How to Redesign Government Processes for Proactive Public Services?

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Abstract. Proactive government is a promising approach to user-friendly public services. By acting proactively instead of reacting, governments reduce the interaction effort of a public service for the user and, in doing so, increase its user-friendliness. However, implementing such proactive services in practice is challenging and requires the redesign of the according processes. For example, the data that currently is provided by the user, now has to be collected by someone else. The goal of this paper is to identify reoccurring challenges in the redesign of processes for proactive public services and to develop strategies to overcome them. We analyse business processes from nine public services and conduct ten expert interviews with practitioners. We synthesis the reoccurring challenges into three implementation dimensions and present three implementation strategies. The implementation dimensions inform the feasibility of proactive services in practice and the strategies can be used by practitioners to streamline their efforts to provide user-friendly public services.

Keywords: Proactive government · Proactive public services · Business processes

1 Introduction

In the course of digital transformation, governments aim at providing user-friendly services, i.e. public services that are not only digital but also have a high service quality [1]. To this end, concepts like "once-only", the "single digital gateway" and the "one-stop-shop" are pursued in various countries (e.g. [2]).

One approach to user-friendliness is proactive government. The approach aims at eliminating any effort for the user whatsoever, resulting in a "no-stop-shop" [3, 4]. In particular, a service from such a government is provided proactively to the user [5] and without any application or user-government interaction [6]. The approach has been implemented in practice, e.g. for child benefits in Austria [7], and declared a strategic goal of countries like estonia [4]. While the exact relation of non-interaction and service quality is yet to be understood in detail [8], proactive public services are arguably the next step for governments towards user-friendliness [9].

Although promising from a conceptional point of view and despite the successful examples from practice, the implementation of proactive services remains challenging [10]. Current public services often rely on the user's activity, e.g. to provide necessary data. When attempting to minimize those user efforts, the data that currently is provided by the user, has now to be collected by other entities. Consequently, scholars argue that proactive government requires a fundamental shift in the way government works [5] and a redesign of government processes [3].

Literature on proactive services has investigated the differences between reactive and proactive public services [5, 6, 9], and conceptualized the integration of data collection and storage in proactive governments [3]. However, according to our review of literature, there exist no guidelines on how to redesign government processes for proactive services in practice.

We address this gap by identifying the dimensions of reoccurring challenges in the redesign of processes for proactive public services and develop strategies to overcome them. To this end, we analyse process models of nine public services and conduct ten expert interviews. We synthesis three dimensions of those reoccurring challenges in the redesign of government processes for proactive public services. Namely, the service trigger, the data collection, and the process control. Based on that, we develop three strategies - internalize user activities, leverage other parties, and enable the user to outsource - to overcome these challenges. The strategies are applied to an exemplary public service to demonstrate their applicability.

The findings of this paper show that there are fundamentally different strategies to the implementation of proactive public services. We contribute to theory by informing the feasibility of proactive services in practice and provide practical guidance for organizations that want to offer proactive services.

The paper is organized as follows. After this introduction the existing literature on proactive government and business process redesign is summarized in Sect. 2. We then explain the methodology of the conducted research in Sect. 3 before we present the results in Sect. 4. The paper is concluded by a discussion of the results (Sect. 5) and final conclusions as well as an outlook (Sect. 6).

2 Theoretical Background

2.1 Proactive Government

The notion of proactivity in government is a current topic of research and is discussed from different perspectives and for different aspects [3, 5, 6, 9]. The proactive service provision by governments can be defined as delivering "a service to a citizen when a life event occurs, without the citizen having to request the service" [3]. A government that delivers proactive services is considered user-friendly and improving service quality, since it supplies a service to the user (user-centric) instead of just approving it (government-centric) [3]. Consequently, proactive services can be distinguished from non-proactive services.

In a continuous interpretation, proactivity of a service can be seen as inversely proportional to the interaction effort the has user to get the service [6]. In the spirit of this interpretation, truly proactive services are therefore non-interactive, i.e. do not require

user-government interaction from user to government whatsoever [8]. In this context, a distinction between two-way and one-way interactions can be made [9]. Whereas a two-way interaction requires an effort from the user, a one-way interaction from the government to the user, e.g. the transfer of money, causes no effort for the user and, thus, can occur even in a strictly proactive service.

