Document Management System with Consideration for Compliance and Internal Control

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The need for digitizing paper-based documents for the purpose of enhancing compliance is on the rise at financial institutions against the backdrop of an era when problems with the government pension system are being exposed and the legal application of e-documents are taking place. The loss of paper-based documents can lead to a leak of personal information, which can potentially develop into credibility problems for financial institutions by society. OKI has been offering to our numerous customers image processing systems for financial institutions (centralized systems for fund transfer processes and personal seals). OKI continues to provide solutions intended to increase the efficiency of clerical work and reduce the burden of clerical processes by utilizing our know-how related to business operations and management gained through such experiences[1].

This paper describes the "Image Vault System", a solution developed by drawing on the image processing technologies, based on the system know-how as well as operational know-how of OKI.

Requirements of financial institutions

Many customers desire requirements to "prevent the loss and soiling of documents", "reduce storage costs and storage space" and "improve customer satisfaction through speedy responses to inquiries and complaints".

(1) Prevent loss and soiling of documents

The loss of original paper documents can lead to the leaking of personal information, which can potentially significantly damage the credibility of a financial institution by society and for this reason, a mechanism to prevent such an occurrence is required. One preventative measure that can be implemented is the digitization of paper documents into electronic files. Since the process of digitizing documents into electronic files (hereinafter referred to as "entries") for the purpose of implementing such systems can present branches with a large burden and high costs, a system that minimizes this burden is desired.

(2) Reduce storage costs and storage space

Storage costs are borne by branches and the storage center (or depository) when documents are transported from individual branches to storage centers. Before forms can be shipped to the storage center the branch needs to carry out the work of binding them (sorted by individual categories) and storing them in the vaults. The work required at the storage center includes sorting materials sent in from individual branches, as well as unpacking materials that have been sorted and storing them in cabinets according to their dates. Furthermore, disposal process work is necessary for forms that have exceeded the storage period once every half year and a mechanism for reducing personnel costs relating to these work procedures is required.

It is possible to establish branches that do not require any vault facility by implementing a mechanism that renders the storage of various forms obsolete at branches. Reduced costs relating to the establishment of cashless branches and mini banks is an issue for financial institutions at the present time.

(3) Improve customer satisfaction: Speedy responses to inquiries and complaints

The storage center needs to produce the original paper documents if an audit is initiated by the tax office (investigations to collect evidence for suspected tax evasion). In such cases, labor is required to search for the relevant documents in the depository or in cabinets.

Branches provide responses to inquiries, such as verifying inter-account fund transfer request documents, as part of their work operations. At the present time, whenever an inquiry is made actual inter-account fund transfer request documents are searched and the responses are provided to customers at a later date. This method not only involves costs relating to searching for the original paper documents but the rapidness for providing responses to customers cannot be considered adequate, which means there is a lot of room for improvement.

Requirements for system

Requirements for the system based on the needs of customers, include the realization of "prevent the loss of documents through the imaging of documents", "improve efficiency for clerical processes" and "improve customer services".

(1) Prevent loss of documents through imaging of documents

Numerous financial institutions are currently sending various forms, generated at branches, to storage centers and depositories for storage. Such a method involves a load of work, which needs to be performed in order to send forms and reduce the risk of loss. Furthermore, in the unlikely event such forms become lost the financial institution loses evidence. Losses are prevented and costs relating to transportation are reduced by eliminating direct handling of the original documents, which occurs between branches and the storage center, when this procedure is replaced with the transmission of images.
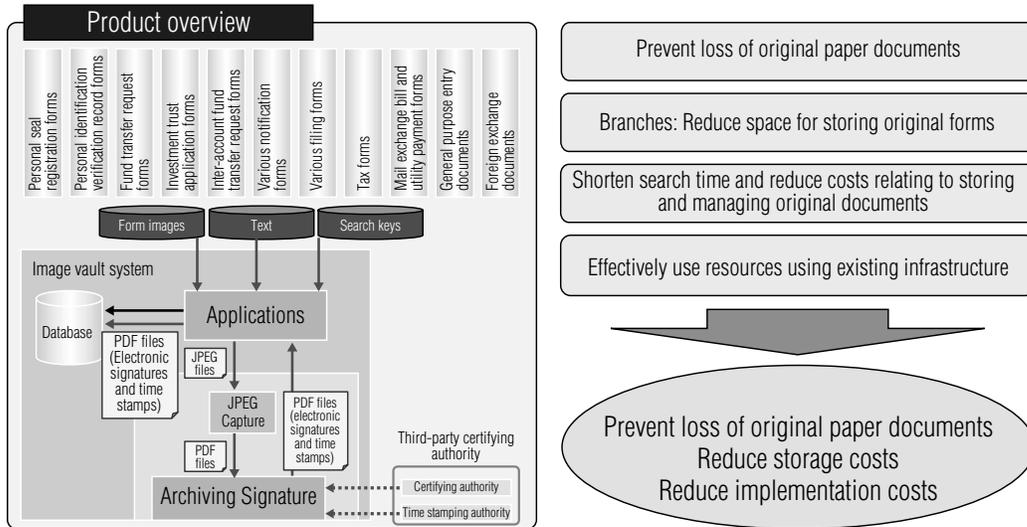
Fig. 1　Overview of image vault and benefits of implementation

