White Paper.
Enterprise Application Integration.
Interconnecting Public Sector Organisations.
In this white paper we will explain the integration needs of public authorities. We will show how Enterprise Application Integration (EAI) can make public sector organisations more service-oriented and future-proof. We will present an approach that has proven its value in several public sector projects. This approach consists of solutions and concepts, which provide a new, yet already verified view on the integration of IT solutions in the international public sector environment, with an emphasis on the European landscape.

We will discuss some of the methodologies and tools for interface management that are of particular value for the public sector. We will expand the typical view on e-government by addressing the need for open communication with a large variety of different stakeholders. This requires concepts for providing the necessary flexibility as well as taking into account the often stringent security needs.

Finally, we will elaborate on a specific example, how the Berlin Police efficiently realizes its interoperability needs with over 20 other government organisations, which all use different communication standards and technologies. Furthermore, we will explain some working scenarios for the international arena.

This white paper was prepared by T-Systems experts, Jens Kuehnast and Willem Hengeveld. T-Systems is one of Europe’s largest service providers for the public sector. A short glossary is included, as well as a concise list of references, most of which are available or can be ordered through online resources.
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1. The Management Perspective.

The European Public Sector uses information and communication technologies with more intensity than ever. There is a trend driven by policies aimed at increasing safety and security, at improving the efficiency of authorities and at offering better services to the public and the business community.

Federal, state and local governments are under pressure to perform efficiently. Despite drastic budget cuts, they are expected to provide better services for businesses and private citizens. E-government provides an answer to this challenge. By offering more and more online services, government agencies make life easier for citizens and businesses. Therefore, it is a challenge to create customer-oriented, networked administrative organisations. By employing Information and Communications Technology (ICT) solutions and skills in ways that have already proven successful in the private sector, governments attempt at increasing their service levels while at the same time keeping a close look at the budgets.

Using ICT as a means to modernise public administrations and the effort to offer improved services to citizens and businesses necessarily leads to an enhanced cooperation between public administration units.

This is even more the case when modern government organisations provide personalised on-line services for end users, also known as e-government. Citizens and businesses expect not to be confronted with repetitious requests from different government organisations. In addition, citizens and businesses have a need for transparency of the processes and possible decisions made by public authorities.

“Public-sector organisations are transforming themselves into genuine service providers.”

This requires government organisations to develop new organisational structures which give flexibility and efficiency. Entrepreneurial thinking has to find its way into a streamlined public sector, which in the end will mean: better service for everyone.

Typical applications for citizens are for example proof of identity, taxation, social security services, health care services, issuance of permits, registration services, family status certificates, etc. Furthermore, typical e-government applications for businesses include social security contributions, employment services, health and safety regulations, corporate taxes, VAT submissions, company registries, public procurement, electronic invoicing, customs declarations and many more.

Today, many of the political goals of the EU targeted at a harmonisation of its comprehensive legal framework result in an EU-wide implementation of information technology. An example is the customs cooperation in the EU that has improved customs declarations by the evolution of electronic data interchange (EDI) and subsequent cooperation programs that meet the goals of the EU Internal Market. This is also exemplified by the development of the IT systems defined in the Schengen Agreements, or those needed to allow for the liberalization of energy markets.

Many of the above-mentioned application areas already benefit from the significant interest of governments worldwide and in many cases, technology infrastructures are already established and are being used successfully in e-government transactions.
“The public sector faces special challenges.”

In their attempt to streamline and improve the organisation of the EU government and its processes, managers in the public sector are faced with challenges that are less eminent in the private sector.

- Both in the private and in the public sector flexibility is required due to changing customer needs and requirements. But in the public sector, changes are often being triggered by new or adjusted laws and regulations and these are sometimes dictated at levels different from the actual authorities, which need to implement the necessary IT means. Therefore, the processes and supporting systems need to be flexible and easily adjustable to deal with changes required by laws or by political changes and with the decisions of various stakeholders at different hierarchy levels.