The implementation of proactive services has been studied from a conceptual perspective and on a government level. Numerous authors ([3, 5, 8, 11, 12]) describe general challenges and requirements from technical and organizational perspectives. For instance, in the stage model of Scholta et al. [3] proactive service delivery affects the storage and use of data inside government. Yet, examples from practice like in Estonia show, that data integration not automatically results in proactive services [11]. While legal regulations can hinder the implementation [13], process management and use of technology enables it [3, 5, 9].

2.2   Business Processes and Business Process Redesign

Business processes and the redesign of business process are a studied field in information systems and e-government literature (e.g. [14–16]). Business processes have a clearly defined starting and end point, in between which an input is transformed by the process into an output. The transformation can be split up into process steps [17].

Literature on the redesign of Business Processes includes Business Process Change (BPC), which has its origins in Business Process Reengineering and Total Quality Management [18] and can be defined as a fundamental rethinking and radical redesign of business processes [19]. The goal of BPC is an improvement in performance and is dependent on capabilities such as project management, change management, and IT to be successful [18].

Like in the private sector, in the public sector the modelling of processes supports the comprehension of structures and dependencies and, thus, can help to understand and analyse organisational challenges (e.g. [14, 20]).While there are many similarities to the private sector, research has identified unique characteristics of BPC implementation in the public sector [16]. Examples are strategic volatility and resource forecasting. However, also in the private sector, the redesign of processes can provide benefits [21].

3   Methodology

The paper follows the methodology of design science research [22] and analyses data from a literature review, nine public service process models and ten expert interviews. In order to determine the research gap, we conducted a literature review [23] and studied the theoretical foundations on proactive government and redesign of business processes in the public sector. For the literature on proactive services we used the work of Scholta et al. [3] as a starting point; for literature on the redesign of business processes the paper by Jurisch et al. [18]. We used the results to guide the analysis of the process models and structure the expert interviews.

According to our literature review there are no clear guidelines on how to redesign government processes for proactive services in practice yet. Based on this research gap,

the goal of this paper is to design such guidelines. In order to achieve that goal we collected qualitative data from the analysis of process models from nine public services. Table 1 lists the analysed services, including their service category.

Table 1. Analyzed services.

Process ID	Public service	Service category
Process 1	Sponsorship for community services	Leisure activities
Process 2	Application for "yellow" gun ownership license	Leisure activities
Process 3	Application for "green" gun ownership license	Leisure activities
Process 4	Petition for a referendum	Leisure activities
Process 5	Visitor's tax (Tourism)	Business activities
Process 6	Proceedings of administrative fines	Law and order
Process 7	Federal grant for university studies	Education
Process 8	Formal obligation	Immigration
Process 9	Residence for work	Immigration

The process models are official modellings from the database FIM and were obtained from the so-called "FIMportal" website. The database is a project of the German government to standardize service descriptions, data schemas and process models [24]. The process models are notated in BPMN and conform to the legal regulations of the respective service. Following [8] we considered the processes through the lens of user-government interactions. I.e., we identified the interactions of each public service by selecting the BPMN arrows that cross the swim lane boundaries of the user and clustered them into interaction types. This analysis of the process models revealed 29 user-government interactions that distinguish the service from a proactive one. Based on the interaction types and by modelling proactive versions of the services, we identified three implementation dimensions for proactive services.

Based on the identified dimensions, we developed three strategies for the implementation of proactive public services with the help of 10 semi-structured expert interviews. The interviewed experts were selected for their knowledge in process and services design. Their selection also considered the different stakeholders in the implementation of new (digital) public services, i.e. IT service providers and consulting experts. We conducted the interviews from 26th June 2020 until 04th August 2020 and they lasted between 31 and 49 min. The interviews were recorded, transcribed and coded. Before coding the transcriptions were send to the expert for approval. Table 2 gives an overview over the interviewed experts and their positions.

Table 2. Conducted interviews.

Interviewee	Organisation	Position
Interviewee 1	Large municipality 1	Organization expert
Interviewee 2	Large municipality 1	Process expert
Interviewee 3	State owned IT service provider	Process expert
Interviewee 4	IT service provider	Digitalization expert
Interviewee 5	State ministry	Innovation and technology expert
Interviewee 6	Large municipality 2	Digitalization expert
Interviewee 7	State owned IT service provider	IT Systems expert
Interviewee 8	Large municipality 1	IT Systems expert
Interviewee 9	Medium municipality 1	Process expert
Interviewee 10	In-house consulting municipality 1	Strategy expert

