Information Technology (IT) for E-Government

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In Japan, most administrative services are scheduled to go online by the end of 2003. The two main challenges are how to establish network security and how to establish effective management of data and work-flow in the government. Privacy must be absolutely protected in on-line transactions with the government. At the same time, the administrative process of work needs to be more efficient and administrative transactions need to be more convenient. Fujitsu will offer total solutions to these challenges using our know-how of both the elemental infrastructure and the various software applications we have provided to the private sector so far. As for network security, we can provide various applications to protect networks from intrusions and damage. These applications are based on technologies such as electronic authentication. Public Key Infrastructure (PKI) is currently the most appropriate application for this purpose. For effective management, we plan to support our customers with a total package that includes XML and work-flow tools to manage data, documents, and work processes. Fujitsu is enthusiastically dealing with these challenges by drawing on its creativity and extensive experience.

1.　What is e-Government?

The Japanese government is preparing to complete the basic infrastructure for e-Government over the Internet by the end of FY 2003. Among many other advantages, e-Government will lead to a reduction in paper consumption for transactions between the government and business (G to B transactions) and between the government and the community (G to C transactions).

We have already installed some e-Government IT systems for government agencies. One of these is an Intranet for agencies called "Kasumigaseki-WAN." (Kasumigaseki is the district in Tokyo where the government offices are located.) We also have a public document exchange system and a work-flow management system operating within the agencies.

The main objective of the e-Government initiative is to expand the range of G to B and G to C transactions that are done on-line. This also includes setting up a network between the central and local governments and a system for sharing public documents among government agencies.

There are about 9000 government forms for business and the community, and it is planned that by the end of 2003 most of these forms will be processed online.

The government sector is a huge body which produces about 10% of the GDP, making it Japan's biggest service sector. If such a sector fully implements IT into their business, the impact on the private sector will be tremendous and will further propel the IT Revolution. This is one of the reasons why the government is promoting its e-Government initiative (**Figure 1**).
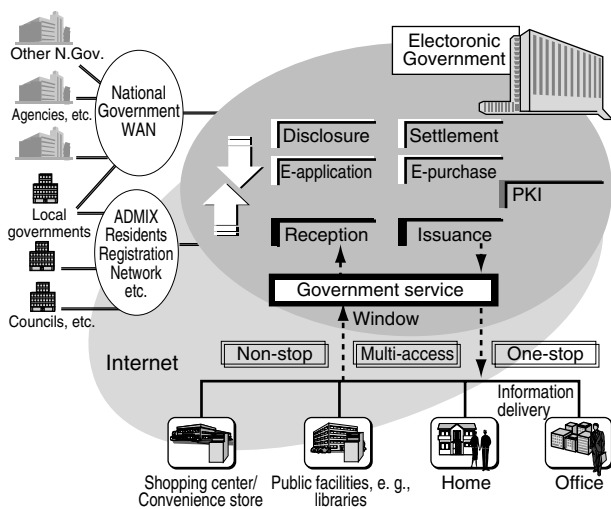
Figure 1
How EG is functioning.

2. Technical challenges in e-Government initiative

Although the planned e-Government will be based on openness to the public through the Internet, the government must also maintain the confidentiality of much of the information it possesses, for example, private information about citizens and companies. Therefore, our first priority must be to guarantee a high-level of security in e-Government.

Furthermore, IT will help to build a more effective management system for data and work flows within the government agencies ("inG transactions"), which will be indispensable for achieving a good e-Government system.

An efficient management system will enable us to reduce turn-around times and human effort and will inform its users of the status of documents. These improvements should lead to complete business process reengineering (BPR) in national and local government.

The following four kinds of elemental technologies are required to build an effective e-Government system.

- **A secure network**

This technology protects a network from wire-tapping and alteration of transmitted infor-

mation. Some cryptographic security technologies for Internet protocols are already available, for example, SSL/V3 and S/MIME, but we need to further develop the technology so that it is compatible with all the major platforms (i.e., Windows, UNIX, etc.).

- **Electronic authentication**

For the e-Government initiative to succeed, we must first provide a highly-reliable personal identification system, both for private individuals and businesses and also for government officials who handle forms and make decisions about their contents. Electronic authentication can solve this issue, and among the existing technologies, Public Key Infrastructure (PKI) is currently considered to be the best electronic authentication system for e-Government.

At the same time, additional security technologies such as certification using biometrics are being developed.

- **Extensible Markup Language (XML)**

XML is a common format language for documents and data on the Web. Unlike HTML, XML uses special tags that enable it to identify individual types of data, for example, the submission date and applicant name on an application form.

Because XML can recognize individual types of data, it is easy to use with the different data systems for forms and databases and enables us to handle data from forms and make judgments more quickly.

