

2000

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Recommended Citation

Bodendorf, Freimut and Saueressig, Gabriele, "Internet Based Self Service Systems for Customer Oriented Processes in Public Administration" (2000). *ECIS 2000 Proceedings*. 170.
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Internet Based Self Service Systems for Customer-Oriented Processes in Public Administration

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Self service systems in public administration can lead to a more efficient organization as well as to an improved customer orientation. The objective is to offer high-quality services and to involve the service recipient in the administrative process to a greater extent. Re-engineering public service processes is necessary to promote a shift from the supplier-dominated push principle to a demand-oriented pull principle. A self service infrastructure allows direct access to IT supported public services. The transactions between service suppliers and service recipients are based on Internet communication. A smartcard represents a powerful element to identify and authenticate the user and offers value-added functions such as data storage, data encryption or electronic payment.

I. INTRODUCTION

In recent years the need for more customer oriented services in public administration is emphasized. It is essential to increase productivity and quality of public services. But still, thinking of value chains [1] to increase quality and productivity is an exception. Self service approaches show that consistent orientation on business processes and an optimization of administrative and organisational structures may change the public administration to a modern citizen-centered service enterprise. The information technology (IT) serves as *enabling technology*, providing innovative concepts to implement new organizational structures in public administration.

The transactions between the service recipient and the service supplier are handled over the Internet. Self-service-offerings are accessed with the help of a multifunctional smart card which enables the authentication of the user and other functions, such as electronic payment.

In the following a self service approach, seen as an IT supported organization concept, is presented. It aims at satisfying the requests of the citizens as well as raising efficiency and effectivity of administrative processes. Section II represents the objectives and the underlying research methodology. Section III characterizes the self service approach and intro-

duces the IT architecture which enables customers to recall public services in a time and location independent way. Section IV shows an example of a self service application. Finally, section V highlights the benefits of this concept.

II. RESEARCH OBJECTIVES

Regarding the relationship between public administration and citizens there are two major problems to be solved. First, there are several difficulties for the citizen in the role of a passive customer who has to wait for an undefined amount of time until his request will be processed. He or she has no influence on the duration and type of process handling. Moreover, usually there is more than one institution involved to process the request. Second, there are many internal organizational weaknesses. There is a high turn-around time to handle application forms which are predominantly paper based. In addition the process flow is often very complex and there is a lot of idle time inbetween the process handling.

Self service approaches pursue complementary objectives (see Fig. 1).

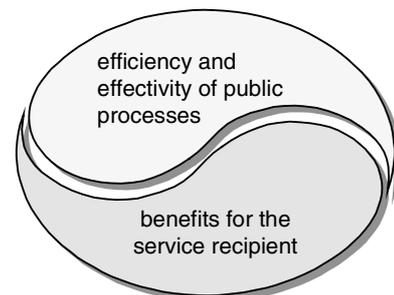


Fig. 1. Motivation for a self service approach

On the one hand self service aims at increasing the efficiency and effectivity of public processes. On the other hand self service systems can produce benefits for the service reci-

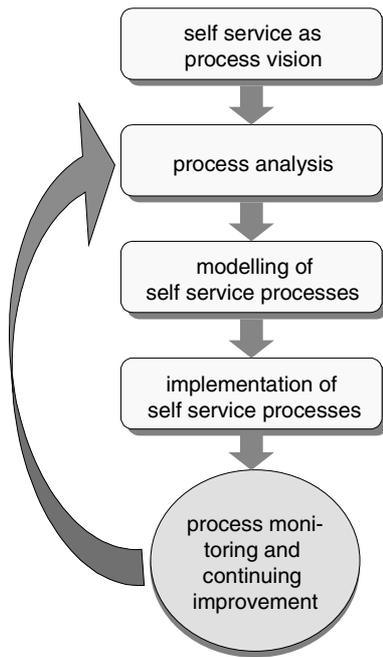


Fig. 2. Research methodology

order to find redundant and time consuming activities. This can be done by modelling self service processes. The following implementation of self service processes is closely connected to building up the necessary IT infrastructure. Finally the new self service flows must be controlled. Process monitoring is based on defined process variables, for example turn-around times of a request handling, information times etc., which are matched with defined target values. The implementation of a customer management system is suitable for permanent improvement of the benefits for the service recipient [2]. The results of the monitoring can invoke a new process analysis to find out which activities can be improved continuously.

recipient as well. Self service is aiming at an integrated service supply with a single point of access.