- Another issue is security. The government has special requirements when it comes to securing its information, whereas on the other hand it is obliged to make its activities transparent to serve the citizens’ need for control and openness. This means that the processes and the data used in them need to be secured so that the operations of the government organisations can proceed without interruptions, and at the same time allow the control by public bodies, in particular democratically elected representations in town councils, parliaments etc. Of special nature are the information security needs of government organisations with responsibilities for public safety and security, like the police and federal investigation authorities.

- Finally, government organisations differ from business organisations in regard to their interactions with other stakeholders. The public sector needs to deal with virtually all sectors of society and therefore there is a great challenge when it comes to interoperability.

"The decisive factor for public authorities is the ability to identify the options and advantages of application integration."
2. The Technical Perspective.

The deployment of government applications and services requires the development of an integrated electronic environment for applications with regard to the exchange of government information and the access of repositories by authorized public servants and citizens. The status quo, however, shows a different picture: the exchange of information between government organisations is drastically hindered by legacy applications and various, often proprietary standards, which are not able to interact. The sheer number of stakeholders who have to co-operate in the public sector alone indicates that this is one of the greatest challenges.

In the private sector, the integration dilemma issue is actually approached by the use of Enterprise Application Integration (EAI). Attempts to make business applications interacting and make information available to the users through a single information channel can be achieved by the introduction of concepts such as the Service Oriented Architecture (SOA).

In recent years the introduction of information technologies to the public sector has matured and ICT is being used at least for the support of a few critical processes. In addition, current e-government approaches, the technological emphasis is put on information technologies that are leveraged to deliver online services and back office functionalities at the same time. But this seems to be not enough.

"Today, more and more large-scale application integrations are needed."

Today, more and more large-scale application integrations are needed to enable members of governmental organisations, be it police officers, administrators responsible for social security or embassy personnel issuing visa, to access different data and information sources in an integral way, which consistently supports the variety of information processes.

The potential of application integration for the public sector is enormous. A one-to-one take-over of the approaches used in the businesses of the private sector, however, cannot be realised for the public sector. Flexibility, security and interoperability, the already outlined special challenges characterising the public sector, require EAI to be introduced in a different way. Approaches with various middleware layers or massively adherence of public standards driven by only one authority are not always very successful, as the public sector does not face such a strong hierarchical structure as is often met in the private sector, e.g. as in a supply chain. Nevertheless, there are some practical and proven approaches that enable government organisations to realise a really high degree of interoperability, which is comparable to what is being achieved in the industry.

The establishment of interoperable government applications offering secure and interoperable services is a critical intermediary step towards such an environment. In addition Web Services and the use of interface management frameworks can further enhance the level of integration and therefore the performance of the public sector organisations.

The impact of such interoperability between government organisations depends on the technology features as well as organisational resources available. At all times it is necessary to maintain a sense of strategic vision and to keep the legal framework as a meaningful instrument to achieve the desired results of transforming public sector processes.
3. Enterprise Application Integration.

Enterprise Application Integration (EAI) is a concept for the enterprise-wide integration of business functions (services), which are spread over various applications on different platforms. This contains data and business process integration methods leaving the implementations of the single business services themselves untouched and rather coupling them loosely together.

EAI can be seen as a process-oriented integration of internal and external applications in heterogeneous IT-architectures. In contrast to a pure interface adoption, EAI offers the opportunity to implement business processes. To support this behaviour, functional interfaces will be abstracted via adapters. A connecting integration platform contains dynamic rules and process descriptions and serves a secure and reliable data transfer. The data will be given to the single services in the correct order and the results will be processed in the same way.

In the words of the Gartner Group, EAI is the “unrestricted sharing of data and business processes among any connected application or data sources in the enterprise”.

"Problems of information exchange – EAI is the solution?"

Enterprise Application Integration means increased flexibility. This becomes especially important when new business processes have to be introduced and various organisational units (internal and external) have to be involved. Usually this is achieved by using a middleware, which enables communication between applications in a standardised way. In modern concepts, like SOA, this middleware is realised by an enterprise service bus (ESB), in which the applications can offer their functionalities as services.

EAI also means increased efficiency. This is realized by the possibility to improve process efficiency through realigning the IT landscape. As the architecture of the IT-environment will become more transparent it allows for better governance models for organizing IT and service processes. This can be achieved by incorporating the existing IT landscape, built up over many years.