To achieve a broad standardization (i.e., standardization between coding conventions, operating systems, communication protocols, database schemes, XML, etc.) it is clear that we need a higher level standardization for sentence structure and the identification of different data types.

- **Work flow**

Work-flow technology is used to manage the work flow and data during the planning, execution, and evaluation stages. One of the main goals of the e-Government initiative is to build a more effective management system for the data and work flow of government agencies and to enable

on-line administration. Work-flow tools, therefore, are indispensable for e-Government. Also, work-flow technology can show an individual or organization the progress of, for example, an on-line application.

Work-flow technology is expected to develop into the basic technology for improving productivity using a network and for knowledge-management systems that support high-level intellectual work.

3. What Fujitsu is doing

3.1 Building the government digital authentication infrastructure and ensuring network security

The Japanese government is now using PKI to build a system for electronic authentication, which as we mentioned above is indispensable for putting e-Government into practice. The new system will authenticate the identity of government officials who make final decisions. Furthermore, PKI will also certify individuals and forms by mutual certification through the world's first practical bridge certification authority (bridge CA). The bridge CA will be responsible for certification within the government and for certification of private companies and citizens. Fujitsu is now cooperating with the Japanese government for certifying electronic documents with our advanced technology.

Fujitsu is now using its experience and expertise to build PKI-related systems for the government. For example, we intend to use and customize Fujitsu products such as InfoCA, Enterprise PKI Manager (EPM), and InfoDirectory and to deploy an interface between various applications and certification functions.

An important issue in realizing e-Government is to guarantee network security. Fujitsu's expert staff is now preparing to provide various security solution packages, for example, "@Secure-Vision." We provide not only the elemental systems necessary to establish network security but also a total solution, from planning the secu-

rity policy to supporting the installation of the security system and providing a secure network monitoring service. Furthermore, we will provide the full service 24 hours a day to enable round-the-clock execution of government work. We are planning to establish a government customer support center close to Kasumigaseki and make preparations so that the government can take immediate action if an emergency occurs.

3.2 Providing various software for on-line administration

Two of the goals of the e-Government initiative are to make all procedures executable on-line and to deploy a common infrastructure. In Japan, there are three principles for processing government work: 1) transactions should be done face-to-face, 2) transactions should be documented, 3) transactions should begin only on the arrival of the appropriate government form. The e-Government systems we develop must therefore satisfy these three principles.

Fujitsu will provide a solution that integrates PKI and related technologies into the traditional processes. For example, we will satisfy the principles of face-to-face transaction and documentation by providing application software for identifying people and information through digital certification. We will also offer software that meets the needs of the principle of transaction upon form arrival, for example, software that performs time stamping of application acceptance. The current laws and systems are now being reviewed, and we will be ready to offer solutions suitable for the coming changes.

3.3 Offering the e-Government solution

The Japanese administrative system consists of two parts: the central government and the approximately 3300 independent local governments at the prefecture and city levels. The e-Government initiative is mainly being promoted by the central government; however, it is inevitable that local governments will catch up with this trend

in the near future, so we must be ready to respond efficiently and effectively to their local e-Government initiatives.

To meet this challenge, we are planning to offer a total solution to our customers that consists of four hierarchical layers: the platform layer, middleware layer, application layer, and service layer. The platform layer is based on infrastructure and application packages, the middleware layer on common functionalities such as e-authentication solutions, the application layer on business oriented solutions such as e-application/registration, and the service layer on consulting services. When the e-Government process has matured, we also intend to provide all-purpose engines in the middleware layer by implementing required technologies such as XML, PKI, and the work-flow technologies.

4. Future challenges

It is crucial to consider the impact of IT on government administration. In general, we can define the new business model of the IT revolu-

tion as an innovative model in which the whole-sale markets disappear and new markets emerge.

The national e-Government projects are now trying to establish a common IT infrastructure, for example, a system for electronic authentication, which is indispensable for administering government in a network environment. However, as yet various important aspects regarding the interface between an e-Government system and the general public and businesses remain to be investigated.

To clarify these aspects, it will be especially important to propose a new administrative business model and we should also refer to the successful models which are already being used in the private sector.

The effective implementation of G to C and G to B e-Government in Japan will be difficult, and the expansion to inG and G to G processes will be a further hurdle. However, Fujitsu will use its expertise to meet these difficulties and overcome them.

Hajime Omura received the B.S. degree in Electronic Engineering from Osaka University, Osaka, Japan in 1980. He joined Fujitsu Ltd. in 1980. After working for Fujitsu Hitachi Limited (FHL) for several years, he was engaged in application system development and system support. He also has had several years' experience working on advanced information networks, R&D institution services, and system development for an information-oriented regional society. He is now working as a planning consultant for a system for electronic government and electronic administration.