The research methodology integrates both process and customer-oriented aspects. The self service process vision is the starting point of a self service oriented process optimization and is an essential assumption for process analysis (see Fig. 2). Administrative processes which can be easily transferred in a self service environment must be determined. It is important to visualize process flows in

III. SELF SERVICE

A. Characteristics

A smartcard and Internet based self service concept for public administration provides methods to improve the organizational and technical support of service processes. There is a focus on the customer and thus on a stronger integration of the recipient in the service process. The customer plays an active role in the business process. This involvement reaches from simple information retrieval to complete control of service transactions.

The demand-oriented point of view replaces the supplier-oriented aspect of public services. A self service approach can show a way to switch from the supplier-dominated *push principle* to the customer-centered *pull principle*, in which the customer takes an active role by initiating, controlling and tracking his requests. This corresponds to the vision of a value chain which is pulled by the customer [3].

Reorganization of administrative processes is crucial for an effective IT implementation of self service systems. Process standardization is an important issue. The consideration of customer requirements is a central motive for business process reengineering [4]. A bundling of services may bring additional benefits for the customer. IT-based self service systems allow to bundle several services and provide a single point of service access.

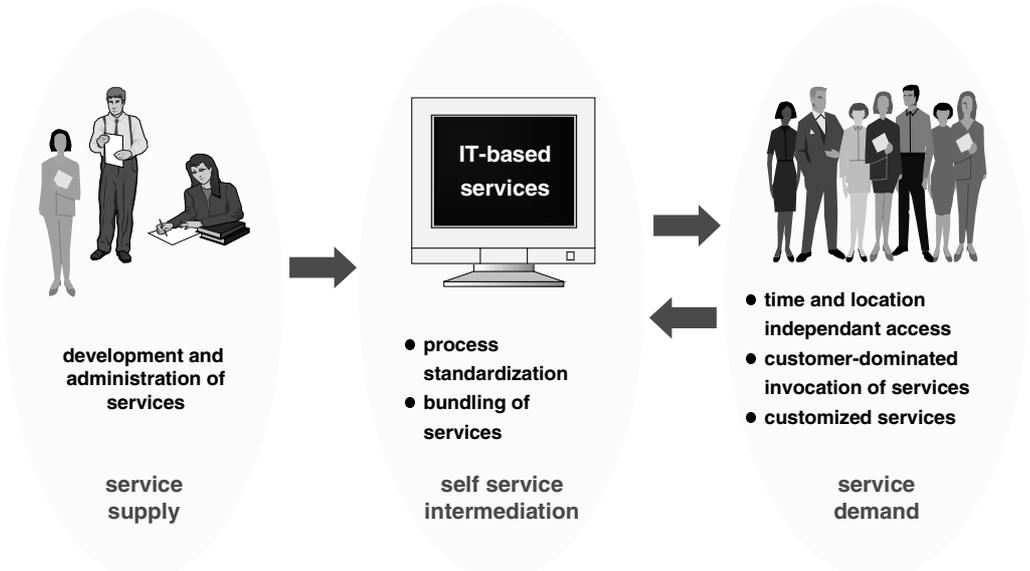


Fig 3. Self service approach

B. Self-Service-Architecture

Internet based access to public services is a basic idea for self service concepts. This leads to different consequences. The supplier must intensify the service preparation. There has to be a service potential [5] which is usable "on call". Customers needs must be anticipated and transformed into a directly usable supply system. Since services are often not homogeneous and are not able to be standardized the service preparation is particularly pretentious. In addition, a direct access to the service supply must be given. With the customer being able to access services directly, identification and authorization are necessary. Because the customer is more involved in the business process and may manipulate operational data directly, a number of additional security issues arise.

Advances in information and communication technology make it possible to master these demands to a large extent. State of the art software solutions can be deployed to create personalized automated services and easy-to-use access systems. The latter serve as a bridge between service providers and customers and can be provided with sophisticated control and security mechanisms. A self service architecture must supply a suitable access system as well as application systems which are able to handle self-service requests (see Fig. 4).

