

# TOSHIBA REVIEW

2001. VOL.56 NO.12

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## Special Reports I

### Technologies for Content Business

#### \*Core Technologies to Enhance Content Value

KAWADA Tsutomu

#### \*System Architecture and Core Technologies for BtoC Internet Services

MURANAGA Tetsuro YAMASHITA Katsuhiko HASEBE Koichi  
This paper describes a system architecture to provide Web-based services employing Toshiba's core technologies. This architecture enables flexible and scalable Web-based services in the rapidly changing Internet business environment.

On top of the architecture, Toshiba provides BtoC type Internet services such as the Ekimae-Tanken Club (Internet based navigation service for train passengers), and the FreshEye (information searching service). At the same time, core software components such as the train-transfer guide, map processor, natural language processor, and mobile Internet system development techniques are supplied in application service provider (ASP) form for other BtoC sites or corporate customers.

#### \*Engine for Finding Train and Airplane Transfer Sequences

KARASAKI Yukihiko HANDA Keichi SUZUKI Takahiro

The engine for finding train and airplane transfer sequences is the key component of Toshiba's route guidance service, which is one of the main services of the "Ekimae-Tanken Club", Internet-based navigation service for train passengers. The route guidance service, based on actual timetable and operation data, was realized by Toshiba for the first time in Japan in May 1997. The service provides practical guidance on the optimum course to be taken, covering the nationwide railway network consisting of about 500 lines and 9,000 stations as well as the main air routes in Japan. Timetable information is constantly updated and users can obtain the latest data from the day on which any change occurs.

To support this service, Toshiba has developed an original engine which is designed as a module that is independent from applications. We have defined a route guidance application program interface (API) to enable flexible services, such as support for various types of terminals (PCs, mobile phones, etc.) and supply of application service provider (ASP) service. The output of this engine is in the form of Extensible Markup Language (XML), allowing further extension.

#### \*Route Guidance Map Services with Point of Interest Information

KOYAMA Noriaki TANIGAWA Satohide MIKI Masaaki

Toshiba is currently providing route guidance map services with point of interest (POI) information. This paper describes our guidance map services from four perspectives: a Web software architecture achieving robust and stable operation, user interfaces enabling consumers to use the services easily, two types of application service provider (ASP) services satisfying business customers' requirements, and new technologies for browser-phone navigation.

We aim to develop new services and Web systems applying new functions of browser-phones.

#### \*Mechanism for Effective Mobile Information Services: Mobile Multi-protocol Services (MMS)

MORI Masafumi NOZUE Hiroshi MIYASHITA Motoki

This paper describes Toshiba's mobile multi-protocol services (MMS), which have been developed to provide mobile information services that require adequately laid-out information to mobile devices such as cellular phones, personal digital assistants (PDAs) and personal computers (PCs) having a wide variety of screen sizes and communication methods.

#### \*Travel Reservation Engine

KAWAKURA Yasushi NONOMURA Takuto KIZU Sachio

Hotel rooms and air tickets have distinctive features as sales products. Suppliers not only wish to sell reservations at the highest price possible but also to reduce unsold stocks. Consumers, on the other hand, not only wish to make reservations at the lowest price possible but also need to make their purchase before stocks are sold out. Unfortunately, most of the current Internet travel reservation sites do not provide sufficient benefits to consumers because they do not support such features.

Toshiba has developed travel reservation systems that can support retailers' marketing strategies. Retailers can present special rates or special plans to segmented consumers such as frequent purchasers or corporate business travelers. These systems provide merits to both suppliers and consumers.

#### \*Natural Language Processing Engines

NOGAMI Hiroyasu SUZUOKA Takashi KAJIURA Masahiro

An immense volume of digitized documents can now be accessed via the Internet. The more information there is, however, the more difficult it is for users to find the documents they really need. Natural language processing technology is required in order to alleviate this problem.

Using its highly accurate analysis technology, Toshiba has developed four key engines: information filtering, Web-page search, English-Japanese machine translation, and Internet robot. Toshiba provides services using these engines as an application service provider (ASP), including a newspaper article distribution service (NewsWatch Inc.), a Web real-time search service (FreshEye Corp.), and others. We will realize further new services in the future utilizing these technologies.

#### \*Multimedia Services on the Web

OWA Tsutomu GOTOJ Tetsuya KAWABATA Motoo

Toshiba has been providing various services over the Internet to PC and mobile Web-enabled phone users including the "Ekimae-Tanken Club" Internet-based information and guidance service (ekitan.com). Toshiba has now developed an image delivery system based on our long experience with ekitan.com. The system distributes still pictures as well as text information to multiple carriers and multiple devices. It adapts original pictures to each device according to its display capabilities such as screen size, color depth, and acceptable image file format.

Toshiba has also developed a voice-based railway timetable guidance system, which reads out the timetable for the nearest station using Toshiba's text-to-speech (TTS) technology, a map engine, and the railway timetable service. Moreover, as the first step in contents business deployment based on TTS technology, Toshiba has produced a virtual announcer system that performs lip-synced animation. Toshiba is aiming at business deployment in various fields such as the digital broadcasting industry, the Internet, the cellular phone industry, and the game industry.

## Special Reports II

### e-Government Solutions

#### \*G-EC Solutions toward the Vision of e-Japan

IKEDA Takashi

#### \*Approaches to Practical Electronic Government

MATSUSHITA Kunihiko

Electronic government and electronic local government are important elements of Japan's information technology (IT) policy. The Japanese government has prepared a number of programs and laws and is constructing bases for electronic government such as the Kasumigaseki Wide Area Network (Kasumigaseki WAN), a basic residential registers network system, a local government WAN (LWAN), government public key infrastructure (GPKI), and local government PKI (LGPKI).