(2) Improve efficiency for clerical processes

It is not enough to simply provide entry functions for storing the images of original documents to convert forms into images, but it is essential to consider a mechanism for reducing the burden of entry work through coordinated linkups with other systems. The personal seal registration system and multiple image entry system developed by OKI, for example, can be utilized to coordinate linkups between entered data with the system for converting corresponding forms into images enabling a function for storing documents. Coordinated linkups with systems developed by other companies must also be considered to enable a unified interface.

(3) Improve customer services

When inquiries are received to query documents for customers arriving at the tellers of branches or when inquiry calls are received at storage centers, stored forms must be available from the terminals at branches and storage centers in order to facilitate rapid responses without the need to search for actual paper documents. Furthermore, expandability must be secured and uniformity of the systems is required through such means as using web architecture.
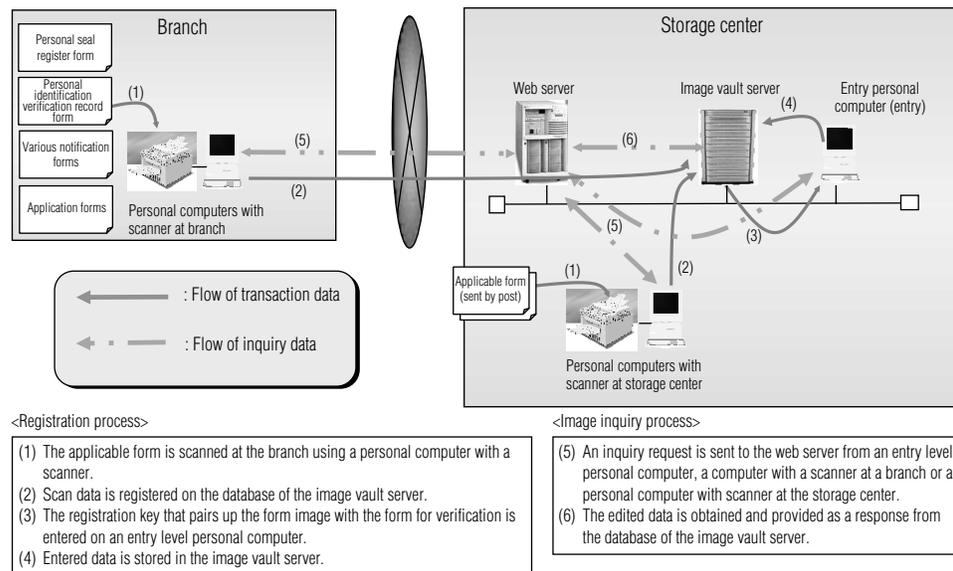

<Registration process>
(1) The applicable form is scanned at the branch using a personal computer with a scanner.
(2) Scan data is registered on the database of the image vault server.
(3) The registration key that pairs up the form image with the form for verification is entered on an entry level personal computer.
(4) Entered data is stored in the image vault server.

<Image inquiry process>
(5) An inquiry request is sent to the web server from an entry level personal computer, a computer with a scanner at a branch or a personal computer with scanner at the storage center.
(6) The edited data is obtained and provided as a response from the database of the image vault server.

Fig. 2　Overview of image vault system (entry)

Summary of system

The "Image vault system" was developed at OKI to realize such requirements. A summary of the system and the benefits of its implementation are provided in **Fig. 1**. The system can be implemented without the need to be aware of the existing environment as the interface is capable of delivering form images, text and form keys to channels entering existing forms at individual branches. Through this unified interface it becomes possible to reduce the load of entry operations at the same time.