4 Results

4.1 Reoccurring Implementation Challenges and Their Dimensions

A major user-government interaction in many public services is the application. For that reason, we describe the consequences of making a reactive public service application-free in order to illustrate the challenges in the implementation of proactive public services. In a reactive version the service, the provision is initiated by an application of the user. The application serves the purpose of triggering the service as well as providing data. This raises the question, how the service can be implemented such that the trigger and the data is not coming from the user. An example is the federal grant for university studies (Process 7) which currently requires the student to collect data about the parent's income but also about the current enrolment status and previous grants. Thus, the student has to orchestrate multiple public and private agencies to get the necessary data. Then, by applying, the student also triggers the service. In a proactive version of this service, government or another entity has to trigger the service and also organise the data collection. Given that the income data is sensitive, this extents to the question whether a central government entity should have access to all the data necessary.

Our analysis of nine process models from non-proactive services revealed 29 user-government interactions that have to be eliminated for a proactive version. Attempting to eliminate these interactions towards a proactive service creates various challenges including but not limited to the elimination of the application. While the challenges vary, the possible solutions to overcome them have similar properties. We synthesized those properties into three dimensions that reflect the central questions that have to be answered when implementing proactive service. The dimensions and their manifestations are summarized in Table 3.

Service Trigger. All nine investigated services include an application by the user. I.e., a user-government interaction to trigger the process. In a completely proactive version of the service, this trigger has to happen without the user. In the example of the federal grant

Table 3. Implementation dimensions.

Dimension	Central question	Manifestations
Service trigger	By whom is the service triggered?	User, other
Data collection	How is the data collected?	concentrated, distributed
Process control	Who is controlling the process across the involved entities?	User, other

for university, the service trigger could be triggered by the university which informs the responsible entity about new students. However, this depends on the knowledge of the university that the student is in need of a grant. The implementation of proactive public services, thus, has to consider which non-user entity has the necessary information to trigger the service.

Data Collection. In all investigated services data is supplied to the government by the user. I.e., the user serves a central data hub where the data collection is concentrated. Some data comes from the user directly, other data is collected by the user from other parties. In a proactive version of the service, this data has to be obtained without the user. In the case of the federal grant for university the data of the university can be requested by a government agency or be sent by the university automatically. The two options differ in the mode in which the data is collected: Either by a central player, e.g. the responsible government agency, in a concentrated effort. Or in a distributed way by decentral entities. The former constitutes mostly two-way, the latter one-way interactions.

Process Control. Finally, in all but one investigated services the user is in contact with more than one party in order to get the service. The orchestration of these parties is a central user effort that goes beyond the collection of data. Not only needs the data be collected but also the order of these steps needs be in the right order. In a proactive version this control of the process is not exercised by the user anymore. In the example of federal grant for university, this role can be fulfilled by the responsible government entity but also by a third party like the university or a hired company. The implementation of proactive public services, thus, has to consider which entity controls the process.

4.2 Implementation Strategies

Based on the identified dimensions, we synthesised three strategies for the implementation of proactive public services in ten expert interviews. The strategies can be seen as distinct approaches for an agency to achieve user-friendliness via proactive public services and can be used as guidelines to redesign the respective processes. They are described from the perspective of the service providing agency. In order to contrast the differences, we proceeded the descriptions of the different strategies by a description of a reactive process.

The strategies can be visualized using the three dimensions presented in the previous section (Fig. 1). A strategy constitutes the movement in the three dimensional space of

the cube into a certain sub-cube. While there is a potential fourth strategy in the back top right, this strategy was excluded by the experts for impracticability.
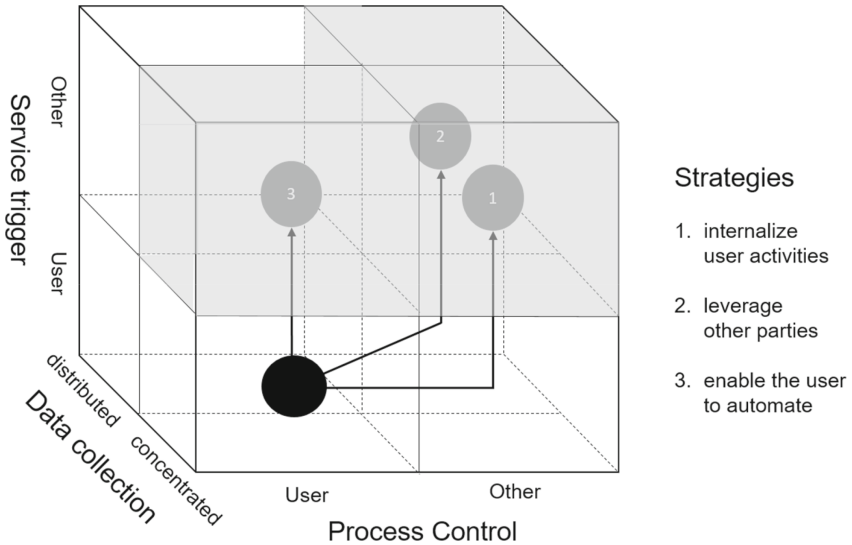
Fig. 1. Illustration of implementation strategies from proactive public services in three dimensional space using the dimensions presented above.