Central government offices have been constructing document management-related systems, electronic application systems, and electronic procurement systems. Local governments are not only constructing such systems, but are also planning to implement common basic functions such as user management and work-flow management as their system infrastructure. They are thereby intending to improve and reform their work processes.

#### \*Software Technologies for Electronic Government Systems

ISHIZAKA Hisashi KATO Hideki SUZUKI Yoshiaki

Systems that fully utilize information technology (IT) are essential for the realization of electronic government systems, which are an important element of the e-Japan Project.

Toshiba is promoting model electronic government systems that realize improved recycling and maintenance, as well as scalability supporting not only small-scale but also large-scale systems, by adopting an integrated system architecture such as the three-tier type Webtop system and object-oriented development. We have realized electronic government systems constructed with our software technologies, including filing and work-flow technologies for an administrative document management system, and security technology based on digital signatures.

#### \*Security Technologies for Electronic Government Systems

NIWA Akito ISHIHARA Tatsuya SHIMADA Tsuyoshi

Information technology (IT) security technologies are indispensable for electronic government systems. (Without proper security countermeasures, such systems are vulnerable to various threats such as unauthorized access to application documents, illegal modification of documents, falsification of applicants' identities, and computer viruses.

Toshiba provides security technologies such as cryptography, digital signatures, public key infrastructure (PKI), granting of official seals, and system development methodologies focusing on IT security to protect systems against critical threats.

#### \*e-Application System

MIYAZAWA Tadahiko TANAKA Yasunari

The Japanese government will construct an e-application system, which will enable people to make about 10,000 types of applications online, by the year 2003 through the Millennium Project and the e-Japan Priority Policy Program. Reflecting this, local governments in Japan are also being encouraged to construct e-application systems. For e-application systems using the Internet, some issues regarding application procedures need to be considered such as applicant confirmation, fee payment methods, delivery timing, and so on. In particular, based on public key infrastructure (PKI) technology, government PKI (GPKI) and local government PKI (LGPKI) technologies are being prepared as a means of applicant confirmation.

Toshiba has been investigating the requirements and preconditions related to e-application systems together with clients since 1999, and has developed an e-application system.

#### \*Electronic Procurement and Public Works Execution Systems

OOSHIMA Susumu IINO Shigehito KUMANO Hisashi

The achievement of electronic government and electronic local government is one of the highlights of the e-Japan Priority Policy Program announced by the Japanese government. In particular, attention has been paid in recent years to continuous acquisition and life-cycle support (commerce at light speed)/electronic commerce (CALS/EC) systems, in which public works processes including planning, design, procurement, execution management, and maintenance are computerized so that information can be shared and utilized by both suppliers and public purchasers through the online network.

In the phases of procurement and execution in public works, for example, the introduction of CALS/EC makes it easy to establish an electronic bidding system, organize complex work flows sequentially, and construct an interconnected database system. CALS/EC is therefore expected to produce significant results.

#### \*Electronic Local Government System

KOGA Shigeki TORIMITSU Junko SANO Motoyasu

With the progress of the information technology (IT) revolution, which is creating dramatic changes in society and the economy, local governments are required to offer better services and to improve their work efficiency by means of IT.

Toshiba has developed an electronic local government system to meet these requirements. Composed of an electronic local government platform, an administrative document management system, and an electronic financial system, the electronic local government system enables internal office work to be processed more quickly and efficiently.

## Feature Articles

#### \*MAGNIA™ Z300 Compact and High-Performance IA Server

KOMURO Hiroshi WATAKABE Takeshi NAITO Kenichi

Toshiba has developed a new, compact and high-performance 2-way Intel architecture (IA) server called the "MAGNIA™ Z300". This computer incorporates the latest architecture, such as high-performance processors and high-capacity memories, but in half or less the space of the previous machine. It has high-reliability functions such as hot swap integrated drive electronics (IDE) and redundant arrays of independent (expensive) disks (RAID), as well as Toshiba original server management software. Moreover, it is equipped with easy setup tools and easy maintenance tools, which are a very important function of an IA server. It also supports wireless LAN and access point software, so that it is ready for the mobile-computing environment.

With these features, the MAGNIA™ Z300 is a new-concept product that responds to various needs.

#### \*Degradation and Life Diagnosis Method for Solder Joints

HISAZATO Yuji WAKAMATSU Kengo SAITO Yuji

For stable operation of industrial equipment, it is important to clarify the state of degradation of printed circuit boards, which are the main components of electric and electronic devices, and to prevent any trouble beforehand. In recent years, thermal stress at solder joints has been increasing with the increasing density and functionality of electronic parts mounted on circuit boards.

Toshiba has investigated the mechanism of degradation of solder joints by thermal fatigue, and has developed a diagnostic method using surface roughness to detect the degradation and life of such joints nondestructively.

#### \*\*"HIKARI PLASMA SENZOHO" Model GR—473K Refrigerator

SAKUMA Tsutomu OKADA Daishin HIGASHIGUCHI Keiichi

The Food Product Recycling Law was enforced in May 2001 geared toward industries related to food. In line with the increase in food storage due to the enlargement of refrigerator capacities, the reduction of waste food materials in the home in a circulation type society has become an important theme of household refrigerators.

Toshiba has developed the "HIKARI PLASMA SENZOHO" model GR—473K refrigerator with "HIKARI PLASMA," offering long-term preservation of food by ethylene gas resolution, superior deodorizing, and superior antibacterial performance, for the first time in the world. The GR—473K is also an energy-saving type refrigerator with a "3 compartment, 3 cooling system" design offering long-term preservation of food and independent control functions.

## Techno Notes

### \*Machine Translation Technology Supporting Global Communication

## Toshiba Technologies for the New Century

### \*9. Air Cleaning Device Using Plasma-Enhanced Photocatalyst