Furthermore, by establishing client terminals for the entry of forms at the storage center where the image vault system is installed, it is possible to make entries for the image vault system even when entry systems have not yet been implemented at the branches (**Fig. 2**).

A number of functions featured in the image vault system realized by OKI are introduced herein.

Main functions of image vault system

(1) Coordinated linkups with other systems

The entered images in general are automatically registered as form images handed over by upper level channels, as shown in **Fig. 3**. In this way images can be stored without putting a burden on the operators. Upper level channels must be incorporated to match up with the OKI proprietary unified interface in order to facilitate coordinated linkups with other systems.

A function for registering such an entry directly at the image vault system is also available, when no system corresponds to the entry of the form subject to storing.

(2) Image storage and management

Storage in the database is achieved with images representing forms shown to be managed in cabinets and binders. Furthermore, a storage period is determined for each form and the corresponding data is backed up on external media at the time such a storage period expires, followed by deletion of the data from the system.

(3) Query function

The date and customer number are specified in order to display images already in storage. Queries can also be made from terminals at the branch via a network, without the installation of any dedicated software.

Even though a search key corresponding to the particular type of form is designated at the time of a query, a search function feature for narrowing down the search can also be provided.

Example 1) Personal seal registration form: Financial institution code, branch number, account type, account number and sub-account numbers can be used to specify a particular personal seal.

Example 2) Personal identification verification form: The form can be specified by entering the branch number, customer number, etc.

Since key items required for searching are divided up by categories for management, the extraction of data can be performed at high speeds even when a search is performed on all entries with a large volume of stored data containing several thousand to hundreds of millions of entries.

(4) Time stamp (option)

Time stamps can be obtained to ensure the legitimacy of documents (optional feature).

Time stamps certify that given data existed at a particular location at a particular time. A time stamping authority, which is a third-party authority, must provide the time stamp impression for the purpose of certification.
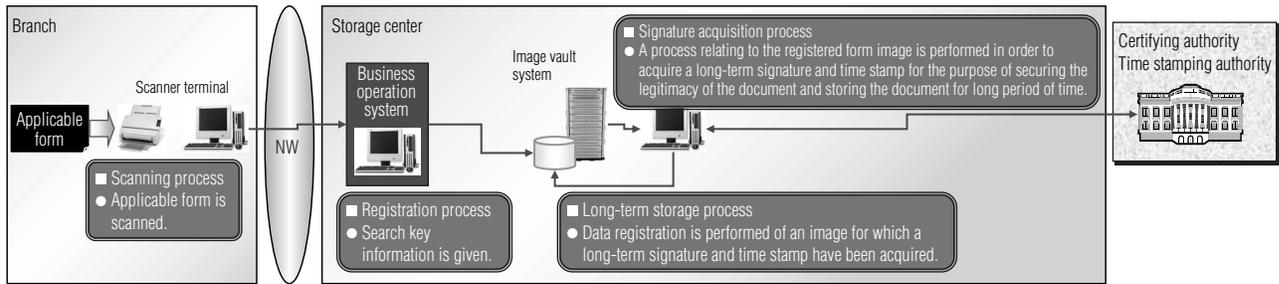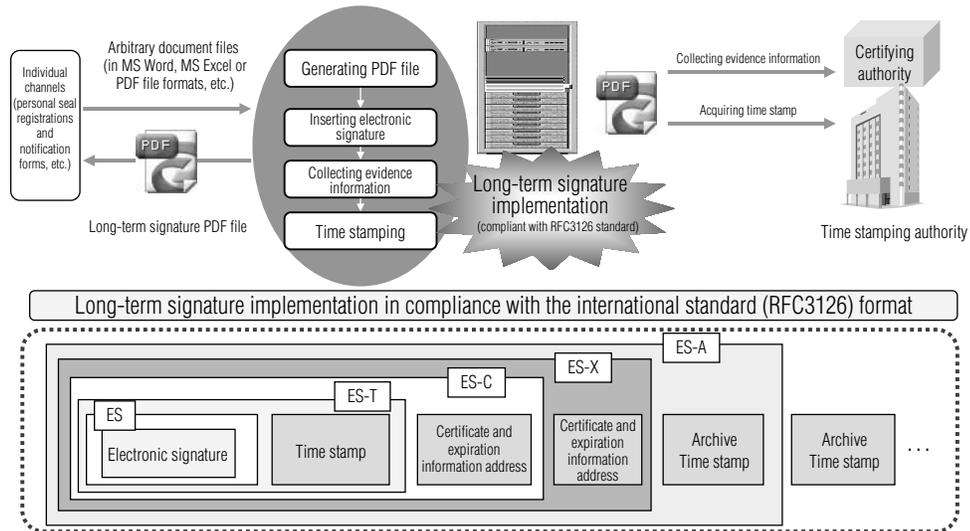

Fig. 3   Registration flow

Fig. 4   International standard (RFC3126)

① **Long-term signature**

A long-term signature has been realized through a format that is compliant with the international standard (RFC3126), shown in **Fig. 4**, also the settings can be implemented for each individual category or purpose for storing forms. The ES-A (ES with Archived validation data) format is necessary for forms requiring storage permanently.