In reactive processes (bottom-left sub-cube in the front) the users serves as the trigger of the service, collects the data in a concentrated manner and controls the overall process. An exemplary user journey starts with the need for a service, which prompts the user to gather data, i.e. certificates from a third party. In this collection the user has to consider which data needs to be organized first and what are the dependencies between the parties that provide the data. The data is then forwarded by the user in form of an application to the responsible agency. Based on the application the service is finally provided by the service providing entity.

Strategy 1: Internalize user activities (top-right sub-cube in the front)**.** Following this strategy the service providing entity aims at taking over all activities from the user and handles them itself. In this case the activities of the user are fulfilled by the government and, thus, reducing the effort for the user. "This has to happen within the public entity itself" (Interviewee 1), e.g. "initialized by some kind of event or data condition" (Interviewee 8). I.e,, the service is triggered, the data is collected and the process is controlled by the providing entity. In the visualisation this strategy corresponds to a shift to the right and up.

Strategy 2. Leverage other parties (top-right sub-cube in the back). The service providing entity aims at leveraging third parties in taking over activities from the user. A third party can be another public entity or a trusted organisation. In this case, the activities of the user will be taken over by the third party and, thus, reduce the effort for the user. The third party triggers a service by notifying the providing entity based on an event or an information state, initiating a "whole chain of data exchange" (Interviewee

2). Also the providing entity can organize third parties to provide data that is necessary for the service provision. Finally, a third party can also orchestrate different parts of the service, e.g. initiating the provision of certificates, potentially leading to "a process network [...] which makes sure that one process triggers another" (Interviewee 10). In the visualisation this strategy corresponds to a shift to the back-right and up.

Strategy 3: Enable the user to outsource (top-left sub-cube in the front**).** The service providing entity aims at bringing the user into a position in which he or she can outsource certain activities to a trusted intermediary. The intermediary can be a person, an organization or a software like an app. The app, for example, could "manage several applications [...] and govern processes" (Interviewee 7) In this case, the activities of the user will be taken over by the intermediary "which communicates in all directions" (Interviewee 7) and, thus, reduces the effort for the user. I.e. the service trigger, the data collection, and the process control are exercised by the intermediary. In the visualisation this strategy corresponds to a shift up.

4.3   Exemplary Application

In order to demonstrate the applicability of the presented strategies we applied them to a simplified version of the service "federal grant for university". In this version the income of the parents is not required. Consequently, only the service providing entity and the university are involved. For each strategy we modelled a resulting process model. For the sake of limited space, Table 4 provides simple schematic visualizations of the resulting processes, emphasising the major interactions of the process with arrows.

Table 4. Schematic visualizations of the implementation strategies for an exemplary service.
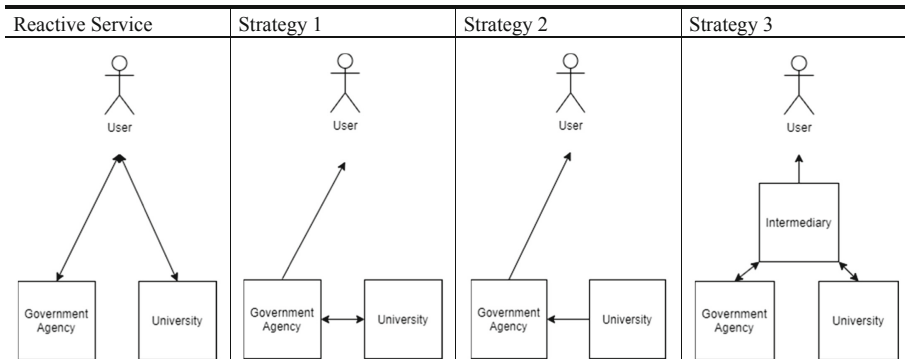
Currently, in the simplified, reactive version there are two two-way user-government interactions. The user first requests a enrolment certificate from university and then uses that certificate to apply for the grant from the agency. In both cases the user triggers the interactions and controls the process. The data is also collected by the user in a concentrated manner.