Of course, investments have to be considered when introducing EAI concepts, but in the end cost reductions are achieved due to a higher level of process automation, less maintenance costs and cheaper system changes. A living IT landscape is constantly changing. It is an essential need to have an architecture which is open enough to meet these changes but at the same limits the costs of changes.

In general the actual system integration is achieved by coupling applications using some kind of service bus or hub. Adapters handle the connections between the bus and the applications. The bus itself allows handling of the data, which often need to be converted into different formats to achieve interconnectivity. Furthermore, there is a need to include business logic, as the applications together shall support and automate particular business processes. When using an enterprise service bus in an SOA environment where only web services have to be connected, this business logic can be defined using a special Business Process Execution Language (BPEL), which then will be interpreted by a so-called BPEL engine. Advanced Integration Software has modelling tools for defining and configuring the current business processes across applications.

EAI in the private sector first of all is driven by the need of saving costs through increasing the process efficiency. This is forced by the big companies and global players dictating the kind and level of automation and connectivity, e.g. in their net of subsidiaries or in a supply chain. Smaller companies have to adapt to these concepts if they want to keep their status as first or second tier supplier. Therefore if highly-structured processes, which are often found in the banking, automotive or telecom sector, are predominant, extensive enterprise bus systems are prevailing. Some large software vendors provide platforms, which usually require the client to use the whole suite of one vendor to get all advantages of the respective solution (SAP, Oracle, IBM, etc.).
Such solutions require a large initial investment in software licenses, before it is possible to model and define customer specific requirements. On the other hand the advantage of such software suites lies not the least in the relatively wide-spread know-how which leads to a high (world-wide) availability of consultants or smaller third party companies specialized in customizing this software.

In the public sector the introduction of EAI is driven more by a service-oriented approach offering to the citizens and companies reliant on public authorities. To achieve this goal, government officials also need to be empowered through IT and supported with business processes which lead them through their daily work. Paper-based forms have to be replaced by IT-based transactions providing a fast information exchange. Current laws and policies have to be integrated in the processes, which have to be continuously adapted whenever necessary. Offering a comprehensive service to the citizens means also reducing the bureaucracy leading to an increasing need for integration of different governmental authorities, setting up new processes and making their systems interact respectively. Therefore the public sector requires EAI solutions offering flexibility, security and before all openness. Open standards and open source solutions mean lower initial costs and ensure independency from a single software vendor. In the end this limits overall costs as well.

Especially for public sector organisations, T-Systems has developed an open source interface management solution which may be an ideal way to handle the integration needs of authorities and to connect to other departments and stakeholders – The Interface Manager. The Interface Manager couples government organisations and their partners’ different applications, such as case administration, document management, or information systems, with existing plug-ins, and automates business processes. It connects all communication channels on one IP-based service bus. It is possible to control and manage all connections by the help of one application.

The Interface Manager framework provides error identification and incident resolution. IT-resources are used in the best possible way through component re-use and extensibility (plug-in) concepts. The Interface Manager represents a platform, operating system and protocol independent integration solution, which guarantees the safety of investments. It is a cost-effective and future-proof framework. The solution as a whole is developed with open source components, but is open to include also proprietary technologies like those of Microsoft and IBM. Operating of business critical applications will be ensured.

3.1 Introducing EAI in Public Sector organisations.

How to introduce EAI in Public Sector organisations? Based upon its experience in the public and private sector, T-Systems has actually managed one of the largest EAI projects ever performed in the world for Deutsche Telekom, one of the world’s leading telecommunications companies. The general approach usually follows the same steps and uses similar methodologies. The actual approach to be followed depends of course on the specifics of the client’s situation and business. When it comes to selecting solutions and to deciding on the final configuration every EAI project is different.