- **Signature only: ES (Electronic Signature)**

This basic electronic signature format does not have any capability for long-term storage.

- **Time stamp: ES-T (Electronic Signature with Timestamp)**

A time stamp is assigned to an ES.

This guarantees the existence of ES data when the time stamp is issued.

- **Authentication path and expiration information: ES-X**

A digital certificate and its expiration information, which are required for the verification of prepared digital signature, have been added to ES-T. This makes tamper-proof certification possible.

- **Archive time stamp: ES-A (ES with archived validation data)**

A time stamp to guarantee that no tampering has taken place is added to the ES-T (long-term storage is certified).

② **File management method**

The management of files is realized in units of single files in a form that has long-term signature data embedded into the image data file, as shown in **Fig. 5**. A digital certificate can be verified simply by opening the applicable file to which a signature has been issued, thereby increasing the level of convenience.
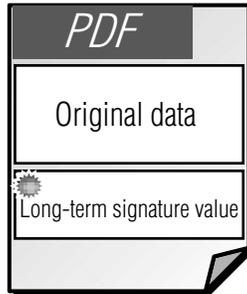
Fig. 5 File format

③ **Tamper-proof certification**

Verification for whether or not a file has been tampered with can be performed through a simple operation, as shown in **Fig. 6**. A digital certificate can be verified simply with a click.

(5) Duplication of data among disaster strategy sites (optional)

Real-time redundancy and remote backups are realized using TrueCopy (TrueCopy Remote Replication)/SR, as shown in **Fig. 7**. TrueCopy can duplicate data on two disk array units with each access to the database. When one of the disk array units (main site) becomes disabled, due to a malfunction or disaster, switchover to the other disk array unit (backup site) occurs and operation resumes and continues.

At the same time data is loaded into the SR (Sun Rise) of the main site, the same data is also loaded into the SR of the backup site, providing redundant loading and reducing the loss of data to zero.
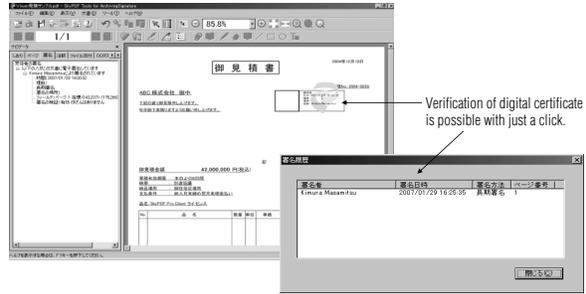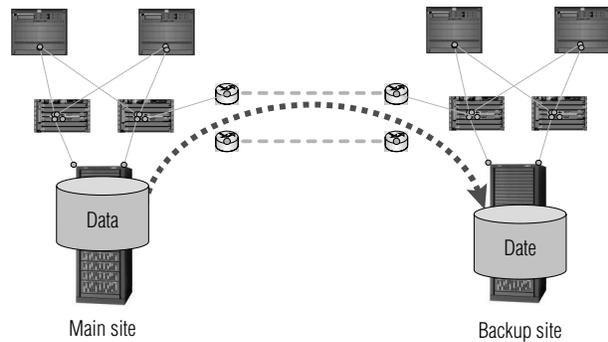
Fig. 6 Tamper-proof certification

Fig. 7 TrueCopy/SR configuration example

Conclusion

This paper introduced features of a file management system that uses image processing technologies. Methods that utilize this system will be proposed in the future as a system add-on that can be implemented at an affordable price to users who have already implemented collection and distribution servers. It is our intent to contribute to the overall financial institutions by providing systems that are really wanted by capturing the needs of corporate organizations that actually utilize such systems.

References

1) Tsuda: "Integrated Image Processing Solution", OKI Technical Review, Issue 191, Volume 69, Number 3, pages 91 to 101; July 2002.

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