Pursuing strategy 1, the service providing agency redesigns the service such that all activities of the user are now conducted by itself. I.e. the agency has a two-way interaction with university to obtain the certificate. It then uses the certificate and provides the service to the user in a one-way interaction. Following this strategy, the service is triggered and the process is controlled by the agency. In addition, the agency also collects the data in a concentrated manner.

Pursuing strategy 2, the service providing agency redesigns the service such that the university can trigger the service by providing the enrolment certificate to the agency in a one-way interaction. The agency then uses the certificate in order to provide the service to the user in a one-way interaction. Following this strategy, the service trigger and the process control lies with lies with the university. The data collection is organized in a distributed manner, indicated by the one-way arrow.

Pursuing strategy 3, both, the service providing agency and the university, allow an intermediary to take over the activities of the user. This changes the data collection such that the intermediary instead of the user obtains the enrolment certificate in a two way interaction with the university. It then uses the certificate to apply for the grant from the agency – again in a two-way interaction. Finally, after receiving the service, the intermediary provides the service to the user in a one-way interaction. Following this strategy, the service trigger and the process control lie with the intermediary which is controlled by the user. Also, the data is collected by the intermediary in a concentrated manner.

5   Discussion

The findings of this paper show that there are fundamentally different strategies to the implementation of proactive public services. The responsible agency can take over activities from the user, but also leverage third parties or enable the user to outsource activities. Based on this insight, three remarks can be made.

First, the diversity of potential implementation strategies for proactive services is not yet reflected in theoretical conceptualizations. For example, in their investigation of differences in the conceptualization of reactive and the proactive "No-Stop" government, Scholta und Lindgren [9] stress that for the latter internet-based technology is "necessary for the government, not for the citizen" (page 6). However, outsourcing activities to an intermediary, as suggested by strategy 3, could be automated in a software-based user assistant. Thus, this approach to proactivity would use internet-technology. This is relevant for practice, since proactive government can, for instance, enable proactive services by providing application programmable interfaces (APIs), while taking over as an agency requires know how on internal process automation.

Second, proactive government does not necessarily mean a fundamental change in how government works. In the case of user outsourcing but also when leveraging third parties, the two-way interactions between the service providing agency and other parties remain the same in principle. There is only a change in the parties that the agency interacts with. Taken together this suggests that proactive services not necessarily require a proactive government. The shift from pull to push, as observed by Linders et al. [5], thus, represent only one option, and proactivity not necessarily requires a pull. This has

also implications for the redesign of business processes in practice which might not need a fundamental redesign.

Third, proactive government does not necessarily mean data integration within government or government process control. Scholta et al. argue that for proactive services government departments need to "have access to their own data and the data of all other government departments" [3]. However, when leveraging third parties or letting the user outsource, the data collection can also be decentralized or lie with the user. A practical implication of this is, that privacy concerns may be avoided. Similarly, even for proactive services, the trigger of a service can be still under the control of the user. That adds another option to the government-based trigger that literature suggests [3].

6   Conclusion and Outlook

In this paper we present strategies for the implementation of proactive public services. The strategies are based on reoccurring challenges extracted from process models and are developed in expert interviews. The strategies address the challenges from different angles and provide guidelines for practice. We contribute to theory by informing the requirements of proactive services for implementation and provide practical guidance for organizations that want to offer proactive services.

The findings of this paper have limitations that restrain their general applicability and should be met with further research. The number of analysed processes and the interviewed experts are limited in their number and originate from one country only. The findings should be evaluated in other contexts and from more experts to validate their transferability. Also, the strategies are not necessarily equally suitable and advisable for usage in practice. For example, the potentially different effects on service quality have not been studied. Potentially the trust in a service is higher when the process control lies with the user. This should be considered when applying. Finally, the strategies remain abstract and do not specify concrete implementation steps. Further research should aim at operationalizing the strategies with methods and tools for practice.

Although limitations exist, we believe that our research is valuable to both theory and practice. In particular, we hope that the presented strategies support the implementation of proactive public services and increase user-friendliness in the public sector.

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