Actually, a challenge that is often faced is that of a landscape with different legacy applications in different environments each requiring their own application and systems management. Usually maintenance is time-consuming and changes are cumbersome and costly – even more so when applications are linked to every other application within the framework. As a result the users of the applications are confronted with the use of different applications and their interfaces. Therefore users are required to structure their own work processes according to the applications and not the other way round. They need to know which applications should be used at what moment. Moreover, IT Managers and IT departments have to maintain and keep many different applications alive and have to develop numerous interfaces leading to complex and risky IT environments. Another great risk is that the know-how to use and maintain this heterogeneous IT landscape often lies in the hands of only some if not a single person. If these people leave work, retire or leave office due to other reasons this know-how, often not thoroughly documented, is lost forever.
As a result of all this, the general management of a business or public sector organisation is facing a high IT budget, which sees little new added value because new business-triggered features are hard to implement. Managers feel the risk of system hick-ups and unreliability and experience that the IT-environment is not maintainable in an efficient way.

In the public sector the issues at hand are even harder. Applications come from different providers as a result of public tender procedures. Integrating these applications is often a project on its own and often not even considered. However, even in the public sector success stories exist, as we will present in the next chapter. One major improvement that EAI delivers is the promise that users have better information available for their work, and do not need to understand the IT-environment; as a matter of fact they are being offered services and guidance for doing their daily activities.

For system administrators the need to maintain applications remains. However, the architecture is simplified and thus more reliable and far simpler to maintain. Changes can be realized easier and in a more controlled and structured way.

Based upon our experience, the following roadmap for EAI can be developed:

1. Problem identification: check, where the real issues are and perform further analysis: check on IT assets (e.g. the applications) versus work processes and goals to be achieved by an integrated architecture.

2. Design a new infrastructure and a concept for its development and migration.

3. Realize the concept through configuration of selected tools and plug-ins.

4. Introduce and maintain after a roll out.

Road Map

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The structured step-by-step EAI roadmap for the public sector
3.2 Pitfalls and Risks in EAI.

EAI projects are not simple IT projects. EAI solutions must be closely dovetailed with the business processes within a company. It is no wonder then that difficulties in the implementation of an EAI project are not exclusively related to the use of complex technology or an opaque procedural model in the realization. High costs arise when the solution proposed is not in line with the existing IT infrastructure. This leads to customized development activities and rigidity when it comes to new or changed requirements for additional interfaces and connections. The problem is often caused by the fact that there has been insufficient alignment with business processes and lack of flexibility to change.

However, in the public sector the introduction of EAI, coupling applications of different government administrations is affected by different dimensions that have their influence on interoperability: At the European level, the so called EIF (European Interoperability Framework) provides a structured view on these dimensions. The EIF describes political, legal and semantic interoperability apart from the organizational and technical interoperability.

Some of the pitfalls to be watched out for, which are special to integration projects, are the following:

The political dimension clearly relates to the identification of stakeholders. When it comes to identifying stakeholders in the public sector, it is difficult to assess the way other stakeholders work, act and are organized and where one needs to co-operate with organisations that fall under different (political) responsibilities. The international dimension makes this even more complex. Political support for interoperability efforts is an absolute necessity.

Legal interoperability means for example to make sure that data coming from a governmental application of one country are also accepted in another country. In some cases this may require new legislation or even treaties; in other cases it may be enough to make agreements on data ownership and to make a technical solution that respects these. Data protection is an issue that needs to be considered in the context of data ownership. The semantic dimension involves the establishment of common sets of data structures, data elements and protocols. The stakeholders involved need to agree on meaning and format of the information to be exchanged. This often means that administrators need to align their view on the data to be exchanged. Luckily in public sector environments some of these sets are already established at national and sometimes even at international levels. Problems occur when incompatibilities show up and some of these data sets or elements need to be adjusted.

For the analysis of the data structures and the business processes it sometimes turns out that the (process and IT-landscape) analysis gets too complex and takes a lot of time, as the supporting staff lacks the necessary process knowledge and experience. Also the proposed technical concept for the integration may be excessively expensive. This is usually the case when advisors wish to propose only expensive licences for a complete rebuilt. Often no viable solution is presented as designers lack hands-on experience. EAI skills are rare and often related to proprietary products. It requires a whole set of disciplines and tools and procedures to be built up to deal with things such as capacity management and load balancing, security, change management and monitoring.

