites a reference process model based performance measurement may be initiated. The reference process model has in a first step to be adapted to the needs of the applying PA. Here the PA has to eliminate process steps that are not relevant or to add missing ones. Simultaneously each function may be connected with one or more operational goals. On the one hand the execution of a function may be steered by the goal. On the other hand a certain process step may only be executed in order to support a special goal (for example in order to increase customer satisfaction it may be necessary not only to start working on a request but as well to acknowledge the receipt of the request).

Subsequently for KPIs which are defined for the goals so called OPIs have to be found. These OPIs deal with what can indeed be measured on the function level. In case that for each function of the reference process model a set of possible performance indicators is provided a matching of the strategic KPIs to the OPIs or a deduction of OPIs may be facilitated.

Figure 3 contains a simplified example for the proceeding described so far. The strategic goal „reduce cycle time” is divided into the operational goals „reduce process time” and „reduce wait time”. The corresponding KPIs are „process time” and „wait time”. Naturally, for every function the process time can be determined. As a consequence in this case KPI and OPI are the same for this function. For the „wait time” however two

OPIs are needed. In our example these are the „end time” of function 1 and the „start time” of function 2. The already mentioned prioritisation of the operational goals is shown in the indices of the operational goals. Whereas the „process time” may be quite difficult to influence, the „wait time” offers more potentials to reduce the overall time. Such prioritisations nevertheless may be changed due to current performance measurement findings.

The resulting structure of the combination between functions and goals will support the customization and implementation of appropriate IT-solutions for the performance measurement of PAs. Workflow management systems can use the functions as basis for the process execution whereas the goals and corresponding KPIs and accordingly OPIs can be used to configure adequate performance measurement systems. The established relation between operational goals and functions will support the seamless integration of workflow management and performance measurement systems. The scope of the workflow management system has to be extended from the mere support of the process execution to the provision of data for the performance measurement system by extracting real-time data from the operative systems. Hence, the presented approach will support PAs in closing the often existing gap between operative and analytic information systems [7].

### SUMMARY AND OUTLOOK

Following this integrated approach all relevant points of view including strategy, business processes and IT will be considered. Thus, a holistic approach for the conceptual and technical performance measurement of administrative processes is provided. By applying this approach in practice it is possible to control the effects of newly introduced IT solutions. Especially if the operating department is involved in the customization of the IT it may as well participate in defining the measurement criteria. This will avoid that the defined criteria are not accepted later on [8].

In order to facilitate the applicability of the approach further research should try to elaborate a proceeding for a structured mapping between the KPIs and the OPIs.

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