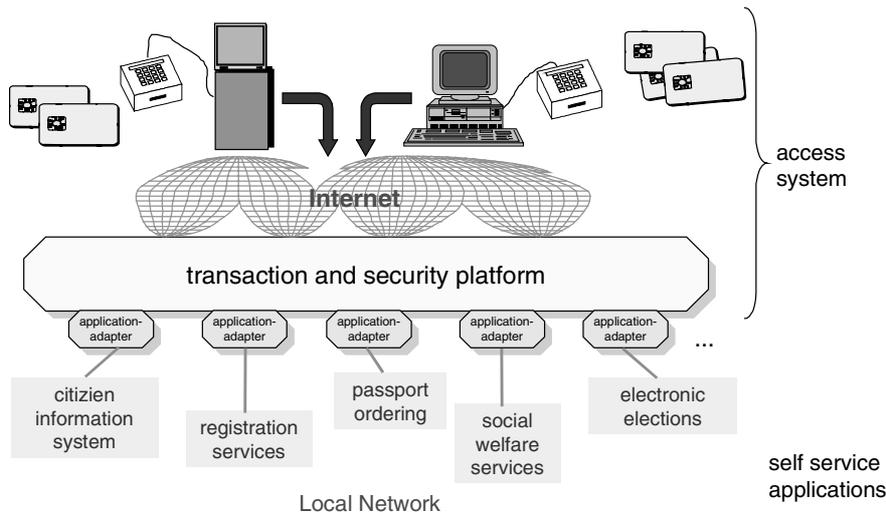


Fig. 4. Self service architecture

The user is supposed to access the services with the help of a multi-functional smartcard at a self service terminal or at a suitably equipped PC. A smartcard is a substantial component of the access system. It integrates all components of a micro-processor, a data memory (EEPROM), a random access memory (RAM) and a read-only memory (ROM) as well as its own operating system. Compared with magnetic strip cards it provides high storage capacity, high reliability as well as extensive protection and security mechanisms [6] [7]. Besides being deployed as identity card (identification and authoriza-

tion as well as storage of data), it can be used for electronic payments, for example as an electronic purse.

The transaction and security platform serves as an interface between the applications network and the open access network (Internet). This platform implements procedures for authentication of the communication partners, access authorization, generation and administration of cryptographic codes as well as for the management of the transactions securing the data communication in client/server environments.

IV. SAMPLE APPLICATION

Based on this self service architecture scenarios of public self service applications can be developed. Promising applications in public administration are found especially in public-intensive areas. The registration office is considered as one of the most public-intensive areas in public administration [8]. The information about notifiable personal data from the registration office serves as an example. Here only so-called simple information inquiries are regarded, i.e. information about names, titles and postal addresses. The access to extended information (e.g. date of birth) is allowed after prove of authentication. For an automated request of extended information over the Internet a digital signature is necessary.

The actual situation in a registration office of a medium size city (population of about 0.5 million) in Germany is characterized by approximately 400 inquiries a day, which are received in written form and must be entered manually into a data processing system (see Fig. 5). First, there is a check whether the fee was paid (e.g. by supplement of a crossed cheque). Then the inquiries are sorted and distributed for the input processing which is done by some employees of the registration office. Overnight there is a batch-search in a mainframe system. The search results are printed, sorted, enveloped and dispatched to the customer.

This process causes an enormous amount of work for the registration office. The time delay between inquiry and response is from five working days to four weeks depending on the complexity of the inquiries.

The implementation of a self service system results in an automated paperless inquiry procedure and in improved response time by providing direct access to the desired data (see Fig. 6). With the help of the access system there is a secure connection based on the secure socket layer (SSL) protocol between the client PC or a self service terminal and the server application. SSL is a de facto standard for secure TCP/IP