An interface management solution shall optimize the collaboration between different organisations with highly-diverse systems.
In the end, an application integration project can also fail because of a very basic issue. For example, an EAI project often does not include the necessary flexibility in planning and costing taking into account the various actors, their culture and background. Moreover, many companies fail to create sufficient acceptance for the planned measures by means of targeted communication activities towards the stakeholders.

A risk that is included in every project is the possible mismatch between expectations of the client and the offered solution and a lack of proper project management. Things become more expensive when complexity is underestimated. EAI projects spread across organisation boundaries and even across borders into different countries when business processes are integrated. Therefore, project management needs to be flexible and approaches should allow for some sort of negotiation process that everybody agrees on. Project management in the public sector requires, in addition to EAI skills dedicated competencies and understanding of the actual way that decisions in this sector are being taken.

The main pitfalls, as known from our extensive experience can be controlled by using our step by step approach. Working with an experienced supplier for the public sector one may avoid the main pitfalls outlined above.
4. EAI in the Public Sector.

4.1 A Real Working Example in the Public Sector: The Berlin Police.

It may be good to illustrate the general issue of the need for connectivity, information exchange and integration of sources with the help of an example.

The Berlin Police.

The Berlin Police comprise over 17,000 police officers. Berlin, the Capital of Germany and actually the largest city in the country has been highly successful in decreasing the crime rate to 1990 levels. At the same time the police of Berlin have been able to increase the level of solved crimes to a level higher than that of 1990. Theft decreased significantly.

The Berlin police organisation is divided into six regional districts. The state investigation bureau of Berlin performs investigations on serious crime cases in co-operation with other German police units and international organisations using modern forensic technologies.

A central directorate is responsible for the traffic management, the river police and the Berlin police academy for the education and training of the police officers. This directorate is also responsible for the information and communication infrastructure of the police force.

The Challenge.

The police forces of Berlin needed a modular and flexible IT platform for their operative daily work. They wanted to get rid of the paper-based administrational work and wanted to work more effectively and efficiently. Therefore the Berlin police needed a single IT application, which should integrate all relevant business processes of the police administration including a central process management as well as a search and information retrieval system.

In addition, the IT platform should provide an integration of various external sources and systems of other public agencies both in Berlin and in the whole of Germany as well as other European countries. The variety of external systems and sources ranges from applications for the checking of traffic violations to systems for the exchange of information on manhunts performed by international organisations such as Europol and Interpol.

T-Systems has developed an IT system for information, communication and administration on behalf of and in close collaboration with the Berlin police forces. Over a time span of five years POLIKS was designed and implemented by T-Systems based on the huge requirements catalogue of the Berlin Police forces. With a set of modern technologies and services, T-Systems ensured a future-proof, flexible, yet highly reliable solution.
Interfaces to external systems.

An important part of the POLIKS system is the Interface Manager, which is tailored to the specific demands of public agencies in Europe. As a core component of a flexible EAI platform it allows for the integration of business processes of external (legacy) systems. This way, POLIKS is connected to the police records department, to a data warehouse system and to various external applications and IT systems of police and other governmental organisations.

Connections to over 20 systems exist and allow on-line access. The central information system of the federal German police forces, the IT system of the German registration offices, the IT system of the German Department of Motor Vehicles, the IT system for research in traffic accident causes and the systems of the district public prosecution authorities are among the many important external IT systems to which links have already been established.

Additional interfaces can be easily integrated by the Interface Manager. The Interface Manager allows an easy set up of new business processes with the inclusion and help of external applications. It provides the necessary flexibility, reliability and stability of the police system POLIKS as a whole. The figure below illustrates the state of play at the editorial deadline of this white paper. The interfaces are realised with various technologies and use accepted government standards.
Not only connections to judicial organisations in Berlin or Germany have been realized, but also links to international organisations, like Europol and Interpol have been established. The next generation European police systems such as SIS II, providing information on internationally wanted persons, lost identity papers, stolen vehicles and pieces of art have just been connected at the time being.

All information can thus be provided in an integral way to the police in Berlin, whereby the police does not need to bother where to find their information. It allows the police organisation of Berlin to send updated information to the various information systems.

The data communication issues are being solved with secure IP networking. Information exchange is organized by T-Systems at the application level.

4.2 EAI in the International European Arena: Some Case Studies.

Another scenario in the public sector demanding for EAI is the exchange of information between government organisations, lacking a single responsible organisation in the lead of the process and orchestrating the services to be provided. Let's give some examples:

Employment and Social Security.

Social security provides the protection against a variety of social risks. It includes health care, provisions for incapacity for work due to disease or accidents, unemployment and pensions. Due to limited financial means, social security needs to work efficiently.

In most countries, a large number of institutions play a role in social security. The information used for the activities is quite similar for each of these institutions. One needs data that identifies the citizen concerned, data on the professional and social status, data that relate to working periods and actual wages and data concerning certain events, e.g. the occurrence of a social risk, like a disease or unemployment.

Citizens and companies are overloaded with providing information through multiple collections of the same information by several governmental bodies and are limited by the lack of re-use of the available information. This leads to a lot of avoidable contacts with citizens and companies due to multiple, uncoordinated checks by various organisations. The result is a waste of efficiency and time within the governmental bodies and higher possibilities for fraud.

In the public sector there are many stakeholders that need to co-operate and exchange information.
The image above depicts the social security sector of Belgium. Similar to the Berlin Police organisation there are again many organisations that need to co-operate. However, this scenario is a bit different: The organisations need to exchange information, but none of them is formally in the lead. In Belgium a dedicated organisation was given the task of realizing the information exchange between the different actors in the sector. Its main purpose is to diminish the paper information exchange. This has led to a total of over 500 Million messages exchanged between the actors in the social security sector in the last years. As a matter of fact, a kind of clearing house was established to fulfil this task. In other countries service providers have been invited to take up this role, like for example in Germany, where T-Systems performs such a critical role in the social security sector on behalf of the Bundesknappschaft.

The integration of the applications becomes even more complex when one introduces the international dimension in Europe. Here we have the European regulations and directives which fall into the framework of free movement of persons and should contribute towards improving their standard of living and conditions of employment.

Within the borders of the European Union it is thus necessary to guarantee the equality of treatment for the persons concerned under the different national legislations. This principle of equal treatment is of particular importance for workers who do not live in the member state where they are employed. This includes for example frontier workers.

European Countries are encouraged to use new technologies to facilitate the free movement of persons by modernizing the information flow between institutions and by the use of electronic means for this data exchange.
The Bolkestein Directive.

Another interesting example in the area of employment is the so-called Service Directive. The European Union Services Directive is intended to promote cross-border trade in services. It is an important step in promoting the implementation of a single European market. It has been in force since December 2006.

There are two key criteria that the member states have to meet: Firstly the restrictions for service providers in the internal market are to be reduced and, secondly, administration is to be simplified and procedures are to be made faster. According to the directive, in the future there must be a “single point of contact”. This institution (not an individual) must act as advisor, “guide” and process manager for the service providers in relation to the relevant authorities for the required procedures and formalities. It must provide reliable, basic information using a simple, clear and understandable language. It must also be able to provide applicants with up-to-date information about the status of their applications. It must also be possible for the service provider to handle all the processes by electronic means.

All member states have to implement the directive until the end of 2009. This includes:

- The provision of all information on the Internet
- A “single point of contact” for all formalities
- The option of electronically carrying out all procedures/formalities from start to finish.

The EU Services Directive is actually called the Bolkestein Directive, named after the famous Dutch Commissioner who was responsible for its introduction. A company or individual in one member state may provide services to individuals or companies in another country. The services can be provided without registering with the regulators of the receiving state. The Bolkestein Directive creates a need for the free flow of information across borders. Such information can be transferred via web-based, cross-border applications, but requires a reliable formal translation in a secure environment.

Actually a pilot implementation was already developed and demonstrated by T-Systems at a large international trade fair early 2008. This pilot included all main functionalities and means to handle the legal obligations that the Services Directive requires, irrespective of the particular organisational setting that is being chosen (local, regional or national, or in a PPP with public sector).