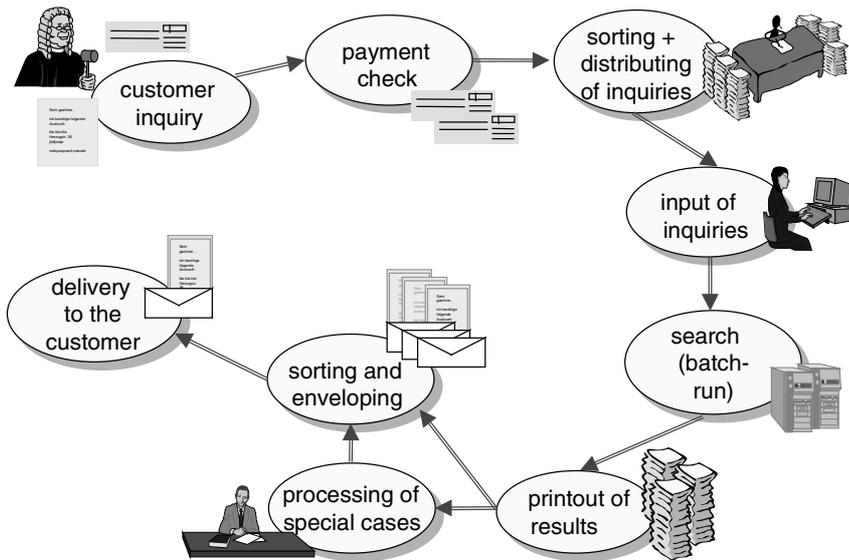


Fig. 5. Conventional inhabitant inquiry procedure

based data transmission. The electronic inquiry has to be routed through this connection to guarantee data protection. The server application handles the inquiries and checks the authorization of the customer. The inquiry fee is calculated and sent back to the customer for his approval. The payment can be deducted from the electronic purse integrated in the smart-card. Subsequently the inquiries are processed and a search routine in the inhabitants' data base is started. The results of the retrieval process are finally delivered to the customer.

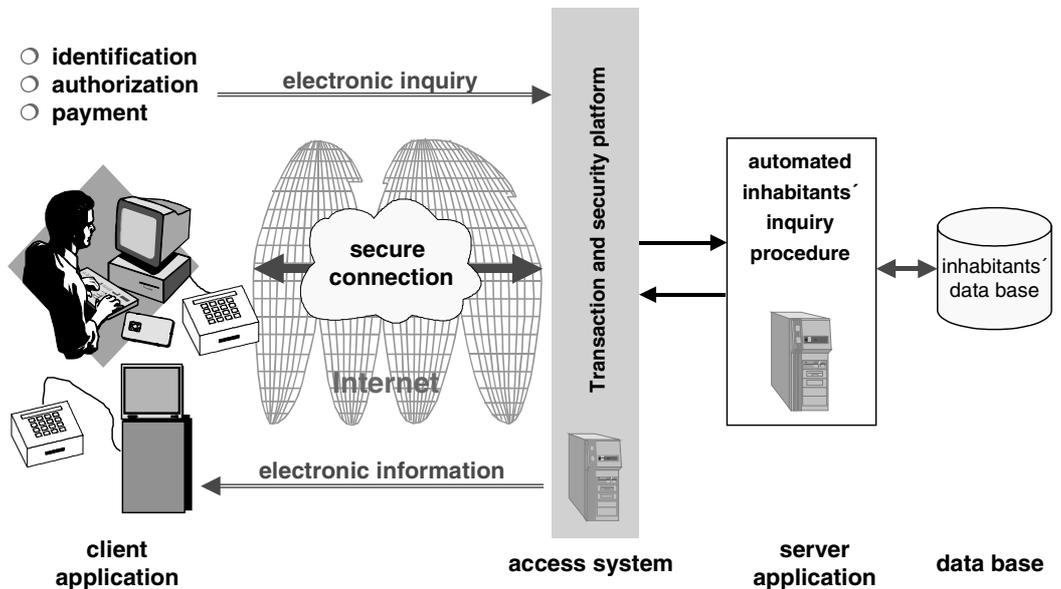


Fig. 6. Self service inquiry procedure

The user identification, the digital signature as well as the electronic payment will be integrated in a smartcard identification document. This makes it possible to handle different activities constantly in the sense of a "one-stop non-stop service".

V. CONCLUSIONS

The change of the existing order processing in public administration to smartcard and Internet based self service processes offers various advantages both for the customer as well as for the service provider (see Table I).

TABLE I.
BENEFITS FROM SELF SERVICE APPLICATIONS

For the service supplier	For the service recipient
<ul style="list-style-type: none"> • Reduced turn-around times for the service preparation • Lean business processes • Consistent service processing • Simplification of the control flow • Resource optimization • Cost savings 	<ul style="list-style-type: none"> • Direct call or faster production of the service • Time and place flexibility • Shortened period of reply • Customer driven service production • Considerably reduced waiting times • Higher availability (up to 24 hours a day and 7 days a week)

From the point of view of the service provider the most important benefit is the rationalization of the business processes. This results especially from the reduction of medium breaks and of organizational units involved. In the example 'self service inquiry procedure' the functions of the post office are void using electronic communication media. There is a strong reduction of turn-around time. The time needed for an inquiry can be reduced from between five days and four weeks to an immediate feedback coming in a few seconds. This certainly increases customer satisfaction. Besides that, by complete automation of the process manual work is set to zero and therefore costs can be saved.

The possibility of customer-centered control of self service processes brings advantages for the service recipient as well. The customer is able to integrate self service transactions into his own business processes. Using a multi-functional smartcard as access key to self service systems it is possible to replace different documents of identification and cards. Such a card can also be used as a general payment medium. Additionally applications for public transportation or authorization for parking garages, etc. can be integrated.

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