An important aspect is the single point of contact that could be developed further into a fully integrated portal with the various systems from responsible authorities. Solutions that are flexible and understand the very different nature of government applications provide the necessary means to develop such online services.

The need for interoperability of application integration is emerging in the public sector on an international level.
5. Conclusion and Outlook.

“When one considers the explosion in the volume of exchanged data that we have witnessed in recent years, it is easy to foresee that in the public sector application integration will be continuously growing.”

The importance of IT in governmental institutions is increasing. More and more government organisations use IT systems for their daily business. Today, there is a need to empower the public servants to work more effectively and there is also a need to improve the provision of services to citizens and companies. More and more on this is realized on an electronic basis. This requires the systems of the different government organisations to interconnect, to interoperate and to interwork with each other. Public administrators have to be able to efficiently use information available from other public sector organisations.

There is a growing demand for the integration of government processes and IT systems across different public sector organisations. EAI is a leading topic for government organisations due to an increasing service-orientation towards the citizens and due to the fact that governance styles increasingly orient themselves towards business practices. Therefore, not only at the regional or national level has enterprise application integration become an issue. The need for interoperability of application integration in the public sector is also emerging on an international level which can, not least, be traced back to initiatives of institutions related to the European Union.

This is why application integration is crucial for the public sector to implement a successful service strategy. To do this, it is however necessary to follow a structured path using the right technologies and tools. T-Systems provides the necessary skills and solutions for a full integration of the IT landscapes of public sector organisations.

A structured approach based on our experience in the private sector includes four steps and it was argued that the main pitfalls and hurdles can be handled in a controlled manner. This enables a continuous process of improvements with the possibility to start at small scale (and with low budget) with carefully selected pilot implementations. Nevertheless, the focus on any EAI project in the Public Sector should cope with security and flexibility requirements.

In this white paper we have described a successful method and good examples for some public sector friendly solutions. We explained how they allow the integration of different applications and have characterized requirements necessary for the public sector: flexibility, security, scalability and low costs. Examples from the public sector, including some international scenarios covering areas like security and justice, employment and social security and health care show how real Enterprise Application Integration – or should we rather say Public Sector Application Integration – can be accomplished in practical situations.

Authentication.

Verification of an alleged identity by checking credentials (after successful identification). For example, the user is checked to ascertain whether or not he is actually the person he alleges he is. The check is performed using credentials such as passwords.

Authorization.

Procedure for granting subjects (users, machines) access to objects (IT resources). In this process, rights are granted (access to IT resources is enabled) after policies and access rights have been checked.

B2B/B2G.

Business-To-Business (B2B) is a term commonly used to describe electronic data exchange transactions between businesses or institutions (Business-To-Government, B2G), resp. – especially in coherence with the support of business processes by the means of electronic communication. B2G is an important part of eGovernment (in the public sector), while B2B is part of the eBusiness (in the private business sector). For the implementation of B2B/B2G depending on the demands various technologies will be used, like portals, EDI and WebServices.

EAI.

Enterprise Application Integration (EAI) is a concept for enterprise-wide integration of business functions (services), which are spread over various applications on different platforms. This contains data and business process integration methods, while the implementation of the single business services itself keeps untouched – instead there will be loosely coupled together. Functional interfaces will be abstracted via adapters.

eGovernment.

eGovernment refers to the simplification and realization of information and communication processes and transactions within governmental institutions and between these institutions and the citizens or companies by means of Information and Communications Technology (ICT). The primary scope of eGovernment is to improve the internal efficiency of institutions and the delivery of public services.

ERP.

The term Enterprise Resource Planning describes the corporate task of deploying the resources (capital, equipment or personnel) available in a company efficiently for the purpose of the operational processes.

Interface Manager.

The Interface Manager is an EAI platform which enables institutions to connect all their business services and which manages their B2B/B2G data exchange. The Interface Manager is a reliable and comfortable software product for a time and cost efficient deployment of business processes. Organisations can define their business functions as services and combine them in any way they like. Besides conventional approaches there is also the possibility to use state-of-the-art technologies, like web Web services, e.g. for the implementation of information systems to (for) and from external applications. The Interface Manager gives support especially for a series of (German) public sector standard formats and protocols.


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